

GOVERNMENT OF INDIA

**MINISTRY OF SCIENCE & TECHNOLOGY
SURVEY OF INDIA**

National Hydrology Project BID

NO.IN-SOI--NC-RFB

**NATIONAL COMPETITIVE BIDDING for NON-
CONSULTING SERVICES**

NAME OF NON_CONSULTING SERVICE	Providing Services for Bathymetric Surveys in River Cross section
PERIOD OF SALE OF BIDDING DOCUMENT	: 08-08-2020 TO 20-09-
LAST DATE AND TIME FOR RECEIPT OF BIDS	: DATE 20-09-2020 TIME 1100 HOURS
* TIME AND DATE OF OPENING OF BIDS	: DATE 20-09-2020 TIME 1200 HOURS
PLACE OF OPENING OF BIDS	: Directorate of Survey (Air) & Delhi GDC, 2 nd Floor, West Block-4, Wing No.-IV, R.K. Puram, New Delhi
OFFICER INVITING BIDS	: <i>Project Director, NHP NGDC, Survey Of India Post Box: 200, Block No. 6, Hathibarkala Estate, Dehradun Telephone: +91-135-2747623, +91-135-2745566 Facsimile number: +91-135-2747623 Email: <u>pd.nhp.soi@gov.in</u></i>

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Part I – Bidding Procedures

Section I. Instructions to Bidders

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Instructions to Bidders

A. General

- 1. Scope of Bid** The Employer, as defined in the **Bidding Data Sheet (BDS)**, invites bids for the Services, as described in the Appendix A to the Contract. The name and identification number of the Contract is **provided in the BDS**.

The successful Bidder will be expected to complete the performance of the Services by the Intended Completion Date **provided in the BDS**.

- 2. Source of Funds** 2.1 The Borrower, as **defined in the BDS**, intends to apply part of the funds of a loan from the World Bank, **as defined in the BDS**, towards the cost of the Project, **as defined in the BDS**, to cover eligible payments under the Contract for the Services. Payments by the World Bank will be made only at the request of the Borrower and upon approval by the World Bank in accordance with the Loan Agreement, and will be subject in all respects to the terms and conditions of that Agreement. Except as the World Bank may specifically otherwise agree, no party other than the Borrower shall derive any rights from the Loan Agreement or have any rights to the loan proceeds.

- 3. Corrupt or Fraudulent Practices** It is the Bank's policy to require that Borrowers (including beneficiaries of Bank loans), as well as bidders, suppliers, and contractors and their subcontractors under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts.

¹In pursuance of this policy, the Bank:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "corrupt practice"² is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
 - (ii) "fraudulent practice"³ is any act or omission, including a misrepresentation, that knowingly or

¹ In this context, any action taken by a bidder, supplier, contractor, or a sub-contractor to influence the procurement process or contract execution for undue advantage is improper.

² For the purpose of these SBDs, "another party" refers to a public official acting in relation to the procurement process or contract execution]. In this context, "public official" includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

- (iii) “collusive practice”⁴ is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) “coercive practice”⁵ is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) “obstructive practice” is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
 - (bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under para. 1.14 (e) of the Bank’s Procurement Guidelines.
- (b) will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;
- (c) will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, coercive or obstructive practices

³ For the purpose of these SBDs, “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

⁴ For the purpose of these SBDs, “parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non-competitive levels.

⁵ For the purpose of these SBDs, “party” refers to a participant in the procurement process or contract execution.

during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to remedy the situation;

- (d) will sanction a firm or individual, including declaring them ineligible, either indefinitely or for a stated period of time, to be awarded a Bank-financed contract if it at any time determines that they have, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a Bank-financed contract; and
- (e) will have the right to require that a provision be included in bidding documents and in contracts financed by a Bank Loan, requiring bidders, suppliers, contractors and consultants to permit the Bank to inspect their accounts and records and other documents relating to the Bid submission and contract performance and to have them audited by auditors appointed by the Bank.

3.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clauses 1.7 and 2.6.1 of the General Conditions of Contract.

4. Eligible Bidders

This Invitation for Bids is open to all bidders from eligible countries as defined in the Procurement Guidelines. Any materials, equipment, and Services to be used in the performance of the Contract shall have their origin in eligible source countries.

All bidders shall provide in Section III, Bidding Forms, a statement that the Bidder (including all members of a joint venture and subcontractors) is not associated, nor has been associated in the past, directly or indirectly, with the consultant or any other entity that has prepared the design, specifications, and other documents for the Project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Borrower to provide Consultant Services for the preparation or supervision of the Services, and any of its affiliates, shall not be eligible to bid.

Government-owned enterprises in the Employer's country may only participate if they are legally and financially autonomous, operate under commercial law, and are not a dependent agency of the Employer.

The loan agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or

for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council, taken under Chapter VII of the Charter of the United Nations.

4.5 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Bank in accordance with ITB Sub-Clause 3.1.

5. Qualification of the Bidder All bidders shall provide in Section III, Bidding Forms, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.

In the event that prequalification of potential bidders has been undertaken **as stated in the BDS**, only bids from prequalified bidders shall be considered for award of Contract, in which case the provisions of sub-clauses 5.3 to 5.6 hereafter shall not apply. These qualified bidders should submit with their bids any information updating their original prequalification applications or, alternatively, confirm in their bids that the originally submitted prequalification information remains essentially correct as of the date of bid submission. The update or confirmation should be provided in Section IV.

If the Employer has not undertaken prequalification of potential bidders, all bidders shall include the following information and documents with their bids in Section IV, unless otherwise **stated in the BDS**:

- (a) copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder;
- (b) total monetary value of Services performed for each of the last five years;
- (c) experience in carrying out bathymetric survey of reservoirs and perennial rivers and size for each of the last five years, and details of Services under way or contractually committed; and names and address of clients who may be contacted for further information on those contracts;
- (d) list of major items of equipment proposed to carry out the Contract;
- (e) qualifications and experience of key site management and technical personnel proposed for the Contract;
- (f) reports on the financial standing of the Bidder, such as

- profit and loss statements and auditor's reports for the past five years;
- (g) evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);
- (h) authority to the Employer to seek references from the Bidder's bankers;
- (i) information regarding any litigation, current or during the last five years, in which the Bidder is involved, the parties concerned, and disputed amount; and
- (j) proposals for subcontracting components of the Services amounting to more than 10 percent of the Contract Price.

Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements, unless otherwise stated in the **BDS**:

- (a) the Bid shall include all the information listed in ITB Sub-Clause 5.3 above for each joint venture partner;
- (b) the Bid shall be signed so as to be legally binding on all partners;
- (c) the Bid shall include a copy of the agreement entered into by the joint venture partners defining the division of assignments to each partner and establishing that all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms; alternatively, a Letter of Intent to execute a joint venture agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement;
- (d) one of the partners shall be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and
- (e) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

To qualify for award of the Contract, bidders shall meet the following minimum qualifying criteria:

- (a) annual volume of Services of at least the amount **specified**

in the BDS;

- (b) experience as prime contractor in the provision of at least two service contracts of a nature and complexity equivalent to the Services over the last 5 years (to comply with this requirement, Services contracts cited should be at least 70 percent complete) **as specified in the BDS;**
- (c) proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment **listed in the BDS;**
- (d) a Contract Manager with five years' experience in Services of an equivalent nature and volume, including no less than three years as Manager; and
- (e) liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than the amount specified in the **BDS.**

A consistent history of litigation or arbitration awards against the Applicant or any partner of a Joint Venture may result in disqualification.

5.6 The figures for each of the partners of a joint venture shall be added together to determine the Bidder's compliance with the minimum qualifying criteria of ITB Sub-Clause 4.4(a), (b) and (e); however, for a joint venture to qualify the partner in charge must meet at least 40 percent of those minimum criteria for an individual Bidder and other partners at least 25% of the criteria. Failure to comply with this requirement will result in rejection of the joint venture's Bid. Subcontractors' experience and resources will not be taken into account in determining the Bidder's compliance with the qualifying criteria, unless otherwise **stated in the BDS.**

6. One Bid per Bidder

6.1 Each Bidder shall submit only one Bid, either individually or as a partner in a joint venture. A Bidder who submits or participates in more than one Bid (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the Bidder's participation to be disqualified.

7. Cost of Bidding

7.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Employer will in no case be responsible or liable for those costs.

