

# **Terms of Reference (TOR) for Package -1 (Bhopal) under (49377-IND) Madhya Pradesh District Roads II Sector Project (MPDRIISP)**

## **1. BACKGROUND**

### **1.1 Introduction**

The Government of India has applied for financial assistance from the Asian Development Bank (ADB) towards the cost of the proposed Madhya Pradesh District Roads II Sector Project (MPDRIISP) aims to improve about 1550 km of priority district road sections in Madhya Pradesh state of India.

Madhya Pradesh Road Development Corporation Ltd. (MPRDC), a company fully owned by Govt. of Madhya Pradesh has been entrusted with the responsibility of Widening and Re-construction of Major District Roads (MDRs) under MPDRIISP. These Terms of Reference (TOR) broadly define the services required of the consultant who is to be engaged to assist the Madhya Pradesh Road Development Corporation Ltd. in the implementation of the afore mentioned Project. The Project is being considered for financing by the Asian Development Bank (ADB).

The Consultants shall be engaged under three packages namely Package - 1 (Bhopal), Package-2: (Jabalpur) and Package-3: (Rewa).

Package – 1 (Bhopal) consists 5 Civil Work Contracts. This Package involves Widening and Reconstruction of about 321.08 Km of selected district roads in Madhya Pradesh. The input of International Experts is about 23 person months while the National Experts (including non key experts) is estimated to be 1152 person-months. The estimated cost is about US\$ 3.35 Million for this consultancy package.

Package – 2 (Jabalpur) consists 9 Civil Work Contracts. This Package involves Widening and Reconstruction of about 658.60 Km of selected district roads in Madhya Pradesh. The input of International Experts is about 26 person months while the National Experts (including non key experts) is estimated to be 2202 person-months. The estimated cost is about US\$ 4.88 Million for this consultancy package.

Package – 3 (Rewa) consists 6 Civil Work Contracts. This Package involves Widening and Reconstruction of about 552.53 Km of selected district roads in Madhya Pradesh. The input of International Experts is about 26 person months while the National Experts (including non key experts) is estimated to be 2085 person-months. The estimated cost is about US\$ 4.46 Million for this consultancy package.

The roads and the key/non key personnel mentioned in this Terms of Reference are subject to the approval of Asian Development Bank.

## 2. OBJECTIVE

MPRDC now invites Expression of Interest (EOI) for all the three Consultancy Packages separately from eligible consulting firms for the said assignment. Only the firms from the ADB member countries are eligible for submitting EOIs. A firm can apply for more than one Consultancy Package, but the firm will be awarded only one Consultancy Package. However, this Terms of Reference is issued for **Package -1 (Bhopal)**.

The objective of the proposed consultancy services is to assist the MPRDC to implement the subproject works in the State by:

- i. Ensuring high standards of quality assurance in the execution of work and completion of work within stipulated time limit. Consultant will be specially responsible for quality and timely completion;
- ii. Comprehensive supervising project implementation activities carried out by the Contractor(s) to ensure complete compliance with the drawings, technical specifications and various stipulation contained in the Contract Documents;
- iii. Efficiently supervising the construction by deploying personnel who are experienced in modern methodology of construction supervision and contract management;
- iv. Proper management of civil works contracts as "the Engineer" in terms of civil works contract;
- v. Comprehensive supervision of project implementation activities carried out by the contractors to ensure compliance with the drawings, technical specifications and various stipulations contained in the Contract Documents, with high standards of quality assurance in supervision and in the execution of work; and
- vi. Training MPRDC staff in managing the contracts.

## 3. Contract Management Framework

The civil construction contract will be based on the FIDIC MDB June 2010 version (hereafter referred to as FIDIC) with appropriate amendments to incorporate local requirements.

MPRDC will administer the project as "the Employer".

MPRDC will nominate a senior officer, who will act as "Employer's Representative." Substitution of key professional staff and C.V.'s of junior staff of the consultant shall be approved by this officer in MPRDC.

The construction supervision consultant (CSC) will act as "the Engineer" under FIDIC for the contract. The CSC will make the necessary measurements and ensure the quality of work. The CSC shall make all engineering decisions required during the

implementation of the Contract. However, the CSC shall seek prior approval of the Employer with regard to the following:

- Issuing the order to commence the works;
- Issuing/approving variation orders in quantities exceeding 10% of the individual BOQ items or aggregate variation exceeding 5% of the contract value with financial implications;
- Issuing/approving variation orders for non BOQ items which have financial implications ; except in an emergency situation as reasonably determined by the CSC
- Sanction of additional items, sums or costs and variations of rates and price including fixation of new rates;
- Approval of subletting of any part of works;
- Approval of any extension of contractual time limits;
- Stopping and/or termination of the Contract of works;
- Where this TOR or the Civil construction contract conditions require to do so;

The CSC will be a firm of consultants. The firm's full time Director will be "the Engineer." The CSC designates its Team Leader as the Engineer's Representative, who shall act on all matters pertaining to the Engineer's Representative. However, the Consultant's firm shall be responsible for all actions taken by its Team Leader, and his team.

## **4. Scope of Consulting Services**

4.1 The scope of consulting services will include, but not necessarily be limited to the following:

1. Act as the 'Engineer' in terms of civil works contract to the extent of the delegation given;
2. Assist the Employer in contract administration and management of the project and the civil works contract;
3. Interpretation of the Technical Specifications and Contract Documents;
4. Review designs, drawings, BOQ provisions and specification with respect to actual site conditions and suggest modifications, if required or deemed appropriate. Any realignment, redesign/modification, any additional design of bridge desired for completion of the project will be done by CSC and related approvals from concerned authorities will be obtained by the CSC without any

extra cost including remuneration of personnel, equipment, software and office supplies;

5. Conduct road safety audit during construction and pre-opening of road for traffic;
6. Review and ensure conformity of contractor's securities in approved formats and ensure validity of these securities;
7. Ensure requisite insurances have been received and they comply with the requirements of the contract;
8. Review compliance with the documentation and advance actions requirements, including securing of all statutory clearances and permits or handing over of site, and advise on issuing the notice to set the Commencement Date;
9. Ensure the contractor effects and implements a system for the quality assurance of the works. The system of control of quality of materials and completed works shall also include sampling methods and criteria and acceptance criteria. The sampling methods and the acceptance criteria shall be based on statistical methods and the recommendations of the relevant IRC and MORTH/IS publications (as applicable) and international practices;
10. Scrutinize the contractor's detailed work programme, suggest modifications, if any, to the programme after a careful study and ensure the contractor complies with the programme;
11. Scrutinize and/or review contractor's superintendence, personnel and suggest modifications, if any;
12. Scrutinize the contractor's mobilization of the Contractor's Equipment to ensure the nominated plant and equipment is delivered to the site in accordance with the contractor's programme and that permits where necessary are obtained in a timely manner;
13. Scrutinize the construction methods proposed by the contractor for carrying out the works to ensure that these are satisfactory with particular reference to the technical requirements, project implementation schedule and environmental aspects as well as safety of works, personnel and the general public;
14. Review the horizontal and vertical alignment for the roads based on review of tender drawings and the topographic survey carried out by the contractor. This work will include if required, amending the DPR alignment plan and profile drawings based on the updated topographic surveys;
15. Issue of finalized or revised 'Good for Construction' drawings and prepare and provide additional detailed drawings, if and as necessary, including drainage (inclusive of drainage scheme through the built-up areas), junctions, road signs and markings, safety measures, km stones, protection works etc. based on the contractor's survey and setting out;

