



**GOVERNMENT OF MIZORAM**  
**PUBLIC WORKS DEPARTMENT**



***Competitive e-Bidding - Request for Proposal.***  
***(Through e-procurement mode only – <https://tender.mizoram/gov.in>)***

***Name of Work: Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram.***

**(Package – V)**

***Engineer-in-Chief, PWD***  
***Mizoram, Aizawl***

**January 2020**

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**Government of Mizoram  
Public Works Department  
Mizoram  
Request for Proposal**

**(Through e-procurement mode only - <https://tender.mizoram.gov.in>)**

Tender No: **1 (EnC) of 2020**

The Governor of Mizoram, represented by the Engineer-in-Chief, Public Works Department, Mizoram, Aizawl invites bids in two envelope system through e-procurement from the eligible established and reliable agencies/ Institution Consultants for the following works in six packages from eligible, established and reliable agencies / institutions/ consultants for execution of work as detailed below:

1. Name of Work:

Sl. No.	Name of Work	Cost of document/ Tender fee	Bid Security (EMD)	Contract Duration
1.	<i>Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report &amp; Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram.</i>	Rs. 15000.00 Per Package	Rs.3.60 lakhs per package	10 Months

2. Details of Packages & Road

**PACKAGE - I**

Sl. No	Name of proposed road	Approximate Length in Km	Proposed standard and status	Division assigned
<i>1</i>	<i>2</i>	<i>3</i>	<i>5</i>	<i>6</i>
1	Construction of Reiek – Lengte road	20.00	New construction with single lane	ARSD
2	Construction of Hmunpui – Phaizau road	25.00	New construction with single lane	Mamit
3	Construction of Mamit Western Bypass	8.00	New construction with intermediate lane	Mamit
4	Construction of Hualtu – Hmuntha – Maite road	27.00	New construction with single lane	Serchhip
5	Construction of Khawlailung - Hmunzawl road	24.00	New construction with single lane	Serchhip
6	Re-alignment of Mualcheng - Khawbung road	60.00	Upgradation in intermediate lane	Serchhip/Champhai
7	Construction of Dampui to West Phaileng road	15.00	New construction with single lane	Mamit
	<b>TOTAL OF PACKAGE - I</b>	179.00		

**PACKAGE – II**

<b>Sl. No</b>	<b>Name of proposed road</b>	<b>Approximate Length in Km</b>	<b>Proposed standard and status</b>	<b>Division assigned</b>
<i>1</i>	<i>2</i>	<i>3</i>	<i>5</i>	<i>6</i>
1	Construction of New Vervek - Vanbawng - Mimbung road	120.00	New road with Intermediate Lane road	NHD – II
2	Construction of Khawruhlian - Tuirial - Selesih road	20.00	New construction with single lane	NHD – II
3	Re-alignment of Kawnpui – Lungdai – Selesih road	35.00	Re-alignment with upgradation to intermediate lane	NHD – V
	<b>TOTAL OF PACKAGE - II</b>	175.00		

**PACKAGE - III**

<b>Sl. No</b>	<b>Name of proposed road</b>	<b>Approximate Length in Km</b>	<b>Proposed standard and status</b>	<b>Division assigned</b>
1	Construction of Lungtan – Ngengiang – Thentlang road	35.00	New construction with single lane	Khawzawl
2	Construction of Mimbung – R. Tuivai road	15.00	New construction, single lane	Khawzawl
3	Construction of Tualte – Zawngtetui–Bungzung road	26.00	New construction with single lane	Khawzawl/Champhai
4	Construction of Hliappui – Rabung – Hnahlan road	58.00	Improvement of existing road with single lane	Khawzawl/Champhai
	<b>TOTAL OF PACKAGE - III</b>	134.00		

**PACKAGE - IV**

<b>Sl. No</b>	<b>Name of proposed road</b>	<b>Approximate Length in Km</b>	<b>Proposed standard and status</b>	<b>Division assigned</b>
1	Biate - Bungzung - Buang - Hruaikawn – Zokhawthar	85.00	New construction of road with single lane	Khawzawl/Champhai
2	Construction of Hnahlan – R. Tiau road	12.00	Existing road to be upgraded to Intermediate Lane	Champhai
3	Construction of Zote - R. Tiau road	10.00	Existing road to be upgraded to Intermediate Lane	Champhai
4	Construction of Lianpui – Vangchhia - Vaphai road	20.00	New construction with single lane	Champhai
	<b>TOTAL OF PACKAGE - IV</b>	127.00		

**PACKAGE - V**

Sl. No	Name of proposed road	Approximate Length in Km	Proposed standard and status	Division assigned
1	Diversion of Lunglei to Buarpui road at Kawlhawk village	5.00	New construction with intermediate lane	Lunglei
2	Construction of Muallianpui Lungleng S-Tuipui 'D' road	30.00	New construction with single lane	Lunglei
3	Construction of Lunglei to Putlungasih road	25.00	New road with single Lane road	Lunglei
4	Construction of Bualpui V to Lungmawi road	9.00	New road with single Lane road	Lunglei
5	Construction of Tlabung - Marpara road	70.00	New constrn from Marpara - Tlabung to intermediate lane	Tlabung
TOTAL OF PACKAGE -V		139.00		

**PACKAGE -VI**

Sl. No	Name of proposed road	Approximate Length in Km	Proposed standard and status	Division assigned
1	Construction of Diltlang S - Lunglei road	65.00	New road with Intermediate Lane road	Lawngtlai
2	Re-alignment of Lobo – R. Chhiantuipui road	11.00	Existing road to be upgraded to Intermediate Lane	Saiha
3	Construction of Amotlah – Tuipui – Thingfal road	30.00	New constrn from Amotlah to Thingfal to intermediate lane	Saiha
4	Construction of Lopu - Bymari road	15.00	New construction with single lane	Saiha
TOTAL OF PACKAGE -VI		121.00		

3. The interested bidders are required to quote their **rates per kilometer of road** put to tender as above details for *Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram.* and thus, the Final Amount (inclusive of GST & all applicable taxes) of the bid.
4. The tender document can be obtained through website <https://tender.mizoram.gov.in>
5. Date of Inviting Tender: **17<sup>th</sup> February, 2020**
6. Place & Date of Pre-bid meeting: Not required
7. Date of Downloading the bid document through website <https://tender.mizoram.gov.in> : **from 17<sup>th</sup> February 2020 to 5<sup>th</sup> March 2020 up to 12:00 Noon**
8. The last date and time of receipt of bids through website of <https://tender.mizoram.gov.in>: **9<sup>th</sup> March 2020 up to 12:00 Noon.**
9. The last date and time of receipt of Hard Bound Copy of Bid in the Office of Engineer-in-Chief, PWD Mizoram : **9<sup>th</sup> March 2020 up to 12:00 Noon.**
10. Time & Date of opening of technical bids, through website <https://tender.mizoram.gov.in>: **9<sup>th</sup> March 2020 at 12:30 PM.**
11. Date & time of opening of Financial Bid: To be communicated later for the qualified bidder.
12. Officer inviting bids: Engineer-in-Chief, PWD, Mizoram, Aizawl.
13. For participating e-tendering process, the contractor/consultant shall have to get themselves registered to get user ID, Password and digital signature. This will enable them to access the website <https://tender.mizoram.gov.in> and download/participate in e-tender.
14.
  - (i) Bid process fee to be paid by Demand Draft/Banker's Cheque in the names of Engineer-in-Chief, PWD. Payable at Aizawl.
  - (ii) Bids along with necessary documents must be submitted through e-procurement portal <https://tender.mizoram.gov.in> on or before the date & time specified in NIT. The department does not take any responsibility for the delay due to communication problems or any other reason.

15. Cost of Document/Tender fee should be paid by Demand Draft of any Schedule Bank payable in favour of Engineer-in-Chief, PWD, Mizoram payable at Aizawl. Original Bank Draft is to be deposited in the office of the Engineer-in-Chief, PWD Mizoram.
16. Earnest Money is to be paid By DD/NSC/ Unconditional BG from a schedule bank in favour of /pledged infavour of Engineer-in-Chief, PWD Mizoram, payable at Aizawl and should be submitted as explained in the terms and conditions mentioned in instruction to bidders failing which the tender will be rejected.
17. Along with the e-bids, the technical bids should be submitted in hard bound form with page numbering and index. Any additional information shall also be furnished by the bidder in hard bound form with **proper indexing** and page numbering. The details submitted in other forms like spiral bound form, loose form etc. would be rejected. ***The financial Bid submitted through the website <https://tender.mizoram.gov.in> will only be acceptable.***
18. The format of downloaded tender documents should not be disturbed/altered; otherwise the bids will be rejected. The tender documents are non- transferable and **only the** firms to whom the tenders have been issued may submit their bids.
19. All the information /corrigendum/addendum related to the bid shall be published on the website: <https://tender.mizoram.gov.in>
20. Further details of the work can be obtained from the office of the Engineer-in-Chief, PWD, Mizoram, Aizawl. For clarification regarding the e-tendering process please contact Er. J. Zothanpuia, Chief Engineer (P), PWD, Aizawl, Mizoram, Ph. No. 0389 2300179.

**Engineer -in - Chief  
Public Works Department, Mizoram,  
Aizawl, Mizoram**

## PRESS NOTICE/NIT

### **PRESS TENDER NOTICE**

On behalf of the Governor of Mizoram, Engineer-in-Chief, Public Works Department, Mizoram, Aizawl invites bids in two envelope system through e-procurement from eligible established and reliable agencies/ Institutions/Consultants for the work ***“Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads (as details given in the bill of quantities and Tender Notice) in the State of Mizoram.”***, **in six packages.**

The tender document can be obtained through website <https://tender.mizoram.gov.in>, Bid process fee to be paid by Demand Draft/Banker’s Cheque in the name of Engineer-in-Chief, PWD. Payable at Aizawl.

The bid/tender document for downloading through website <https://tender.mizoram.gov.in> will be available **from 17<sup>th</sup> February 2020 to 5<sup>th</sup> March 2020 up to 12:00 Noon**

**Engineer -in - Chief  
Public Works Department, Mizoram,  
Aizawl, Mizoram**

## SECTION- 2

### 1. INSTRUCTION TO BIDDERS

#### 2.1 INTRODUCTION

- 2.1.1 The Public Works Department, Mizoram, Aizawl, is responsible for the development, maintenance and management of Road & Bridges of State Highways, Major District Roads, Other District Roads, Village Roads and National Highways and for matters connected or incidental thereto.
- 2.1.2 PWD, Mizoram officiates from its Head Office at Tuikhuahtlang, Aizawl, Mizoram and also has Divisional offices at various places of Mizoram. Issues relating to Planning for Highways are being done in the Office of Engineer-in-Chief, PWD and the execution of work at site are being done mainly through agencies by Chief Engineer concerned, Circles and Divisional Offices.
- 2.1.3 Mizoram intends to have full project reports of these roads for the State.
- 2.1.4 Bids are invited by Engineer-in-Chief, PWD Mizoram from established and reliable agencies/ institutions for conducting *Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram. Bid for package* (Working drawings & preparation of DPRs incorporating *the extant IRC guidelines, codes and any other suitable codes as may be required.*

#### 2.2 DEFINITIONS

- a) **“PWD”** means Public Works Department, Mizoram.
- b) **“Circle”** means jurisdiction of Superintending Engineer, PWD. Mizoram. There are nine number of Circles with their jurisdictions as below:
- c) **“Divisions”** means jurisdiction of Executive Engineer, PWD, Mizoram.
- d) **“The Employer”** or **“ The Authority”** means the Governor of Mizoram, represented by Engineer-in-Chief, Mizoram, Public Works Department, Mizoram, Aizawl. .
- e) **“The Consultant”** means agency appointed by PWD with a stipulated mandate or Firm, or Institution undertaking the specified job in this tender document..
- f) **“The Bidder”** means a firm or JV or Consortium which participates in the tender and submits its proposal.
- g) **“The Products/equipment/ system”** means all the equipmentsuch as all survey instruments, Soil investigation equipment Lab equipment for soil testing and similar type of equipment which is required to collect for the road design data&testing,servers etc.
- h) **“Successful Bidder”** means the Bidder, who, after the complete evaluation process, gets the Letter of Award. The Successful Bidder shall be deemed as “Consultant” appearing anywhere in the document.
- i) **“The Letter of Acceptance”** means the issue of a signed letter by the Employer of its intention to accept the offer of successful bidder and awarding the work mentioning the total Contract Value.

- j) **“The Contract”** means the agreement entered into between the Employer and the Consultant, as recorded in the Contract documents signed by the parties, including all attachments and appendices thereto and all documents incorporated by references therein
- k) **“The Contract Price”** means the price payable to the Successful Bidder under the Letter of Acceptance for the full and proper performance of its contractual obligations. The Contract Price shall be deemed as **“Contract Value”** appearing anywhere in the document.
- l) **“Services”** means Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice.
- m) **“NIT”** is the Notice Inviting Tender. It is essentially the Press Notification of the Tender.

## 2.3 BID DOCUMENT

2.3.1 The process and procedures of bidding, the materials to be supplied and the various terms and conditions of this tender are provided in the Bid Document. The Bid Document includes:

Section 1	Notice Inviting Tender
Section 2	Instructions to Bidders
Section 3	General (Financial & legal) Conditions of Contract
Section 4	Special Conditions of Contract
Section 5	Scope of the work Terms of References
Section 6	Formats for Submission of Proposals
Section 7	Formats for submission of bank guarantees.
Section 8	Draft Contract Agreement

2.3.2 The Bidder should carefully read all the instructions, terms and conditions, specifications and various forms that are provided in the Bid Document. The tender may be rejected if any or all of the information asked for in this document are not furnished along with the tender or if the tender is not responsive technically or financially in accordance with the Bid Document.

## 2.4 PRE-BID MEETING

Pre bid meeting is scheduled on : N.A.

~~Clarifications sought during the meeting will be issued at the same time and if any issue could not be resolved on the same day, clarifications of the same can be obtained from office of The Engineer in Chief, PWD, Mizoram, Aizawl, 5(five) days prior to bid submission. No separate information will be passed on to any individual Bidder in this regard.~~

~~The bidder or his official representative is invited to attend a pre bid meeting which will take place at the address, venue, time and date as indicated in appendix.~~

~~The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.~~



~~The bidder is requested to submit any questions in writing or by e-mail to reach the Employer not later than one week before the meeting.~~

~~Minutes of the meeting, including the text of the questions raised (without identifying the source of enquiry) and the responses given will be transmitted without delay to all purchasers of the bidding documents. Any modification of the bidding documents which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant and not through the minutes of the pre-bid meeting. All bidders have to collect any addendum on next working day of pre-bid meeting. The bidder shall receive the minutes of the meeting on the next working day of the pre-bid meeting.~~

~~***Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder***~~

## 2.5 AMENDMENT OF BID DOCUMENTS

At any time, 5 days prior to bid submission, the Employer may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify bid documents by amendments.

## 2.6 COST OF BIDDING

The Bidder has to bear all the costs associated with the preparation and submission of the bid. Employer will, in no case, be responsible or liable for any of the costs, regardless of the conduct or outcome of the bidding process.

