

GOVERNMENT OF MEGHALAYA
OFFICE OF THE CHIEF ENGINEER (NH), P. W. D. (ROADS)
LOWER LACHUMIERE: MEGHALAYA, SHILLONG.

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REQUEST FOR EXPRESSIONS OF INTEREST
(Consulting Services – Quality Based Selection (QBS))

INDIA: MEGHALAYA INTEGRATED TRANSPORT PROJECT (MITP).
Project ID: P-168097

Assignment Title: Consultancy Services for DPR Preparation of Non Urban Roads & Major / Minor Bridges in the state of Meghalaya under the World Bank Meghalaya Integrated Transport Project (MITP).

Reference No: IN-PWD-218510-CS-QBS

The Government of Meghalaya has applied for financing from the World Bank toward the cost of the Meghalaya Integrated Transport Project and intends to apply part of the proceeds for consulting services.

The consulting services (“the Services”) include

- i. Preparation of cost-effective engineering design for construction/ upgradation/ rehabilitation of roads with green and climate resilient technologies. The work to include to provide proposal along with cost estimate for improvement of the deficiencies in the existing geometry including deficiencies in the road safety measures provided on the road within available road width, as per IRC specifications.
- ii. Preparation of cost-effective designs for rehabilitation/ reconstruction/ construction of the existing/ proposed structures (culverts, minor bridges, major bridges and other structures).
- iii. Preparation of cost estimate of rehabilitation/ reconstruction of the existing protection works along the road including design and cost of the new protection works, if any, required, along the road.
- iv. Preparation of plan and profile of the existing roads, covering all the existing features within the existing Right of Way (ROW).
- v. Preparation of inventory of roads, bridges (culverts, minor bridges, major bridges and other structures) and protection structures as per IRC guidelines/ specifications.
- vi. Preparation of detailed layer-wise thickness of the existing crust of the roads at a distance of 200m c/c.
- vii. Preparation of plan and profile of the existing/ proposed new roads with latest technology as per IRC specifications.
- viii. Preparation of existing drainage plan of the existing roads, design and cost estimate for the rehabilitation and augmentation of the existing drainage as per IRC specifications.
- ix. Identification and cost estimate of some suitable places for providing roadside amenities like bus stops, passing places, parking places, huts for road maintenance staff and any other provisions as per the direction of the employer.

- x. Preparation of designs and cost estimate of the local streams joining the road from the hill top including proper disposal of the discharge in the nearby cross drainage structures.

For Bridges:

- xi. to finalize the selection of the most viable/ feasible/ economical site for the construction of bridge on the existing road or on a new road to be constructed by studying the course of the stream, its meandering tendency, existence of firm banks, confluence with other streams, alternative sites, Hydraulic survey, Design Discharge, H.F.L, L.W.L, Scour depth, type of foundation, length of the structure by studying the existing bridges on the river in the vicinity (Upstream & Downstream) and span arrangements.
- xii. to undertake detailed Hydraulic survey of the finally selected site to decide the design discharge, linear waterway, scour depth, afflux and vertical clearance above H.F.L., including sub-soil investigation etc.
- xiii. to develop cost effective keeping in mind both the options i.e. Steel bridges & RCC bridges, Innovative and Aesthetically pleasing structure with due considerations given to the site conditions & Environment friendly, climate resilient keeping in consideration the hilly terrain and construction friendly designs of Bridges with latest innovative technology. The design shall conform to the specifications & design parameters contained in relevant Indian Roads Congress Codes / Ministry of Road Transport & Highways specifications/ guidelines and circulars (latest versions).
- xiv. to design appropriate river training works including slope pitching, Toe wall, Guide Bunds, apron, launching apron etc, if any required with full justification, keeping in consideration the hilly terrain, and
- xv. Preparation of the General Arrangement Drawing (GAD) and methodology (philosophy) of the design
- xvi. Design of different parts of the Bridge (Structure)
- xvii. Preparation of technical specifications of all the works involved in construction of the bridge project in totality including quality assurance plan for the same
- xviii. Preparation of cost estimate including details of measurements, Bill of Quantities and analysis of rates; and
- xix. to transfer the technology and develop skill of PWD engineers in design of major/ minor bridges.

The Meghalaya Public Works Department (R&B), Government of Meghalaya (PWD) now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The short listing criteria are:

- Experience of the consulting firm of last 7 years.
- Turn-over of the existing firm of last 5 consecutive financial year, from the year of REOI.
- Experience of the firm of last 7 years in preparing the cost-effective designs and cost estimates of bridges over river/roads in hill areas specifically in North-Eastern States of the India.
- Qualifications and Experience of the key personnel of the consultancy firm.

The TOR for the activity is also enclosed.

The employer intends to engage the services of a consultant for the aforementioned works.

The attention of interested Consultants is drawn to paragraph 3.17 of the World Bank's *Procurement Regulations for IPF Borrowers, July 2016- Revised November 2017 and August 2018* as amended from time to time [under *IBRD Loans and IDA Credits & Grants*] by the World Bank Borrowers, setting forth the World Bank's policy on conflict of interest.

Consultants may associate with other firms in the form of a joint venture or a sub consultancy to enhance their qualifications.

A Consultant will be selected in accordance with the Quality Based Selection (QBS) method set out in the Consultant Guidelines of the World Bank.