8. Site Visit

8.1 The Bidder, at the Bidder's own responsibility and risk, is encouraged to visit and examine the Site of required Services

and its surroundings and obtain all information that may be necessary for preparing the Bid and entering into a contract for the Services. The costs of visiting the Site shall be at the Bidder's own expense.

B. Bidding Documents

9. Content of Bidding Documents

The set of bidding documents comprises the documents listed in the table below and addenda issued in accordance with ITB Clause 11:

Section I	Instructions to Bidders
Section II	Bidding Data Sheet
Section III	Bidding Forms
Section IV	Eligible Countries
Section V	Activity Schedule
Section VI	General Conditions of Contract
Section VII	Special Conditions of Contract
Section VIII	Performance Specifications and Drawings (if Applicable)
Section IX	Contract Forms

The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in the rejection of its bid. Sections III, V, and IX should be completed and returned with the Bid in the number of copies specified in the **BDS**.

10. Clarification of Bidding Documents

10.1 A prospective Bidder requiring any clarification of the bidding documents may notify the Employer in writing or by cable ("cable" includes telex and facsimile) at the Employer's address indicated in the invitation to bid. The Employer will respond to any request for clarification received earlier than 14 days prior to the deadline for submission of bids. Copies of the Employer's response will be forwarded to all purchasers of the bidding documents, including a description of the inquiry, but without identifying its source.

11. Amendment of Bidding Documents

Before the deadline for submission of bids, the Employer may modify the bidding documents by issuing addenda.

Any addendum thus issued shall be part of the bidding

documents and shall be communicated in writing or by cable to all purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum by cable to the Employer.

- 11.3 To give prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer shall extend, as necessary, the deadline for submission of bids, in accordance with ITB Sub-Clause 21.2 below.

C. Preparation of Bids

- | | |
|---|---|
| 12. Language of Bid | 12.1 The bid prepared by the Bidder, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer shall be written in the language specified in the BDS . Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the Bidding Data Sheet, in which case, for purposes of interpretation of the Bid, the translation shall govern. |
| 13. Documents Comprising the Bid | <p>The Bid submitted by the Bidder shall comprise the following:</p> <ul style="list-style-type: none"> (a) The Form of Bid (in the format indicated in Section III); (b) Bid Security; (c) Priced Activity Schedule; (d) Qualification Information Form and Documents; (e) Alternative offers where invited; <p>and any other materials required to be completed and submitted by bidders, as specified in the BDS.</p> <p>Bidders bidding for this contract together with other contracts stated in the IFB to form a package will so indicate in the bid together with any discounts offered for the award of more than one contract</p> |
| 14. Bid Prices | 14.1 The Contract shall be for the Services, as described in Appendix A to the contract and in the Specifications, Section VIII, based on the priced Activity Schedule, Section V, submitted by the Bidder. |

The Bidder shall fill in rates and prices for all items of the Services described in the in Specifications (or Terms of Reference), Section VIII and listed in the Activity Schedule, Section V. Items for which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the other rates and prices in the Activity Schedule.

All duties, taxes, and other levies payable by the Service Provider under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the total Bid price submitted by the Bidder.

If **provided for in the BDS**, the rates and prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract in accordance with and the provisions of Clause 6.6 of the General Conditions of Contract and/or Special Conditions of Contract. The Bidder shall submit with the Bid all the information required under the Special Conditions of Contract and of the General Conditions of Contract.

For the purpose of determining the remuneration due for additional Services, a breakdown of the lump-sum price shall be provided by the Bidder in the form of Appendices D and E to the Contract

The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Bid and in the Activity Schedule(s) shall conform to the requirements specified below.

All lots (contracts) and items must be listed and priced separately in the Activity Schedule(s).

The Bidder shall quote any discounts and indicate the methodology for their application in the Letter of Bid

15. Currencies of Bid and Payment The lump sum price shall be quoted by the Bidder separately in the following currencies:

- (a) for those inputs to the Services which the Bidder expects to provide from within the Employer's country, the prices shall be quoted in the currency of the Employer's country, unless otherwise **specified in the BDS**; and
- (b) for those inputs to the Services which the Bidder expects to provide from outside the Employer's country, the prices shall be quoted in up to any three currencies of any

member country of the Bank.

Bidders shall indicate details of their expected foreign currency requirements in the Bid.

Bidders may be required by the Employer to justify their foreign currency requirements and to substantiate that the amounts included in the Lump Sum are reasonable and responsive to ITB Sub-Clause 15.1.

16. Bid Validity Bids shall remain valid for the period **specified in the BDS**.

In exceptional circumstances, the Employer may request that the bidders 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 the Bid Security. A Bidder agreeing to the request will not be required or permitted to otherwise modify the Bid, but will be required to extend the validity of Bid Security for the period of the extension, and in compliance with ITB Clause 17 in all respects.

In the case of contracts in which the Contract Price is fixed (not subject to price adjustment), if the period of bid validity is extended by more than 60 days, the amounts payable in local and foreign currency to the Bidder selected for award, shall be increased by applying to both the local and the foreign currency component of the payments, respectively, the factors specified in the request for extension, for the period of delay beyond 60 days after the expiry of the initial bid validity, up to the notification of award. Bid evaluation will be based on the Bid prices without taking the above correction into consideration.

17. Bid Security The Bidder shall furnish, as part of the Bid, a Bid Security or a Bid-Securing Declaration, if required, as **specified in the BDS**.

The Bid Security shall be in the amount **specified in the BDS** and denominated in the currency of the Employer's Country or a freely convertible currency, and shall:

- (a) at the bidder's option, be in the form of either a letter of credit, or a bank guarantee from a banking institution, or a bond issued by a surety;
- (b) be issued by a reputable institution selected by the bidder and located in any eligible country. If the institution issuing the bond is located outside the Employer's Country, it shall have a correspondent financial institution

located in the Employer's Country to make it enforceable.

- (c) be substantially in accordance with one of the forms of Bid Security included in Section IX, Contract Forms, or other form approved by the Employer prior to bid submission;
- (d) be payable promptly upon written demand by the Employer in case the conditions listed in ITB Sub-Clause 17.5 are invoked;
- (e) be submitted in its original form; copies will not be accepted;
- (f) remain valid for a period of 28 days beyond the validity period of the bids, as extended, if applicable, in accordance with ITB Sub-Clause 16.2;

If a Bid Security or a Bid- Securing Declaration is required in accordance with ITB Sub-Clause 17.1, any bid not accompanied by a substantially responsive Bid Security or Bid Securing Declaration in accordance with ITB Sub-Clause 17.1, shall be rejected by the Employer as non-responsive.

The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the Performance Security pursuant to ITB Clause 35.

The Bid Security may be forfeited or the Bid Securing Declaration executed:

- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Submission Form, except as provided in ITB Sub-Clause 16.2; or
- (b) if the successful Bidder fails to:
 - (i) sign the Contract in accordance with ITB Clause 34;
 - (ii) furnish a Performance Security in accordance with ITB Clause 35.

The Bid Security or Bid- Securing Declaration of a JV must be in the name of the JV that submits the bid. If the JV has not been legally constituted at the time of bidding, the Bid Security or Bid- Securing Declaration shall be in the names of all future partners as named in the letter of intent to constitute the JV.

18. Alternative

18.1 Unless otherwise indicated in the BDS, alternative bids shall

**Proposals by
Bidders**

not be considered.

When alternative times for completion are explicitly invited, a statement to that effect will be **included in the BDS**, as will the method of evaluating different times for completion.

Except as provided under ITB Sub-Clause 18.4 below, bidders wishing to offer technical alternatives to the requirements of the bidding documents must first submit a Bid that complies with the requirements of the bidding documents, including the scope, basic technical data, graphical documents and specifications. In addition to submitting the basic Bid, the Bidder shall provide all information necessary for a complete evaluation of the alternative by the Employer, including calculations, technical specifications, breakdown of prices, proposed work methods and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer. Alternatives to the specified performance levels shall not be accepted.

When bidders are **permitted in the BDS** to submit alternative technical solutions for specified parts of the Services, such parts shall be described in the Specifications (or Terms of Reference) and Drawings, Section VIII. In such case, the method for evaluating such alternatives will be as **indicated in the BDS**.

**19. Format and
Signing of Bid**

The Bidder shall prepare one original of the documents comprising the Bid as described in ITB Clause 11 of these Instructions to Bidders, bound with the volume containing the Form of Bid, and clearly marked "ORIGINAL." In addition, the Bidder shall submit copies of the Bid, in the number **specified in the BDS**, and clearly marked as "COPIES." In the event of discrepancy between them, the original shall prevail.