16. Ensure all bridge details are complete and modify the design and drawings wherever required due to founding level as a result of the change in the founding strata or any other reason at the time of execution;
17. Scrutinize and approve the Contractor's working drawings based on survey setting out details, and drawings for temporary works, as required under the contract;
18. Carry out detailed checking and verification of the setting-out data for the work including lines, levels and layout to ensure conformity with the working drawings;
19. Carry out supervision of all works as per approved method statements of various items of work and ensure proper supervision as per requirement;
20. Examine Contractor's preparation and the completed portion of work as per 'requests for inspection' and promptly advise the contractor;
21. Monitor closely and regularly the progress of work and advise the contractor about corrective measures;
22. Carry out regular inspection of the contractor's equipment, plant, machinery, installations, housing and medical facilities etc. and ensure they are adequate and are in accordance with the terms and conditions of the contract;
23. Direct the contractor to carry out all such works or to do all such things as may be necessary to avoid or to reduce the risk in case of any emergency affecting the safety of life or of the works or of the adjoining property and advise the Employer thereof as soon thereafter as is reasonably practicable;
24. Supervise the Contractor in all matters concerning safety and care of the work including environmental aspects and labour welfare;
25. Witness sampling and testing being carried out by staff of the Contractor and undertake additional audit tests as necessary to ensure the quality of works and promptly inform the contractor of the results;
26. Review the test results/certificates of all construction materials and/or sources of materials and undertake additional tests as necessary to assess the quality of works;
27. Review all mix designs proposed by the contractors and approve/suggest modifications in the mix design, laying methods, sampling and testing procedure, and quality control measures, to ensure required standard and consistency in quality at the commencement of items;
28. Maintain a permanent record of all tests carried out for monitoring the quality of works;
29. Prepare updated and additional drawings as required during the contract period and supply to the contractor in time;

30. Measurement of quantities and certification, recording of measurements; verify, certify and issue interim and final payment certificate of the contractor based on the conditions of the contract/approval of employer;
31. Examine the requests for advances and monthly statements of contractors;
32. Support the MPRDC in matters relating to land acquisition and resettlement including updating the Resettlement Plan, monitoring the implementation of the resettlement plan and providing expert advice in all matters relating to acquisition and resettlement which include, but not necessarily limited to, the following activities:
  - (i) Review results of internal monitoring and verify claims through random checking at the field level to assess whether resettlement objectives have been generally met. Involve the affected people and the community groups in assessing the impact of land acquisition for monitoring and evaluation purposes.
  - (ii) Identify the strengths and weaknesses of the resettlement objectives and approaches, implementation strategies and suggest corrective action plans.
  - (iii) Review and verify the progress in land acquisition/ resettlement implementation and prepare monthly and semi-annual monitoring reports for the EA and ADB respectively.
  - (iv) Evaluate and assess the adequacy of compensation given to the affected persons and the livelihood opportunities and incomes as well as the quality of life of the affected persons after the project induced changes.
  - (v) Evaluate and assess the adequacy and effectiveness of the consultative process with the affected persons, particularly those who are vulnerable, especially women, including the adequacy and effectiveness of the grievance redressal mechanism and procedures available to the affected persons and dissemination of information about these.
  - (vi) Advise the EA on safeguard compliance issues and if necessary a corrective action plan will be prepared to address such issues.
33. Assist MPRDC in arranging the relocation of services including providing plans of the location of all services if not shown in sufficient detail on the existing plans, preparing correspondence for the MPRDC, arranging meetings and generally ensuring that the MPRDC is meeting the deadlines necessary to avoid delay claims from the Contractor;
34. Maintain a permanent record of all measurements for the work quantities to be paid for and of all payments made;
35. Prepare monthly reports fully describing the progress of works including implementation of environment, social and resettlement safeguard requirements

and the services rendered by the Consultant during the month under review, indicating also the problem areas and action required to overcome them;

36. Prepare Financial Statements;
37. Maintain a day-to-day diary recording all events relevant to the works;
38. Review and approve 'as-built' drawings prepared by the contractor and maintain records of all test data and results and also certify "as constructed" drawings for each component of the works furnished by the contractor;
39. Inspect the works on completion of the milestone before accepting the work and indicate to Project Manager/Nodal Officer any outstanding work to be carried out by the contractor before issuing a milestone certificate;
40. Inspect the works on completion of the milestone for the whole of the Permanent Works before accepting the work and indicate to Project Manager/Nodal Officer any outstanding work to be carried out by the contractor before issuing the milestone certificate or during the Defects Notification Period for the Permanent Works;
41. Inspect the works at appropriate intervals during the Defect Notification Period for the Permanent Works (to the extent of the duration of the services) and advise the MPRDC on remedial works, if any;
42. Review the IEE report and update the Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMOP) in accordance with the details given in the Appendix;
43. Ensure the contractor implements the EMP;
44. Conduct coordination and training workshops on roles and responsibilities on EMP and EMOP implementation;
45. Prepare Environmental Monitoring reports based on the EMP monitoring and EMOP implementation activities as given in the Appendix to be submitted to ADB (Once a year atleast);
46. Monitor the status of the contractor's compliance with HIV/AIDS provisions in the Civil Works Contracts;
47. Operate a quantitative and qualitative project performance monitoring system (PPMS) in consultation with ADB and to monitor and evaluate the performance of the project in relation to its goals, purposes and outputs. Carry out baseline surveys to collect baseline values with reference to the methodology developed under another study. The baseline values to be collected include, but not limited to, the followings; (a) traffic volumes and journey times, (b) freight tariffs and bus fares, (c) environment and social impact indicators, (d) socio – economic indicators and (e) social and poverty reduction impact indicators. Implementation and evaluation monitoring indicators would be measured at necessary agreed frequency during the project. Measurements of these indicators, together with relevant comments would be included in the Quarterly Progress reports and the Final Completion report; and

48. Assist the MPRDC staff to carry out all of the duties as defined above as they apply to the Maintenance Works Contracts until the completion of the services while simultaneously training the MPRDC staff to undertake all of these duties.
49. Assist MPRDC in respect of contractor's claims and other matters.
50. Assist MPRDC in preparing the reply with respect to the arbitration, the appeal of arbitration or litigation related to the work, whenever required.
51. Make online entries on the MIS system of MPRDC.
52. Provide services of any other specialist (not listed in the contract), as may be required and authorized by MPRDC, at the rate established in the Construction Supervision Contract or as mutually agreed upon.

## **5. OTHER RELEVANT INFORMATION**

- 1 The detailed engineering for the work has been presented in the Detailed Project Reports (DPRs) for each contract package, prepared generally in accordance with the Indian Roads Congress standards, by the consultants engaged by MPRDC.
- 2 The DPRs contain drawings which are deemed 'Good for Construction' except where modification is required to adapt to on site conditions.
- 3 The Specifications are based on the latest edition of the Ministry of Shipping, Road Transport and Highways (MORTH) Specifications for Roads and Bridge Works.

## **6. MEASUREMENT OF QUANTITIES AND CERTIFICATION TO CONTRACTOR**

The CSC must ensure that all the levels and detailed measurements required to arrive quantities of items are recorded in Measurement Book.

If CSC wants to use any software for working out the quantities of area or volume, such software/computer programme shall be got approved from the Employer prior to its use. Nevertheless, recording of detailed measurements in the Measurement Book is necessary even when software is used by the CSC. In any circumstances standard mode of measurement as given under MORTH specifications shall not be deviated.

The CSC will process interim and final payments certificates for the contractor's work in accordance with contract of the civil works contractor. Interim monthly payments shall be based on interim payment certificates processed by the CSC on the basis of statements filed by the Contractor. The CSC should ensure that all the deductions are made as per the Contract provisions before recommending the interim payment certificate. The CSC will be liable to pay the Contractors' claims on account of delay in payment of interim payment certificate due to recommending of ineligible payments or not proposing of eligible recoveries/ deductions. In processing contractual certificates, the Team Leader of the CSC will certify that he has checked atleast 10% of the measurements and quality control tests. The Resident Engineer checks and certifies 50% of the measurements and quality control tests, while the Assistant Resident Engineer checks and certifies 100% of



the measurements and quality control tests. The Team Leader shall intimate the details of these check tests to the Project Manager/Nodal Officer before undertaking them, so that the Project Manager/Nodal Officer could associate, if they wish to do so. The Consultant or any of his concerned experts shall do the repeat tests or measurements, if directed by the Project Manager/Nodal Officer In-Charge of the construction package, in the presence of the same or any of his delegated representatives. In case of any conflict the Consultant may do the test check in the presence of the Project Manager/Nodal Officer In-Charge limited to 5% of total measurement/quality control tests.