Further information can be obtained at the address below during office hours i.e., 11:00 am to 03:00 pm.

Expressions of interest must be delivered in a written form to the address below (by e-mail or by post/courier) on or before **14.03. 2021 at 4.00 PM.**

Attn: B.P. Marak,
O/o The Chief Engineer PWD (Roads), Meghalaya Shillong.
Lower Lachumiere, Shillong-793001, Meghalaya.
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TERMS OF REFERENCE

Consultancy Services for DPR Preparation of Non Urban Roads & Major / Minor Bridges in the state of Meghalaya.

1. Introduction

Meghalaya is a relatively small hilly state situated in the North-East region of the country. It is lagging in development as compared to rest of the country due to its poor transport infrastructure, difficult hilly terrain and climatic conditions, tenuous communication, poor market access, low agriculture productivity, and low level of industrialization.

Government of Meghalaya has received a loan from the World Bank (IBRD) under its Meghalaya Integrated Transport Project (MITP) for the up gradation of the transport infrastructure in the State. Meghalaya Integrated Transport Project (MITP) has the objective of improving transport connectivity and efficiency, and enhancing transport sector management in Meghalaya. For the management & administration of the project, a dedicated Project Management Unit (PMU) has been established in MIDFC at Shillong, headed by a Project Director and supported by other staff responsible to implement the project.

MITP includes rehabilitation / up-gradation of existing roads and construction of missing links / bypasses / Bridges in the State of Meghalaya. The Public Works Department (PWD) of the Government of Meghalaya is the implementing agency for improvement/rehabilitation of roads and construction of bridges under the World Bank funded MITP. With this background, PWD wishes to engage a reputed and experienced consultant for preparation of Detailed Project reports including Designs with innovative technology for Construction / Up- gradation of Roads and Bridges.

2. Objective of the DPR Consultancy Services

2.1 To prepare cost effective engineering designs and cost estimates (detailed project reports) for up-gradation, rehabilitation , improvement of existing deficient road geometrics within the available right of way , rehabilitation / widening / reconstruction or new construction of culverts , bridges and other roads related structures like retaining walls / Breast walls , longitudinal / cross drains , road side facilities like Bus Stops , Village Haat / market platform , Toilet Blocks , villagers meeting platform , view point etc. and making good the deficiencies of road safety measures.

2.2 To introduce latest innovative and green & climate resilient technologies in the designs.

2.3 The objective of the services is to provide high quality professional and Engineering DPRs of the candidate roads / Bridges under the project. Minor bridges of length up to 30 M shall be considered as part of Roads.

3. Scope of the Consultancy Services

3.1 Designs & DPRs of Roads and Minor Bridges of length up to 30 M:

The main tasks shall be:

Task-1: Preparation of plan and profile of the existing / proposed new roads, covering all the existing features of road/ road environment , available land width, all installations and establishment etc. within a Right of Way (ROW) of 30 m width.

The topographical surveys will be provided by the Public works Department in soft copy to the Consultant. The Consultant shall design the roads as per the requirements prescribed in relevant IRC Specifications / guidelines for hills and try to best fitting within the available / existing Right of Way. The Consultant should consider that no land acquisition is going to take place under the project. However for the approaches of the Bridges / construction of new bypass / missing link / improvement of few very bad Geometrics may necessitate requirement of some additional land. The Consultant should workout the most feasible alignment / designs of the bypass / approaches of the Bridges / improvement of Geometrics involving the bare minimum requirement of land acquisition.

Task-2: Traffic Surveys & Road and Bridge Inventory

The Public works Department has already collected the required data from the field; the same will be made available to the consultant by the PWD, Meghalaya. The Consultant shall utilize the collected traffic survey & inventory information in the DPR wherever applicable. The Consultant is free to request for any additional information regarding the Traffic Survey, Road and Bridge Inventory from the Public Works Department, Meghalaya.

Task-3: Soil and Material testing

The Public works Department has already collected the required data from the field; the same will be made available to the consultant by the PWD, Meghalaya. The Consultant shall utilize the same in the DPR wherever applicable. The Consultant is free to request for any additional information regarding the Soil and Material Survey from the Public Works Department, Meghalaya.

Task-4: Pavement design

The Public works Department has already designed the pavement (i) Flexible pavement for new links / roads / Bypass as per IRC: 37-2012 (Guidelines for the design of flexible pavements), and (ii) overlay for strengthening of the existing flexible pavement on the basis of falling weight deflectometer (FWD) as per IRC -115 (Guidelines for Structural Evaluation and Strengthening of Flexible Pavements using falling weight deflectometer technique), the same will be made available to the consultant by the PWD, Meghalaya. The Consultant shall use the same in the DPR wherever applicable. The Consultant is free to request the Public Works Department, Meghalaya for any additional information regarding pavement design / composition of the pavement for innovation purpose / utilization of the suitable local materials for cost saving / for the purpose of making the pavement climate resilient.

Task-5: Road side drainage plan

The Consultant shall prepare the existing drainage plan of the existing roads, design and cost estimate for the rehabilitation and augmentation of the existing drainage as per actual site requirements.

The roadside drainage shall be examined and an efficient and adequate roadside drainage system for the project roads shall be designed in accordance with the IRC relevant guidelines. Proposals for drainage of urban stretches shall adequately address the specific needs of protection against erosion, quick disposal, and maintenance.