The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder, pursuant to Sub- Clauses 5.3(a) or 5.4(b), as the case may be. All pages of the Bid where entries or amendments have been made shall be initialed by the person or persons signing the Bid.

The Bid shall contain no alterations or additions, except those to comply with instructions issued by the Employer, or as necessary to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the Bid.

D. Submission of Bids

20. Sealing and Marking of Bids

The Bidder shall seal the original and all copies of the Bid in two inner envelopes and one outer envelope, duly marking the inner envelopes as “ORIGINAL” and “COPIES”.

The inner and outer envelopes shall

- (a) be addressed to the Employer at the address **provided in the BDS;**
- (b) bear the name and identification number of the Contract as **defined in the BDS** and Special Conditions of Contract; and
- (c) provide a warning not to open before the specified time and date for Bid opening as **defined in the BDS.**

In addition to the identification required in ITB Sub-Clause 20.2, the inner envelopes shall indicate the name and address of the Bidder to enable the Bid to be returned unopened in case it is declared late, pursuant to ITB Clause 22.

If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

21. Deadline for Submission of Bids

Bids shall be delivered to the Employer at the address specified above no later than the time and date **specified in the BDS.**

The Employer may extend the deadline for submission of bids by issuing an amendment in accordance with ITB Clause 11, 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.

22. Late Bids

22.1 Any Bid received by the Employer after the deadline prescribed in ITB Clause 21 will be returned unopened to the Bidder.

23. Modification and Withdrawal of Bids

Bidders may modify or withdraw their bids by giving notice in writing before the deadline prescribed in ITB Clause 21.

Each Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with ITB Clauses 19 and 20, with the outer and inner envelopes additionally marked “MODIFICATION” or “WITHDRAWAL,” as appropriate.

No Bid may be modified after the deadline for submission of

Bids.

Withdrawal of a Bid between the deadline for submission of bids and the expiration of the period of Bid validity specified in the BDS or as extended pursuant to ITB Sub-Clause 16.2 may result in the forfeiture of the Bid Security pursuant to ITB Clause 17.

Bidders may only offer discounts to, or otherwise modify the prices of their bids by submitting Bid modifications in accordance with this clause, or included in the original Bid submission.

E. Bid Opening and Evaluation

- 24. Bid Opening** The Employer will open the bids, including modifications made pursuant to ITB Clause 23, in the presence of the bidders' representatives who choose to attend at the time and in the place **specified in the BDS.**

Envelopes marked "WITHDRAWAL" shall be opened and read out first. Bids for which an acceptable notice of withdrawal has been submitted pursuant to ITB Clause 23 shall not be opened.

The bidders' names, the Bid prices, the total amount of each Bid and of any alternative Bid (if alternatives have been requested or permitted), any discounts, Bid modifications and withdrawals, the presence or absence of Bid Security, and such other details as the Employer may consider appropriate, will be announced by the Employer at the opening. No bid shall be rejected at bid opening except for the late bids pursuant to ITB Clause 22; Bids, and modifications, sent pursuant to ITB Clause 23 that are not opened and read out at bid opening will not be considered for further evaluation regardless of the circumstances. Late and withdrawn bids will be returned unopened to the bidders.

The Employer will prepare minutes of the Bid opening, including the information disclosed to those present in accordance with ITB Sub-Clause 24.3.

- 25. Process to Be Confidential**
- 25.1 Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful Bidder is notified of the award. Any effort by a Bidder to influence the Employer's processing of

bids or award decisions may result in the rejection of his Bid.

25.2 If, after notification of award, a bidder wishes to ascertain the grounds on which its bid was not selected, it should address its request to the Employer, who will provide written explanation. Any request for explanation from one bidder should relate only to its own bid; information about the bid of competitors will not be addressed.

26. Clarification of Bids To assist in the examination, evaluation, and comparison of bids, the Employer may, at the Employer's discretion, ask any Bidder for clarification of the Bidder's Bid, including breakdowns of the prices in the Activity Schedule, and other information that the Employer may require. The request for clarification and the response shall be in writing or by cable, telex, or facsimile, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with ITB Clause 28.

Subject to ITB Sub-Clause 26.1, no Bidder shall contact the Employer on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Employer, he should do so in writing.

Any effort by the Bidder to influence the Employer in the Employer's bid evaluation or contract award decisions may result in the rejection of the Bidder's bid.

27. Examination of Bids and Determination of Responsiveness Prior to the detailed evaluation of bids, the Employer will determine whether each Bid (a) meets the eligibility criteria defined in ITB Clause 4; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the bidding documents.

A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the bidding documents, without material deviation or reservation. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the Services; (b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the Bidder's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

If a Bid is not substantially responsive, it will be rejected by the

Employer, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

- 28. Correction of Errors** Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Arithmetical errors will be rectified by the Employer on the following basis: if there is a discrepancy between unit prices and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected; if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; if there is a discrepancy between the amounts in figures and in words, the amount in words will prevail.

The amount stated in the Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected, and the Bid Security may be forfeited in accordance with ITB Sub- Clause17.5(b).

- 29. Currency for Bid Evaluation** The Employer will convert the amounts in various currencies in which the Bid Price, corrected pursuant to ITB Clause 28, is payable (excluding Provisional Sums but including Daywork where priced competitively) to either:

(a) the currency of the Employer's country at the selling rates established for similar transactions by the authority **specified in the BDS** on the date **stipulated in the BDS**;

or

(b) a currency widely used in international trade, such as the U.S. dollar, **stipulated in the BDS**, at the selling rate of exchange published in the international press as **stipulated in the BDS** on the date **stipulated in the BDS**, for the amounts payable in foreign currency; and, at the selling exchange rate established for similar transactions by the same authority specified in ITB Sub-Clause 29.1 (a) above on the date **specified in the BDS** for the amount payable in the currency of the Employer's country.

- 30. Evaluation and Comparison of Bids** The Employer will evaluate and compare only the bids determined to be substantially responsive in accordance with ITB Clause27.

In evaluating the bids, the Employer will determine for each Bid

the evaluated Bid price by adjusting the Bid price as follows:

- (a) making any correction for errors pursuant to ITB Clause 28;
- (b) excluding provisional sums and the provision, if any, for contingencies in the Activity Schedule, Section V, but including Day work, when requested in the Specifications (or Terms of Reference) Section VIII;
- (c) making an appropriate adjustment for any other acceptable variations, deviations, or alternative offers submitted in accordance with ITB Clause 18; and
- (d) making appropriate adjustments to reflect discounts or other price modifications offered in accordance with ITB Sub-Clause 23.5.

The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors, which are in excess of the requirements of the bidding documents or otherwise result in unsolicited benefits for the Employer will not be taken into account in Bid evaluation.

The estimated effect of any price adjustment conditions under Sub-Clause 7.6 of the General Conditions of Contract, during the period of implementation of the Contract, will not be taken into account in Bid evaluation.

- 31. Preference for Domestic Bidders** 31.1 Domestic bidders shall not be eligible for any margin of preference in Bid evaluation.

F. Award of Contract

- 32. Award Criteria** Subject to ITB Clause 33, the Employer will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest evaluated Bid price, provided that such Bidder has been determined to be (a) eligible in accordance with the provisions of ITB Clause 4, and (b) qualified in accordance with the provisions of ITB Clause 5.

If, pursuant to ITB Sub-Clause 13.2 this contract is being let on a “slice and package” basis, the lowest evaluated Bid Price will be determined when evaluating this contract in conjunction with other contracts to be awarded concurrently. Taking into account

any discounts offered by the bidders for the award of more than one contract.

33. Employer's Right to Accept any Bid and to Reject any or all Bids

33.1 Notwithstanding ITB Clause 32, the Employer reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Employer's action.

34. Notification of Award and Signing of Agreement

The Bidder whose Bid has been accepted will be notified of the award by the Employer prior to expiration of the Bid validity period by cable, telex, or facsimile confirmed by registered letter from the Employer. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Employer will pay the Service provider in consideration of the execution, completion, and maintenance of the Services by the Service provider as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

The notification of award will constitute the formation of the Contract.

The Contract, in the form provided in the bidding documents, will incorporate all agreements between the Employer and the successful Bidder. It will be signed by the Employer and sent to the successful Bidder along with the Letter of Acceptance. Within 21 days of receipt of the Contract, the successful bidder shall sign the Contract and return it to the Employer, together with the required performance security pursuant to Clause 35.