## **7. EXPECTED INPUTS**

The implementation of "**Madhya Pradesh District Roads II Sector Project is organised under 20 Construction Packages in Three consultancy Services viz. Package – 1 (Bhopal), Package - 2 (Jabalpur) and Package - 3 (Rewa)**". The suggested composition and duration for the Supervision Team for the Construction Supervision Consultancy Services is given in **Table 1**. Position based tasks/responsibility assignments are given in **Table 2**. These details are tentative, for the purposes of the EOI, and are likely to be refined for the RFP.

**Table 1: Staffing Requirements**

**PACKAGE - 1 (BHOPAL)**

SI No	Position	Person months
<b>A.</b>	<b>KEY EXPERTS</b>	
<b>I</b>	<b>International</b>	
1	Team Leader Cum Senior Contract Administration Specialist – 1	23
	<b>Total (MM – International (Key Experts)</b>	<b>23</b>
<b>II</b>	<b>National</b>	
a.	<b>TL’s HQ Office</b>	
1	Senior Highway Engineer - 1	23
2	Senior Material Engineer – 1	21
3	Senior Quantity Surveyor cum Contract Specialist – 1	23
4	Senior Bridge Engineer – 1	23
5	Environment Specialist – 1	06
6	CAD Expert – 1	23
7	Senior Pavement Engineer – 1	6
8	R & R cum Social Development Specialist – 1	6
9	Electrical Engineer - 1	23
10	Road Safety Engineer	02
	<b>Total (MM – National TL’s HQ Office)</b>	<b>156</b>
b.	<b>Site office</b>	
1	Resident Engineer – 5	95
	<b>Total (MM – National (TL Office + Site Office)</b>	<b>251</b>
<b>B.</b>	<b>NON-KEY EXPERTS</b>	
a.	<b>Site office</b>	
1	Asstt. Resident Engineer ( Roads) – 5	95
2	Asstt. Resident Engineer ( Bridge) – 5	95
3	Quantity Surveyor cum MIS In-charge – 5	95
4	Material Engineer / Quality Control Engineer – 5	85
5	Field Engineer – Roads –8	138
6	Field Engineer – Bridges – 7	117
7	Field Engineer – Survey – 8	138
8	Lab Technician – 8	138
	<b>Total (MM –Non Key Experts )</b>	<b>901</b>
	<b>Total (MM – National Key Experts &amp; Non Key Experts (TL Office + Site Office)</b>	<b>1152</b>
	<b>Total</b>	<b>1175</b>