## 2.7 APPLICATION FEE (AF) AND EARNEST MONEY DEPOSIT (EMD)

The proposal should be submitted along with EMD (for the amount given in section 1 of this document) in the form of a Demand Draft in favor of **Engineer-in-Chief, PWD, Mizoram, Aizawl payable at Aizawl** or the Bank Guarantee from a schedule bank in favour of Engineer-in-Chief, PWD, Mizoram, Aizawl in the format specified in section 7 of this document, valid for 45 days beyond the validity of the bid or NSCs pledged in favour of Engineer-in-Chief, PWD, Mizoram, Aizawl. The Bid submitted without EMD will be summarily rejected. Cost of document/tender fee of Rs. 15,000/- should be accompanied with the furnished offer, in case, the Bid documents has been downloaded from the e-tendering website <https://tender.mizoram.gov.in>. ***Bid processing FEE and Bid Document Cost is non-refundable.***

2.7.2 The EMD of the successful Bidder will be returned when the successful bidder has signed the Contract Agreement with the Employer and has furnished the required Performance BANK Guarantee for the amount equivalent to **05% (Five percent) of the contract price** on the prescribed format specified in section 7, within 15 days from the receipt of the Letter of Acceptance.

2.7.3 The EMD will be forfeited:

- (a) If a Bidder withdraws his bid during the period of bid validity.
- (b) If the Bidder fails to accept the Employer's corrections of arithmetic errors in the Bidder's bid (if any), or
- (c) If the Successful Bidder fails to sign the contract agreement with the Employer within **the prescribed** period, or

- (d) If the Successful Bidder fails to furnish the Performance guarantee within the stipulated time.

**2.7.4** The technically disqualified bidders would be informed regarding their non-qualification, and thereafter EMD will be returned. The financial bid of disqualified bidder will not be opened.

## **2.8 BID PRICES**

**2.8.1** Bidder shall give the pricing as a total composite price inclusive of GST & all other applicable taxes, duties, Packing, Forwarding, Freight and Insurance etc. and also items wise breakup of total price.

**2.8.2** Custom duty exemption will be as per the provisions of relevant taxes as applicable. For these taxes the bidder may find out themselves the applicable exemptions and quote accordingly. The Employer would not be liable to pay them later as these taxes are supposed to be taken in to account by the bidder in the bid.

**2.8.3** If any or all of the information asked in the Section-6 are not available in the Financial Proposal, the bid is liable for rejection.

## **2.9 DISCOUNTS**

The Bidders are informed that discount, if any, should be indicated separately at part-A and part-B of section 6.

## **2.10 BID VALIDITY**

The bids shall remain valid for a period up to and including the date 60 (sixty) days from the last date of submission of bids. The bidders are required to submit an undertaking in this regard.

A bid valid for a shorter period shall be rejected by the Employer as non-responsive. In case of discrepancy in bid validity period between that given in the undertaking and the Form of Bid submitted by the bidder, the latter shall be deemed to stand corrected in accordance with the former and the bidder has to provide for any additional security that is required.

In exceptional circumstances, prior to expiry of the original time limit, the Employer may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security.

## **2.11 SUBMISSION OF PROPOSALS**

The proposals are invited in two bid system comprising of Technical Bid and Financial Bid through e-procurement mode (<https://tender.mizoram.gov.in>). The Financial bid will be submitted through e-procurement mode only.

### ***TECHNICAL BID:***

All bidders shall also furnish the following information in Section 2.

- (i) Evidence of access to or availability of credit facilities Rs. 30 lakh certified by the bankers.

- (ii) Undertaking that bidder would be able to invest a minimum of cost upto 25% of the contract value of work, during implementation of contract.
- (iii) A duly notarized affidavit that the participating firm has no history of litigation (debarred or terminated) with the State Governments throughout the country or the Central Government.
- (iv) Proposals, if any, for sub-contracting of elements of work, costing more than 10% of the bid amount.
- (v) Power of attorney if any

### **Documents Comprising the Bid**

The bid to be submitted by the bidder shall be in two separate parts:

#### **Part I shall be named "Technical Bid" and shall comprise**

- (i) Earnest money as per clause no. 2.7.1
- (ii) Qualification Information and supporting documents as specified in Section- 2
- (iii) Certificates, undertakings, affidavits as specified in Section 2
- (iv) Any other information pursuant to Section 2 of these instructions
- (v) Undertaking that the bid shall remain valid for the period specified in Section 2
- (vi) An affidavit affirming the information he has furnished in the bidding document is correct to the best of his knowledge and belief.
- (vii) Pan card (Photostat copy duly attested).
- (viii) GST registration No.

#### **Part II shall be named "Financial Bid" and shall comprise**

- (i) Form of Bid as specified in Section 6 (BID DOCUMENT).

**TECHNICAL BID:** All the technical proposals will have to be submitted on line through e-portal and also in **HARD BOUND**(Hard bound implies such binding between two covers through stitching or otherwise whereby it may not be possible to replace any paper without disturbing the document) form with all pages sequentially numbered either at the top or at the bottom right hand corner of each page e.g.,by writing page 1 of 10 on page 1, if total pages are 10. It should also have an index giving page wise information of above documents. Incomplete proposal or those received without hard bound will summarily be rejected.

The Bidders are required to fill up and submit the **Section 6** documents with their proposals. Clause-by-clause compliance should be provided against the technical specifications of the equipment mentioned in **Section 6**.

The bids/proposals shall be submitted in two parts in the office of the Engineer-in-Chief, PWD, Aizawl viz.

**Envelope-1:** Containing application fee of Rs. 15,000 (Rupees fifteenthsand only) and an EMD as prescribed in the tender document in **section 2.7.1**. The envelope should be super scribed as **“Envelope 1 – EMD / Application Fee for *Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram.* Bid for package \_\_\_.”**

**Envelope-2:** Pre-qualification Proposal and Technical Proposal super scribed as **“Envelope 2 – *Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram.* Bid for package \_\_\_”** (Containing duly signed PRE-QUALIFICATION PROPOSAL SUBMISSION FORM as prescribed in **Section-6**, Other required Prequalification documents, all technical literature, brochures etc.). In the technical proposal, there should not be any indication about the prices (printed or otherwise) of any of the products offered.

All the sealed envelopes should again be placed in a sealed cover super scribed as **“*Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities and Tender Notice in the State of Mizoram.* Bid for package \_\_\_.”** **“NOT TO BE OPENED BEFORE 9<sup>th</sup> March 2020 at 12:30 PM.”** which should be received in the office of *the Engineer-in-Chief, PWD, Mizoram, Aizawl*, on or before 27<sup>th</sup> Sept. 2019 up to 12:00 Noon.

**FINANCIAL BID:** Financial Proposal should be submitted through the e-portal \ <https://tender.mizoram.gov.in> as prescribed in Section-6.

Any individual(s) signing the bid or other documents connected therewith should specify whether he is signing the offer as Chief Executive of a single firm / agency / institution making the offer, Lead partner of the consortium of firm / agency / institution making the offer, a Director, Manager or Secretary in case of the authority conferred by Memorandum of Association.

**Power of Attorney:** The Power of Attorney issued by a firm, a limited company or a JV authorising an individual to sign the documents should be duly notarized and submitted in original with the Hard Bound Copy of The Bid Document.

The power of attorney should be executed separately by each member of JV/ consortium authorizing the individual to sign the bid document on behalf of JV/ consortium.

Participating JV firms are required to submit a letter of intent for participating in the bid and duly signed.

- 2.11.1 In the case of a firm not registered under the Indian Partnership Act, all the partners or the attorney duly authorized by all of them should sign the bid and all other connected documents. The original power of attorney or other documents empowering the individual or individuals to sign should be furnished to the Employer for verification, if required.
- 2.11.2 The consultant shall submit, a copy of original document defining constitution or legal status, place of registration, principal place of business and power of attorney along with the proposal. In case of a company, Memorandum of Association and Article of Association, Name of directors and shareholders may also be furnished.
- 2.11.3 The Applicant whether a sole applicant or lead member with joint ventures/Consortium may include an Associate Company also. Credentials of associate firm except key personnel, if any, will not be considered for evaluation. The applicant shall submit a Memorandum of Understanding (MOU) with the Associate regarding role and responsibilities of the associate company. Maximum numbers of key personnel of the associate company /firm during RFP proposal and implementation of contract is limited to 3.
- 2.11.4 The Bids and all correspondence and documents relating to the bids, shall be written in the English language.

## **2.12 LATE BIDS**

Any bid received by the Employer after the time and date for receipt of bids prescribed by the Employer in the tender as per Section-2.11 may be rejected and returned unopened to the Bidder.

Complete Bids (including Technical and Financial) must be received by the Employer at the address specified above not later than the date indicated in appendix. In the event of the specified date for the submission of bids have declared a holiday for the Employer, the Bids will be received up to the appointed time on the next working day.

The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 10, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will then be subject to the new deadline.

## **2.13 MODIFICATION AND WITHDRAWAL OF BIDS**

- 2.13.1 The Bidder is not allowed to modify. However, bidder is allowed to withdraw its submitted bid at any time prior to the last date prescribed for receipt of bids, by giving a written notice to the Employer.
- 2.13.2 Subsequent to the last date for receipt of bids no withdrawal of bids shall be allowed.

- 2.13.3 The Bidders cannot withdraw the bid in the interval between the last date for receipt of bids and the expiry of the bid validity period specified in the Bid. Such withdrawal may result in the forfeiture of its EMD from the Bidder.

## **2.14 LOCAL CONDITIONS**

- 2.14.1.1 Each Bidder is expected to visit and examine the sites/its surroundings for getting fully acquainted with the local conditions & factors and to obtain all information, which would have any effect on the execution / performance of the contract and / or the cost for preparing the bid, at their own interest and cost. The Employer shall not entertain any request for clarification from the Bidder regarding such local conditions.
- 2.14.1.2 The Bidder and any of their employees/agents/sub consultants will be granted permission by the Employer to enter upon its premises and lands for the purpose of such inspection, but only upon the condition that the Bidder and any of their employees/agents/sub consultants will be responsible for any personal injury (whether fatal or otherwise), loss of or damage to life, property and other loss damage, costs and expenses however caused, which, but for the exercise of such permission would not have arisen.
- 2.14.1.3 It is the Bidder's responsibility that such factors have properly been investigated and considered while submitting the bid proposals and no claim whatsoever including those for financial adjustment to the contract awarded under the bidding documents will be entertained by the Employer. Neither any change in the time schedule of the contract nor any financial adjustments arising thereof shall be permitted by the Employer on account of failure of the Bidder to know the local laws / conditions.
- 2.14.1.4 The site related **information furnished** by EMPLOYER in this Bid Document is only indicative. The bidders are advised to undertake site visits and make their own assessment as to the correctness of the information. Requests for price revision after bid opening on account of inaccuracies in information given by EMPLOYER shall not be entertained at any stage.

## **2.15 *CONTACTING THE EMPLOYER***

Any effort by a Bidder influencing the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the bid.

## **2.16 *ELIGIBILITY/ PRE-QUALIFICATION CRITERIA***

- 2.16.1 A consultant is allowed to submit only one bid for each packages. Alternative proposals i.e. one as sole or in JV /consortium with other consultant and another in JV with any other consultant will be summarily rejected. In such cases, all the involved proposals shall be rejected.

2.16.1.2 **Bidders that meet ALL of the following pre-qualification criteria need only apply.**

- (i) The bidder, JV/Consortium should have annual turn-over either singly or as a JV/consortium over related civil engineering works above Indian Rs. **1.0 crore in** any of the last three financial years (for currencies other than Indian Rupees, the applicable conversion [selling] rate of Reserve Bank of India on the last date of bid submission shall apply). Documentary proof in the form of a Certificate from the statutory auditor/charter accountant of the Bidder's company strictly as per the format specified in **Section-6** duly signed and stamped by the statutory auditor/charter accountant needs to be submitted as proof for the above. Any declaration or letter from the Bidder in any other format will not be accepted.

The bidder JV /Consortium must have successfully completed Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads for at least **3 projects during the last 5 years** elsewhere in India or abroad.

**The bidder, JV /consortium should have sufficient exposure of Feasibility Study, Road Alignment Survey and Detail engineering preferably in hill road.**

~~Bidder, JV /consortium should submit a summary as per **IRC SP: 35** for review to ensure Mizoram State Government that the bidder is competent of preparing of the manual within the given time frame.~~

The bidder shall furnish contact particulars of the relevant Officers of these agencies(Government/Public sector) to enable EMPLOYER to verify the claim **of the bidder**. The bidder should also furnish the following;

- (a) Forms strictly as per format provided in **Section-6**.
- (b) Successful completion certificate mentioning start and end date of **the work** duly signed by the client (Government/Public sector) organization's Project In-charge / any equivalent officer / the authorized signatory, or as sub consultant for any principal consultant working on Government / Public sector organizations.
- (c) Copies **of work orders** / contracts from the client stating the project title, **project value and the brief scope of work of the project**.

2.16.2 Each bidder should further demonstrate availability of key personnel with adequate experience as required; as per **clause 2.17.5**.

2.16.3 **Bids submitted by a Joint Venture/Consortium shall meet the following:**

**2.16.3.1** The Registered JV/Consortium Agreement should legally bind on all partners/members.

**2.16.3.2** Consortium or Joint venture allowed (maximum 2 partners). One of the members/partners shall be nominated by the JV/Consortium as being in charge, and this authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatories of each member/partner.

- 2.16.3.3** The partner in-charge shall be authorized to incur liabilities and receive instructions on behalf of any and all partners of the Joint Venture/ Consortium during the entire execution of the Contract.
- 2.16.3.4** All partners of the Joint Venture/Consortium shall be liable jointly and separately for the execution of the contract in accordance with the Contract terms, and a statement to this effect shall be included in the Agreement (in case of successful bidder).
- 2.16.3.5** The joint-venture/consortium agreement shall indicate precisely the responsibility of all members in respect of planning, design construction equipment, key personnel, work execution and financing of the project. All the members should have active participation during the contract period. This shall not be varied/ modified subsequently without prior approval of the Employer.
- 2.16.3.6** Copy of the agreement entered into by the partners shall be submitted with the Bid. Alternatively, a letter of Intent to execute a JV in the event of successful bidder shall be signed by all partners of JV and submitted with the bid together with the copy of the proposed agreement pursuant to the foregoing, the JV shall include among other things, the JV'S objective, the proposed management structure, the contribution of each partner to JV operation, the commitment of the partners to several liabilities due to performance, recourse/sanctions within the JV in the event of default or withdrawal of any partner and arrangements for providing required identities.
- 2.16.3.7** In case of a joint venture the minor partner must have executed at least one project in the relevant field during the last three years. Manufacturer or authorized supplier of MBIU or similar bridge inspection unit can also be a minor partner. In that case at least the lead partner must have executed two projects in the relevant field. Each partner must produce, the permanent Account Number, GST Number, A Notarized affidavit that the information furnished are correct in all respect.
- 2.16.3.8** For calculation of annual average turnover, annual turnover of each partner in proportion to their JV participation will be evaluated. However, each partner should have minimum average turnover of **Rs. 0.3 crore** in the last three financial years.
- 2.16.3.9** The experience of Associate will not be considered.