The design and drawings of the drainage system should show drain location, section, specifications, and outfall locations with details of outfall structures.

Task-6: Road Safety Audit, Road signs, Markings and Traffic safety devices

The Consultants shall carry out road safety audit of the roads as per the guidelines contained in IRC: SP: 88 (Manual on Road Safety Audit) and propose provisions together with designs and specifications of road signs, pavement markings, crash barriers, railings, delineators, overhead signs, road boundary stones, km stones, 200m stones, etc keeping in view the provisions / guidelines contained in IRC:67(Code of Practice for Road Signs) & IRC:35(Code of Practice for Road Markings) . The proposals shall be accompanied with the Road Safety Audit report along with design and drawings showing locations and specifications of proposed safety measures.

Task-7: Evaluation of existing protection works and designs of new protection works required

The Consultant shall evaluate the soundness of the existing protection works like retaining walls, breast walls, slope pitching etc. along with the remedial measures.

The Consultant shall work out the new protection works with proper justification and design of the same.

Task-8: Engineering designs

(i)The Consultant shall prepare cost-effective engineering design for construction/ up gradation/ rehabilitation of roads with green and climate resilient technologies. The work to include providing proposal along with cost estimate for improvement of the deficiencies in the existing geometry including deficiencies in the road safety measures provided on the road within available road width, as per IRC specifications.

(ii) The Consultant shall prepare cost-effective designs for rehabilitation/ reconstruction/ re-construction of the existing/ construction of new structures (culverts, minor bridges up to length of 30 M and other structures).

(iii)The Consultant shall prepare designs / arrangement and cost estimate of the local streams joining the road from the hill top including proper disposal of the discharge in the nearby cross drainage structures.

(iv) PWD Meghalaya will identify the landslide and flooding prone locations / areas and conduct geophysical investigation and recommend the protection measures including applying bioengineering solutions. The same along with specifications will be made available to the Consultant by PWD Meghalaya for evaluating the cost of the measures and including the same in the project report. Consultant will build the cost in the estimate of the work.

Task-9: Road side amenities (Project facilities)

The Consultant shall identify suitable places for providing roadside amenities for freight terminals / full fledged truck stops (Truck lay byes) with last mile connectivity to wholesale markets , primary markets (Mandis) , Cold Storage facilities , ware houses and processing facilities (MSME Clusters) , bus stops, passing places , huts for road maintenance staff , toilet blocks , village market platform , view point and any other amenity as per the direction of the PWD and prepare the designs along with cost estimates of the same .

Task-10: Cost Estimate

The Consultant shall prepare cost estimate of rehabilitation/ reconstruction of the existing roads and also of the new roads under the project.

The Consultant shall worked out the analysis of rates based on the schedule of rates of PWD and the data book published by the IRC on behalf of the Ministry of Roads and Highways , Govt. of India(latest edition).

Task-11: Preparation of Bill of Quantities Road / Package wise along with Technical Specifications

The Consultant shall prepare Bill of Quantities along with Technical Specifications for each road / package, as decided by PWD, separately.

Task-12: Preparation of standalone road / package wise Bidding Document

The Consultant shall prepare bidding documents following the World Bank procurement guidelines and Standard Bidding Documents (SBD). The contract shall be sliced and packaged to attract medium size contractor from the sub region.

3.2 Designs & DPRs of Major Bridges and Minor Bridges of length more than 30 M:

The main tasks shall be:

Task -1: Selection of Site for the Bridge:

The selection of site of bridges is an art and requires considerable investigations. The site selection may have to start with the study of available maps before starting the reconnaissance survey. As per best industry practices, two or three possible alignments should be marked on survey sheets considering the topography of the land, land use, soil type, water bodies, river profile, straightness of the reach, width of crossing, presence of high banks etc., before taking up the reconnaissance survey. Some landmarks for easy identification during reconnaissance survey may also be marked on survey sheets.

Data of the existing bridges (in the vicinity about 50- 100 km on either side from the proposed bridge sites) including plan, length of the bridge, span arrangement, longitudinal sections and river cross sections be procured from the owning entity, if not possible, Consultant will prepare at its own. All the activities shall be carried out as per relevant IRC Codes / Specifications and best industry practices.

Task-2: Comparative feasibility study of the proposed alternative sites:

Consultant shall prepare a feasibility report on the basis of the merits and demerits of the different alternative sites. The same shall be discussed with the Employer (PWD, Meghalaya) and thereafter final decision about the best site will be taken and recorded. All the activities shall be carried out as per relevant IRC Codes/ Specifications and best industry practices. Before finalization of the site, the status of underground/ overhead utilities be also verified and taken into consideration. The bridge site shall be proposed in a way which helps in improving the longitudinal gradient and plan & profile of the approaches of the bridge. If required, possibility of providing *skew bridge, curved bridge and/ or bridge in longitudinal gradients* may be explored. On the basis of field visits, possible sites be finalized with merits & de-merits including tentative/ likely cost, ease of construction, methodology of design/ construction, availability of specific skilled labor in the State/ nearby areas etc. and submitted to the Employer for decision. All the activities shall be carried out as per relevant IRC Codes/ Specifications and best industry practices.

After finalization of the proposed bridge site, topographic survey at the bridge site including a length of 500 m U/S & 500 m D/S, including Plan, longitudinal sections (existing / proposed road & river) and river cross section be carried out.