**Table 2: Position based tasks/responsibility assignments**

Sl.No.	Position	Tasks/Responsibilities
I.1	Team Leader / Senior Contract Administration Specialist	<ul style="list-style-type: none"> <li>• Assist the Employer and Engineer in contract administration and management of the Project and Civil Work Contract</li> <li>• Interpret the Technical Specifications and Contract Documents</li> <li>• Obtain consent of the concerned authorities before approvals of any redesign of road realignment, modifications and redesign of bridges.</li> <li>• Review the contractors securities being in approved format and ensure timely renewal of securities</li> <li>• Ensure receipt of requisite insurances as per contract requirement</li> <li>• Review documentations and advance actions for handing over of site and advise on issuing notice to set the commencement date.</li> <li>• Ensure contractor's effects and implements Quality Assurance System</li> <li>• Issue approval to the contractor's detailed work programme, suggest modifications if any and ensure contractor compliance with the Program</li> <li>• Issue approval to the Contractor's Superintendence Personnel with modifications if any</li> <li>• Scrutinize contractors mobilization of equipment in accordance with the contractor's program</li> <li>• Scrutinize and approve contractor's construction methods statement.</li> <li>• Issue finalized or revised "Good for Construction drawings" and additional detailed drawings required for the execution of the work</li> <li>• Issue to contractor amended alignment plan and profile drawings based on review of tender drawings and updated topographic surveys</li> <li>• Issue bridge details and modified drawings wherever required due to change in founding level, as a result of change in founding strata or any other reason at the time of execution.</li> <li>• Approve contractor's working drawings based on setting out details</li> <li>• Approve setting out data for the Works finalized as a result of ground verification and survey</li> <li>• Monitor supervision of all works and ensure proper supervision as per contract requirement</li> <li>• Monitor closely and regularly the progress of work and advise the contractor about corrective measures.</li> <li>• Monitor status of contractor's equipments, plant, machinery installations, housing and medical facilities.</li> <li>• Direct and/or advise contractor to avoid and/or reduce</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<p>the risk in case of any emergency</p> <ul style="list-style-type: none"> <li>• Advise contractor in all matters covering safety and care of work, environmental aspects and labour welfare</li> <li>• Review the test results / certificate of all construction material and/or sources of materials to ensure quality.</li> <li>• Review and approve mix designs proposed by the Contractors</li> <li>• Verify and recommend, if in order, contractors requests for advance and interim payment certificate</li> <li>• Assist Client in arranging relocation of services</li> <li>• Maintain a permanent record of all payments made to the contractor</li> <li>• Prepare monthly reports</li> <li>• Prepare Financial Statement</li> <li>• Approve and compile “as built” drawings</li> <li>• Inspect the works on completion of each milestone before accepting the work and report to the MPRDC.</li> <li>• Inspect Works at appropriate intervals during Defect Notification Period and advise the MPRDC</li> <li>• Ensure the contractor’s Implements and maintains the environmental monitoring in compliant with the Environmental Management Plans</li> <li>• Operate PPMS System</li> <li>• Assist MPRDC Staff to carry out all the duties as apply to Maintenance Works Contract</li> <li>• Ensure requisite insurances furnished by the Contract being Contract compliant.</li> <li>• Assist in finalization of bidding documents, if not already done.</li> <li>• Assist MPRDC in evaluating bids for contracts for civil works.</li> <li>• Assist MPRDC in dispute resolution activities, if necessary, during the pendency of the contract</li> <li>• Overall responsible for Contract administration and Management i/c monitoring of alignment, profile and quality of road, Bridge and CD works, correctness of quantity of work executed and payable to contractor, implementation of EMP, Social and safeguard issues etc..</li> </ul>
II.1	Senior Highway Engineer	<ul style="list-style-type: none"> <li>• Review designs, drawings for the road works</li> <li>• Suggest modifications, if required as per actual site conditions</li> <li>• Carry out design of any realignment, redesign/modifications of the roadwork components, if necessary, as per site conditions.</li> <li>• Review horizontal and vertical alignment for the road based on review of tender drawings and topographic survey carried out by the contractor including amending the alignment plan and profile based on updated topographic surveys</li> <li>• Check setting out data for the Works finalized as a</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<p>result of ground verification and survey</p> <ul style="list-style-type: none"> <li>• Overall responsible for the correctness of alignment, profile and quality of road</li> </ul>
II.2	Senior Pavement Engineer	<ul style="list-style-type: none"> <li>• Review crust design and assist TL in finalizing crust composition as a result of ground verification</li> <li>• Assist TL in approving “Typical Good for Construction Sections” for road part</li> <li>• Scrutinize and assist TL in approving contractor’s construction methods statement.</li> <li>• Prepare revised “Typical Good for Construction Sections” and additional detailed drawings required for the execution of the work</li> <li>• Overall responsible for the Crust design.</li> </ul>
II.3	Senior Material Engineer	<ul style="list-style-type: none"> <li>• Assist TL and DTL (if any) to finalize sampling methods and criteria and acceptance criteria for quality control and assurance</li> <li>• Examine Contractors preparation and completed portion of work as per “Request for Inspection (RFI)” and advise Contractor promptly regarding deficiency, if, any.</li> <li>• Monitor closely and regularly the progress on materials procurement and quality and report to the TL</li> <li>• Carry out inspection of Contractor’s lab equipment and report to TL</li> <li>• Ensure and witness sampling and testing being carried out by staff of the Contractors and undertake additional tasks as necessary to ensure quality of works</li> <li>• Scrutinize test results/certification of all construction materials and/or sources of materials and undertake additional tests if necessary and report to TL</li> <li>• Scrutinize mix design proposed by the Contractor and report to TL</li> <li>• Maintain a Permanent record of all tests carried out for monitoring the quality of works</li> <li>• Approval of Borrow Areas and quarries with the consent of TL</li> <li>• Overall responsible for the quality of construction material, road, Bridge and CD works</li> </ul>
II.4	Senior Quantity Surveyor cum Contract Specialist	<ul style="list-style-type: none"> <li>• Review BOQ items and quantity with drawings and point out the discrepancies/variations, if any, to TL</li> <li>• Verify record measurements and BoQ items / Work quantities executed in the contractors monthly statement</li> <li>• Verify, examine and certify interim payment certificates received from contractors</li> <li>• Prepare variation statement for TL</li> <li>• Maintain a permanent record of all measurement for the work quantities</li> <li>• Assist TL in Contract administration and the civil works contract</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<ul style="list-style-type: none"> <li>• Assist TL in Interpretation of the Technical Specifications and Contract Documents</li> <li>• Review and ensure conformity of contractor's securities in approved formats and ensure timely renewal of securities.</li> <li>• Ensure requisite insurances furnished by the Contractor being Contract compliant</li> <li>• Assist TL in preparing the monthly reports and Financial Statements</li> <li>• Assist in finalization of bidding documents, if not already done</li> <li>• Assist MPRDC in evaluating bids for contracts for civil works</li> <li>• Assist MPRDC in dispute resolution activities, if necessary, during the pendency of the contract</li> <li>• Overall responsible for correctness of quantity of work executed and payable to contractor and Payment to contractor</li> </ul>
II.5	Senior Bridge Engineer	<ul style="list-style-type: none"> <li>• Review alignment, designs, drawings for bridges/culverts/other structures</li> <li>• Suggest modifications and design, if required as per actual site conditions</li> <li>• Carry out any design, if required for bridges/ culverts/ other structures</li> <li>• Check and modify design and drawings, if required due to change in founding level, or any other reason as a result of scrutiny of geotechnical data</li> <li>• Scrutinize contractors working drawings for temporary works for structure</li> <li>• Carry out Supervision of all bridge works and CD works as per approved methods statements</li> <li>• Examine Contractors preparation and completed position of work as per "Request for Inspection (RFI)" and advise contractor promptly regarding discrepancy, if any</li> <li>• Monitor closely and regularly the progress of work of bridges / CD works and report to the TL</li> <li>• Supervise the Contractor in all matters concerning safety and care of the works</li> <li>• Witness sampling and testing being carried out by the Staff of Contractor particularly of bridge and CD works components</li> <li>• Assist TL in compilation of "as build" drawings</li> <li>• Overall responsible for the alignment, line, level and quality of Bridge and CD works</li> </ul>
II.6	R & R cum Social Development Specialist	<ul style="list-style-type: none"> <li>• Support the MPRDC in matters relating to land acquisition and resettlement</li> <li>• Update resettlement plan prepared.</li> <li>• Monitor the implementation of resettlement plan</li> <li>• Provide expert advice in all matters relating to acquisition and resettlement</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<ul style="list-style-type: none"> <li>• Monitor implementation of the resettlement plan</li> <li>• Monitor the status of the contractor compliance with HIV/AIDs provisions in the contract</li> <li>• Identify current economic and social management issues</li> <li>• Mobilize community participation in the Project</li> <li>• Organize and facilitate multi-stakeholder participatory processes</li> <li>• Organize regional and buffer zone development programme</li> <li>• Develop communication channels with the Stakeholders and reporting</li> <li>• Undertake data collection and correlation on PPMS based upon Traffic Volumes and Journey times, freight tariffs and bus fares, environmental and social impact indicators and socio economic indicators, social and poverty reduction impact indicators</li> <li>• All the related assignments mentioned under section 8 Part B, Annexure A and A1 of the bid document</li> </ul>
II.7	Environmental Specialist	<ul style="list-style-type: none"> <li>• Scrutinize Contractors construction method statement for its being compliant to environmental aspects,</li> <li>• Supervise the Contract in all matters concerning environmental aspects</li> <li>• Monitor compliance with the Environmental Management Plan</li> <li>• Assist MPRDC in undertaking environmental safeguards</li> <li>• Prepare and execute Environmental Management Plan as per requirement of ADB.</li> </ul>
II.8	CAD Expert	<ul style="list-style-type: none"> <li>• Assist TL, Senior Highway Engineer, Senior Bridge Engineer and Resident Engineer on all matters relating to computer-aided designs productions.</li> </ul>
II.9	Electrical Engineer	<ul style="list-style-type: none"> <li>• Review the proposal of electrical lines, Poles &amp; Transformer to be shifted and proposal of raising of electric lines crossing the road.</li> <li>• Review the BOQ quantities related with electrical utility shifting.</li> <li>• Prepare the proposal of electrical utility shifting jointly with contractor's and MPSEB representatives.</li> <li>• Assure that all the electrical utility dangerous to road user be shifted.</li> <li>• Assure that unnecessary shifting of Electrical utility shall not take place.</li> <li>• Assure the specification and quality of all the items of electrical utility shifting.</li> <li>• Certify the quantities of electrical utility shifting claimed by Contractor in each IPC.</li> <li>• Overall responsible for quality of electrical utility shifting material, work and correctness of quantity executed and payable to contractor.</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
II.10	Road Safety Engineer	<p>The road safety expert shall study, review and comment on safety audit manual prepared by the contractor/Concessionaire, review safety measures adopted by the contractor/concessionaire during execution of different component of works, review scheme for traffic management and diversion plan during construction period, review the safety measures provided for the traffic and Project workers, conduct road safety inspection and prepare site specific road safety audit report and suggest measures to address various issues.</p> <ul style="list-style-type: none"> <li>•</li> </ul>
III.1	Resident Engineer	<ul style="list-style-type: none"> <li>• Interpret the Technical Specifications and Contract Documents and advise to TL</li> <li>• Obtain related approvals from concerned authorities for any redesign of road realignment, modifications and redesign of bridges.</li> <li>• Review the contractors securities being in approved format and ensure timely renewal of securities</li> <li>• Ensure receipt of requisite insurances as per contract requirement</li> <li>• Review documentations and advance actions for handing over of site and advise on issuing notice to set the commencement date.</li> <li>• Ensure contractor's effects and implements Quality Assurance System</li> <li>• Review and assist TL in approving the contractors detailed work programme suggesting modifications, if any and ensure contractor compliance with the Program</li> <li>• Review and assist TL in issuing approval to the Contractor's Superintendence Personnel suggesting modifications if any, Scrutinize contractors mobilization of equipment in accordance with the contractors program</li> <li>• Scrutinize and approve contractor's construction methods statement.</li> <li>• Review and assist TL in Issuing finalized or revised "Good for Construction drawings" and additional detailed drawings required for the execution of the work</li> <li>• Assist TL in Issuing to contractor amended alignment plan and profile drawings based on review of tender drawings and updated topographic surveys</li> <li>• Assist TL in Issuing bridge details and modified drawings wherever required due to change in founding level, as a result of change in founding strata or any other reason at the time of execution.</li> <li>• Assist TL in Approval of contractor's working drawings based on setting out details</li> <li>• Ensure compliance of setting out data for the Works finalized as a result of ground verification and survey</li> <li>• Monitor supervision of all works and ensure proper</li> </ul>