## **2.17** *EVALUATION*

2.17.1 Any time during the process of evaluation, the Employer may seek for clarifications from any or all Bidders.

### **2.17.2** **Evaluation procedure**

#### **Stage-1(a): Responsiveness w.r.t. Tender fee & EMD:**

First, the envelope containing cost of document/tender fee (in case of Bid Document downloaded from website) and Earnest Money Deposit will be opened and if both are found furnished by the Bidders in the prescribed manner as mentioned in Para 2.7.1, then the second envelope containing Pre-Qualification & Technical Proposal documents shall be opened. At any stage during the evaluation, if the EMD is found invalid, the respective Bidder's bid will be summarily rejected.



### **Stage-1(b): Technical Proposal Evaluation:**

The Bidder shall have to fulfill all the Pre-qualification Criteria as specified in Para 2.16.1.3, in totality and submit all the required documents that relate to the Pre-qualification Criteria terms and conditions. These documents will be scrutinized along with the Technical Proposal in this phase of evaluation. Those bidders who do not fulfill the terms and conditions of Pre-qualification Criteria as specified in this tender or whose Technical Proposal is non-responsive will not be eligible for further Financial Proposals Evaluation. Technical Proposals of the Bidders would be evaluated for the clause-by-clause compliance of the technical specifications as mentioned in the Bid document. Evaluation of Pre-qualification and Technical Proposal by PWD, Mizoram shall not be questioned by any of the Bidders. The Employer reserves the right to ask for a technical elaboration/clarification in the form of a technical presentation from the Bidder on the already submitted Technical Proposal at any point of time before opening of the Financial Proposal. Finally, bidders would be evaluated for technical competence using the marking system as in **2.17.3** and only those bidders who score  $\geq 75\%$  marks shall qualify for financial bid opening. Decision of Authorities in the technical evaluation shall be taken as FINAL and no questions shall be entertained in this regard.

### **Stage-2: Financial Proposal Evaluation:**

The financial Bids submitted on e-portal will be opened for short listed-qualified firms only, which can be seen on the website <https://tender.mizoram.gov.in>. The Price Bids of only the qualifying firms who are short-listed in Stage-I will be evaluated. The date of opening shall be intimated to the qualified bidders at the appropriate time. The unqualified bidders would be informed regarding their non-qualification alongwith the reason through <https://tender.mizoram.gov.in> and thereafter their price bid (Financial proposal) will not be opened. The financial proposal shall be inclusive of GST and all other applicable taxes. The Financial Proposal Evaluation will be based on the total payouts including all other taxes, duties and levies for **Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice.**

- (i) The financial bids for package will be opened on e-tendering mode, as indicated in Section 1 of the RFP document.
- (ii) The Evaluation Committee will determine whether the submitted Financial Proposal is complete (i.e. whether they have included cost of all items of the corresponding proposals; if not, then the cost towards such missing items will be considered as NIL, but the Consultant shall, however, be required to carry out such obligations without any additional compensation.) and without computational error. In case under such circumstances, if Client feels that the work cannot be carried out within the overall cost as per the submitted financial proposal, such proposals shall be considered non responsive.
- (iii) The lowest financial proposal ( $F_M$ ) will be given a financial score ( $S_F$ ) of 100 points. The financial scores of other proposals will be computed as follows:  

$$S_F = 100 \times F_M / F \quad (F = \text{amount of financial proposal})$$

(iv) Proposals will finally be ranked according to their combined technical ( $S_T$ ) and financial ( $S_F$ ) scores as follows:

$$S = S_T \times T_w + S_F \times F_w$$

Where  $S$  is the combined score, and  $T_w$  and  $F_w$  are weights assigned to Technical Proposal and Financial Proposal that shall be 0.80 and 0.20 respectively.

(v) The selected Consultant shall be the first Ranked Applicant (H-1, having the highest combined score). The second ranked applicant (H-2) shall be kept in reserve and may be invited for negotiation in case the first ranked Applicants withdraws, or fails to comply the requirements specified in this document.

(vi) In the event the proposals of two or more consultants have the same scores in the final ranking, the proposal with the highest technical score should be ranked first. Further even in case of same technical scores of the bidders the work will be awarded through Lottery System.

(vii) In case H1 applicant withdraws or fails to comply the requirements specified in this document, H2 may be called for negotiation and in case he matches the rates with H1 or at his rates, whichever is lower, the work will be awarded to H2 bidder.

**2.17.3 Evaluation of technical bid shall be done based on the following:**

Sl. No	Evaluation Criteria	Max. Marks
1	Past experience of the firm in Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads.	30
2	Total Nos. of similar work completed and implemented during the last five years.	10
3	Key Personnel	40
4	Methodology & Work Plan	15
5	Structure and Organization	5
TOTAL		100

Only bids securing  $\geq 75\%$  marks shall qualify for further consideration. *Bidders shall fill up all formats as given in [Section-6](#)*

2.17.4 The marking criteria will be based on the following:

<p>1.Past experience of the firm in Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report &amp; Cost Estimate for the roads.</p>	<p><u>Maximum of 30 marks</u></p> <p>10 Experiences on Feasibility studies, Economic Analysis ERR etc. Traffic count &amp; Analysis.</p> <p>10 For Detail contour &amp; alignment survey of road using Total Station etc. and GPS tec.</p> <p>10 marks for design of permanent structures road geometry &amp; Cost Estimate of Road.</p>	<p>1 mark each for one project for which the consultancy is work costing Rs. 50 lakh.</p> <p>1mark each for for one project having a minimum road length of 20 Km, and accordingly to the length of road project completed mark may be considered</p> <p>Other experience like estimate &amp; type of bridge structures.</p>
<p>2.Total Nos. of similar work completed and implemented during the last five years.</p>	<p>10 Marks: Similar works means the work completed for feasibility study, detail contour survey, selection of alignment and preparation of project report &amp; cost estimate for the road project preferably hill road.</p>	<p>Proof of experience of having more Nos. and more length will score higher marks, weightage will also be given for hill road similar project</p>

Total marks for above is maximum of 30 marks.

**Note: The experience certificate to be signed by the officer not below the rank of Executive Engineer/General Manager.**

1. Key Personnel will be evaluated as per clause 2.17.5. :Maximum 40 marks
2. Methodology & Work Plan- Maximum 15 marks: The marks will be provided on the basis of quality of approach and the methodology, work program and manning schedule proposed.
3. Structure and Organization- Maximum 10 marks:

Sl. No.	Formation of company	Marks
1	More than 10 years before date of NIT	10
2	8 to 10 years before date of NIT	8
3	6 to 8	6
4	3 to 5 year before date of NIT	5

The bidders are advised in their own interest to frame the technical proposal in an objective manner as far as possible so that these could be properly assessed in respect of points to be given as part of evaluation criteria.

### 2.17.5 List of key personnel to be deployed on contract work

Sl. No	Personnel	Minimum Qualification	Number
1	Team Leader cum Senior Highway Engineer.	Master (Civil) degree with 8 years or Graduate Engineer (civil) with 15 years, of Highway experience and 5 years of experience design of highways.	1
2	Geotechnical Engineer	Master degree with 6 years or Graduate Engineer (civil) with 10 years, of experience in roads construction.	1
3	Surveyor	BE/B.Tech (Civil) 8 years' professional experience in surveying of road alignment and highways.	2
4	Hydrologist	Bachelor degree in any civil engineering field with 8 years of general experience.	1
5	Quantity Surveyor	BE/B. Tech (Civil) 8 years' professional experience in highway engineering and at least 2 years experienced in quantity surveying works.	1
6	CAD Operator	Graduate Technical Engineer having 8 years experience with Road design software such as Inroad tec.	1
<b>Total</b>			<b>7</b>

**2.17.5.1** Qualification and competence of following professional/sub-professional staff for the assignment shall only be evaluated. The weightage for various key staffs are as under:

Sl. No.	Staff Position	Marks
1.	Team Leader cum Senior Highway Engineer.	10
2.	Geotechnical Engineer -1 Nos.	5
3.	Surveyor -2 Number	3+3=6
4.	Hydrologist -1 Number	3
5	Quantity Surveyor - 1 No.	3
6	CAD Operator - 1 No.	3
<b>Total</b>		<b>30</b>

**2.17.5.2** Sub criteria for qualification of Key Personnel (i.e. Professional staff)

Sl. No.	Qualification	Marks (%)
1	General qualifications	25
2	Adequacy for the project	70
3	Employment with the firm	5
<b>Total</b>		<b>100</b>

**2.17.5.2.1 Sub Criteria for General Qualification:**

S. No	Qualification	Marks
1	Educational Qualification	10
2	Professional Experience	10
3	Training, publication etc.	5
<b>Total</b>		<b>25</b>

**2.17.5.2.1.1 Sub Criteria for Educational Qualification- Maximum 10 Marks.:-**

S. No	Staff Position	Qualification	Marks
1	Team Leader cum Senior Highway Engineer.	B.E/Tech. in civil Engineering or equivalent	6
		Master Degree in Structure/Bridge Engineering	+2
		Doctorate Degree in Structure/Bridge Engineering	+2
2	Geotechnical Engineer	B.E/Tech. in civil Engineering or equivalent	6
		M. Tech./ME in Geotechnical Engineering or equivalent	+2
		Doctorate Degree in Geotechnical Engineering or equivalent	+2
3	Surveyor -2 Number	BE/B.Tech in Civil Engineering	8 (x2)
		M. Tech/ME in Structural Engineering/hydrology or equivalent	+2 (x2)
4	Hydrologist	BE/B. Tech in Civil Engineering	8
		M.Tech/ME in Structural Engineering/hydrology or equivalent	+2
5	Quantity Surveyor - 1 No.	BE/B. Tech in Civil Engineering	8
		M. Tech/ME in Structural Engineering/hydrology or equivalent	+2
6	CAD Operator - 1 No.	BE/B. Tech in Civil Engineering	8
		M. Tech/ME in Structural Engineering/hydrology or equivalent	+2

**2.17.5.2.1.2 Sub Criteria for Professional Experience - Maximum 10 Marks.**

S. No	Staff Position	Experience	Marks
1	Team Leader cum Senior Highway Engineer.	More than 15 years and 5 years in design of highways professional experience	10
		Between 15 years professional experience without design of highway experience	8
		Between 10 – 15 years experience as	5
2	Geotechnical Engineer, Surveyor, Hydrologist, Quantity surveyor and CAD Operator	More than 10 year professional experience	10
		Between 5to 10 year professional experience	8

**2.17.5.2.1.3** Sub Criteria for Training, publication etc.- Maximum 5 Marks:

Key professional who has undergone training in the relevant filed or whose technical paper/article has been published will be given 5 marks. Maximum marks will be assigned to the persons, who has attended maximum training on the subject and published maximum number of papers, accordingly marks will be assigned to others.

**2.17.5.2.2** Sub Criteria for Adequacy for the project- Maximum 70 marks:-

Sl. No.	Staff Position	Experience	Marks
1	Team Leader cum Senior Bridge Engineer	(i)Experience in specific positions in similar projects	15marks/assignment, maximum 30 marks.
		(ii)Experience relevant to particular assignment, not included in (i) above	10marks/assignment, maximum 40 marks
2	Geotechnical Engineer, Surveyor, Hydrologist, Quantity surveyor and CAD Operator	(i)Experience in specific positions in similar projects	15marks/assignment, maximum 30 marks.
		(ii)Experience relevant to particular assignment, not included in (i) above	10marks/assignment, maximum 40 marks

**2.17.5.2.3** Sub Criteria for Employment with the firm –maximum 5 marks:-

S. No	Criteria	Marks
1	Employed for more than 5 years	5
2	Employed for 2 to 4 years	3
3	Employed for less than 2 year	1

**2.18** **NOTICES**

Any notice to be served under this contract shall be deemed to be validly served if sent by registered post, speed post or fax to the Consultant's registered office herein before mentioned or in respect of the Employer, to *The Engineer-in-Chief, PWD, Mizoram, Aizawl* as the case may be. Any notice so posted shall be prima-facie proof of serving at the expiration of the time within which in the normal course of posting, it would have reached the address to which it was sent.

**2.19** **MISCELLANEOUS**

- a. The contract or any interest there under shall not be assignable to any third party by the consultant unless such assignment is mutually agreed to in writing by both the Employer and the consultant.
- b. No modification to the Contract document shall be binding unless it is in writing and signed by both the parties to the Contract.

- c. The terms and conditions in the Bidding document and the bids submitted and accepted constitute the entire Contract Agreement between the parties. Signed contract agreement shall supersede previous communications, representations or agreements either oral or written between the parties with respect to the subject matter of the Contract Agreement and no agreement or understanding varying or extending the Contract Agreement shall be binding on either the Employer or the Consultant. Contract shall have to be executed in writing and signed by duly authorized officers or representatives of both the parties.
- d. All the provisions of the contract agreement shall be harmoniously construed. In case of variation between certain points in the Tender document and the attached specifications / requirements for the inspection and acceptance of the system, the provision contained in Contract Agreement shall have overriding effect.
- e. The contract shall be concluded in good faith and shall be kept confidential by both the contracting parties.
- f. The headings of Clauses are for the purposes of reference only and shall have no effect on the meaning or substances of any clause of the contract.
- g. Any further modifications/improvements in the system desired by the Employer shall be carried out by the consultant on mutually agreed terms.
- h. The contract shall be governed, interpreted and executed according to the Indian Law.
- i. The complete tender document comprising page 1 to page 59 along with the forms is the "Accepted Tender" (AT). The authorized signatory of the consultant i.e. the firm is supposed to initial every page of the AT with complete signatures at places where the representatives of the Employer has signed to acknowledge the acceptance of AT within one week failing which it will be deemed as accepted by the consultant. The number of this AT would be quoted in all future correspondence.

## **2.20 COMING INTO FORCE**

### **PERFORMANCE GURANTEE**

The Successful Bidder (Lowest Bidder) is required to submit an irrevocable Performance Guarantee for the amount equivalent to **5% (Five%) of the contract price** on the prescribed format specified in section 7, within 15 days from the issue of the Letter of Acceptance. The performance Guarantee will be in form of unconditional BG issued by a Schedule Bank failing which the Employer will be at liberty to call the next lowest bidder (L2) for negotiations and the agreement thereafter.

The performance Guarantee shall be initially valid up to 30 days beyond the completion period. In case the time for completion of work gets enlarged, the Agency shall get the validity of performance Guarantee extended to cover such enlarged time for completion of work, the performance guarantee shall be returned to the Agency without any interest after the completion of all the obligations of the Contract.

(iii) The Authority/ The employer shall not make a claim under the Performance guarantee except for amounts to which it is entitled under the contract (notwithstanding and/or without prejudice to any other provisions in the contract agreement) in the event of:

(a) Failure by the Contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance guarantee.

(b) Failure by the Contractor to pay the Authority/ the Employer any amount due, either as agreed by the Agency or determined under any of the Clauses/Conditions of the agreement, within 30 days of the service of notice to this effect by the Authority.

(c) Failure by the Contractor to rectify any error in the reports and DPRs to the satisfaction of the Authority within 30 days of the service of notice to this effect by the Authority.

(d) In the event of the contract being terminated or rescinded under provisions of any of the clause/condition of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Authority.