Upon fulfillment of ITB Sub-Clause 34.3, the Employer will promptly notify the unsuccessful Bidders the name of the winning Bidder and that their bid security will be returned as promptly as possible.

If, after notification of award, a bidder wishes to ascertain the grounds on which its bid was not selected, it should address its request to the Employer. The Employer will promptly respond in writing to the unsuccessful Bidder.

35. Performance Security

Within 21 days after receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Employer a Performance Security in the amount and in the form (Bank Guarantee and/or Performance Bond) **stipulated in the BDS**, denominated in the type and proportions of currencies in the Letter of Acceptance and in accordance with the General Conditions of Contract.

If the Performance Security is provided by the successful Bidder

in the form of a Bank Guarantee, it shall be issued either (a) at the Bidder's option, by a bank located in the country of the Employer or a foreign bank through a correspondent bank located in the country of the Employer, or (b) with the agreement of the Employer directly by a foreign bank acceptable to the Employer.

If the Performance Security is to be provided by the successful Bidder in the form of a Bond, it shall be issued by a surety which the Bidder has determined to be acceptable to the Employer.

Failure of the successful Bidder to comply with the requirements of ITB Sub-Clause 35.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

**36. Advance
Payment and
Security**

36.1 The Employer will provide an Advance Payment on the Contract Price as stipulated in the Conditions of Contract, subject to the amount **stated in the BDS**.

37. Adjudicator

37.1 The Employer proposes the person **named in the BDS** to be appointed as Adjudicator under the Contract, at an hourly fee **specified in the BDS**, plus reimbursable expenses. If the Bidder disagrees with this proposal, the Bidder should so state in the Bid. If, in the Letter of Acceptance, the Employer has not agreed on the appointment of the Adjudicator, the Adjudicator shall be appointed by the Appointing Authority designated in the Special Conditions of Contract at the request of either party.

Section II. Bidding Data Sheet

Instructions to Bidders Clause Reference

A. General																																						
1.1	<p>The Employer is <i>Project Director, NHP</i> <i>NGDC, Survey Of India</i> Post Box: 200, Block No. 6, Hathibarkala Estate, Dehradun Telephone: +91-135-2747623, +91-135-2745566 Facsimile number: +91-135-2747623 Email: pd.nhp.soi@gov.in</p> <p>The name and identification number of the Contract is GIS ready database/Project Director, NHP, Dehradun 2017- 2020 dated/2017.</p> <p>The name of the Services is: Bathymetry survey in River cross section The identification number of the Services is: the Invitation for Bids is: <u>/Bathymetric Survey/Project Director, NHP, Dehradun 2017-2020 dated/2017</u></p> <p>The number and identification of lots comprising this bidding process is:</p> <table border="1"> <thead> <tr> <th>Lot no</th> <th>Approximate Estimated Width of CS (Lin.KM) and no. of cross Sections</th> <th>Services</th> <th>Bid Security (INR)</th> <th></th> <th>Period of completion</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2479.46 Lin. Km./ 1667</td> <td rowspan="5">“Bathymetric Surveys for river cross section”</td> <td></td> <td></td> <td>18 months</td> </tr> <tr> <td>2</td> <td>2489.34 Lin. Km./ 1189</td> <td></td> <td></td> <td>18 months</td> </tr> <tr> <td>3</td> <td>391.21 Lin. Km./ 2333</td> <td></td> <td></td> <td>18 months</td> </tr> <tr> <td>4</td> <td>256.75 Lin. Km./ 3523</td> <td></td> <td></td> <td>18 months</td> </tr> <tr> <td>5</td> <td>3.72 Lin Km/ 72</td> <td></td> <td></td> <td>8 months</td> </tr> </tbody> </table>						Lot no	Approximate Estimated Width of CS (Lin.KM) and no. of cross Sections	Services	Bid Security (INR)		Period of completion	1	2479.46 Lin. Km./ 1667	“Bathymetric Surveys for river cross section”			18 months	2	2489.34 Lin. Km./ 1189			18 months	3	391.21 Lin. Km./ 2333			18 months	4	256.75 Lin. Km./ 3523			18 months	5	3.72 Lin Km/ 72			8 months
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1.2	<p>The Intended Completion Date is 18 months from date of signing of Contract for each Lot 1 to 4 and 8 months for Lot 5.</p>																																					
2.1	<p>The Borrower is Government of India</p> <p>The Project is National Hydrology Project</p> <p>The loan/credit number is 8725-IN</p>																																					
4.4	<p>The list of firms debarred from participating in World Bank projects is available at: http://www.worldbank.org/debarr/.</p>																																					
5.2	<p>Prequalification has not been undertaken.</p>																																					

5.3	The Qualification Information and Bidding forms to be submitted are as follows: None
5.4	The information needed for Bids submitted by joint ventures is as follows: The bidders are allowed to form Joint ventures for submission of the bid. The maximum number of Partners in the J.V allowed are two- lead.
5.5	The qualification criteria for each lot (for more than one lot the qualification criteria shall be cumulative) in Sub-Clause 5.5 are modified as follows: _____
5.5(a)	<p>1. The minimum required annual volume of Services for the successful Bidder in any of the last five years shall be <i>achieved, in at least two financial years, a minimum annual financial turnover (in all classes of Geo-spatial services) of INR million for Lots 1 to 4 each; INR --- million for Lot 5</i></p> <p>2. Financial turnover shall be brought at 2016-17 price level. Financial turnover of previous years shall be given weightage @5% per year based on rupees value to bring them to the price level of the financial year in which bids are received.</p>
5.5(b)	<p>The experience required to be demonstrated by the Bidder should include as a minimum that he has executed during the last 5 years the following:</p> <p>1. satisfactorily completed works worth <i>INR --- million separately in each case for Lots 1, 2 3 and 4; INR --- million for Lot 5 value survey works/services as a prime service provider, (or as subcontractor duly certified by the employer/main service provider)</i></p> <p>2. <i>The bidder has successfully completed at least one contract of value not less than INR --- million separately in each case for Lots 1, 2, 3 and 4; INR --- million for Lot 5 value in the area of bathymetric survey of reservoirs and/or cross sectional survey of perennial rivers.</i></p>
5.5(c)	<p>The essential equipment to be made available by the successful Bidder shall be <i>The bidder should demonstrate the availability of suitable hardware, software.</i></p> <p style="text-align: center;">List of Hardware</p> <p>Dual Frequency GNSS instruments: 4 (Four) sets for each of lots 1 to 4 in UP and WB & Jharkhand Digital / Auto Level : 8 (Eight) nos. for each of lots 1 to 4 in UP and WB & Jharkhand</p>

	<p>GPS-equipped boat-mounted echo sounders- 4 (Four) nos. for each of lots 1 to 4 in UP and WB & Jharkhand</p> <p>Dual Frequency GNSS instruments: 1 (One) set for lot 5 under BBMB Digital / Auto Level : 2 (Two) nos. for lot 5 under BBMB GPS-equipped boat-mounted echo sounders- 1 (One) no. for lot 5 under BBMB</p>
5.5(e)	<p>The minimum amount of liquid assets and/or credit facilities net of other contractual commitments of the successful Bidder shall be <i>INR --- for Lots 1 to Lot 4 each; INR --- million for Lot 5 million</i></p>
5.6	<p>Subcontractors' experience will not be taken into account.</p>
5.6	<p>The figures for each of the partners of a joint venture shall be added together to determine the Bidder's compliance with the minimum qualifying criteria of ITB Sub-Clause 5.5(a), (b) and (e); however, for a joint venture to qualify one of the partner must meet at least 60 percent of those minimum criteria for an individual Bidder and other partner at least 40% of the criteria. Failure to comply with this requirement will result in rejection of the joint venture's Bid.</p> <p>Subcontractors' experience and resources will not be taken into account in determining the Bidder's compliance with the qualifying criteria</p>
B. Bidding Data	
9.2 and 19.1	<p>Electronic –Procurement System</p> <p>The Employer shall use the following electronic-procurement system to</p>