Sl.No.	Position	Tasks/Responsibilities
		<p>supervision as per contract requirement</p> <ul style="list-style-type: none"> <li>• Monitor closely and regularly the progress of work and advise the contractor about corrective measures.</li> <li>• Monitor status of contractor's equipments, plant, machinery installations, housing and medical facilities.</li> <li>• Direct and/or advise contractor to avoid and/or reduce the risk in case of any emergency</li> <li>• Advise contractor in all matters covering safety and care of work, environmental aspects and labour welfare</li> <li>• Review and check the test results / certificate of all construction material and/or sources of materials to ensure quality.</li> <li>• Review and check the mix designs proposed by the Contractors</li> <li>• Verify and recommend, if in order, contractors requests for advance and interim payment certificate</li> <li>• Assist Client in arranging relocation of services</li> <li>• Maintain a permanent record of all payments made to the contractor</li> <li>• Prepare monthly reports</li> <li>• Prepare Financial Statement</li> <li>• Assist TL in approve and compilation of "as built" drawings</li> <li>• Inspect the works on completion of each milestone before accepting the work and report to the TL/MPRDC.</li> <li>• Inspect Works at appropriate intervals during Defect Notification Period and advise the TL/MPRDC</li> <li>• Ensure the contractor Implements and maintains the environmental monitoring in compliant with the Environmental Management Plans</li> <li>• Operate PPMS System</li> <li>• Assist MPRDC Staff to carry out all the duties as apply to Maintenance Works Contract</li> <li>• Monitor Assistant Resident Engineer (Roads) and Assistant Resident Engineer (Bridge) work.</li> <li>• Overall responsible for Contract administration and Management i/c monitoring of alignment, profile and quality of road, Bridge and CD works, correctness of quantity of work executed and payable to contractor, implementation of EMP, Social and safeguard issues etc.</li> </ul>
III.2	Assistant Resident Engineer (Roads)	<ul style="list-style-type: none"> <li>• Assist in management of the Project and contract administration</li> <li>• Assist in Interpretation of the Technical Specifications and Contract Documents</li> <li>• Review designs, drawings, BoQ Provisions and Specifications</li> <li>• Conduct road safety audit during construction and preopening of road</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<ul style="list-style-type: none"> <li>• Review and Assist in compliance of documentation and advance actions for handing over site and advise on setting the commencement date</li> <li>• Assist RE to ensure contractor's Quality Control Assurance System</li> <li>• Scrutinize Contractor's detailed work program</li> <li>• Scrutinize and/or review Contractor's Superintendence, Personnel and report to RE, on modifications, if any.</li> <li>• Scrutinize contractor's mobilization of equipments, in accordance with the contractor programme.</li> <li>• Scrutinize contractors construction methods statement and report to RE for its being compliant to technical requirement, project implementation schedule, environmental aspects, safety of works, personnel and general public</li> <li>• Review horizontal and vertical alignments and follow up action based on report of Sr. Highway Design Engineer</li> <li>• Review "Good for Construction Drawings", prepare additional detailed drawings, if required, based on contractors survey and setting out</li> <li>• Scrutinize contractors working drawings based on survey setting out details.</li> <li>• Scrutiny, checking and verification of setting out data</li> <li>• Carry out supervision of all works as per approved methods states</li> <li>• Examine Contractors preparation and the completed position of work as per "Request for Inspection" and promptly advise the contractor regarding the deficiency, if any</li> <li>• Monitor closely and regularly the progress of work and report to the RE</li> <li>• Carry out regular inspection of Contractor's equipment, plant, machinery, installations, housing and medical facilities.</li> <li>• Direct contractor to carry out works, as may be necessary to avoid or to reduce the risk in case of any emergency</li> <li>• Supervise the contractor in all matters concerning safety of works, labour, workmen and environmental aspects and labour welfare.</li> <li>• Witness sampling and testing being carried out by staff of the Contractor and undertake additional audit tests to ensure quality</li> <li>• Monitor and review the test results / certificates for all construction material and/or resources of materials and report to RE</li> <li>• Monitor and review the mix designs proposed by the Contractor</li> <li>• Examine the requests for advances and monthly statements of contractors and examine interim</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<p>payment certificates.</p> <ul style="list-style-type: none"> <li>• Assist MPRDC in arranging relocation of services including all correspondence, meetings and preparation of details.</li> <li>• Maintain a permanent record of all measurements for the works /quantities to be paid for and of all payment date.</li> <li>• Prepare monthly reports</li> <li>• Review “as-built” drawings prepared by the Contractor and maintain record of tests of all data and records.</li> <li>• Maintain a day to day diary recording all events relevant to the work</li> <li>• Responsible for the Contract administration and Management, Horizontal &amp; Vertical profile and quality of road work, correctness of quantity of work executed and payable to contractor, implementation of EMP, Social and safeguard issues etc..</li> </ul>
III.3	Assistant Resident Engineer (Bridge)	<ul style="list-style-type: none"> <li>• Assist in management of the Project and contract administration</li> <li>• Assist in Interpretation of the Technical Specifications and Contract Documents</li> <li>• Review designs, drawings for bridges/culverts/other structures</li> <li>• Suggest modifications and design, if required as per actual site conditions</li> <li>• Carry out any design, if required for bridges/culverts/ other structures</li> <li>• Check and modify design and drawings, if required due to change in founding level, or any other reason as a result of scrutiny of geotechnical data</li> <li>• Review BoQ Provisions and Specifications</li> <li>• Conduct road safety audit during construction and preopening of road</li> <li>• Review and Assist RE in compliance of documentation and advance actions for handing over site and advise on setting the commencement date</li> <li>• Assist RE to ensure contractors Quality Control Assurance System</li> <li>• Scrutinize Contractors detailed work program</li> <li>• Scrutinize and/or review Contractor's Superintendence, Personnel and report to RE, on modifications, if any.</li> <li>• Scrutinize contractor's mobilization of equipments, in accordance with the contractor programmed.</li> <li>• Scrutinize contractors construction methods statement and report to RE for its being compliant to technical requirement, project implementation schedule, environmental aspects, safety of works, personnel and general public</li> <li>• Review horizontal and vertical alignments at structure</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
		<p>locations and follow up action based on report of Sr. Highway Design Engineer</p> <ul style="list-style-type: none"> <li>• Review “Good for Construction Drawings”, prepare additional detailed drawings, if required, based on contractors survey and setting out</li> <li>• Scrutinize contractors working drawings based on survey setting out details.</li> <li>• Scrutiny, checking and verification of setting out data</li> <li>• Carry out supervision of all works as per approved methods states</li> <li>• Examine Contractors preparation and the completed position of work as per “request for inspection” and promptly advise the contractor regarding the deficiency, if any</li> <li>• Monitor closely and regularly the progress of work and report to the RE</li> <li>• Carry out regular inspection of Contractor’s equipment, plant, machinery, installations, housing and medical facilities.</li> <li>• Direct contractor to carry out works, as may be necessary to avoid or to reduce the risk in case of any emergency</li> <li>• Supervise the contractor in all matters concerning safety of works, labour, workmen and environmental aspects and labour welfare.</li> <li>• Witness sampling and testing being carried out by staff of the Contractor and undertake additional audit tests to ensure quality</li> <li>• Monitor and review the test results / certificates for all construction material and/or resources of materials and report to RE</li> <li>• Monitor and review the mix designs proposed by the Contractor</li> <li>• Examine the requests for advances and monthly statements of contractors and examine interim payment certificates.</li> <li>• Assist MPRDC in arranging relocation of services including all correspondence, meetings and preparation of details.</li> <li>• Maintain a permanent record of all measurements for the works /quantities to be paid for and of all payment date.</li> <li>• Prepare monthly reports</li> <li>• Review “as-built” drawings prepared by the Contractor and maintain record of tests, all data and records.</li> <li>• Maintain a day to day diary recording all events relevant to the work</li> <li>• Responsible for monitoring the line, level and quality of Bridge work and CD structures.</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
III.4	Quantity Surveyor cum MIS In-charge	<ul style="list-style-type: none"> <li>• Review BOQ items and quantity with drawings and point out the discrepancies/variations, if any, to RE</li> <li>• Measure quantities of work, record measurements and verify BoQ items / Work quantities executed in the contractors monthly statement</li> <li>• Verify and examine interim payment certificates received from contractors</li> <li>• Prepare variation statement for RE</li> <li>• Maintain a permanent record of all measurement for the work quantities</li> <li>• Assist RE in preparing the monthly reports and Financial Statements</li> <li>• Make online entries in the MIS system of the Employer</li> <li>• Responsible for correctness, accuracy of measurement and quantity of works recorded.</li> </ul>
III.5	Material Engineer/ Quality Control Engineer	<ul style="list-style-type: none"> <li>• Assist RE and Senior Pavement / Material Engineer to finalize sampling methods and criteria and acceptance criteria for quality control and assurance</li> <li>• Examine Contractors preparation and completed portion of work as per “Request for Inspection” and advise Contractor promptly regarding the deficiency, if any.</li> <li>• Monitor closely and regularly the progress on materials procurement and quality and report to the RE and Senior Pavement / Material Engineer</li> <li>• Carry out inspection of Contractor’s lab equipment and report to RE and Senior Pavement / Material Engineer</li> <li>• Ensure and witness sampling and testing being carried out by staff of the Contractors and undertake additional tasks as necessary to ensure quality of works</li> <li>• Scrutinize test results/certification of all construction materials and/or sources of materials and undertake additional tests if necessary and report to RE and Senior Pavement / Material Engineer</li> <li>• Scrutinize mix design proposed by the Contractor and report to RE and Senior Pavement / Material Engineer</li> <li>• Maintain a Permanent record of all tests carried out for monitoring the quality of works</li> <li>• Assist Senior Pavement / Material Engineer in Approval of Borrow Areas and quarries with consent of Senior Pavement / Material Engineer</li> <li>• Monitor and maintain quality in all aspects.</li> <li>• Responsible for Quality Control of construction material and completed works.</li> </ul>
III.6	Field Engineer – Roads	<ul style="list-style-type: none"> <li>• Assist RE and Assistant Resident Engineer on all matters at site relating to road works.</li> <li>• Responsible for the Horizontal &amp; Vertical profile and quality of road work.</li> </ul>