Task-3: Preliminary survey, subsoil investigation and hydraulic survey:

Once the best possible site is selected on the basis of Task-1 & 2 above, reconnaissance survey, detailed survey, detailed sub soil investigation and hydraulic study shall be conducted at the selected site.

Task-4: Fixation of length of the structure, span arrangement and selection of type of the structure:

Keeping in mind, the guidelines on aesthetics with due considerations given to the site conditions and environmental considerations issued by IRC, Ministry of Roads Transport & Highways and best international practices, the length, span arrangement and type of the structure shall be decided. A detailed report should be submitted to the Employer for the final approval.

While suggesting type of structure, Steel or RCC or composite , possibility of providing *integral bridge* (where piers are monolithic to the superstructure) shall also be explored which have enhanced performance during seismic/ flood conditions, improved durability, least maintenance problems and better riding quality.

Type of structure shall be finalized with due consultations with the Employer. While suggesting span arrangements, due considerations should be given to the site conditions, hydraulic data and span arrangement of the existing bridges (U/S and/ or D/S) over the river/ stream.

Design discharge, Linear Waterway, scour depth, Afflux, Vertical clearance, HFL, LWL etc. be worked out as per relevant IRC Codes/ Indian Standard Codes / Best International Codes.

Task-5: Finalization of different components of the structure i.e. Foundations, Sub-structure & Super-Structure, approach slab and Bearings etc.:

For sub soil investigation, bores at each of the Abutment location and at each pier location be got done to suitable depth as per relevant IRC Codes/ Indian Standard Codes/ Best International Codes and type of foundation including depth of foundation be selected in consultation with the Employer.

Task-6: Preparation of the General Arrangement Drawing (GAD) and methodology (philosophy) of the design:

On the basis of above parameters, proper GAD of the bridge be prepared and submitted to the Employer for its consent. Before taking up the detailed designs of the various components of the structure a concept report containing the methodology (philosophy) of the design is prepared in consultation with the Employer.

Task-7: Design of different parts of the Bridge (Structure):

After finalization of GAD & methodology ((philosophy) of the design, design of various parts be carried as per the guidelines / parameters / yard sticks contained in the relevant IRC Codes / Indian Standard Codes / Best International Codes.

Analysis of the bridge shall be done on the basis of latest acceptable computer aided methods/ software. Design of various components shall be in conformity with various latest IRC Codes/ Ministry of Roads Transport &Highways guidelines and best international practices. The input data, design parameters, assumptions made in the design and final analysis results for each component of the structure shall be clearly spelt out with proper reference of relevant codes, where required, and shall be indicated in the design report for better appreciation of the design.

Task-8: Design of river training works, if required:

Based on the site requirements, the consultant shall design the river training works like Guide Bunds, Aprons, Launching Apron, Slope Protection, curtain wall, tow wall etc. as per the relevant IRC Codes / Indian Standard Codes / Best International Codes.

Task-9: Preparation of working drawings of each component of the bridge, approach slab, river training works, and other allied works required, if any, based on the designs made as per above:

The consultant shall prepare working drawings of each component of the bridge based on the design and approach slab, river training works, and other allied works required, if any, based on the designs made as per above.

Task-10: Design & drawings of both side approaches shall be made as per relevant IRC Codes / Specifications & Standards of MORTH / Indian Standard Codes / Best International Codes. Approaches of length (each side) up to 250 M shall be considered as part of the Bridge and no additional payment shall be made. However for rest of the length additional payment , as mutually decided , shall be made.

Task-11: Preparation of technical specifications of all the works involved in construction of the bridge project in totality including quality assurance plan for the same:

The consultant shall prepare technical specifications of all the works involved in construction of the bridge , approach roads & allied components based on the Specifications for Road and Bridges (fifth revision) published by Indian Roads Congress and relevant Indian Standard Codes and best international practices. The same shall be reviewed by the Employer and after incorporating the comments of the Employer, the specifications shall be finalized by the Consultant.

The Consultant shall also prepare quality assurance plan for the bridge project keeping in consideration the publications of IRC, Ministry of Road Transport & Highways, Indian Standards and best international

standards. The same shall be reviewed by the Employer and after incorporating the comments of the Employer, the specifications shall be finalized by the Consultant.

Task-12: Preparation of cost estimate including details of measurements, Bill of Quantities and analysis of rates:

Analysis of rates shall be carried out on the basis of latest edition of the Data Book published by IRC on behalf of Ministry of Road Transport & Highways; however, the rates of labour, materials and usage charges of Equipment/ Machineries shall be adopted as approved by the Public Works Department, Government of Meghalaya. Items not covered under above, shall be analyzed on the basis of prevailing market rates. Rates shall be analyzed excluding GST; provision for GST is made at the end of project cost as applicable at the time of framing cost estimate.

Task-13: Proof Checking of Designs/ report etc., submitted by the design consultant

PMU (MIDFC)/ PWD Govt. of Meghalaya will appoint a proof consultant (preferably any Indian Institute of Technology (IIT) / National Institute of Technology (NIT) of the Country for the proof checking of the Designs/ reports submitted by the design consultants. Design consultants shall be responsible for giving proper support for the proof checking of the designs/ reports. Any discrepancies/ modifications required by the proof consultants shall be made good by the design consultant to the satisfaction of the proof consultant.