After submission of performance Guarantee, the contract will be signed. The contract shall come into force with effect from the date of its signing contract agreement by both the contracting parties. The contract agreement will be operated by the Engineer-in-Chief PWD, Aizawl, Mizoram on behalf of the Governor of Mizoram.

**2.21** After signing of contract the Employer will be issuing letter to proceed to the consultant. The consultant shall start the work within 28 days from letter to proceed, failing which a penalty @2.5% per month subjected to 10% of Contract will be imposed on the consultant.

The time allowed for execution of the Works as specified in the Contract' or the extended time in accordance with these conditions shall be the essence of the Agency. The execution of the works shall commence from such time period as mentioned in letter of acceptance or from the date of handing over of the site whichever is later. If the Agency commits default in commencing the execution of the work as aforesaid, the Authority shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the security deposit absolutely

**2.22 Recovery of Security Deposit**

The person/persons whose Offer (s) may be accepted (hereinafter called the Agency) shall permit the Authority at the time of making any payment to him for work done under the contract to deduct a sum at 5 % (Five percent) from the gross amount of each running bill till full amount of security deposit 10% (Ten percent) of agreement value or value of work (whichever is higher) is reached. If value of work exceeds the agreement value, security deposit 10% (Ten percent) will be recovered for the exceeded work.



## 2.23 **Foreclosure of Contract due to Abandonment or Reduction in Scope of Work Cancellation of contract in full or part**

If Agency:

(i) at any time makes default in proceeding with the works or any part of the work with the due diligence and continues to do so after a notice in writing of 7 days from the Authority; or

(ii) commits default to comply with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Authority; or

(iii) fails to complete the works or items of work with individual dates of completion, on or before the date(s) of completion, and does not complete then within the period specified in a notice given in writing in that behalf by the Authority; or

(iv) being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors; or

(v) being a company, shall pass a resolution or the Court shall make an order for the winding up of the company, or a receiver or manager on behalf of the debenture holders or otherwise shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or

(vi) shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days; or

(vii) assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Accepting Authority;

The Accepting Authority may, without prejudice to any other right or remedy which shall have accrued or shall accrue hereafter to the Authority, by a notice in writing to cancel the contract as a whole or only such items of work in default from the Contract

## 2.24 **FORCE MAJEURE**

- a. If either party is temporarily unable by reason of force majeure or the laws or regulations of India to meet any of its obligations under the contract, and if such party gives to the other party written notice of the event within fourteen (14) days after its occurrence, such obligations of the party as it is unable to perform by reason of the event shall be suspended for as long as the inability continues.
- b. Neither party shall be liable to the other party for loss or damage sustained by such other party arising from any event referred to in above mentioned section or delays arising from such event.
- c. The term 'force majeure' as employed herein shall mean acts of God, strikes, lock outs or other industrial disturbances, acts of the public enemy, wars, blockades, insurrection, riots, epidemics, landslides, earthquakes, storms, lightning, floods, washouts, civil

disturbances, explosions, and any other similar events, not within the control of either party and which by the exercise of due diligence neither party is able to overcome.

- d. In case of Natural Disaster force measure will be applicable on the particular affected Bridge.
- e. In any such case the authority mentioned in the Contract may give a fair and reasonable extension of time and reschedule the milestones for completion of work. Such extension shall be communicated to the Agency by the Authority in writing, within 1 months of the date of receipt of such request. Non application by the Agency for extension of time shall not be a bar for giving a fair and reasonable extension by the Authority and this shall be binding on the Agency.

#### **2.25 ADDRESS AND COMMUNICATION**

- a. All communications to the Employer are to be addressed to *The Engineer-in-Chief, Public Works Department, Aizawl, Mizoram.*
- b. All communications to the consultant are to be addressed to (to be filled by the consultant at the time of bidding)

#### **2.26 ADDITION / DELETION CLAUSE**

Addition / Deletion of Bridges will be applicable as per requirement of the department.

### **SECTION- 3**

#### **3.0 GENERAL (FINANCIAL AND LEGAL) CONDITIONS OF THE CONTRACT**

##### **3.1 GENERAL**

3.1.1 The consultant will bear all the cost relating to deployment & operation & maintenance of all his equipment. The Consultant will procure/hire all necessary equipment/machine required for detailed Engineering Survey, Geo-technical/ Hydrological Investigation etc. No separate charges shall be paid for visit of engineers or attending to faults and repairs or supply of spare parts.

##### **3.2 PAYMENT TERMS**

3.2.1. Payments will be made in **Indian Rupees only**

3.2.2 Payments shall be adjusted for deductions of advance payments, security deposit, other recoveries in terms of the Contract and taxes at source, as applicable under the law.

##### **3.2.3 ADVANCE PAYMENT**

3.2.3.1 The Employer will make the advance payment to the Consultant against provision by the Consultant of an Unconditional Bank Guarantee from a Nationalised Bank acceptable to the Employer in amounts equal to 10% of the advance payment, up to 10% of Contract Value. The guarantee shall remain effective until the advance payment including interest has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Consultant.

3.2.3.2 The Consultant is to use the advance payment only to pay for procurement/hiring of Equipment/ Mobilization expenses required specifically for the Work. The Consultant shall demonstrate the advance payment has been used in this way by supplying copies of invoices or other documents.

3.2.3.3 The advance payment shall be repaid with compound interest @ SBI PLR+ 2% applicable on the date of release of mobilization or on the date of recovery of the advance whichever is maximum by deducting from payments otherwise due to the Consultant.

3.2.3.4 The mobilization advance with interest will be recovered in two installments from second & third running bill. In any case, the mobilization advance with interest must be recovered within four months from the date of agreement. No account shall be taken of the advance payment or its repayment in assessing valuations of work.

##### **3.2.4 PAYMENT SCHEDULE**

Payments will be made within 30 days of successful submission of desired reports and submissions of the **Reports**, DPRs, and As Built Drawings to *The Engineer-in-Chief, Public Works Department, Mizoram, Aizawl* as per following payment schedule:

<b>RA Bill No.</b>	<b>Deliverable</b>	<b>Payment (% of Contract Price)</b>
1	Submission of Site Visit / Preliminary Report including proposed alignments on Survey of India contour map.	15 %
2.	On submission Feasibility Reports which include etc.	25 %
3.	On submission & acceptance of Draft Detailed Design Reports; (Feasibility Report, Survey Report, Analysis and Design, Drawings, Detail Quantity Calculations and Cost Estimates)	35 %
4.	On submission & Approval of Final Reports; Feasibility Report, Survey Report, Analysis and Design, Drawings, Detail Quantity Calculations and Cost Estimates)	25%

5 % retention money to be released after completion of work.

5 % performance guarantee to be released 60 days after approval of the Final Report submitted by Consultant.

3.2.6 A security deposit of 5% (Five Percent) will be deducted from each bill. The same will be released after successful completion of the contract and acceptance by the Authority.

### **3.3 PRICES**

3.3.1 The rates and prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subjected to any adjustment.

3.3.2 Bidder shall give the pricing as a total composite price inclusive of GST and all applicable levies & taxes, Custom Duties Packing, Forwarding, Freight, Insurance and also items wise breakup of total price.

3.3.3.1 All applicable taxes and Custom duty exemption will be as per the applicable provisions of relevant act. For these taxes the bidder may find out themselves the applicable exemptions and quote accordingly. The Employer would not be liable to pay them later as these taxes are supposed to be taken in to account by the bidder in the bid.

### **3.4 EMPLOYER'S RIGHTS**

3.4.1 The Employer reserves the right to make changes within the scope of the Contract Agreement at any point of time.

3.4.2 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of contract without assigning any reason whatsoever and without thereby incurring any liability to the affected bidder or bidders on the grounds of Employer's action.

If at any time after acceptance of the Rate Offer the Authority shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Authority shall give notice in writing to that effect to the Agency and the Agency shall act accordingly in the matter. The Agency shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works. The Agency shall be paid at contract rates full amount for works completed.

### **3.4 SUBCONTRACTING BY THE BIDDER**

3.5.1 If subcontracting for specialized work, is required, the Successful Bidder will take prior permission from the Employer. Under all circumstances, the value of works sub-contracted by Successful Bidder should not exceed 25% of the Contract Price. The Bidder is required to provide the details of the activities that it proposes to subcontract to third parties as per format given in **Section – 6**.

3.5.2 In any case, the Successful Bidder shall be solely responsible to ensure compliance of all obligations under the contract.

#### **3.5.3 Changes in a Firm**

- (i) Where the consultant is a partnership Firm, partners shall not be changed in the Firm except with the previous consent in writing of **theEmployer**, which may be granted only on a written undertaking by the all(old/new) partners to perform the contract and accept all liabilities incurred by the firm under the contract prior to the date of such undertaking.
- (ii) On the death of any partner of the consultant firm before complete performance of the contract, Employer may, at the option of the consultant, cancel the contract, and in such case the consultant shall have no claim whatsoever to compensation against the Employer.
- (iii) If the contract is not determined as provided in sub-clause (ii) above, notwithstanding the retirement of a partner from the Firm, he shall continue to be liable under the contract for acts of the Firm until a copy of the public notice given by him under section 32 of the Partnership Act has been sent by him to the Employer by registered post acknowledgement due.

### **3.6 CODES & STANDARDS GOVERNING THE TENDER**

Wherever applicable, the standards published by following recognized bodies shall be applicable for equipment, if any to be supplied under this contract.

- i) Bureau of Indian Standards (BIS)
- (ii) International Standards Organisation (ISO)
- (iv) IRC SP 18 & 35 and all **other relevant** IRC Codes.

### 3.7 DELAYS IN SUBMISSION OF DATA AND PROVIDING TECHNICAL SUPPORT / STAFF / TEAM LEADER

Should any of the said services / personnel not be executed / provided during the contract period, the Employer shall in respect of any delays, have the right to claim and deduct from the payments due affected by such delay as agreed, liquidated damages in respect of such said services / personnel for the sum of 1% of the contract price of the unexecuted portion of the anticipated services / personnel for each and every week or part of a week subject to a maximum of 10% of the contract price for delayed services / personnel. Should the said delay in respect of execution of the said services / personnel exceed two and a half months, the Employer shall have the right to terminate this contract fully, or in so far as it relates to the services / personnel which are subject matter of such delay, by sending written notice to that effect to the Consultant, in which case the furnished performance Bank Guarantee will be revoked.

However, if the completion of service is delayed due to the reasons beyond the control of the consultant as mentioned in clause 2.21, suitable extension may be granted by *The Engineer-in-Chief, Public Works Department, Aizawl, Mizoram* receipt of express request along with full justification. In case of grant of any time extension, the consultant upon advice shall also suitably extend the validity of the Bank Guarantee. It is made explicitly clear that the payment of penalty shall not relieve the consultant from the obligations and liabilities under the contract agreement.

The Employer is also entitled to cancel the contract either in whole or in part, if the consultant fails to redo the rejected data of detailed Engineering Survey, Geo-technical/ Hydrological Investigation etc, within one month from the date of its notification, in which case the furnished performance Bank Guarantee will be revoked.

### 3.8 LAWS GOVERNING THE CONTRACT

- (a) This contract shall be governed by the laws of India for the time being in force.
- (b) Irrespective of the place of installation, the place of performance or place of payment under the contract, the contract shall be deemed to have been made at the place from which the acceptance of tender has been issued.
- (c) Jurisdiction of courts: The courts of the place from where the acceptance of tender has been issued i.e., **Gauhati High Court**, Aizawl Bench shall alone have jurisdiction to decide any dispute arising out of or in respect of the contract.

### 3.9 CONSEQUENCE OF BREACH

The decision of the Employer as to any matter or thing concerning or arising out of the consultant or any partner of the consultant firm has committed a breach of any of the conditions of the contract, shall be final and binding on the consultant.

Should the consultant or a partner in the consultant firm commit breach of either of the conditions of the contract, it shall be lawful for the Employer to cancel the contract, and award the contract to another consultant, at the risk and cost of the consultant.

### 3.9.1 RISK AND COST:

If Agency:

- (i) at any time makes default in proceeding with the works or any part of the work with the due diligence and continues to do so after a notice in writing of 7 days from the Authority or
- (ii) commits default to comply with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Authority; or
- (iii) fails to complete the works or items of work with individual dates of completion, on or before the date(s) of completion, and does not complete then within the period specified in a notice given in writing in that behalf by the Authority; The Authority will have all the rights to
  - (a) take possession of the site and any equipment, etc., thereon; and/or
  - (b) carry out the incomplete work by any means at the risk and cost of the Agency. On cancellation of the contract in full or in part, the Authority shall determine what amount, if any, is recoverable from the Agency for completion of the works or part of the works or in case the works or part of the works is not to be completed, the loss of damage suffered by the Authority. In determining the amount, credit shall be given to the Agency for the value of the work executed by him up to the time of cancellation, the value of Agency's equipment taken over and incorporated in the work and use of plant and machinery belonging to the Agency.

Any excess expenditure incurred or to be incurred by Authority in completing the works or part of the works or the excess loss or damages suffered or may be suffered by the Authority as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to the Authority in law be recovered from any moneys due to the Agency on any account, and if such moneys are not sufficient the Agency shall be called upon in writing and shall be liable to pay the same within 30 days.

### 3.10 RIGHT OF ACCEPTANCE OF OFFER

The Employer reserves the right to accept partly or reject any offer without assigning any reason thereof. The Employer does not pledge itself to accept the lowest or any other tender and reserves to itself the right of acceptance of the whole or any part of the tender or portion of the quantity offered and the consultant shall supply the same at the rate quoted.

### 3.11 BANKRUPTCY

If the consultant commits any act of bankruptcy or goes into liquidation or shall commence winding up by reasons of its insolvency or shall make an assignment for the benefit of creditor or goes into liquidation, this agreement may be terminated wholly or in part by the Employer and amount paid in advance if any received by the consultant shall become due to the Employer including interest.

## SECTION –4

### 4. SPECIAL CONDITIONS OF THE CONTRACT

#### 4.1 DEFINITION

These conditions given in this Section 4, supplement the “Instructions to the Bidders” given in Section 2 & "General (Financial and Legal) Conditions of the Contract" given in Section 3 and in case of any conflict, the conditions given herein shall prevail over those in Sections 2 and 3.

#### 4.2 EQUIPMENT

##### 4.2.1 *Equipment / system, if any to be procured/hired by the Consultant shall conform to the relevant technical requirements necessary for execution of the contract.*

4.2.2 Bidders have to give clause-by-clause compliance to the clauses mentioned in Section 5 of this document along with reference to documentary support, giving the Page / Para number of the document. The clauses for which the compliances are required to be provided by the Bidders are given in the Section-6.

4.2.3 The cost of all data and/or analysis shall be fully borne by the consultant. Material put up for inspection shall be those to be supplied and in quantities laid down in the Schedule of Quantities. Any variation shall require the prior approval of the Employer before the material is manufactured/ offered for inspection.

4.2.4 The Employer shall inspect and re-check the data at all stages and shall have full powers to reject all or any data that may be considered defective or inferior in quality. The Consultant shall carry out any additional collection of data at his cost as are necessary in the opinion of the Employer.

4.2.5 All material/equipment brought to site shall be permitted to be erected/utilized only after initial inspection / acceptance by the Employer.