	<p>manage this Bidding process:</p> <p>Government of India e-procurement system</p> <p>URL: https://eprocure.gov.in/eprocure/app</p> <p>The electronic-procurement system shall be used to manage the following aspects of the Bidding process:</p> <p>Bid creation/publishing and addenda/corrigendum if any thereon</p> <p>Issuing/Downloading bid documents</p> <p>Submission of bids</p> <p>Opening of bids</p> <p>The Employer address is <i>Project Director, NHP</i> <i>NGDC, Survey Of India</i> <i>Post Box: 200, Block No. 6, Hathibarkala Estate, Dehradun</i> <i>Telephone: +91-135-2747623, +91-135-2745566</i> <i>Facsimile number: +91-135-2747623</i> <i>Email: pd.nhp.soi@gov.in</i></p>
10.1	<p>Replace Clause 10.1 as below:</p> <p>The electronic bidding system specified in the BDS 9.2 provides for online clarifications. A prospective Bidder requiring any clarification on the Bidding Documents may notify the Purchaser online. Clarifications requested through any other mode shall not be considered by the Purchaser. The Purchaser will respond to any request for clarification, provided that such request is received no later than fifteen (15) days prior to the deadline for submission of bids. Description of clarification sought and the response of the Purchaser shall be uploaded for information of all Bidders without identifying the source of request for clarification. Should the Purchaser deem it necessary to amend the Bidding Documents as a result of a clarification, it shall do so following the procedure under ITB Clause 11 and ITB Sub-Clause 21.2. It is the bidder's responsibility to check on the e-procurement system, for any addendum/ amendment/ corrigendum to the bidding document.</p>
10.1.a	<p>A Pre-Bid meeting will take place at the following date, time and at the place below to clarify issues and to answer questions on any matter that may be raised at that stage:</p> <p>Date 20-08-2018 Time: 1000 hrs .</p> <p>Place: Western Printing Group, Survey of India, Palam Village Road, Near Railway Crossing, Delhi Cantt-110010</p>

C. Preparation of Bids	
12.1	Language of the bid: English
13.1	<p>Replace Clause No. 13.1 with the following:</p> <p>The Bid shall be in two parts. Technical Bid submitted by the Bidder shall comprise the following:</p> <ul style="list-style-type: none"> (a) The Form of Bid (in the format indicated in Section III); (b) Bid Security; (c) Qualification Information Form and Documents; <p>The Bidder shall submit the following additional documents in its Bid as part of Technical Bid:</p> <ol style="list-style-type: none"> 1. Information on all past similar Projects and satisfactory performance with special reference to India. 2. <i>All documents and Bidding Forms stipulated in Clause 5 of Section of ITB and Section III (Bidding Forms).</i> 3. <i>Brochures and documents in support of goods to be supplied & equipment to be used and in support of method statement– as necessary</i>
	<p>Add ITB Clause No. 13.3 as below:</p> <p>The Financial Bid shall contain the following:</p> <ul style="list-style-type: none"> (a) Letter of Bid – Financial Part: prepared in accordance with ITB 14 and ITB20; (b) Price Schedules: completed prepared in accordance with ITB 14 and ITB20;
	<p>Add ITB Clause No. 13.4 as below:</p> <p>The Technical Part shall not include any financial information related to the Bid price. Where material financial information related to the Bid price is contained in the Technical Part, the Bid shall be declared non-responsive.</p>

	<p>Add ITB Clause No. 13.5 as below:</p> <p>The Bidder shall furnish in the Letter of Bid, information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.</p>
14.4	The Contract <i>is not</i> subject to price adjustment in accordance with Clause 6.6 of the General Conditions of Contract.
15.1	Local inputs shall be quoted in <i>Indian National Rupee</i> .
16.1	The period of Bid validity shall be <i>120</i> days after the deadline for Bid submission.
17.1	<p>The Bidder shall provide: Bid security shall be in the form of Fixed deposit/bank guarantee from Scheduled Bank in favour of CP&AO, Dehradun. While submitting electronic bids, the bidder shall upload the scanned copy of bank Fixed deposit/bank guarantee and shall also send the original bank Fixed deposit/bank guarantee by post/courier/in person so as to reach latest by the last date of submission of bids to the Project Director at the address mentioned above in BDS Clause 9.2. The details of the bank Fixed deposit/bank guarantee, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission otherwise the uploaded bid shall be rejected. Bid Security should be in favour of <u>CP&AO, Dehradun</u>. Other types of acceptable securities are as under;</p> <p>Bank Fixed deposit/bank guarantee from Scheduled Bank.</p>
17.2	The amount of Bid Security shall be INR per lot or an equivalent amount in a freely-convertible currency.
18.1	Alternative bids are not permitted.
18.2	Alternative times for completion are not permitted.
18.4	Not Permitted
19.1	<p>Replace Clause No. 19.1 with the following:</p> <p>The Bidder shall prepare the Bid as per details given in ITB 19.2.</p>
19.2	<p>Replace Clause No. 19.2 with the following:</p> <p>The bid shall be signed by a person duly authorized to sign on behalf of the Bidder. The authorization shall consist of a written confirmation and shall be uploaded along with the bid.</p>
19.3	Not used

	<p>Add Clause No. 19.4 as below:</p> <p>Corrections if any in the bid can be carried out by editing the information before electronic submission on e-procurement portal.</p>
D. Submission of Bids	
ITB 20.1	<p>Replace Clause 20.1 with the following: The Letter of Bid – Technical Part, Letter of Bid – Financial Part, and Price Schedules shall be prepared using the relevant forms furnished in Section III, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 19.2. All blank spaces shall be filled in with the information requested.</p>
ITB 20.2	<p>Replace ITB Clause 20.2 with the following: Entire Bid including the Letter of Bid and filled-up Price Schedules shall be submitted online on e-procurement system specified in ITB 10.1. Details and process of online submission of the tender and relevant documents are given in the website mentioned above. Scanned copies of documents listed in clauses 13 and 20.3 should also be uploaded on this website.</p>
ITB 20.3	<p>Replace ITB Clause 20.3 & 20.4 with the following: The bidders are required to separately submit (i) original demand drafts towards the cost of bid document and registration on e-procurement website (if not previously registered)(asper RFB);(ii)original bid security in approved form; and (iii) original affidavit regarding correctness of information furnished with bid document, with the office, before the opening of the technical part of the Bid, either by registered/speed post/courier or by hand, failing which the bids will be declared non-responsive and will not be opened. Hard copy of rest of the bid is not to be submitted.</p>
ITB 21.1	<p>Replace ITB Clause with the following: Bids, both Technical and Financial Parts, shall be submitted online on the e-procurement system specified in BDS 10.1. Detailed guidelines for viewing bids and submission of online bids are given on the website. The Invitation for Bids under this Project is published on this website. Any citizen or prospective bidder can logon to this website and view the Invitation for Bids and can view the details of goods for which bids are invited. A prospective bidder can submit its bid online; however, the bidder is required to have enrolment/registration in the website and should have valid Digital Signature Certificate (DSC) in the form of smart card/e-token obtained from any authorised certifying agency of Government of India. The bidder should register in the website using the relevant option available. The completed bid comprising of documents indicated in ITB 13, should be uploaded on the e-procurement portal along with scanned copies of requisite certificates as are mentioned in different sections in the bidding document and scanned copy of the bid security.</p>

	<p>Add ITB Clause 21.2:</p> <p>All the documents are required to be signed digitally by the bidder. After electronic on-line bid submission, the system generates a unique bid identification number which is time stamped as per server time. This shall be treated as acknowledgement of bid submission.</p>
	<p>Add ITB Clause 21.3:</p> <p>Physical, Email, Telex, Cable or Facsimile bids will be rejected as non-responsive</p>
ITB 22.1	<p>Replace ITB Clause 22.1 with the following: The electronic bidding system would not allow any late submission of bids after due date & time as per server time.</p>
ITB 23.1	<p>Replace ITB Clause 23.1 with the following: Bidders may modify their bids by using appropriate option for bid modification on the e-procurement portal, before the deadline for submission of bids. For this the bidder need not make any additional payment towards the cost of bid document. For bid modification and consequential re-submission, the bidder is not required to withdraw his bid submitted earlier. The last modified bid submitted by the bidder within the bid submission time shall be considered as the bid. For this purpose, modification/withdrawal by other means will not be accepted. In online system of bid submission, the modification and consequential re- submission of bids is allowed any number of times. A bidder may withdraw his bid by using appropriate option for bid withdrawal, before the deadline for submission of bids, however, if the bid is withdrawn, re- submission of the bid is not allowed.</p>
ITB 23.2	<p>Replace ITB Clause 23.2 with the following: Bids requested to be withdrawn in accordance with ITB Sub-Clause 23.1 shall not be opened.</p> <p>No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid (Technical Part and/or Financial Part) or any extension thereof.</p>
ITB 24.1	<p>Replace ITB Clause 24 with the following: The Purchaser shall publicly open Technical Parts of all bids received by the deadline, at the date, time and place specified in the presence of Bidder's designated representatives and anyone who chooses to attend, and this could also be viewed by the bidders online. The Financial Parts of the bids shall remain unopened in the e-procurement system, until the subsequent public opening, following the evaluation of the Technical Parts of the Bids. In all cases, original documents submitted as specified in ITB 12.3 shall be first scrutinized, and Bids that do not comply with the provisions of ITB 12.3 will be declared non-responsive and will not be opened. Thereafter, bidder's names, and such other details as the Purchaser may consider appropriate will be notified online as Technical Part bid opening summary.</p>