4. Total Time for Assignment

The total time period for completion of the study including submission of final Designs DPR, drawings and Bill of Quantities Package wise along with Technical Specifications, standalone bidding documents and quality assurance plan covered under the scope of services is **6 (six) months** from the date of commencement of services notified by the Client / Employer.

The client shall ensure to give approval on alignment plans, GAD, designs, draft reports, proposals, etc submitted by the Consultant, in reasonable time so as not to delay the performance of the Consultant's services.

List of proposed Roads & Bridges is annexed with this TOR at Appendix-1.

5. Consultancy Team

(i)The Consultant shall form a multi-disciplinary team for undertaking this assignment. The consultant's Team shall be manned by adequate number of experts and technical staff with requisite qualification and experience for the assignment.

(ii)The tentative list of Key personnel to be fielded by the consultant as per the client's assessment is given in **Appendix-II**. The key personnel are required to be available for the period of assignment.

(iii) The Design Consultant should arrange for his office accommodation as required at Shillong , capital city of the State of Meghalaya including electricity & water and watch & ward facilities. Accordingly provision shall be made in the financial proposals.

(iv) The Design Consultant should provide for their own all the logistics, consumables, furniture's, furnishers, Computers, Laptops and equipment, software etc. required for proper completion of the work. Accordingly provision shall be made in the financial proposals.

(v) For transportation cost, the consultants shall make provision for the rental of vehicles including running and maintenance charges towards transportation in their financial proposals. No provision for the purchase of vehicles shall be made by the consultants in the financial proposals. Accordingly provision shall be made in the financial proposals.

6. Inputs to be provided by the PWD / PMU (MIDFC)

6.1 (i) Traffic census data as available with the PWD , Lead Chart showing location of quarries and copy of the Schedule of Rates of PWD , Government of Meghalaya .

(ii) Provide help in procuring required data about the rivers from the concerned departments of Government of Meghalaya.

(iii) Soil and Material testing Report as mentioned under Task- 3 of Clause 3.1 above.

(iv) Traffic Surveys and Road and Bridge Inventory as mentioned under Task- 2 of Clause 3.1 above.

(v) Topographical Surveys of each road of all the towns covered under the services as mentioned under Task- 1 of Clause 3.1 above.

(vi) PWD Meghalaya will identify the landslide and flooding prone locations / areas and conduct geo-physical investigation and recommend the protection measures including applying bioengineering solutions. The same along with specifications will be made available to the Consultant by PWD Meghalaya as mentioned under Task- 8 of Clause 3.1 above.

7. Cost of Sub Soil Investigation in all type of soils / Rocks etc. including testing of samples for Major Bridges and Minor Bridges of length more than 30M

7.1 The Consultants are directed to quote the rate for sub – soil investigation in all type of soils / Rocks etc. including testing of the samples in a bracket of 5m intervals i.e. (i) Mobilization & Demobilization of necessary equipment for Borehole testing, (ii) 0 to 5 m depth, (iii) 6 to 10 m depth, (iv) 11 to 15 m depth, (v) 16 to 20 m depth, and (vi) more than 20 M depth.

Price of the proposals shall be compared for 20M depth only.

8. Reports and Documents to be submitted by the Consultant

(i) All reports, documents and drawings are to be submitted separately for each of the road section and for each Bridge.

(ii) Project preparation activities will involve the following stages:

Stage 1: Inception Report

Stage 2: Draft Project Report (Draft PR)

Stage 3: Detailed Project Report (DPR)

(iii) Consultant is required to complete fully all the different stages of study within the time frame indicated in the schedule of submissions for becoming eligible for payment. No time-over-run in respect of these submissions will normally be permitted.

(iv) The Consultant shall submit to the client the final reports and documents in bound volumes in the number of copies specified in and also a soft copy of the final reports in CD.

(v) The reports and documents to be submitted by the consultant to the client are described in the following paragraphs.

Stage 1:

Inception Report

The Inception Report shall cover:

Project appreciation and detailed methodology to meet the requirements of the TOR finalized in consultation with the PWD; including scheduling of various sub-activities to be carried out for completion of various stages of the work; stating out clearly their approach & methodology for project preparation after due inspection of the project roads and collection/ collation of necessary information;

Key plan and Linear Plan

Design standards

Work program

STAGE 2:

A. Strip Plans and Clearances

- (i) The Consultants shall submit the following documents:
 - a) Plans showing the centre line of the proposed improvement/ widening of the road along with the existing and existing right-of-way limits;
 - b) Strip plans showing the location of existing utilities and services to be shifted.
 - c) Separate strip plans showing shifting / relocation of each utility services in consultation with the concerned local authorities;
 - d) The utility relocation plans should clearly show existing right-of-way and pertinent topographic details including buildings, major trees, fences and other installations such as water-mains, telephone, telegraph and electricity poles, and suggest relocation of the services along with their crossings the road at designated locations as required and prepare necessary details for submission to the Service Departments;
- (ii) The Report accompanying the strip plans should cover the essential aspects as given under:
 - a) Details of properties, such as buildings and structures falling within the existing right-of-way , if any
 - b) Kilometer-wise Utility Relocation Plan (URP) within the existing right-of-way, if any
 - c) Kilometer-wise account in regard to felling of trees of different type and girth within the existing right-of-way, if any.
- (iii) The strip plans shall clearly indicate the scheme for widening (left, right or symmetrical) duly taking into accounts the views and suggestions of PWD. The widening scheme shall be finalized in consultation with PWD.