4.2.6 The completed installation at all stages shall be subjected to checks and tests as decided by Employer. The consultant shall be liable to remedy all of such defects as discovered during these checks and tests and make good all deficiencies brought out.

4.2.7 The consultant shall advise the Employer at least 15 days in advance for inspection when any equipment or a portion of the work is offered for inspection. The Employer shall carry out inspection upon receipt of such advice.

#### 4.3 PERFORMANCE AND SPARES

Consultant shall maintain sufficient spares for equipment utilized for conducting detailed Engineering Survey, Geo-technical/ Hydrological Investigation etc. by him for the satisfactory performance of the Contract.

#### 4.4 INSURANCE

4.4.1 All insurances (e.g. all risk insurance including transit, fire, theft etc., third party insurance, workmen’s compensation insurance etc.) are the responsibility of the Bidder. The equipment utilized by the Consultant under the contract shall be fully insured by the Bidder against any kind of loss or damage incidental to manufacture or acquisition, transportation, storage, delivery and installation. The period of insurance shall be from the date of commissioning of products/equipment at each site till the completion of contract period.



- 4.4.2 The consultant shall cause all its workmen and the workmen of any sub consultants of the Consultant to be covered by workmen's compensation insurance in accordance with applicable laws. The consultant agrees that the Employer shall not be liable for any damages or compensation payable to any workman or other person in the employment of the Consultant.
- 4.4.3 The Consultant hereby undertakes:
- (a) Adequate all-risks insurance in respect of all the equipment **and any** additional insurance required by law in respect of the Contract Works and the performance thereof by the Consultant, including in respect of motor vehicles used by the Consultant in relation thereto.
  - (b) Any other insurance sufficient to provide adequate coverage for those types of risk which are reasonably foreseeable in the performance of the Contract Works.

#### **4.5 ARBITRATION**

Any Dispute between the Employer and the Consultant arising under general conditions or special conditions of the contract or in connection with this contract (except as to any matters the decision of which is specially provided for by the general or the special conditions) is to be resolved through mutual consultation following good business practices as far as possible.

However, in case of non-settlement of the disputes between the parties, the same to be settled through Mizoram Public Works Contracts Dispute Arbitration Tribunal Act 2008.

**SECTION - 5**  
**TERMS OF REFERENCES (TOR)**

**SURVEY**

**Stages of Survey as per IRC SP 52, IRC SP 48 & IRC SP 19**

Sl. No.	Particulars	Percentage	Cumulative Percentage
1	Reconnaissance Survey	10%	10%
2	Preliminary Survey	20%	30%
3	Determination of Final Centre line	20%	50%
4	Final Location Survey and DPR Preparation	30%	80%
5	DRP Submission and Feasibility Report	10%	90%
6	Sanction by Competent Authority	10%	100%

**1. RECONNAISSANCE SURVEY**

**Purpose:**

The main objective of reconnaissance survey is to examine the general character of the area for the purpose of determining the most feasible routes, or routes, for further more detailed investigations. Data collected should be adequate to examine the feasibility of all the different routes in question, as also to furnish the Engineer-in-charge with approximate estimates of quantities of costs, so as to enable him to decide on the most suitable alternative or alternatives. The survey should also help in determining any deviations necessary in the basic geometric standards to be adopted for the highway facility.

**Survey Method**

The reconnaissance survey may be conducted in the following sequence:

- (a) Study of topographical survey sheets, agricultural, soil, geological and meteorological maps, and aerial photographs, if available.
- (b) Aerial reconnaissance (where necessary and feasible)
- (c) Ground reconnaissance (including another round of aerial reconnaissance for inaccessible and difficult stretches, where called for).

**Study of Survey Sheets, Maps, etc.:**

Reconnaissance begins with study of all the available maps. The types of useful map information which are currently available in the country are as below:

- (a) Survey of India (SOI) maps.
- (i) The most useful maps are the topographical sheets available in the scale of 1:25,000, 1:50,000. Maps coverage on 1:50,000 and 1:25,000 scale area available for the whole of India but map coverage with the preferable scale of 1:25,000 is at present, available only for about 30% of the country.
- (ii) State maps on scale of 1:1,00,000.:  
These are useful as index maps or to indicate an over view of the project location and are available for most of the States.
- (iii) Plastic Relief Maps on scale of 1:15,000,000.  
One may be lucky to have these maps for certain regions. For very difficult areas highway location planning may be very much helped if these three-dimensional maps delineating ridges, valleys, peaks, etc. with contour information are available.
- (b) Apart from the above mentioned SOI maps there are special purpose maps, like, Forest Survey of India, Vegetation Maps on scale of 1:25,000,000 showing incidence of orchards, reserve forest, clusters of social forestry areas, etc. which may be helpful in special cases in selection of alignment.

Also, maps prepared by National Bureau of Soil Survey and Land use Planning (NBSS&LUP) indicating information on Soil, Wasteland, etc. and Geological Survey of India Maps (on scale 1:250,000 or smaller) with information on geology, geomorphology and changes in drainage, river courses, etc. are available for many cases.

These maps may also be fruitfully used when considered necessary.

After study of the topographical features on the maps, a number of alignments feasible in a general way are selected keeping in view of the following points:

- (i) The alignment should take in to account all the control points and should be the shortest and most economical compatible with the requirements of gradient and curvature.
- (ii) Shape of the alignments.
- (iii) Avoidance, as far as possible, of marshy ground, steep terrain, unstable hill features and area subject to severe climatic conditions, flooding and inundation.
- (iv) Need for connecting important villages and towns.
- (v) Bridging cross - drainage and drainage problems. (Guiding principle stated in para 4.2 shall be kept in view)
- (vi) Need to preserve environment and maintain ecological balance.

If photographs of the area are not available, but if the need are considered imperative, aerial photography may be arranged for further study in the interest of overall economy.

The present status of Aerial Photography (AP) in India on a scale 1:50,000 is available for the whole of India. Depending on their quality the negatives of these photographs, when necessary, can be enlarged easily by about five times without losing clarity and thus obtain AP enlargements on scale of 1:5,000 to 1:20,000

These enlargements are quite adequate for the study of :

- (i) Geology, geomorphology and ground water prospecting and
- (ii) Environmental factors, e.g., vegetation, soil conditions, and use etc.

If stereoscopic techniques are applied, aerial photographs can yield quantitative data showing the terrain in three-dimension and if studied by a skilled photo-interpreter, can give significant soil and sub-soil information.

**Photogrammetry support to highway engineering:**

Photogrammetry technology is also useful to the highway engineer in many ways. Large scale maps on scales of 1:2,000 to 1:25,000 can be very precisely produced through photogrammetric process. The contouring can also be produced, the common intervals depending on the height of the camera. Very minute and precise measurements amounting to sub-metre accuracy can be obtained. In other words, profile (with height values) and cross-sections across highway centre-line can be extracted from optical model.

**Satellite remote sensing:** This technique is used with the help of satellites. At present, it gives resolution of the order of 6 metres. Photographic products of imagery are available from National Remote Sensing Agency, Hyderabad on scales of 1:12,500, 1:25,000 and 1:50,000. Digital products are also available in Compact disk cartridges and tapes.

The cartridge/tape can be digitally processed in the computer and the image on the monitor can be interpreted with the possibility of enhancement of quality through manipulation of image processing software.

Major advantages of satellite imagery is its repeatability as orbiting satellites visit the same spot on earth every few weeks. Thus, the latest information regarding the physical features (like, the extent of a town or urban area, etc.) can be obtained to update on available map. The information on natural resources namely, geology, geomorphology, land use, soil status (water-logging, erosion, etc.) drainage, forest extent, etc. as available may be most useful input for the planners of highway alignment.

**Small format aerial photography (SFAP):** In case of large projects with mapping as one of the main objectives conventional aerial photography in traditional format (23cm x 23 cm) may also be useful. There are at least three known agencies in India for such aerial photography, namely the National Remote Sensing Agency (NRSA), Hyderabad, Air Survey Company, Calcutta/Kolkata and the India Air Force.

All aerial photography work requires clearance from the Ministry of Defense.

The major advantages of SFAP are:

- Very large scale true colour photography can be done in scales up to 1:1,000 to 1:2,000 (upto scales of 1:10,000). Acquisition plan alongside highways can be suitably made in scale of 1:4,000.
- Monitoring of urban areas, villages and environment along the corridor are possible at comparatively lower cost than ground surveys.

**Aerial Reconnaissance:**

An aerial reconnaissance will provide a bird's eye view of the alignments under consideration along with the surrounding area. It will help to identify factors which call for rejection or modification of any of the alignment. Final decision about the alignments to be studied in detail on the ground could be taken on the basis of the aerial reconnaissance.

**Ground Reconnaissance:**

The various alternative routes located as a result of the map study are further examined in the field by ground reconnaissance. As such, this part of the survey is an important link in the chain of activities leading to selection of the final route.

General reconnaissance consists of general examination of the ground walk in gorridding along the probable route and collecting all available information necessary for evaluating the same. In the case of hill sections, it may sometime be advantageous to start the reconnaissance from the obligatory point situated close to the top. If an area is inaccessible for the purposes of ground reconnaissance, recourse may have to of an aerial reconnaissance to clear the doubts.

While carrying out ground reconnaissance, it is advisable to leave reference pegs to facilitate further survey operations. Instruments generally used during ground reconnaissance include compass, Abney level/Altimeter, Pedometer, Aneroid barometer, Clinometer, Ghat-trace, etc. Walkie-talkies etc. Mobile-phone and pagers are useful for communication, particularly in difficult terrain. Use of the instruments mentioned above to obtain ground slopes, maximum gradients, elevation of critical summits or stream crossing, and location of obligatory points, serve as a check on the maps being used.

In difficult hilly and forest terrain assistance of new technology, like Global Position System (GPS) or Differential GPS (DGPS) may also be taken where the magnitude and importance of the work justify their provision. GPS is a comparatively new technology which utilizes the satellites orbiting around the earth. A minimum of four satellites are needed to indicate the coordinates (X,Y,Z) on the ground at any time of day and night with accuracy of a few centimeters, two geo-receivers are sued and this mode of using two GPS is known as differential GPS (DGPS).

**Reconnaissance Report**

Based on the information collected during the reconnaissance survey, a report should be prepared. The report should include all relevant information collected during the survey, a plan to the scale of 1:50,000 or larger as available showing the alternative alignments studied along with their general profile and rough cost estimates. It should discuss the merits and demerits of the different alternatives to help the selection of one or more alignments for detailed survey and investigation.

## 2. PRELIMINARY SURVEY

### Purpose

The preliminary survey is a relatively large scale instrument survey conducted for the purpose of collecting all the physical information which affects the proposed location of a new highway or improvements to an existing highway. In the case of new roads, it consists of running an accurate traverse line along the route previously selected on the basis of the reconnaissance survey. In the case of existing roads where only improvements are proposed, the survey line is run along the existing alignment. During this phase of the survey, topographic features and other features, like, houses, monuments, places of worship, cremation or burial grounds, utility lines, existing road and railway lines, stream, river, canal crossings, cross-drainage structures, etc. are tied to the traverse line. Longitudinal-sections and cross-sections are taken and benchmarks established. The data collected at this stage will form the basis for the determination of the final center line of the road. For this reason, it is essential that every precaution should be taken to maintain a high degree of accuracy.

Besides the above, general information which may be useful in fixing design features within close limits is collected during this phase. The information may concern traffic, soil, construction materials, drainage, etc. and may be collected from existing records as though intelligent inspection/simple measurements. **Detailed investigations dealt within section 10 through 16 are not envisaged at this stage.** It may be found convenient to divide the road in to homogeneous sections from traffic consideration and prepare a typical estimate for one km. stretch as representative of each homogeneous section. With the data collected, it should be possible to prepare rough cost estimates within reasonably close limits for obtaining administrative approval, if not already accorded and for planning further detailed survey and investigations. In particular, information may be collected regarding:

- (i) The highest sub-soil and flood water levels, the variation between the maximum and minimum, and the nature and extent of inundation, if any, gathered from local enquires or other records. These should be correlated to data about the maximum and minimum rainfall and its duration and spacing, etc. by appropriate hydrological analysis.
- (ii) The character of embankment foundations including the presence of any unstable strata like micaceous schists, poor drainage or marshy areas, etc. This is particularly necessary in areas having deep cuts to achieve the grade.
- (iii) Any particular construction problem of the area, like, sub-terranean flow, high level water storage resulting in step hydraulic gradient across the alignment canal crossing and their closure periods. Information regarding earlier failures in the area of slides or settlements of slopes, embankments and foundation, together with causes there to may also be gathered from records and enquiry where feasible.
- (iv) In cut sections, the nature of rock, i.e., hard, soft etc. should be determined by trial pits or boreholes. This is essential to make realistic cost estimates.

### **Survey Procedure:**

The preliminary survey starts with running of a traverse along the selected route, adhering as far as possible to the probable final centre-line of the road. In difficult situations, a secondary traverse connected to the primary one at either end may also be run. In hilly areas, a trace cut 1.0 to 1.2m wide, if required may be made during the preliminary survey. For details in this regard, reference may be made to **IRC:52 “Recommendations About the Alignment Survey and Geometric Design of Hill Roads”**.

The traverse consists of a series of straight lines with their lengths and intermediates angles measured very carefully. In difficult terrain, the alignment may have to be negotiated through a series of short chords, preferably, the traverse should be done with a theodolite with Electronic Distance Measurement (EDM) and all angles measured with double reversal method. Global Positioning System (GPS) is also very useful and appropriate for preliminary survey. The GPS will give locations in coordinates all the necessary points on the traverse. GPS is very fast reasonably accurate for preliminary system and computer friendly for data transfer. Control pillars in cement concrete should be fixed at suitable interval (ranging from 500 m to 2 kms) to have control on accuracy. It also helps in repeating the survey, if required, within the control pillars.

Distances along the traverse lines should be measured with EDM or total station. Accuracy of at least 1 in 10,000 should be aimed at in all distance measurement.

No hard and fast rule can be laid down as regards distance between two consecutive transit stations. In practice, the interval will be dictated by directional changes in alignment, terrain conditions and visibility. The transit stations should be marked by means of stakes and numbered in sequence. These should be protected and preserved till the final location survey.

Physical features, such as, buildings, monuments, burial grounds, cremation grounds, places of worship, posts, pipe lines, existing roads and railway lines, stream/river/canal crossings, cross-drainage structures, etc. that are likely to affect the project proposals should be located by means of offsets measured from the traverse line. Where the survey is for improving or upgrading existing road, measurements should also be made for existing carriage way, road way and location and radii of horizontal curves. In case of highways in rolling and hilly terrain the nature and extent of grades, ridges and valleys and vertical curves should necessarily be covered. The width of land to be surveyed will depend on the category of road, purpose of the project, terrain and other related factors. Generally, the survey should cover the entire right-of-way of the road, with adequate allowance for possible shifting of the centre line from the traverse line.

Leveling work during a preliminary survey is usually kept to the minimum. Generally, fly levels are taken along the traverse line at 50 metre intervals and at all intermediate breaks in ground. To draw contours of the strip of land surveyed, cross-sections should be taken at suitable intervals, generally 100 to 250m in plain terrain, upto 50 m in rolling terrain, and upto 20 m in hilly terrain. To facilitate the leveling work, benchmarks, either temporary or permanent, should be established at intervals of 250 to 500metres. The levels should be connected to GTS datum.