	<p>In the event of the specified date of bid opening being declared a holiday for the Purchaser, the bids will be opened at the appointed time and location on the next working day.</p> <p>The electronic summary of the bid opening will be generated and uploaded online. The Purchaser will also prepare minutes of the Bid opening, including the information disclosed and upload the same for viewing online. Only Technical Parts of Bids, that are opened at Bid opening shall be considered further for evaluation.</p>
29.1	<p>Currency chosen for the purpose of converting to a common currency:</p> <p>Not Applicable</p> <p>Source of exchange rate: Not Applicable</p>
F. Award of Contract	
32.2	<p>Bidders have the option to Bid for any one or more lots. Bids will be evaluated lot-wise, taking into account discounts offered, if any, after considering all possible combination of lots. The contract(s) will be awarded to the Bidder or Bidders offering the lowest evaluated cost to the Employer for combined lots, subject to the selected Bidder(s) meeting the required qualification criteria for lot or combination of lots as the case may be.</p>
35.0	<p>The Performance Security acceptable to the Employer shall be the in the Standard Form of a <i>Bank Guarantee</i>.</p> <p><i>The Performance Security shall be 10% of the Contract price.</i></p>
36.1	<p>The Advance Payment shall be <i>Ten percent</i> of the Contract Price against submission of Bank guarantee for the amount</p>
37.1	<p>The Adjudicator proposed by the Employer is Shri Mahatma Prasad Bhartari, Retd. Chief Engineer and Technical Advisor to Ministry of Energy Govt, of Uttarakhand (refer Appendix-J for C.V. of Adjudicator)</p> <p>The hourly fee for this proposed Adjudicator shall be governed by the Article 11 of “Arbitration and Conciliation (Amendment) Act, 2015”.</p>

Section III. Bidding Forms

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Letter of Bid– Technical Part

The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and address.

Note: All italicized text is for use in preparing these forms and shall be deleted from the final products.

No alterations to the text except as provided in ITB20.2, shall be permitted and no substitutions shall be accepted except as provided in ITB 12.]

Date: *[insert date (as day, month and year) of Bid Submission]* ICB No.: *[insert number of bidding process]* Invitation for Bid No.: *[insert No of IFB]*

Alternative No.: *[insert identification No if this is a Bid for an alternative]*

To: *[insert complete name of Purchaser]*

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda No. issued in accordance with ITB 8: *[insert the number and issuing date of each Addenda]*;
- (b) We meet the eligibility requirements and have no conflict of interest in accordance with ITB4;
- (c) We have not been suspended nor declared ineligible by the Purchaser based on execution of a Bid Securing Declaration in the Purchaser's country in accordance with ITB4.6;
- (d) We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedules specified in the Schedule of Requirements the following Goods and Related Services *[insert a brief description of the Goods and Related Services]*;
- (e) Our bid shall be valid for the period of time specified in ITB Sub-Clause 18.1, from the date fixed for the bid submission deadline in accordance with ITB Sub-Clause 22, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Documents;
- (g) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.2(e), other than alternative bids submitted in accordance with ITB 13;

- (h) We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the World Bank Group or a debarment imposed by the World Bank Group in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the World Bank and other development banks. Further, we are not ineligible under the Purchaser's Country laws or official regulations or pursuant to a decision of the United Nations Security Council;
- (i) We are not a government owned entity/ We are a government owned entity but meet the requirements of ITB4.5;⁶
- (j) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;
- (k) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive;
- (l) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption; and
- (m) 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 Act1988."

Name of the Bidder ***[insert complete name of person signing the Bid]***

Name of the person duly authorized to sign the Bid on behalf of the Bidder** ***[insert complete name of person duly authorized to sign the Bid]***

Title of the person signing the Bid ***[insert complete title of the person signing the Bid]***

Signature of the person named above ***[insert signature of person whose name and capacity are shown above]***

Date signed ***[insert date of signing]*** day of ***[insert month]***, ***[insert year]***

** : Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid Schedules.

⁶Bidder to use as appropriate

1B. Letter of Bid- Financial Part

The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and address.

Note: All italicized text is for use in preparing these forms and shall be deleted from the final products.

No alterations to the text except as provided in ITB 20.2, shall be permitted and no substitutions shall be accepted except as provided in ITB 12.]

Date: *[insert date (as day, month and year) of Bid Submission]* ICB No.: *[insert number of bidding process]* Invitation for Bid No.: *[insert No of IFB]*

Alternative No.: *[insert identification No if this is a Bid for an alternative]*

To: *[insert complete name of Purchaser]*

We, the undersigned Bidder, hereby submit the second part of our Bid, the Financial Part. In submitting our Financial Part we make the following additional declarations:

- (a) Our bid shall be valid for the period of time specified in ITB Sub-Clause 18.1, from the date fixed for the bid submission deadline in accordance with ITB Sub-Clause 22, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

- (b) The total price of our Bid, excluding any discounts offered in item (c) below, is:

In case of only one lot, total price of the Bid ***[insert the total price of the bid in words and figures];***

In case of multiple lots, total price of each lot ***[insert the total price of each lot in words and figures];***

In case of multiple lots, total price of all lots (sum of all lots) ***[insert the total price of all lots in words and figures];***

- (c) The discounts offered and the methodology for their application are:

- (i) The discounts offered are: ***[Specify in detail each discount offered.]***

- (ii) The exact method of calculations to determine the net price after application of discounts is shown below: ***[Specify in detail the method that shall be used to apply the discounts]; Discounts.***

- (d) The following commissions, gratuities, or fees have been paid or are to be paid with respect to the bidding process or execution of the Contract: *[insert complete name of*

each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity]

Name of Recipient	Address	Reason	Amount
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
(If none has been paid or is to be paid, indicate "none.")			

- (e) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.

Name of the Bidder ***[insert complete name of person signing the Bid]***

Name of the person duly authorized to sign the Bid on behalf of the Bidder** ***[insert complete name of person duly authorized to sign the Bid]***

Title of the person signing the Bid ***[insert complete title of the person signing the Bid]***

Signature of the person named above ***[insert signature of person whose name and capacity are shown above]***

Date signed ***[insert date of signing]*** day of ***[insert month]***, ***[insert year]***

** : Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid Schedules.

2. BIDDER Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

Date: *[insert date (as day, month and year) of Bid Submission]*
ICB No.: *[insert number of bidding process]*

Page _____ of _____ pages

1. Bidder's Legal Name <i>[insert Bidder's legal name]</i>
2. Bidder's actual or intended Country of Registration: <i>[insert actual or intended Country of Registration]</i>
3. Bidder's Year of Registration: <i>[insert Bidder's year of registration]</i>
4. Bidder's Legal Address in Country of Registration: <i>[insert Bidder's legal address in country of registration]</i>
5. Bidder's Authorized Representative Information Name: <i>[insert Authorized Representative's name]</i> Address: <i>[insert Authorized Representative's Address]</i> Telephone/Fax numbers: <i>[insert Authorized Representative's telephone/fax numbers]</i> Email Address: <i>[insert Authorized Representative's email address]</i>
6. Attached are copies of original documents of: <i>[check the box(es) of the attached original documents]</i> <input type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.3. <input type="checkbox"/> In case of government owned entity from the Purchaser's country, documents establishing legal and financial autonomy and compliance with commercial law and not dependent agency of borrower or sub-borrower or purchaser, in accordance with ITB Sub-Clause 4.5. <input type="checkbox"/> Included are the organizational chart, a list of Board of Directors, and the beneficial ownership

Bidder's JV Members Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. The following table shall be filled in for the Bidder and for each member of a Joint Venture]].