B. Draft Project Report- DPR

- (i) The Draft PR shall be prepared separately for each construction package and shall contain the following five volumes:

Volume – I: Preliminary Design Report

- a) Executive summary
- b) Project description and socioeconomic profile of the project area
- c) Traffic surveys and analysis
- d) Cost estimates
- e) Conclusions and recommendations

Volume – II: Design Report

- f) Road and bridge inventories
- g) Summary of survey and investigations data

- h) Proposed design standards and specifications
- i) Proposed road and pavement design, and preliminary designs of bridges and structures (except that of major bridges)
- j) Safety audit report

Volume – III: Drawings

- k) Location map
- l) Layout plans
- m) Alignment Plans and widening scheme
- n) Typical cross sections showing pavement details, and other features like drains etc
- o) Drawings for culverts, bridges and other structures
- p) Road junction designs

(ii) The Final Project Report duly modified in the light of comments of the PWD on the draft Project Report shall be submitted within 15 days of the receipt of comments.

STAGE: 3

Detailed Project Report (DPR)

The draft DPR shall be submitted for each road. The final DPR should contain following chapters:

(i)Main Report:

(ii)Design Report:

(iii)Materials Report:

(iv)Technical Specifications:

(v) Rate Analysis:

(vi)Cost Estimates:

(vii)Bill of Quantities:

(viii) Drawing Volume:

Final Detailed Project Report, Documents and Drawings

The Final construction package-wise DPR consisting of Volumes i to viii above incorporating all modifications and revisions as per the comments of the PWD on the draft DPR shall be submitted.

9. Payment Schedule

9.1 The Consultant will be paid consultancy fee (except fee of sub soil investigation cost) as a percentage of the contract value as per the schedule given below:

Sl. No.	Description	Payment
1	On submission of Inception Report	10%
2	On Submission of designed plan & profile of the Roads along with inventory and condition survey of roads & bridges / and Topographic survey sheets on the basis of data provided by PWD along with proposed bridge locations & longitudinal / cross sections, hydraulic calculations, design methodology (philosophy) report and General Arrangement Drawing (GAD) including pavement design reports of Roads & Minor Bridges of length up to 30 M contained from Sl. No.1 to 6 of Appendix-I of this TOR.	20%
3	On Submission of Draft Detailed Project Report along with Technical specifications, standalone bidding document, and cost estimate with detailed analysis of rates along with quality assurance plan of Roads & Minor Bridges of length up to 30 M contained from Sl. No.1 to 6 of Appendix-I of this TOR.	25%
4	On approval of Final Detailed Project Report along with Technical specifications, standalone bidding document, and cost estimate with detailed analysis of rates along with quality assurance plan of Roads & Minor Bridges of length up to 30 M contained from Sl. No.1 to 6 of Appendix-I of this TOR.	10%
5	On submission of topographical surveys, traffic study report, soil testing reports , design report of approaches along with pavement design and other engineering investigation reports & Design reports of various components of Major Bridge / Minor Bridges of length more than 30 M and river training works Including working drawings.	15%
6	On Submission of Draft Detailed Project Report along with Technical specifications, along with Technical specifications, quality assurance plan , standalone bidding document, and cost estimate with detailed analysis of rates of approach roads and Major Bridge / Minor Bridges of length more than 30 M	10%
7	On approval of Final Detailed Project Report of approach roads and Major Bridge / Minor Bridges of length more than 30 M along with Technical Specifications, quality assurance plan, standalone bidding document, and cost estimate with detailed analysis of rates of approach roads and Major Bridge / Minor Bridges of length more than 30 M.	10%
	Total	100%

9.2. The payment against sub soil investigation for Major Bridges / Minor Bridges of length more than 30 M shall be made as per actual depth of boring on submission of the sub soil investigation reports.

9.3 Cost of soil investigation / sub soil investigation in all type of soils / Rocks etc. for Minor Bridges of length up to 30 M are included in the rate of the consultancy and no separate / additional payment shall be made to the Consultant.

10. Data and Software

The consultant shall hand over to the client soft copies (including the raw design files) containing the following data, drawings and software along with the Final Report.

- (i) Engineering Investigations and Traffic Studies including road and bridge inventories and condition survey as made available by the PWD in MS EXCEL or any other editable format as required by the Client.
- (ii) Topographic Surveys and Drawings: All topographic data as made available by the PWD would be supplied in (x, y, z) format along with complete reference so that the data could be imported into any standard highway design software.
- (iii). Rate Analysis for various items in a format which allows updating of rates.