Sl.No.	Position	Tasks/Responsibilities
III.7	Field Engineer – Bridge	<ul style="list-style-type: none"> <li>• Assist RE and Assistant Resident Engineer on all matters at site relating to Bridge works.</li> <li>• Responsible for the line, level and quality of Bridge work and CD structures.</li> </ul>
III.8	Field Engineer – Survey	<ul style="list-style-type: none"> <li>• Scrutinize topographic survey data, if any, in the contract drawings and associate and scrutinize the contractors updated topographic survey data.</li> <li>• Witness and Monitor survey and setting out operations and verify data and details</li> <li>• Carry out detailed checking and verification of setting out data</li> <li>• Carry out levels of different layers along with the surveyor of the contractor</li> <li>• Responsible for maintaining the Horizontal and vertical profile of the road</li> </ul>
III.9	Lab Technician	<ul style="list-style-type: none"> <li>• Assist RE, Assistant Resident Engineer road, Assistant Resident Engineer Bridge and Material Engineer/ Quality Control Engineer on all matters relating to construction material testing and quality of completed works.</li> <li>• Responsible for Quality Control of construction material and completed works.</li> </ul>

## LIST OF ROADS

Package - 1( Bhopal )

Pkg.No.	Road No.	Road Name	Length in km	Total Pkg. Length	Completion Period
1	1	Khatakia to Suthaliya via NH-3, Kumbhraj, Barod, Mragwas, Batawda, Chanchoda, Binaganj, Teligaon	87.30	87.30	21
2	2	Sirsod-Pichhore Road	33.00	59.00	16
	3	Narwar-Chitori to Amola Road	26.00		
3	4	Mungawali-Malahargarh Road	16.60	63.60	16
	5	Bhounrasa-Malhargarh Road	20.60		
	6	Piprod-Thubon Road	8.00		
	7	Belai-Kareela Mata Mandir Road	18.40		
4	8	Sanwer-Chandravatiganj-Gautampura Road	35.00	55.18	16
	9	Kshipradwa-Budhibarlai-Solsindi-Khandakhedi-Jamodi-Maharajganj-Baloda-Rajod-Panod-Sanwer Road	20.18		
5	10	Bijawar-Kataphod-Satwaas-Khategaon Road	56.00	56.00	16
		Total		321.08	

## 8. ADDITIONAL SERVICES

The Supervision Consultant shall, if so required by the Client, provide any additional service at rates or on man-month rates as per the contract, or as mutually agreed upon, as a variation order.

## 9. REPORTS

The Supervision Consultant will prepare and submit the reports as listed in **Table-3** to the Client on the format prepared by the Consultant and as approved by the Client / (except for inception report)

**Table 3: Reports to be submitted**

Sl. No.	Report	Frequency	Due Date	No. of Copies	No. of CDs
1.	Inception Report	One Time	Within 30 days after commencement of services.	5	1
2.	Progress Report (Monthly & Quarterly)	Every month/three months	5 <sup>th</sup> of month following the reporting month/quarter	5	1
3.	Design Review Report	One Time	Within 30 days after the Services Commence	5	1
4.	Final Report	One Time	Within 30 days of completion of services	10	5
5.	Construction Supervision Manual	One Time	30 days after commencement of services	5	1
6.	Quality Assurance (QA) Document	One Time	30 days after commencement of service	5	1
7.	Maintenance Supervision Manual	One Time	30 days before the expected commencement of the first maintenance works	5	1

(i) **Inception Report**

The Inception Report shall contain the details of all meetings held with the Client and any initial meetings held with the Contractor and decisions taken therein, the resources mobilized by the Construction Supervision Consultant as well as the Contractor and the Consultant's perception in the management and supervision of the project. The report shall also include the Master Work Programme and Resources Mobilization for the Project.

(ii) **Progress Reports**

The Monthly Progress Report shall contain details of all meetings, decisions taken therein, mobilization of resources (Consultant and the contractors), physical and financial progress and the projected progress for the forthcoming periods and implementation of environment, social and resettlement safeguard requirements. The Report shall clearly bring out the delays, if any, reasons for such delay(s) and



the recommendations for corrective measures. The Report shall also contain the performance data for contractor's plant and equipment.

The Quarterly Progress Report shall include similar details to the monthly reports for the last month of the quarter, and summarize the overall progress for the quarter and highlight the main issues and the action being proposed to address those issues.

**(iii) Design Review Report**

The Construction supervision consultant shall undertake a detailed engineering review of the design as included in the civil works contract drawings for the purpose of identifying any defects/omissions, which compromise the completeness or consistency of the design. This review shall be carried out immediately after the services commence and a detailed 'Design Review Report' shall be submitted to the Employer within 30 days. This report will set out all findings and recommendations for making good any defects/omissions identified in civil works designs. Notwithstanding the above, the supervision consultant shall also inform the Employer of any defect/omission which may have a substantial impact on the Project at the time the defect/omission is uncovered. Where defects in design are noted or designs are inadequate, the CSC shall prepare revised detail designs suitable for construction in adequate time so as not to delay the Contractor.

**(iv) Final Report**

The Consultant will prepare a comprehensive final completion report of the construction contract packages after completion of the Permanent Works. The reports shall incorporate summaries of the methods of construction, the construction supervision performed, reference to as-built drawings of the construction, problems encountered and solutions undertaken thereon and recommendations for future projects of similar nature to be undertaken by the MPRDC. The Consultant shall submit the self appraisal report within the prescribed time summarizing the following details:

1. Details of Consultant's personnel including substitution made during the assignment.
2. Details of variation orders issued.
3. Details of extension of time granted to the Contractor.
4. Details of Quality Assurance System
5. Quality observed at site by the Consultant.
6. Details of claims.
7. Special preventive measures for maintenance suggested by the Consultant.
8. Overview on environment, social and resettlement safeguard requirements implemented.