Date: *[insert date (as day, month and year) of Bid submission]*

ICB No.: *[insert number of Bidding process]*

Alternative No.: *[insert identification No if this is a Bid for an alternative]*

Page _____ of _____ pages

1. Bidder's Name: <i>[insert Bidder's legal name]</i>
2. Bidder's JV Member's name: <i>[insert JV's Member legal name]</i>
3. Bidder's JV Member's country of registration: <i>[insert JV's Member country of registration]</i>
4. Bidder's JV Member's year of registration: <i>[insert JV's Member year of registration]</i>
5. Bidder's JV Member's legal address in country of registration: <i>[insert JV's Member legal address in country of registration]</i>
6. Bidder's JV Member's authorized representative information Name: <i>[insert name of JV's Member authorized representative]</i> Address: <i>[insert address of JV's Member authorized representative]</i> Telephone/Fax numbers: <i>[insert telephone/fax numbers of JV's Member authorized representative]</i> Email Address: <i>[insert email address of JV's Member authorized representative]</i>
7. Attached are copies of original documents of <i>[check the box(es) of the attached original documents]</i> <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB4.4. <input type="checkbox"/> In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Employer, in accordance with ITB4.6. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Qualification Information

1. Individual

Bidders or

Individual

Members of

Joint Ventures

Constitution or legal status of Bidder: *[attach copy]*

Place of registration: *[insert]*

Principal place of business: *[insert]*

Power of attorney of signatory of Bid: *[attach]*

Total annual volume of Services performed in five years, in the internationally traded currency specified in the BDS: *[insert]*

Services performed as prime Service Provider on the provision of Services of a similar nature and volume over the last five years. The values should be indicated in the same currency used for Item 1.2 above. Also list details of work under way or committed, including expected completion date.

Project name and country	Name of employer and contact person	Type of Services provided and year of completion	Value of contract
(a)			
(b)			

1.4 Major items of Service Provider's Equipment proposed for carrying out the Services. List all information requested below. Refer also to ITB Sub-Clause 5.4(c).

Item of equipment	Description, make, and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
(a)			
(b)			

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract. Attach biographical data. Refer also to ITB Sub-Clause 5.4(e) and GCC Clause 9.1.

Position	Name	Years of experience (general)	Years of experience in proposed
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	position
(a)	
(b)	

Proposed subcontracts and firms involved. Refer to GCC Clause 7.

Sections of the Services	Value of subcontract	Subcontractor (name and address)	Experience in providing similar Services
(a)			
(b)			

Financial reports for the last five years: balance sheets, profit and loss statements, auditors' reports, etc. List below and attach copies.

Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of support documents. We certify/confirm that we comply with eligibility requirements as per ITB Clause4.

Name, address, and telephone, telex, and facsimile numbers of banks that may provide references if contacted by the Employer.

Information regarding any litigation, current or within the last five years, in which the Bidder is or has been involved.

Other party(ies)	Cause of dispute	Details of litigation award	Amount involved
(a)			
(b)			

Statement of compliance with the requirements of ITB Sub- Clause4.2.

Proposed Program (service work method and schedule). Descriptions, drawings, and charts, as necessary, to comply with

the requirements of the bidding documents.

2. Joint Ventures The information listed in 1.1 - 1.11 above shall be provided for each partner of the joint venture.

The information in 1.12 above shall be provided for the joint venture.

Attach the power of attorney of the signatory(ies) of the Bid authorizing signature of the Bid on behalf of the joint venture.

Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that

- (a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;
- (b) one of the partners will be nominated as being in charge, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the joint venture; and
- (c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

3. Additional Requirements

- 3.1 Bidders should provide any additional information required in the BDS and to fulfill the requirements of ITB Sub-Clause 5.1, if applicable.

Price Schedule

For the purpose of preliminary estimation of the contract value, it has been attempted to prepare a list of the cross sections to be surveyed, including its number and width. However, being based on satellite images available on the Google Earth that often pertain to different dates of the past, these should be considered to be of indicative nature only. The actual number, location and extent of the cross sections to be surveyed considering practical limitations (e.g., presence of obstacles etc.) are to be finalized through the reconnaissance survey deploying the services of an experienced hydraulic modeler and presented in the survey plan. The bidder will submit the final number of cross sections under each width category as part of the survey plan to be approved by empowered committee. If required, the contract will be amended to include the variations. The final payment will be made on the basis of actual number of cross sections surveyed under each width category as per the rates agreed upon in the contract.

Price Schedule for Lot 1: Eastern lot of the
Ghaghra River System

Date: _____ Section III. Bidding Forms
RFB No: _____
Page No. _____ of _____

1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
1.	Survey Planning Report: including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc.; iii) diagrams of the proposed survey area and cross- sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001	Lump sum		At the end of 45 days			

2.	Report on sample processed survey data: Report and delivery of sample data for at least 10% of the total cross sections in the lot in terms of contract value, including related office and field observation data for evaluation and acceptance	C. S No .		By third month.			
3.	i) River cross section survey in Ghaghra river and its tributaries in the State of Uttar Pradesh for the different range of spans/ widths, in varying depths of water and preparation of maps on requisite scales to supply them in both soft and hard formats with four copies complete, including cost of manpower, labour, surveying instruments, camp equipage, transportation, etc. and as per technical specifications and as per directions of engineer-in-charge.	C. S No	1667	Progress report in first week of every month after start of survey, and final survey completion report by end of thirteen months			
	ii) Cross Section width 0-250m		206				
	iii) Cross Section width 251-500m		289				
	iv) Cross Section width 501-750m		338				
	v) Cross Section width 751-1000m		206				
	vi) Cross Section width 1001-1500m		189				
	vii) Cross Section width 1501-2000m		79				
	viii) Cross Section width 2001-3000m		178				
	ix) Cross Section width 3001-4000m		49				
	x) Cross Section width 4001-5000m		25				
	xi) Cross Section width 5001-6000m		13				
	xii) Cross Section width 6001-7000m		16				

	<u>xiii)</u> Cross Section width 7001-8000m		19				
	<u>xiv)</u> Cross Section width 8001-9000m		25				
	<u>xv)</u> Cross Section width 9001-10000m		35				
	<u>xvi)</u> Post survey Report: Survey report documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody. <u>xvii)</u> Ground control report that includes, at a minimum, all pertinent base station information and mission notes, including information on additional control station monument names and stability, stitching with LIDAR DEM wherever applicable. (N.B. the payment will be made as per the actual number of cross sections under different widths surveyed and contract rates)						

4.	Construction of Bench Mark RCC Pillar as per drawing along the rivers and its tributaries in the State of Uttar Pradesh as per drawing attached in the contract with standard specifications including its painting, engraving etc complete including cost of manpower, material, labour, etc, as per directions of engineer-in-charge (N.B. the payment will be made as per the actual number of installations and contract rates)	No s	250				
5.	Product Delivery Report: Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. Also report on generation of supplementary cross-sections from LiDAR DEM.	C. S No	1667	by 15 th month			

6.	Final consolidated Project Completion Report: including all previous reports, comments by TAC and Contractor response and actions taken		1667	By 18 th month			
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Price Schedule for Lot 2: Western lot of the Ghaghra River System	Date: _____ Section III. Bidding Forms RFB No: _____ Page No. _____ of _____
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1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
1.	Survey Planning Report: including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc; iii) diagrams of the proposed survey area and cross- sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001	Lump sum		At the end of 45 days			

1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
2.	Report on sample processed survey data: Report and delivery of sample data for at least 10% of the total cross sections in the lot in terms of contract value, including related office and field observation data for evaluation and acceptance	C. S No .		By third month.			
3.	i) River cross section survey in Ghaghra river and its tributaries in the State of Uttar Pradesh for the different range of spans/ widths, in varying depths of water and preparation of maps on requisite scales to supply them in both soft and hard formats with four copies complete, including cost of manpower, labour, surveying instruments, camp equipage, transportation, etc. and as per technical specifications and as per directions of engineer-in-charge.	C. S No	1189	Progress report in first week of every month after start of survey, and final survey completion report by end of thirteen months			
	ii) Cross Section width 0-250m		135				
	iii) Cross Section width 251-500m		215				
	iv) Cross Section width 501-750m		175				
	v) Cross Section width 751-1000m		116				
	vi) Cross Section width 1001-1500m		134				
	vii) Cross Section width 1501-2000m		74				
	viii) Cross Section width 2001-3000m		90				
	ix) Cross Section width 3001-4000m		35				
	x) Cross Section width 4001-5000m		25				