Field notes of the survey be clear and concise, yet comprehensive enough for easy and accurate plotting.

Apart from traverse survey, general information about traffic, soil, drainage should be collected while the traverse is being run as mentioned in para .

### **Map Preparation**

Plans and longitudinal sections (tied to an accurate base line) prepared as a sequel to the preliminary survey are referred to for detailed study to determine the final centre line of the road. At critical locations, like, sharp curves, hair-pin-bends, bridge crossings, etc., the plan should also show contours at 1-3metre intervals, particularly for roads in rolling or hilly terrain so as to facilitate the final decision.

Scales for the maps should generally be the same as adopted for the final drawings. The following scales are suggested:

- (i) Built-up areas and stretches in hilly terrain 1:1,000 for horizontal scale and 1:100 for vertical scale.
- (ii) Plain and rolling terrain – 1:2,500 for horizontal scale and 1:250 for vertical scale.

For study of difficult locations, such as, steep terrain, hair-pin bends, sharp curves, bridge crossings, etc. It may be convenient to have plans to a larger scale than recommended above. If necessary, these plans may show contours preferably at 2 m. intervals, though this could be varied to 1.5m according to site condition.

## **TRAFFIC GROWTH RATE ESTIMATION**

Traffic growth rate is required to be estimated to assess the future corridor traffic. To be realistic, this projection must be made by considering traffic flow pattern by Origin-Destination pairs and changes in vehicle mix expected during the time horizon of the study. Since the transport demand can change due to shift in the pattern of economic activities, it is also necessary to consider trip generation potentials within a region. In view of this, projecting regional socio-economic characteristics, plus the rate of change likely to take place in the economy, the population size, urbanization and the spatial distribution of the economic activities are required to be considered in estimation of growth rate for traffic project. Simple methods which may be considered suitable are described below:

### **Time Trend Analysis**

For this purpose, classified volume count data are to be collected at selected survey locations which are reasonably representatives of the traffic flow conditions along the corridor.

The analysis is then carried out generally by Linear Regression Analysis.  $AR^2$  value of 0.75 or more would be acceptable for forecasting. Erratic and scattered value of  $R^2$  may required consideration of other parameters and appropriate unbiased purification of data base or adjustment of growth rates, nevertheless, this method has its limitations particularly in its applications to a new facility. Secondly, historical growth rates do not cover the changes in the socio-economic structure, as such, fail to reflect fully the prospective growth envisaged in the economy and the spatial distribution of economic



activities, population size and, urbanization. These may require to have some zonal-level forecasting along the corridor. Thus, something more than simple extrapolation of historical growth rates by vehicle type is required.

### **Systematic Forecasting Method**

This method is more related to the projections of Origin-Destination at the zonal- level, as related to the prospective growth in population and the economy.

The traffic forecasting models developed for the study involved the estimation of future transport demand, in terms of future growth rates based on the growth of population and State Domestic Product (SDP), together with the elasticity of transport demand for both passengers and freight, in relation to income and population.

The data inputs required by this method for the determination of growth rates of vehicular traffic comprise:

- (a) the growth of population
- (b) income (in real terms) and
- (c) the elasticity of transport demand in relation to population and income

The data, particularly the income and transport demand elasticity, are generally not available at zonal level, the state level data may be used with due consideration of the zone under consideration.

### **Simplified Approach**

This approach is primarily based on the broad guidelines for economic analysis for highway investments circulated for schemes under the proposed assistance by the Asian Development Bank.

Forecast future normal demand for transport by project road based on, but not necessary limited to, annual population and real income per capita growth rates (in percent per year) estimated in Road Influence Area (RIA), elasticity of transport demand in relation to income and estimated annual production increases (in percentage per year) in RIA. In other words, annual traffic growth must be related to specific economic activity in each RIA. Transport demand should be projected on an annual basis over the project period. The formulae for annual growth (in percent) of passenger vehicles and trucks may be assumed as follows:

#### **(a) Passenger Vehicles**

#### **Example: Assumptions**

- (i) Population growth : 2.1 percent a year during 1981 - 91 (expected population growth rates during 1991 - 2001 2 percent/year)
- (ii) Real income per capita growth : 3.0 percent per year

Then, Growth Rate(%) =  $[1.020 \times 1.03 - 1] \times 100 \times E$

	<b>First five years</b>	<b>Second five years</b>	<b>Third five years</b>
E for Cars, Jeeps and Vans	2.0	2.0	1.8
E for Buses	1.6	1.6	1.5
E for Two and Three Wheelers	2.5	2.3	2.1

Where E is the elasticity of transport demand

### **(b) Freight Traffic**

Estimation of freight traffic more complex in nature and involves the process of iteration as well as subjective decision so as to be compatible with the regional perspective plans and other indicators. The basic steps will comprise:

(i) From socio-economic profile find out the annual weighted average growth rate in percent in the agricultural, industrial, mining and tourism sectors (assumed as the predominant sectors) from the State Domestic Product (SDP) data base. This growth may be computed in five (5) year blocks;

(ii) To the above growth rate, apply the elasticity of transport demand. For example For the first five years 2.0, second five years 1.8 and third five years 1.6;

(iii) Based on the above generate movement quantum in terms of commodity tonnage in the same block of years;

(iv) Now assume percentage of likely market shares by LCV, HCV and MAV during the project period;

(v) Further assign lead distance to connect the commodity movement in to tonne-km and using step (iv), generate numbers of vehicles in blocks of five years;

(vi) As a check back calculate the growth rates to examine its appropriateness in the context of regional development perspective and other development parameters. Apply suitable corrections, on subjective basis, to finalise the growth rates and generate annualized traffic streams in terms of LCV, HCV and MAV for use in pavement design as well as economic analysis.

### **Conclusion**

From the findings of the alternative methods described, appropriate growth rates may be adopted for the project road concerned.

## **CHECK LIST OF MAJOR OPERATIONS INVOLVED IN THE SURVEY AND INVESTIGATION FOR A ROAD PROJECT**

1. **Reconnaissance Survey**
  - (i) Map study
  - (ii) Aerial reconnaissance
  - (iii) Ground reconnaissance
2. **Preliminary Survey**
  - (i) Collection of general information about traffic, soil, sub-soil and surface drainage, etc.
  - (ii) Establishment of reference benchmarks
  - (iii) Traverse survey
  - (iv) Fly levels and cross-sections
  - (v) Map preparation
3. **Determination of Final Centre Line in the Design Office**
4. **Final Location Survey:**
  - (i) Staking of final centre line
  - (ii) Referencing of HIPs, POTs, etc.
  - (iii) Establishment of permanent benchmarks
  - (iv) Longitudinal and cross-sections
5. **Survey of Economic Profile**
6. **Traffic Survey**
  - (i) Study of data from records
  - (ii) Traffic counts, O-D Surveys, etc.
  - (iii) Traffic projections
  - (iv) Collection of traffic particulars for railway level crossings and road junctions
  - (v) Axle load surveys
  - (vi) Analysis of accident records
7. **Soil and Materials Survey**
  - (i) Study of available information
  - (ii) Soil investigations for low embankments and demarcation of borrow areas
  - (iii) Special investigation for high embankment
  - (iv) Detailed investigations for flexible pavement/rigid pavement
  - (v) Survey and evaluation of naturally occurring aggregates
  - (vi) Manufactured aggregates/items
  - (vii) Water for construction purposes
8. **Drainage Studies**
  - (i) HFL and ponded water level
  - (ii) Depth of sub-soil water table
  - (iii) Special investigations for cut section sand seepage flows
  - (iv) Surface run-off
9. **Cross-drainage Structures.**

## RECOMMENDED DESIGN SERVICE VOLUME FOR HILL ROADS

SL. No.	Type of Road	Design Service Volume in PCU/day		
		Carriage way Width	For low curvature (0-200 degrees per Km)	For high curvature (above 200 degree per Km.)
1	Single lane	3.75 m	1,600	1,400
2	Intermediate lane	5.5 m	5,200	4,500
3	Two lane	7 m	7,000	5,000

### 3. Ground Survey

**General :** This survey consists of pegging at 20 or 25 m Intervals the route previously selected on the basis of the reconnaissance survey more accurately and at regular and close Intervals, cutting a trace 1.0 to 1.2 m wide and running an accurate traverse line along it by taking longitudinal and cross sections of the alignment establishing hence marks at convenient intervals and fixing reference pegs where the direction of the alignment changes. The data collected at this stage forms the basis for the determination of the final centre line of the road. For this reason, it is essential that every precaution is taken to maintain high degree of accuracy. Besides the above, general information concerning traffic, soil conditions, construction materials, drainage etc., which may be relevant for fixing the design features should also be collected during this phase. The Survey Team may be similar to that for reconnaissance with supporting staff and equipment.

This survey may be done in the following sequences:

- a) Jungle clearance
- b) Pegging the alignment
- c) Trace cut
- d) Survey
- e) Map preparation

**Jungle clearance :** An advance party with required labourers and tools should commence clearing the jungle along the selected alignment to provide clear sight distance for three or four ranging pole/leveling staff positions at a time on each direction of the alignment. The party should commence work at least three days before the pegging party. The necessary clearance form forest department as required has to be obtained.

**Pegging the alignments:** A party consisting of the following personnel with necessary equipment should commence checking grade level, directions and curvature of the alignment arrived at earlier, during the reconnaissance re-fixing the correct alignment and repegging the alignment at convenient and workable distance, two to three days after the jungle clearance has progressed:

**Personnel**

a) Junior Engineer	-	1 No.
b) Overseer/Surveyor	-	1 No.
c) Helper	-	1 No
d) Labour	-	as required

**Equipment**

a) Levelling Instrument (quick setting level)	-	2 Nos
b) Ghat tracer	-	1 No.
c) Theodolite	-	1 No.
d) Sureveyor's chain	-	2 Nos.
e) Mettalic tape 30 m	-	3 Nos.
f) T&P for labour	-	as required
g) Prismatic Compass	-	1 set
h) Binoculars	-	2 pairs
i) Plain Table survey equipment	-	2 sets

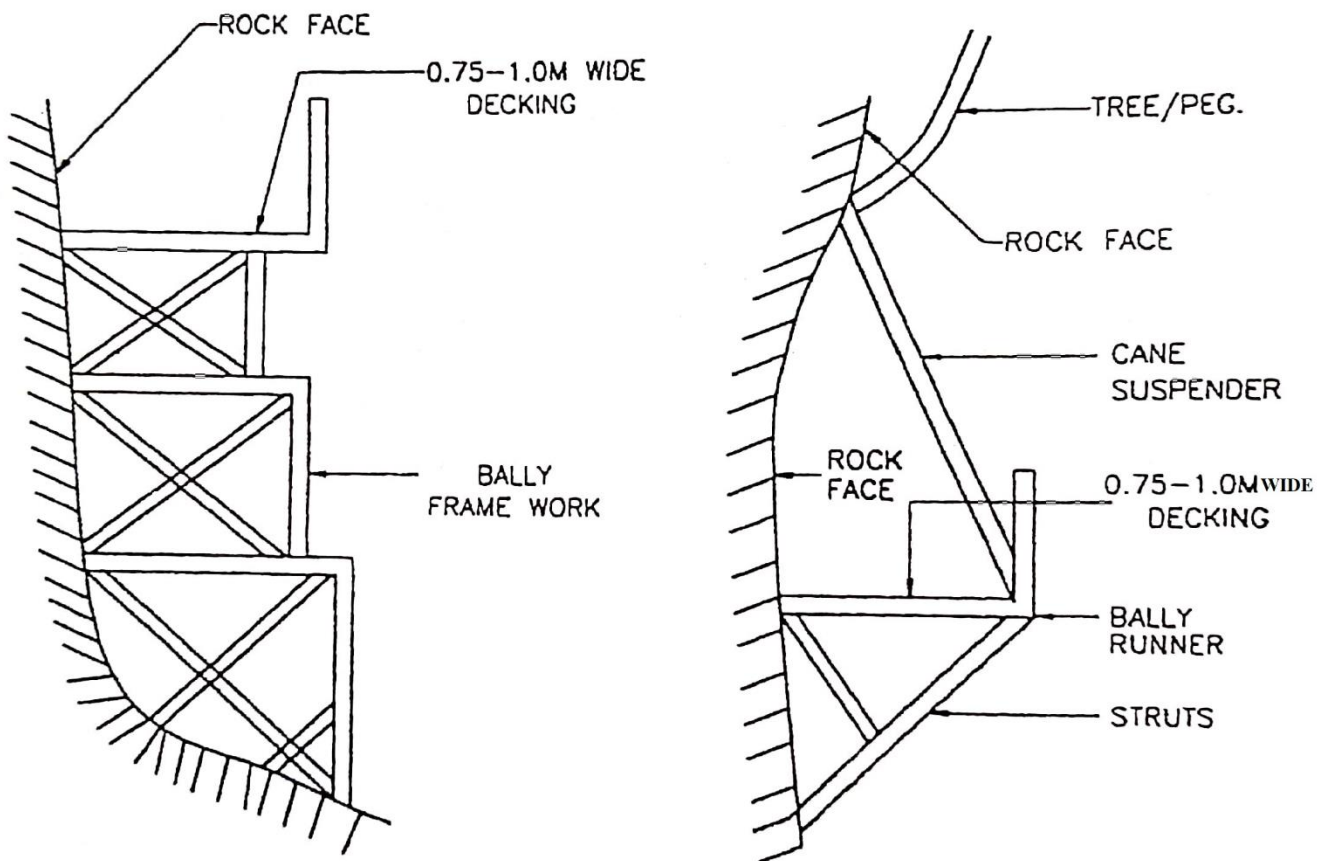
The line, grade and direction of the selected alignment should be properly checked and corrected with the leveling instrument and theodolite with more details and accuracy. The gradient to be followed at this stage should be easier than the proposed to be achieved on the road by a margin of 20 percent or so as stated in para 5.3.11(a). Procedure for pegging will be the same as in para 5.3.11 sub paras (c) and (d). However, the intervals of the pegs should be 20 or 25 m as per ground and terrain condition. The size of the pegs may be 6 cm dia or square and 60 cm long out of which 45 cm be driven into the ground. The indication about the grade should be provided at conspicuous locations so as to be easily visible from a distance as mentioned in para 5.3.11 sub paras (b) to (d). To avoid confusion, the earlier markings made in the trees or roads or poles will have to be removed or erased once the corrected and revised makings are ascertained and displayed.

**Trace cut :** A party consisting of the following personnel should carry cut the trace out along the selected alignment and follow the pegging party:

a) Junior Engineer	-	1 No.
b) Surveyor/Overseer	-	1 No.
c) Helper	-	2 Nos.
d) Labour with T&P	-	as required

Trace Cut will be about 1.0 metre wide track cut along the selected alignment to facilitate access to the area for inspection and survey. It may not be possible to cut a trace where the pegged route traverses precipices and may, therefore, be detoured by cutting the trace either along the top or bottom periphery of these areas.