The report will also summarize the maintenance works carried out to the time of the report on any of the construction contracts where maintenance has commenced.

**(v) Construction Supervision Manual**

The primary objective of the Construction Supervision Manual will be to evolve guidelines for administration, supervision and management of the project and the construction contracts to be implemented. Such a manual is not intended to be a

contractual document nor is it to take precedence over the contract specifications. The Manual will merely act as a guide and reference to the various staff in the management and supervision of the project in discharging their duties in a smooth and systematic manner.

(vi) **Quality Assurance Document**

The Quality Assurance (QA) Documents shall be evolved on the basis of the relevant manual for quality system for bridges and highways published by the Indian Road Congress (IRC).

(vii) **Maintenance Supervision Manual**

The primary objective of the Maintenance Supervision Manual will be to evolve guidelines for administration, supervision and management of the maintenance components of the contracts and to assist the MPRDC in running this part of the works in their own right. Such a manual is not intended to be a contractual document nor is it to take precedence over the contract specifications. The Manual will merely act as a guide and reference to the various staff in the management and supervision of the maintenance works for the project in discharging their duties in a smooth and systematic manner.

## **10. STAFFING SCHEDULE**

- 10.1 The total implementation period for the Construction Supervision Consultant will consist of (i) individual construction periods of 16-21 month civil works contract and (ii) a defects notification period during which the Consultant will only require part time input over the first 12 Months, as per the agreement proposed.
- 10.2 The Supervision Consultant's site team would be mobilized progressively on the date of actual commencement of works by the contractors, or as decided by the Client. During the first 12 Months of defect notification period, the Consultant's Team Leader along with other staff as in Table 1 will be required to continue on a periodic basis, as and when required, which will be dealt with separately at the appropriate stage towards the completion of the construction works.
- 10.3 After award of the contract for Consultancy Services, the Client expects all the proposed key personnel to be available during implementation of the Contract as per the agreed staffing schedule. The Client will not consider substitutions during contract implementation except under exceptional circumstances. In case of such replacements, the Consultant will ensure that there is a reasonable overlap between the staff to be replaced and the replacement wherever feasible/possible. Replacement of Key Experts beyond an upper limit of 25% man-month of total Key Experts shall invite penalty except if replacement asked by the Client under sub-clause 32.1 and 32.2 of Section 8 Conditions of Contract. The new key expert after substitution beyond 25% man-month limit for total Key Experts shall be paid @90% of the agreed billing rates.

## 11. Facilities

The Consultant will make provisions for all facilities, equipment, transport, supplies and supporting staff which he considers necessary to successfully carry out the services for implementation of the Project and will also include the price of those items in his financial proposal. In particular, the consultant should note that the following items must be included in his financial proposal as they will not be provided for the use of the consultant:

- (i) Base office, site office, accessories and its maintenance;
- (ii) Residential accommodation and its maintenance;
- (iii) Vehicles with drivers, maintained and operated;
- (iv) Office equipment, including computers, printers, plain paper copiers; Mobile, Fax Machine, Internet Connection and ancillary devices; and
- (v) Technicians.

## 12. Performance Security

Consultant shall be required to submit acceptable Bank Guarantee for an amount equal to 5% (Five percent) of the accepted consultancy cost towards Performance Security proportionately in the currencies of payment asked for in the financial proposal. The validity of the Bank Guarantee(s) shall cover entire duration of consultancy period (Construction period plus the first 12 Months of defect notification period). The format of the Bank Guarantee(s) shall be got approved by the consultant from Employer. The Bank Guarantee(s) shall be released after satisfactory completion of the assignment.

## 13. Qualification and experience requirements

Qualification and experience requirements for Key Personnel of the Consultant are as suggested below:

The detailed requirements and importance (in terms of weighting) of each requirement are shown in the Evaluation Sheets included in Appendix to the Data Sheet.

### **Team Leader/Senior Contract Administration Specialist (International Position)**

a) Qualifications	Desirable: Bachelor's degree in civil engineering. Preferable: Post graduate degree in civil engineering or its related disciplines. Membership of professional institutions.
b) Total Professional Experience	25 yrs Desirable
c) Project-related Experience	Desirable: 5 yrs as Team Leader/Sr. Highway Engineer/Sr. Material Engineer/Sr. Pavement Engineer and 5 years as Resident Engineer in supervision/contract administration or Project Manager of large highway or road and bridge construction contracts (at least 2 contracts each costing over US\$ 60 million administered under FIDIC or similar contract conditions), preferably managing multiple contracts.

d) Overseas/Country Experience	Preferably with substantial experience in developing countries.
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**Senior Highway Engineer (National Position)**

a) Qualifications	Desirable: Bachelor’s degree in civil engineering Preferable: Post graduate degree in highway or transportation engineering. Membership of professional institutions.
b) Total Professional Experience	15 yrs Desirable
c) Project-related Experience	Desirable: 8 years as Highway Engineer in designing highways for highway construction projects (at least 2 highway projects of similar nature costing over \$50 million each). Familiarity with international and Indian standards for design of highways including related software (MX-Road, AutoCAD 3-D Civil etc.).
d) Experience in working with international organizations/ agencies	Preferably with substantial experience in developing countries

**Senior Pavement Engineer (National Position)**

a) Qualifications	Desirable: Bachelor’s degree in civil engineering Preferable: Post graduate degree in civil engineering or its related fields. Membership of professional institutions
b) Total Professional Experience	15 yrs Desirable
c) Project-related Experience	Desirable: 8 years as Pavement Engineer and with experience of various designs and construction procedures for flexible and rigid pavements (at least 2 highway projects costing over US\$ 50 million each).
d) Experience in working with international organizations/ agencies	Preferably with substantial experience in developing countries

**Senior Material Engineer (National Position)**

a) Qualifications	Desirable Bachelor’s degree in civil engineering Preferable: Post graduate degree in civil engineering or its related fields. Membership of professional institutions
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b) Total Professional Experience	15 yrs Desirable
c) Project-related Experience	Desirable: 8 years as Materials Engineer and with experience of various testing procedures, designs of various mixes like GSB, WMM, Bituminous mixes, Concrete Mixes, etc (at least 2 highway projects costing over US\$ 50 million each).
d) Experience in working with international organizations/ agencies	Preferably with substantial experience in developing countries

**Senior Quantity Surveyor cum Contract Specialist (National Position)**

a) Qualifications	Desirable: Bachelor’s degree in civil engineering Preferable: Post graduate degree in civil engineering or its related fields. Membership of professional institutions.
b) Total Professional Experience	15 yrs Desirable
c) Project-related Experience	Desirable: 8 years as quantity surveyor (at least 2 projects of similar nature costing over US\$ 50 million each administered under FIDIC contract conditions). or Desirable: 8 years in Contract administration of road construction contracts (at least 2 contracts each costing over US\$ 50 million administered under FIDIC contract conditions). Familiarity with international and Indian design standards. Hands-on experience in using various quantity-estimation software and
d) Experience in working with international organizations/ agencies	Preferably with substantial experience in developing countries

**Senior Bridge Engineer (National Position)**

a) Qualification	Desirable: Bachelor’s degree in civil engineering Preferable: Post graduate degree in Structural Engineering. Membership of professional institutions
b) Total Professional Experience	15 yrs Desirable

c) Project-related Experience	Desirable: 8 years as Bridge Engineer and with experience of designs/supervisions  (At least 2 bridge works each of length over 100 m or costing over US\$ 1 million).
d) Experience in working with international organizations/ agencies	Preferable.