11. Deliverables:

11.1 Inception Report: Within Fifteen days after the date of commencement of services.

11.2 For Roads & Bridges of length up to 30M as contained from sl. no. 1 to 6 of Appendix-I of this TOR:

Sl.no.	Item of work	Time schedule (limit) from date of commencement
1	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work "Up-gradation / improvement of Nongstoin Maweit Road."-----Length 35.00 km	60 days
2	Final Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work "Up-gradation / improvement of Nongstoin Maweit Road."-----Length 35.00 km	75 days
3	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work "Umsning- Jagi Road."----Length 40 km	75 days
4	Final Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work "Umsning- Jagi Road."-----Length 40.00 km	95 days
5	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work " Upgradation of road to Export point from the main road (i) Borsora, Length = 6.50 Km (ii) Cherragoan, length = 6.80 Km , and (iii) Bagli, Length = 4.00 Km"----- Length 17.30 Km	95 days
6	Final Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work " Upgradation of road to Export point from the main road (i) Borsora, Length = 6.50 Km (ii) Cherragoan, length = 6.80 Km , and (iii) Bagli, Length = 4.00 Km"----- Length 17.30 Km	115 days
7	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work "Upgradaion of Roads from Nongpoh – Umden-Sonapur "-----Length 25Km	115 days
8	Final Detailed Project Report along with Technical specifications,	135 days

	standalone bidding document and cost estimate with detailed analysis of rates for the work “Upgradation of Roads from Nongpoh – Umden- Sonapur ”-----Length 25Km	
9	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work “Upgradation of road from Mawstep to Pyrda Kukon and Rngi diengsai including bridge”----- Length 3 km plus Bridge	135 days
10	Final Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work “Upgradation of road from Mawstep to Pyrda Kukon and Rngidiengsai including bridge”----- Length 3 km plus Bridge	150 days
11	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work “Construction of Bypass from 4th of Shangpung Sutnga road to Pasyih Garampani road”-----Length 3 km	150 days
12	Final Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work “Construction of Bypass from 4th of Shangpung Sutnga road to Pasyih Garampani road” ----- Length 3 km	160 days
13	Draft Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work “Up-gradation/improvement of Kynshi - Myriaw Road (0.00 - 13.00 Km)” -----Length 13 km	160 days
14	Final Detailed Project Report along with Technical specifications, standalone bidding document and cost estimate with detailed analysis of rates for the work “Up-gradation/improvement of Kynshi - Myriaw Road (0.00 - 13.00 Km)” -----Length 13 km	175 days

11.3 For Major Bridge and Minor Bridges of length more than 30M:

Monthly progress reports and other reports as per the Tasks narrated under 3.2 above

Quantity: Six (6) sets of each submission in hard copies in English and Electronic copy in PDF.

Schedule of Services: Under the services, submissions shall be stage wise as under:

Stage No	Contents	Time period
I	Topographic survey sheets along with proposed bridge locations & longitudinal / cross sections, hydraulic calculations, sub-surface investigation reports, design methodology (philosophy) report and General Arrangement Drawing (GAD)	60 Days from the date of Commencement of services
II	Design reports of various components of bridge, approach roads and river training works including working drawings.	100 Days from the date of commencement
IV	Technical Specifications, standalone bidding document and quality assurance plan	100 days from the date of Commencement of services
V	Cost Estimate, details of measurements, Bill of	120 Days from the date of

	Quantities and analysis of rates	commencement
VI	Final Completion Report of the consultancy along with standalone bidding document.	Within 150 days from the date of Commencement of services
VII	Submission of BOQ	Within 160 days from the date of Commencement of services

The Consultant shall submit all the documents / reports in soft copy as well as hard copy as below:

- (i) All the Draft DPRs along with the required details in 3 sets in hard copy only.
- (ii) All the Final DPRs along with the required details in 6 sets in hard copy and two sets in soft copy only.

12. Financial Proposal to be submitted by the bidders:

12.1 The bidders shall quote the fees & expenses for the consultancy as below:

Sl. No.	Description of item	Total Cost / fee in Rs. (excluding GST)
1	For Roads and Minor Bridges up to 30 M length	
2	For Major Bridge & Minor Bridges of length more than 30 M length	
4	For sub soil investigation for Major Bridge & Minor Bridges of length more than 30 M length	
	Total	

12.2 The Charges of sub soil investigation in all type of soils / Rocks etc. including testing of samples for Major Bridge & Minor Bridges of length more than 30 M length shall be quoted as below:

Sl. no.	Description of item	Cost / Charges in Rs. (excluding GST)
1	Mobilization & Demobilization of necessary equipment for Borehole testing	
2	Borehole testing from 0 to 5 m depth	
3	Borehole testing from 6 to 10 m depth	
4	Borehole testing from 11 to 15 m depth	
5	Borehole testing from 16 to 20 m depth	
6	Borehole testing more than 20 M depths.	

12.3 GST shall be reimbursed as per actual payable at the time of payments made under the consultancy contract.

Appendix-I

Proposal of Roads & Bridges under the Consultancy Services

Sl. No	Name of road	Length in Km
1	Up-gradation / improvement of Nongstoin Maweit Road.	35.00
2	Up-gradation / improvement of Umsning- Jagi Road.	40.00
3	Construction of Bypass from 4th of Shangpung Sutnga road to Pasyih Garampani road.	2.30
4	Up-gradation / improvement of road to Export point from the main road (i) Borsora, Length = 6.50 Km (ii) Cherragoan, length = 6.80 Km , and (iii) Bagli, Length = 4.00 Km	17.30
5	Up-gradation / improvement of road from Mawstep to Pyrda Kukon and Rngidiengsai including bridge.	3.00
6	Up-gradation/ improvement of Roads from Nongpoh – Umden- Sonapur	25.00
7	Construction of Major Bridge of nearly 140 M length including approaches from Evelyne Ride Road to Umpling Dongsharum and protection works.	0.20
8	Up-gradation / improvement of Kynshi - Myriaw Road (0.00 - 13.00 Km)	13.00
	Total	135.80