**Machans :** In continuous long stretches of rock, with sheer vertical faces where trace cutting is not possible, machans can be constructed by erecting framework with locally available ballies, resting on suitable ledges or pegs driven in the crevices/cracks in the rock-face on the valley side. 0.75 to 1.0 m wide platform/decking of ballies/bamboos with suitable railing wherever required, is provided on the top of the framework. Where suitable ledge/support is not available, the machans are constructed by hanging cane suspenders from trees or pegs driven in crevices/cracks on the rock-face on hill side and the platform/decking is tied to these cane suspenders. Typical sketches of machans are shown in Fig.5.1. Where the rock is steep and inaccessibly deep for constructed of machans, temporary pathways can also be developed by driving jumpers of iron rods into the rock-face and putting wooden ballies or planks over them for the men to safely walk along.



MACHANS

#### 4. Final Location Survey :

**Determination of final centre line** : Determination of final centre line of the road in the design office involves the following operations:

- a) Detailed study should be done of the plans, longitudinal profile, cross-sections and contours of the final alignment prepared during the ground survey to work out various alternatives for the centre line of the proposed road. Out of these, the best one satisfying the engineering, aesthetic, economic and environmental requirements should be selected as the final Centre Line. Factors like economy in earth work, least disturbance to hill slope stability, efficient drainage, balanced cut and fill, requirement of protective works such as retaining/breast walls, etc. should be kept in view while making the final choice.
- b) For the selected final centre line, a trial grade line is drawn taking into account the control points which are established by mountain passes, intersections with other roads, river crossings, unstable areas etc. In the case of improvements to an existing road, the existing levels are also kept in view.
- c) For the centre line finally chosen, study of the horizontal alignment in conjunction with the profile is carried out and adjustments made in both, as necessary for achieving proper co-ordination.
- d) Horizontal curves including spiral transitions are designed and the final centre line marked on the map. A typical example of Final Centre Line chosen is given in Plate-2.
- e) The vertical curves are designed and the profiles as shown on the longitudinal sections.

The sub-group of this operation may comprise of the following personnel:

(i)	Assistant Executive Engineer	-	1 No.
(ii)	Junior Engineer	-	1 No.
(iii)	Surveyor/Overseer	-	1 No.
(iv)	Helper	-	4 Nos.
(v)	Labour	-	as required

**Transit survey:** The Final Centre Line of the road, as determined in the design office, is translated on the ground by means of a continuous Transit (Theodolite) survey and pegging of the centre line on the ground as the survey proceeds. All angles should be measured with a theodolite. It will be necessary to fix reference marks, to be pegged along the final centre line for this purpose. These marks should be generally 20 m apart in straight reaches and 10 m apart in curves. To fix the final centre line, reference pillars/control blocks of cement concrete of size 30 cm x 60 cm deep should be firmly embedded in the ground. These should be located beyond the expected edge of the cutting on the hill side. The maximum spacing of reference pillars may be 100 m. The following information should be put down on the reference pillars:

- a) Reduced distance of the reference pillar/block
- b) Horizontal distance of the pillar/block from the centre line of the road
- c) Reduced level at the top of the reference pillar
- d) Formation level of the final centre line of the road

The reference pillars should be so located that these do not get disturbed during construction. Description and location of the reference pillars should be noted in the field book for reproduction on the final alignment plans. Distance of the reference pillars from centre line of road should be measured along the slope, the slope angle determined with theodolite, and the actual horizontal projection calculated.

The final centre line of the road should be suitably pegged at 20 metres or closer intervals. The pegs are intended only for short period for taking levels of the ground along the centre line and the cross-sections with their reference. In the case of existing roads, paint marks may be used instead of pegs. Distance measurements along the final centre line should be continuous, following the horizontal curves, where these occur. At road crossings, the angles which the intersecting roads make with the final centre line should be measured with the help of a transit theodolite.

The sub-group for this operation may comprise of the following personnel:

- |                      |   |              |
|----------------------|---|--------------|
| a) Junior Engineer   | - | 1 No.        |
| b) Surveyor/Overseer | - | 1 No.        |
| c) Helper            | - | 2 Nos.       |
| d) Labour            | - | as required. |



**Detailed levelling :** Bench marks : To establish firm vertical control for location, design and construction, bench marks established during the preliminary survey should be re-checked and where likely to be disturbed during construction re-established at intervals of 250 metres (but not more than 500 metres), and at or near all drainage crossings.

**Longitudinal sections and cross-sections:** Levels along the final centre line should be taken at all pegged stations and breaks in the ground. Cross-sections should be taken at 20 m intervals. In addition, cross-sections should be taken at points of beginning and end of spiral transition curves, at the beginning, middle and end of circular curves, and at other critical locations. All cross sections should be with reference to the final centre line, extend normally up to the right-of-way limits and show levels at every 2-5 metre intervals and all breaks in the profile.

Centre line profile should normally be continued at least 200 metres beyond the limit of the road project. This is intended to ensure proper connecting grades at both ends. With the same objective, profile along all intersecting roads should also be measured up to a distance of about 150 metres. Further, at railway level crossings, the level of the top of the rails, and in the case of subways the level of the roof should be noted. On existing roads, level should be taken at all points of intersection in order to help fix the final profile.

The sub-group for this operation may comprise of the following personnel:

- |                      |   |              |
|----------------------|---|--------------|
| a) Surveyor/Overseer | - | 1 No.        |
| b) Helper            | - | 2Nos.        |
| c) Labour            | - | as required. |

**Proper protection of points of reference :** The final location survey is considered complete when all necessary data and information are available and ready for the designer to be able to plot the final profile and prepare the project drawings and detailed estimate. Among other things, field notes should give a clear description and location of all the bench marks and reference points. This information should be transferred to the plan drawings so that at the time of construction, the centre line and the bench marks could be located in the field without any difficulty.

At the time of execution, all construction lines will be set out and checked with reference to the final centre line established during the final location survey. It is important, therefore, that not only all the points referring the centre line are protected and preserved but these are so fixed at site that there is little possibility of their being disturbed or removed till the construction is completed.

Short notes on the following items that are relevant to survey and fixing of alignment or Hill Roads are given in Appendices 7 and 8.

- a) Aerial Survey, Photogrametry and Remote Sensing
- b) Geological Survey and Considerations.

The survey and fixing of alignment having been done, the stage has been, the stage has been reached to design the road as per standards.

## **5. DETAIL PROJECT REPORT (DPR) SUBMISSION AND FEASIBILITY REPORT**

### **1. FEASIBILITY REPORT**

#### **1.1 Executive Summary**

#### **1.2 Economic and social setting**

- (i) State's economic profile, including GDP, agricultural production, industrial output, mining, etc. and their growth rates.
- (ii) State's population and growth rates
- (iii) Potential of industrial and other economic growth in the project influence area.

#### **1.3 Transport system of the State:**

- (i) Main transport mode and their extent
- (ii) Road network in km by classification, carriage way width and surface type
- (iii) Vehicle fleet and its growth
- (iv) Annual expenditure on roads (original works and maintenance) by road class
- (v) Annual road taxes (State and Central)
- (vi) Profile of road transport industry
- (vii) Road maintenance norms and allotments
- (viii) Road accident statistics
- (ix) Consumption of petrol and diesel and growth trend

#### **1.4 Organization structure of PWD/Highway Department**

#### **1.5 Socio-economic profile of the project area**

#### **1.6 Project description**

- (i) Scope
- (ii) Necessity
- (iii) Sources of funding and budget provision
- (iv) Selection of route
- (v) Management
- (vi) Alignment
- (vii) Cross-sectional elements
- (viii) Drainage facilities
- (ix) Construction technology

**1.7 Methodology adopted for the studies**

- (i) Division into homogenous sections
- (ii) Traffic studies like classified counts, Origin-Destination, Axle Load Survey
- (iii) Traffic growth rates
- (iv) Road inventory, including roughness data
- (v) Survey and Investigation results
  - Soil Survey
  - Material Survey
  - Pavement deflection data
  - Design of cross– drainage works

**1.8 Design, Report**

- (i) Project road inventory
- (ii) Engineering surveys and investigation data
- (iii) Design standards and specifications
- (iv) Special site conditions effecting design
- (v) Pavement design
- (vi) Design of cross-drainage and other structures

**1.9 Cost estimates**

- (i) Item rates and rate analysis
- (ii) Escalation

**1.10 Construction Programme:****1.11 Economic analysis**

- (i) Vehicle operating costs
- (ii) Time costs
- (iii) Accident costs
- (iv) Economic costs and benefits
- (v) Shadow pricing
- (vi) Sensitivity analysis
- (vii) Discussion of results

**1.12 Construction arrangement**

- (i) Prequalification procedure
- (ii) Bidding procedure
- (iii) Supervision arrangements

**1.13 Conclusive and recommendation**

**2. DRAWINGS**

- (i) Locality map
- (ii) Plans showing various alternative alignments considered and the elected alignment
- (iii) L-section of the selected alignment
- (iv) Typical cross-sections showing pavement details
- (v) Strip plan
- (vi) Drawing showing cross drainage and other structures
- (vii) Road junction plans
- (viii) Road ways land acquisition plan

## Section – 6

### 6.0 FORMATS TO BE USED FOR SUBMISSION OF PROPOSAL

#### 1.1 FINANCIAL PROPOSAL SUBMISSION:

*To be submitted through e-portal <https://tender.mizoram.gov.in>*

Detailed break-up of cost for **Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the bill of quantities, in the State of Mizoram.**

**Price Schedule:**

**Package: V**

*The costs mentioned in the Table below are inclusive of all taxes as applicable in the*

#### BILL OF QUANTITY (BOQ)

**Name of Work :**

Sl. No.	Description of item	Unit	Quantity in Km.	Rate/Km (Rs.)	Amount (Rs.)
1	Diversion of Lunglei to Buarpui road at Kawlhawk village	<b>Km.</b>	5.00		
2	Construction of Muallianpui Lungleng S-Tuipui 'D' road	<b>Km.</b>	30.00		
3	Construction of Lunglei to Putlungasih road	<b>Km.</b>	25.00		
4	Construction of Bualpui V to Lungmawi road	<b>Km.</b>	9.00		
5	Construction of Tlabung - Marpara road	<b>Km.</b>	70.00		
	TOTAL OF PACKAGE -V		139.00		

(Rupees .....)

**“Bill of Quantity is given in excel file and to be submitted separately.”**

## PRE-QUALIFICATION/TECHNICAL PROPOSAL SUBMISSION FORM

\_\_\_\_\_ (Location)

\_\_\_\_\_ (Date)

From

\_\_\_\_\_

To

The Engineer-in-Chief,  
Public Works Department,  
Mizoram, Aizawl, Mizoram

**Subject: Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice, in the State of Mizoram.**

**Bid for package \_\_\_\_."**

**Ref.:**

Dear Sir,

Having examined the details given in Technical - Qualification document of the above work I/We hereby submit the Technical – Qualification and other relevant bid document.

I/We hereby certify that all the statements made and information supplied in the enclose forms A to F and accompanying statement are true and correctand, if found incorrect, the Contract is likely to be terminated.

We, the undersigned, confirm that we meet all the pre-qualification criteria listed in the bid document.

We are submitting the following documents for our eligibility for the above assignment.

- Form PQ-1, Bidder's Annual Turn over
- Form PQ-2, Similar Work Experience
- Form PQ-3, Sub contracting Declaration & Request Form
- Form PQ-4, Key Personnel Details
- Form PQ-5, Resume of Proposed key Personnel
- Form PQ-6, Availability of credit facilities
- Form PQ-7, Notarised Affidavit
- Form PQ-8, Undertaking from the bidder

Our Proposal is binding upon us and subject to the modifications resulting from contract negotiations, up to expiration of the validity period of the Proposal.

We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely "Prevention of Corruption Act 1988". We understand you are not bound to accept any Proposal you receive.

Further, I, undersigned do here by undertake that our firm M/s .....agrees to abide by this bid for a period not less than 120 days after the dead line date for bid submission .i.e.....

Yours sincerely,

(Signature of the Authorized signatory):

Name and Designation of the Authorized signatory:

Name and Address of Firm:

Phone, Fax & E-Mail

Seal:

Form: PQ-1

**BIDDER'S ANNUAL TURNOVER  
Proof for clause 2.16.1.3 (i)**

\_\_\_\_\_ (Location)  
\_\_\_\_\_ (Date)

From

\_\_\_\_\_

To

The Engineer-in-Chief,  
Public Works Department,  
Mizoram, Aizawl, Mizoram

**Subject:: Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice, in the State of Mizoram.**

**Bid for package \_\_.”**

Dear Sir/Madam,

We hereby certify that the average annual turnover of M/s. \_\_\_\_\_ (name of the bidder) is not less than Rs..... Lakh (Rupees One Hundred Lakh) during the last three financial years.

Sl. No.	Firm	Year (2016-2017)	Year (2017-2018)	Year (2018-2019)
		Amount (in Lakh)	Amount (in Lakh)	Amount (in Lakh)
1				

Yours Sincerely,

(Signature of Statutory Auditor)

Name of the Statutory Auditor:

Name of the Statutory Auditor Firm:

Seal:

Important Notes: The above data should relate only to the Bidder /JV who has submitted the tender. Data relating to sister companies, group companies, parent company, subsidiary companies shall not be considered.

2. **Form: PQ-2**

**SIMILAR WORK EXPERIENCE**  
**Declaration for clause 2.17.4**  
**(Attach Certificates From the Employer)**

\_\_\_\_\_ (Location)  
 \_\_\_\_\_ (Date)

From

---

To

The Engineer-in-Chief,  
 Public Works Department,  
 Mizoram, Aizawl, Mizoram

**Subject:** *Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice, in the State of Mizoram.*

**Bid for package \_\_\_."**

We hereby declare and confirm that we, \_\_\_\_\_ (Name of the Bidder), having registered office at \_\_\_\_\_ (address) have successfully executed the following qualifying works in the last 5 years. We are providing the details below: (Note: add rows as required).

Sl. No.	Name of the client organization	Purchase Order (P.O) No. & Date of issue of P.O.	Project Value	Brief Scope of Work	Whether the successful completion certificate as required, is attached?		Whether the copies of the purchase orders / contracts from the client as required, is attached?	
					Yes/No	Pg. No. on the Proposal	Yes/No	Pg. No. on the Proposal

Yours Sincerely,

(Signature of Authorized Signatory)

Name and Designation of the Authorized Signatory:

Name and address of the Bidder Company:

Seal:



### 3. Form: PQ-3

#### SUBCONTRACT DECLARATION & REQUEST FORM Declaration for clause 3.5

From \_\_\_\_\_ (Location)  
\_\_\_\_\_ (Date)

To  
The Engineer-in-Chief,  
Public Works Department,  
Mizoram, Aizawl, Mizoram

**Subject:** *Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice, in the State of Mizoram.*

**Bid for package** \_\_. ”.

**Ref.:**

1. We hereby declare and confirm that we, \_\_\_\_\_ (Name of the Bidder), having registered office at \_\_\_\_\_ (address), undertake that the following services towards this tender will not be sub-contracted and will be executed only by the employees of our Company who are on our payrolls.
2. We are intending to subcontract the following works to the respective sub consultants as found in the table below. We submit the same for your approval.

Sl. No.	Name of Subcontracted Service	Details of the Subcontract work	Brief Profile of the Sub consultant proposed	Sub-Consultant Name, Address and Contact Numbers	Value of the subcontracted work.