**R & R cum Social Development Specialist (National Position)**

a) Qualification	Desirable: Bachelor's degree in civil engineering, sociology, or other relevant fields.  Preferable: Post graduate degree in social science.
b) Total Professional Experience	7 yrs Desirable
c) Project-related Experience	Desirable: 4 years as Resettlement Specialist/Resettlement and Rehabilitation (R&R) Specialist/Social Development Specialist dealing with land acquisition and/or R&R in large highway or road construction projects (at least 2 projects, preferably funded by international funding agencies such as ADB, World Bank, etc.)  Conversant with the requirements of the international funding agencies for social safeguards, and familiar with preparation and implementation of R&R plans as per the requirements of ADB.  Design or implementation of quantitative and qualitative project performance monitoring systems for large infrastructure projects of similar nature, preferably funded by international funding agencies such as ADB, World Bank, etc.  Conversant with the requirements of the international funding agencies regarding project performance monitoring and evaluation.
d) Experience in working with international organizations/ agencies	Preferable.

**Environmental Specialist (National Position)**

a) Qualification	Desirable: Bachelor’s degree in environmental engineering/ civil engineering or Post Graduate degree in environmental science or other related fields.  Preferable: Post graduate degree in environmental engineering.  Membership of professional institutions.
b) Total Professional Experience	7 yrs Desirable
c) Project-related Experience	Desirable: 4 years as Environment Specialist/Environment Engineer in large highway or road construction projects (at least 2 projects, preferably funded by international funding agencies such as ADB, World Bank, etc.)  Required to be conversant with the requirements of the international funding agencies for environmental safeguards and familiar with preparation and execution of environmental management plans as per the requirements of ADB.
d) Experience in working with international organizations/ agencies	Preferable.

**CAD Expert (National Position)**

a) Qualification	Desirable: Diploma in civil engineering or other relevant fields.
b) Total Professional Experience	5 yrs Desirable
c) Project-related Experience	Desirable: 3 years in computer-aided design of major highway projects.
d) Experience in working with international organizations/ agencies	Preferable.

**Electrical Engineer (National Position)**

a) Qualification	Desirable: Bachelor’s degree in Electrical engineering.  Preferable: Post graduate degree in Electrical engineering or its related disciplines. Membership of professional institutions.
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b) Total Professional Experience	15 yrs Desirable
c) Project-related Experience	Desirable: 8 yrs as Electrical Engineer in construction/supervision/design of Electrical Infrastructure Projects (at least 2 contracts each costing over US\$ 2.5 million), preferably as Electrical Engineer in one Highway project.
d) Experience in working with international organizations/ agencies	Preferable.

**Road Safety Engineer (National Position)**

a) Qualification	Desirable: Bachelor’s degree in civil engineering. Preferable: Post graduate degree in civil engineering or its related disciplines. Membership of professional institutions.
b) Total Professional Experience	12 yrs Desirable
c) Project-related Experience	Desirable: 6 yrs as Road Safety Engineer in construction/supervision/design of Road Projects (at least 2 contracts each costing over US\$ 10 million).
d) Experience in working with international organizations/ agencies	Preferable.

**Resident Engineer (National Position)**

a) Qualification	Desirable: Bachelor’s degree in civil engineering. Preferable: Post graduate degree in civil engineering or its related disciplines. Membership of professional institutions.
b) Total Professional Experience	15 yrs Desirable
c) Project-related Experience	Desirable: 8 yrs as Resident Engineer/Project Manager in supervision or contract administration of large highway or road and bridge construction contracts (at least 2 contracts each costing over US\$ 20 million administered under FIDIC contract conditions), preferably managing multiple contracts.
d) Experience in working with international organizations/ agencies	Preferable.



**Asstt. Resident Engineer (Road) (National Position)**

a) Qualification	Desirable: Bachelor's degree in civil engineering. Preferable: Post graduate degree in civil engineering or its related disciplines. Membership of professional institutions.
b) Total Professional Experience	10 yrs Desirable
c) Project-related Experience	Desirable: 5 yrs as Asstt. Engineer/ Dy. Project Manager in supervision or contract administration of large highway or road and bridge construction contracts (at least 2 contracts each costing over US\$ 10 million administered under FIDIC or similar contract conditions), preferably managing multiple contracts.
d) Experience in working with international organizations/ agencies	Preferable.

**Asstt. Resident Engineer (Bridge) (National Position)**

a) Qualification	Desirable: Bachelor's degree in civil engineering. Preferable: Post graduate degree in civil engineering or its related disciplines. Membership of professional institutions.
b) Total Professional Experience	10 yrs Desirable
c) Project-related Experience	Desirable: 5 yrs as Asstt. Engineer/Dy. Project Manager in supervision or contract administration of bridge work (at least 2 works each costing over US\$ 0.5 million administered under FIDIC or similar contract conditions), preferably managing multiple contracts. Exclusive experience in Bridges for two years is preferable.
d) Experience in working with international organizations/ agencies	Preferable.

**Quantity Surveyor cum MIS In-charge (National Position)**

a) Qualification	Desirable: Bachelor's degree in civil engineering Preferable: Post graduate degree in civil engineering or its related fields. Membership of professional institutions.
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b) Total Professional Experience	10 yrs Desirable
c) Project-related Experience	Desirable:5 years as quantity surveyor/assistant quantity surveyor (at least 2 projects of similar nature costing over US\$ 10 million each administered under FIDIC contract conditions). Familiarity with international and Indian design standards. Hands-on experience in using quantity-estimation software.
d) Experience in working with international organizations/ agencies	Preferable.

**Material Engineer / Quality Control Engineer (National Position)**

a) Qualification	Desirable: Bachelor's degree in civil engineering Preferable: Post graduate degree in civil engineering or its related fields. Membership of professional institutions
b) Total Professional Experience	10 yrs Desirable
c) Project-related Experience	Desirable:5 years as Materials Engineer/ Assistant Materials Engineer and with experience of various testing procedures, designs of various mixes like GSB, WMM, Bituminous mixes, Concrete Mixes, etc (at least 2 highway/bridge projects costing over US\$ 10 million each). Hands-on experience in Quality Control is preferable along with above.
d) Experience in working with international organizations/ agencies	Preferable.

**Field Engineer – Roads/ Bridges/ Survey (National Position)**

a) Qualification	Desirable: Diploma in civil engineering Preferable: Bachelor's degree in civil engineering or its related fields.
b) Total Professional Experience	5 years Desirable: for degree holder. 8 years Desirable: for diploma holder.

c) Project-related Experience	Desirable: 3 years in relevant area ( <u>Roads/ Bridges/ Survey</u> ) of operation in any construction supervision of road projects.
d) Experience in working with international organizations/ agencies	Preferable.

**Lab Technician (National Position)**

a) Qualification	Desirable: Diploma in civil engineering or Bachelor's degree in Science
b) Total Professional Experience	Desirable: 3 years for Diploma in civil engineering / 5 years for Bachelor's degree in Science
c) Project-related Experience	Desirable: 2 years for Diploma in civil engineering / 3 years for Bachelor's degree in Science in testing construction materials.
d) Experience in working with international organizations/ agencies	Preferable.

**Note:**

- a) The inputs of the Team Leader and Resident Engineers and some Key Professional/ Non Key Experts include 2 months period for advance mobilisation prior to mobilisation by the contractor and for period during the defect liability for finalization of the bills of the contractor after completion of the work.
- b) Visits and review by 'Engineer or any other staff at headquarters will be deemed to have been covered within the overheads.
- c) All other technical support staff may be covered under out of pocket expenses.
- d) The inputs shown are for one Consultancy Package only.
- e) In case of positions requiring field work and if the proposed expert/personnel has age more than 65 yrs, a health certificate from a physician advising suitability for field work must be provided.
- f) The CVs of International and national key Experts shall only be evaluated.

## 14. Client's Input and Counterpart Personnel

- (a) Services, facilities and property to be made available to the Consultant by the Client:  
**Copy of Detailed Project Report submitted by DPR Consultant shall be given to the consultant after signing the agreement.**
  
- (b) Professional and support counterpart personnel to be assigned by the Client to the Consultant's team: **Nil.**

Client will provide the following inputs, project data and reports to facilitate preparation of the Proposals: **N.A.**