Appendix – II /1

Manning Schedule

(This is an indicative list of manpower schedule expected to be required. The consultants can suggest changes in the proposal)

Sl No	Key Personnel	Total Project assignment (six months)
1	Senior Highway Engineer-cum-Team Leader	6 months
2	Highway design Engineer	5 months
3	Senior Bridge Design Engineer	3 months
4	Bridge Engineer	4 months
5	Geotechnical Engineer cum pavement specialist	4 months
6	Senior Survey Engineer	5 months
7	Quantity Surveyor/Documentation Expert	5 months
8	Drainage Engineer cum Hydrologist	4 months
9	Road Safety Expert	4 months
10	Procurement cum Contract Specialist	4 months

Total = 44 person-months

Qualification and Experience Requirement of Key Personnel

1. Senior Highway Engineer-cum-Team Leader

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering
ii)	Essential Experience	
	a) Total Professional Experience	Min. 15 years
	b) Experience in Highway projects	Min. 10 years in Planning, project preparation and design of Highway projects, out of which at least 5 years in hills.
iii)	Age Limit	55 years on the date of submission of proposal (work is in hills)

2. Highway Design Engineer

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering
ii)	Essential Experience	
	a) Total Professional Experience	Min. 15 years
	b) Experience in Highway Projects	Min. 10 years in Planning, project preparation and design of Highway projects including design of road geometry. Minimum 3 years experience in design of hill roads. Thorough knowledge of Hill Roads specifications.
iii)	Age Limit	55 years on the date of submission of proposal

3. Geotechnical Engineer cum pavement specialist

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering
ii)	Experience	
	a) Total Professional Experience	Min. 10 years
	b) Experience in Highway projects	Minimum 5 years experience in pavement design and maintenance
iii)	Age Limit	55 years on the date of submission of proposal

4. Bridge Engineer

i)	Educational Qualification	
	a) Essential	Graduate in Civil Engineering
ii)	Essential Experience	
	a) Total Professional Experience	Minimum 15 years
	b) Experience in Bridge projects	Min. 10 years in design of bridges , at least 5 years in design of bridges in hills
iii)	Age Limit	55 years on the date of submission of proposal

5. Senior Survey Engineer

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering or Diploma in Civil Engineering or Diploma in Surveying
ii)	Essential Experience	
	a) Total Professional Experience	Min.10 years for Degree Holders and 15 years for Diploma Holders. At least 5/7 years experience in hills.
iii)	Age Limit	50 years on the date of submission of proposal

6. Quantity Surveyor/Documentation Expert

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering
ii)	Essential Experience	
	a) Total Professional Experience	Min. 15 years
	b) Experience in Highway Projects	Min. 5 years in Preparation of Bill of Quantities, Contract documents and documentation for roads / highway projects
iii)	Age Limit	60 years on the date of submission of proposal

7. Drainage Engineer cum Hydrologist

i)	Educational Qualification	
	Essential	Graduate in Civil Engineering
ii)	Essential Experience	
	a) Total Professional Experience	Min. 15 years
iii)	Age Limit	60 years on the date of submission of proposal

8. Senior Bridge Design Engineer

i)	Educational Qualification	<p>(i) Graduate in Civil Engineering</p> <p>(ii) Post Graduate in Structural Engineering</p> <p>Above both the degrees should be from a recognized institute of repute and should have been done as regular full time course. Degrees obtained by distance learning or through part time facility shall not be considered.</p>
ii)	Essential Experience	<p>Minimum of 20 years Experience in engineering related field, out of which at least 7 years should be in the design of structures / major river bridges (length more than 60 M) .</p> <p>He should have proven record of project management of the infrastructure projects especially roads/highways involving major bridges.</p> <p>He should have thorough knowledge of specifications / Codes (National and International) related to design of major structures especially river bridges.</p> <p>He should have experience of Design (at its own i.e. independently) of at least five nos. standalone river major bridges (more than 60 m long) during the last five years.</p> <p>He should have experience of Design of bridges with the help of latest acceptable computer aided methods / software.</p> <p>He should have experience of design of at least five nos. major (more than 90 m long) steel and composite bridges.</p>
	a) Total Professional Experience	Min. 20 years
iii)	Age Limit	55 years on the date of submission of proposal

9. Road Safety Expert

i)	Educational Qualification	
	a) Essential	Graduate in Civil Engineering
ii)	Essential Experience	
	a) Total Professional Experience	Min. 10 years
	b) Experience in Highway Projects	Min. 3 years as Road Safety Auditor on Highway / Road projects (National Highways / State Highways) Experience of Hills Roads will be preferred.
iii)	Maximum Age Limit	50 years on the date of submission of proposal

10. Procurement cum Contract Specialist

i)	Educational Qualification	
	a) Essential	Graduate in Civil Engineering from a reputed institution.
ii)	Essential Experience	
	a) Total Professional Experience	Min. 20 years
	b) Experience in Highway Projects	Min. 15 years in the Roads & Highways Sector out of which at least 7 years as Contract / Procurement Expert. He / She should have worked as Contract / Procurement Expert in at least two projects funded by multilateral financing institutions like World Bank / ADB.
iii)	Maximum Age Limit	50 years on the date of submission of proposal