3. We also undertake that under all circumstances, the value of the works sub-contracted by us will not exceed 25% of the contract price.

Yours Sincerely,

(Signature of Authorized Signatory)

Name and Designation of the Authorized Signatory:

Name and address of the Bidder Company:

Seal:

Form: PQ-4

**KEY PROFESSIONEL**

From \_\_\_\_\_ (Location)  
 \_\_\_\_\_ (Date)

To  
 The Engineer-in-Chief,  
 Public Works Department,  
 Mizoram, Aizawl, Mizoram

Subject: **Feasibility Study, Detail Contour Survey, Selection of Alignment and Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details given in the Tender Notice, in the State of Mizoram.**

Bid for package \_\_\_\_.”

**Ref.:**

Dear Sir/Madam,

We, M/s \_\_\_\_\_, hereby propose to engage following key personnel meeting the specified requirements stated in the Bid Document. The Bio data for each candidate indicating their qualification and experience is enclosed in the prescribed format.

1.	<b>Title of position*</b>	<b>Team Leader cum Highway Engineer</b>
	Name	
2.	<b>Title of position*</b>	
	Name	
	Name	
3.	<b>Title of position*</b>	
	Name	
	Name	
	Name	
4.	<b>Title of position*</b>	
	Name	
	Name	
	Name	
5.	<b>Title of position*</b>	
	Name	
6.	<b>Title of position*</b>	
	Name	

Yours Sincerely,

(Signature of Authorized Signatory)

Name and Designation of the Authorized Signatory:

Name and address of the Bidder Company:

Seal:

## RESUME OF PROPOSED PERSONNEL

<b>Name of Bidder</b>
-----------------------

<b>Position</b>									
<b>Personnel information</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"><b>Name</b></td> <td style="width: 50%; padding: 5px;"><b>Date of birth</b></td> </tr> <tr> <td colspan="2" style="padding: 5px;"><b>Professional qualifications</b></td> </tr> <tr> <td colspan="2" style="padding: 5px;"><b>Total years of professional experience</b></td> </tr> <tr> <td colspan="2" style="padding: 5px;"><b>Training, publication etc.</b></td> </tr> </table>	<b>Name</b>	<b>Date of birth</b>	<b>Professional qualifications</b>		<b>Total years of professional experience</b>		<b>Training, publication etc.</b>	
	<b>Name</b>	<b>Date of birth</b>							
	<b>Professional qualifications</b>								
	<b>Total years of professional experience</b>								
<b>Training, publication etc.</b>									
<b>Present employment</b>									
<b>Name of employer</b>									
<b>Address of employer</b>									
<b>Telephone</b>	<b>Contact (manager / personnel officer)</b>								
<b>Fax</b>	<b>E-mail</b>								
<b>Job title</b>	<b>Years with present employer</b>								

Summarize professional experience over the last 20 years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	To	Company / Project / Position / Relevant technical and management experience

**Authorized Signatory**

**SAMPLE FORMAT FOR EVIDENCE OF ACCESS TO OR  
AVAILABILITY OF CREDIT FACILITIES**

(To be submitted with Agreement)

BANK CERTIFICATE

This is to certify that M/s..... is a reputed Company with a good Financial standing. If the Contract for the, namely..... is awarded to the above firm, we shall be able to provide overdraft/credit facilities to the extent of Rs.....to meet their working capital requirements for executing the above contract during the contract period.

Note: This certificate is issued without any guarantee or responsibility of the bank or any other officers.

(Signature)

Name of Bank

Senior Bank Manager

Address of the Bank

**1. NOTARISED AFFIDAVIT**

1. I, the undersigned, do hereby certify that all the statements made in the required attachments are true and correct.
2. The undersigned also hereby certifies that neither our firm M/s \_\_\_\_\_  
\_\_\_\_\_ has been blacklisted/debarred nor has abandoned any work in any government department, in India nor any contract awarded to us for such works have been rescinded, during last five years prior to the date of this bid.
3. The undersigned hereby authorizes and request(s) any bank, person, firm or corporation to furnish pertinent information deemed necessary and requested by the Department to verify this statement or regarding my (our) competence and general reputation.
4. The undersigned understand and agrees that further qualifying information may be requested, and agrees to furnish any such information at the request of the Department Project implementing agency.

\_\_\_\_\_  
(Signed by an Authorized Officer of the Firm)

\_\_\_\_\_  
Title of Officer

\_\_\_\_\_  
Name of Firm

\_\_\_\_\_  
DATE

**UNDERTAKING FROM THE BIDDER**

I, the undersigned do hereby undertake that our firm M/s \_\_\_\_\_  
\_\_\_\_\_ would invest a minimum cash up to 25% of the value of the work during  
implementation of the Contract.

\_\_\_\_\_  
(Signed by an Authorised Officer of the Firm)

\_\_\_\_\_  
Title of Officer

\_\_\_\_\_  
Name of Firm

\_\_\_\_\_  
DATE

***FORMAT FOR SUBMISSION OF BANK GUARANTEES******(PERFORMANCE BANK GUARANTEE)***

(To be stamped in accordance with Stamp Act if any, of the country of issuing bank)

**To**  
**The Engineer-in-Chief,**  
**Public Works Department,**  
**Mizoram, Aizawl.**

Against contract awarded vide letter of award ref. no. \_\_\_\_\_ dated \_\_\_\_\_ for the Tender No. \_\_\_\_\_ dated \_\_\_\_\_ for the Package..... (hereinafter termed as the said "Contract") entered into between The Engineer-in-Chief, Mizoram, PWD, Mizoram,, Mizoram [for the Governor of Mizoram], (hereinafter called "THE EMPLOYER") and M/s \_\_\_\_\_ having its registered office at \_\_\_\_\_ and branch office at \_\_\_\_\_ (hereinafter called the successful bidder), this is to certify that at the request of the successful bidder, we \_\_\_\_\_ Bank having its Registered/Head office at \_\_\_\_\_ and branch at \_\_\_\_\_ are holding in trust, in favour of THE EMPLOYER, the amount of Rs. \_\_\_\_\_ (Rs. in words \_\_\_\_\_) to indemnify and keep indemnified THE EMPLOYER against any loss or damage that may be caused to or suffered by THE EMPLOYER by reason of any breach by the successful bidder of any of the terms and conditions of the said contract/and/or in the performance thereof. We agree that the decision of THE EMPLOYER, whether any breach of any of the terms and conditions of the said contract and/or in the performance thereof has been committed by the Successful bidder and the amount of loss or damage that has been caused or suffered by THE EMPLOYER shall be final and binding on us and the amount of the said loss or damage shall be paid by us forthwith on demand, and without demur to THE EMPLOYER. The decision of THE EMPLOYER in this regard shall be final and binding upon the successful bidder and the bank.

We \_\_\_\_\_ Bank further agree that the guarantee herein contained shall remain in full force and effect up to the date six months after the expiry of the Contract period i.e. \_\_\_\_\_ (hereinafter referred as the said date) and that if any claim accrues or arises against us, we \_\_\_\_\_ Bank by virtue of this guarantee before the said date, the same shall be enforceable against us. Notwithstanding the fact that the same is enforced within six months after the said date, provided that notice of any such claim has been given to us by THE EMPLOYER within this period. Payment under this letter of guarantee shall be made within seven days upon receipt of notice to that effect from THE EMPLOYER.

It is fully understood that this guarantee is effective from the date of the said contract and that we \_\_\_\_\_ Bank undertake that no change or addition or modification of the terms of the contract or the work to be performed there under or any of the contract documents which may be made between "THE EMPLOYER" and the successful bidder, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

We undertake to pay to THE EMPLOYER any money so demanded, notwithstanding any dispute or disputes raised by the Successful bidder in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Successful bidder shall have no claim against us for making such payment.

We \_\_\_\_\_ Bank further agree that THE EMPLOYER shall have the fullest liberty, without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said contract or to extend time for performance by the Successful bidder from time to time or to postpone for any time any of the power exercisable by THE EMPLOYER against the said Successful Bidder and is to forbear or Bank shall not be released from our liability under this guarantee by reason of any such variation or extension being granted to the said Successful bidder or for any forbearance by THE EMPLOYER or any other matter or thing what-so-ever, which under the law relating to sureties would, but for this provision have the effect of so releasing us from liability under this guarantee.

This guarantee will not be discharged due to the change in the constitution of the Bank or Successful Bidder.

Notwithstanding anything contained hereinbefore:

Our liability under this bank guarantee is limited to Rs. \_\_\_\_\_ (Rs. in words)

Will remain in force up to six months after the expiry of Contract period i.e. \_\_\_\_\_;

And unless a claim or demand under this guarantee is made on us in writing on or before \_\_\_\_\_ all our liability shall cease.

DATE \_\_\_\_\_

SIGNATURE OF THE AUTHORIZED SIGNATORY OF THE BANK

(WITH CODE NO.) \_\_\_\_\_

SEAL OF THE BANK \_\_\_\_\_

SIGNATURE OF THE WITNESS \_\_\_\_\_

Name and Address of the Witness \_\_\_\_\_

The bank guarantee shall be issued either by a bank (Nationalized/Scheduled) located in India



***BANK GUARANTEE FORMAT FOR EARNEST MONEY DEPOSIT (EMD)***

(To be stamped in accordance with Stamp Act if any, of the country of issuing bank)

Ref.: **Tender No.** \_\_\_\_\_, **dated** \_\_\_\_\_

Bank Guarantee:

Date:

WHEREAS, \_\_\_\_\_ (Name of Bidder) (hereinafter called "the bidder") has submitted his bid dated \_\_\_\_\_ (date) for the **Tender No.** \_\_\_\_\_, **dated** \_\_\_\_\_ (hereinafter called "the Bid").

KNOW ALL MEN by these presents that We, \_\_\_\_\_ [Name of Bank] of \_\_\_\_\_ [Name of Country] having our registered office at \_\_\_\_\_ (hereinafter called "the Bank") are bound unto \_\_\_\_\_ [Name of Employer] (hereinafter called "the Employer") in the sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ Lakhs Only) for which payment will and truly to be made to the said Employer the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 2018.

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws his Bid during the period of bid validity specified in the Bid document; or
2. If the Bidder does not accept the correction of arithmetical errors of his Bid Price in accordance with the Instructions to Bidder; or
3. If the Bidder having been notified of the acceptance of his Bid by the Employer during the period of bid validity,
  - a. fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or
  - b. fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders,

we undertake to pay the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of one or any of the conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date 180 (one hundred and eighty) days after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rs. \_\_\_\_\_) and the guarantee shall remain valid till \_\_\_\_\_. Unless a claim or a demand in writing is made upon us on or before \_\_\_\_\_ all our liability under this guarantee shall cease.

DATE \_\_\_\_\_

SIGNATURE OF THE BANK \_\_\_\_\_

SEAL OF THE BANK \_\_\_\_\_

SIGNATURE OF THE WITNESS \_\_\_\_\_

Name and Address of the Witness \_\_\_\_\_

The bank guarantee shall be issued by a bank (Nationalized/Scheduled) located in India

**DRAFT AGREEMENT**

**Contract agreement:** **Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads, in the State of Mizoram.**  
**(Package.....)**

**(To be executed on appropriate Stamp Paper of Govt. of India)**

1. This Contract agreement is made on \_\_\_\_\_ between the Governor of Mizoram, represented by the Engineer-in-Chief, PWD, Aizawl, Mizoram, (hereinafter referred to as the 'Employer / Client' the term which shall mean and include its heads, administrators, executors and assignees) of the first part and M/s \_\_\_\_\_, (hereinafter referred to as the Consultant) of the second part.
2. WHEREAS the Consultant represents that it is well reputed Consultant for conducting bridge and culvert condition survey and inventory data for bridges on the SHs and MDRs network using Mobile Bridge Inspection Unit or similar type of equipment.
3. And WHEREAS the Consultant has offered to the Employer **Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads as details Tender Notice, in the State of Mizoram.**(hereinafter called services) as given at para 5(iii) below.
4. And WHEREAS the Employer agrees to get the services and the Consultant agrees to provide the services in pursuant to the bid submitted by the consultants vide letter No.\_\_\_\_\_ Dated \_\_\_\_\_ (hereinafter referred to as "the offer") and the Employer has by his letter of acceptance No.\_\_\_\_\_ Dated \_\_\_\_\_ accepted the offer submitted by the consultant at the contract price of Rs.\_\_\_\_\_ (in words) with details mentioned in para 5(iv) below in accordance with the terms and conditions below hereinafter contained and schedule of payment as mentioned in Para 5(v) AND WHEREAS the consultant has agreed to provide services and has furnished performance security pursuant to para 2.7.2 of the instructions to bidders, section- 2.
5. Now this agreement witnessed as follows:-
  - (i) In this agreement words and expressions shall have the same meanings as are respectively assigned to them in the condition of contract hereinafter referred to:
  - (ii) The following documents/ sections of the Bidding Document shall be deemed to form and be read and construed as part of this agreement
 

Section 1	Letter of Acceptance
Section 2	Instructions to Bidders
Section 3	General (Financial and Legal) Conditions of Contract
Section 4	Special Conditions of Contract
Section 5	Scope of Work/TOR
Section 6	Formats submitted with the proposal(Technical & Financial Proposal)
  - (iii) Scope and object of the Contract is Collection of bridge condition survey and bridge and culvert inventory data under Each Division Office of RCD, Mizoram, Aizawl for, preparation of DPRs for repair, maintenance and rehabilitation, preparation of As Built Drawings, Preparation of Bridge Maintenance Manuals.
  - (iv) Referring to consultant's price bid No. \_\_\_\_\_ dated \_\_\_\_\_ the total price of the **Feasibility Study, Detail Contour Survey, Selection of Alignment and Preparation of Project Report & Cost Estimate for the roads, in the State of Mizoram.** under PWD Mizoram is  
 INR.....

(v) Schedule of Payment:

Payments will be made from the Office of the engineer-in-Chief, PWD, Mizoram, or Divisional office which will be intimated later within 30 days of successful submission of as per agreement clause \_\_\_\_ as per following payment schedule:

XX  
*Insert payment scheduled with amount as per quotation.*  
XX

(vi) In consideration of the payments to be made by the Employer to the Consultant as hereinafter mentioned, the consultant hereby covenants with the Employer to execute and complete the works and remedy any defects therein in all respects inconformity with the provisions of the Contract.

(vii)The consultant hereby also covenants that all the partners of Joint Venture shall be jointly and separately responsible to the Employer for the execution of the contract in accordance with the contract terms.

(viii)The Employer hereby covenants to the consultant in consideration of the execution and completion of the works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the Contract.

In witness whereof the parties hereto have caused this agreement to be executed the day the year first before written, signed, sealed and Delivered by the said Employer through his authorized representative and the Consultant through his Power of Attorney Holders.

(For an on behalf of the Consultant)

\_\_\_\_\_

Engineer-in-Chief  
Public Works Department,  
Aizawl, Mizoram

Witness

1. Signature \_\_\_\_\_

1. Signature \_\_\_\_\_

Name \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_

2. Signature \_\_\_\_\_

2. Signature \_\_\_\_\_

Name \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Address \_\_\_\_\_