1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
	<u>xi)</u> Cross Section width 5001-6000m		49				
	<u>xii)</u> Cross Section width 6001-7000m		32				
	<u>xiii)</u> Cross Section width 7001-8000m		34				
	<u>xiv)</u> Cross Section width 8001-9000m		27				
	<u>xv)</u> Cross Section width 9001-10000m		48				
	<u>xvi)</u> Post-Survey Report: <u>Survey report</u> documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody. <u>xvii)</u> <u>Ground control report</u> that includes, at a minimum, all pertinent base station information and mission notes, including information on additional control station monument names and stability, stitching with LIDAR DEM wherever applicable. (N.B. the payment will be made as per the actual number of cross sections under different widths surveyed and contract rates)						

1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
4.	Construction of Bench Mark RCC Pillar as per drawing along the rivers and its tributaries in the State of Uttar Pradesh as per drawing attached in the contract with standard specifications including its painting, engraving etc complete including cost of manpower, material, labour, etc, as per directions of engineer-in-charge (N.B. the payment will be made as per the actual number of installations and contract rates)	Nos.	250				
5.	Product Delivery Report: Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. Also report on generation of supplementary cross-sections from LiDAR DEM.	C. S No	1189	by 15 th month			

1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
6.	Final consolidated Project Completion Report: including all previous reports, comments by TAC and Contractor response and actions taken		1189	By 18 th month			

Price Schedule for Lot 3: Northern lot for West Bengal	Date: _____ Section III. Bidding Forms RFBNo: _____ Page No. _____ of _____
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1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
1.	Survey Planning Report: including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc; iii) diagrams of the proposed survey area and cross- sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001.	L u m p s u m		At the end of 45 days			
2.	Report on sample processed survey data: Report and delivery of sample data for at least 10% of the total cross sections in the lot in terms of contract value, including related office and field observation data for evaluation and acceptance	C . S N o .		By third month.			

3.	i) River cross section survey in the rivers and their tributaries in the State of West Bengal for the different range of spans/ widths, in varying depths of water and preparation of maps on requisite scales to supply them in both soft and hard formats with four copies complete, including cost of manpower, labour, surveying instruments, camp equipage, transportation, etc. and as per technical specifications and as per directions of engineer-in-charge.	C S N o	2333	Progress report in first week of every month after start of survey, and final survey completion report by end of thirteen month			
	ii) Cross Section width 0-250m		2012				
	iii) Cross Section width 251-500m		160				
	iv) Cross Section width 501-750m		62				
	v) Cross Section width 751-1000m		33				
	vi) Cross Section width 1001-1500m		26				
	vii) Cross Section width 1501-2000m		19				
	viii) Cross Section width 2001-3000m		20				
	ix) Cross Section width 3001-4000m		1				
	x) Post-Survey Report: <u>Survey report</u> documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody. xi) <u>Ground control report</u> that includes, at a minimum, all pertinent base station information and mission notes, including information on additional control station monument names and stability, stitching with LIDAR DEM wherever applicable. (N.B. the payment will be made as per						

	the actual number of cross sections under different widths surveyed and contract rates)						
4.	Construction of Bench Mark RCC Pillar as per drawing along the rivers and its tributaries in the State of Uttar Pradesh as per drawing attached in the contract with standard specifications including its painting, engraving etc complete including cost of manpower, material, labour, etc, as per directions of engineer-in-charge (N.B. the payment will be made as per the actual number of installations and contract rates)	N	250				
5.	Product Delivery Report: Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. Also report on generation of supplementary cross-sections from LiDAR DEM.	C S N	2333	by 15 th month			
6.	Final consolidated Project Completion Report: including all previous reports, comments by TAC and Contractor response and actions taken		2333	By 18 th month			

Price Schedule for Lot 4: Southern lot for West Bengal and near AWLR station locations in Jharkhand	Date: _____ Section III. Bidding Forms RFBNo: _____ Page No. _____ of _____
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1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
1.	Survey Planning Report: including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc; iii) diagrams of the proposed survey area and cross- sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001	Lump sum		At the end of 45days			

2.	Report on sample processed survey data: Report and delivery of sample data for at least 10% of the total cross sections in the lot in terms of contract value, including related office and field observation data for evaluation and acceptance	C. S No .		By third month.			
3.	i) River cross section survey in the rivers and their tributaries in the State of West Bengal for the different range of spans/ widths, in varying depths of water and preparation of maps on requisite scales to supply them in both soft and hard formats with four copies complete, including cost of manpower, labour, surveying instruments, camp equipage, transportation, etc. and as per technical specifications and as per directions of engineer-in-charge.	C. S No	3523	Progress report in first week of every month after start of survey, and final survey completion report by end of thirteen month			
	ii) Cross Section width 0-250m		3345				
	iii) Cross Section width 251-500m		128				
	iv) Cross Section width 501-750m		32				
	v) Cross Section width 751-1000m		5				
	vi) Cross Section width 1001-1500m		9				
	vii) Cross Section width 1501-2000m		2				
	viii) Cross Section width 2001-3000m		1				
	ix) Cross Section width 3001-4000m		0				
	x) Cross Section width 4001-5000m		1				
	xi) Post-Survey Report: Survey report documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must						

	<p>include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody.</p> <p><u>xii) Ground control report</u> that includes, at a minimum, all pertinent base station information and mission notes, including information on additional control station monument names and stability, stitching with LIDAR DEM wherever applicable. (N.B. the payment will be made as per the actual number of cross sections under different widths surveyed and contract rates)</p>						
4.	<p>Construction of Bench Mark RCC Pillar as per drawing along the rivers and its tributaries in the State of Uttar Pradesh as per drawing attached in the contract with standard specifications including its painting, engraving etc complete including cost of manpower, material, labour, etc, as per directions of engineer-in-charge (N.B. the payment will be made as per the actual number of installations and contract rates)</p>	No s.	276				

5.	Product Delivery Report: Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. Also report on generation of supplementary cross-sections from LiDAR DEM.	C. S No	3523	by 15 th month			
6.	Final consolidated Project Completion Report: including all previous reports, comments by TAC and Contractor response and actions taken		3523	By 18 th month			

Price Schedule for Lot 5: Rivers under Bhakra Beas Management Board	Date: _____ Section III. Bidding Forms RFBNo: _____ Page No. _____ of _____
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1	2	3	4	5	6	7	8
Sl. No.	Description of services	Unit	Approximate Quantity and Physical unit	Delivery date	Unit Price INR	GST	Total price per Lot INR
1.	Survey Planning Report: including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc; iii) diagrams of the proposed survey area and cross- sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001.	Lump sum		At the end of 45days			

2.	Report on sample processed survey data: Report and delivery of sample data for at least 10% of the total cross sections in the lot in terms of contract value, including related office and field observation data for evaluation and acceptance	C. S No .		By third month.			
3.	i) River cross section survey in the rivers and their tributaries in the State of Himachal Pradesh and Punjab for the different range of spans/ widths, in varying depths of water and preparation of maps on requisite scales to supply them in both soft and hard formats with four copies complete, including cost of manpower, labour, surveying instruments, camp equipage, transportation, etc. and as per technical specifications and as per directions of engineer-in-charge.	C. S No	72	Progress report in first week of every month after start of survey, and final survey completion report by the end of the 5 th month			
	ii) Cross Section width 0-250m		63				
	iii) Cross Section width 251-500m		9				
	iv) <u>Post-Survey Report:</u> Survey report documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody. v) <u>Ground control report</u> that includes, at a minimum, all pertinent base station information and mission notes,						

	including information on additional control station monument names and stability, stitching with LIDAR DEM wherever applicable. (N.B. the payment will be made as per the actual number of cross sections under different withs surveyed and contract rates).						
4.	Construction of Bench Mark RCC Pillar as per drawing along the rivers and its tributaries in the State of Uttar Pradesh as per drawing attached in the contract with standard specifications including its painting, engraving etc complete including cost of manpower, material, labour, etc, as per directions of engineer-in-charge (N.B. the payment will be made as per the actual number of installations and contract rates)	No s.	24	by 5 th month			
4.	Product Delivery Report: Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. Also report on generation of supplementary cross-sections from LiDAR DEM.	C. S No	72	by 6 th month			
5.	Final consolidated Project Completion Report: including all previous reports, comments by TAC and Contractor response and actions taken		72	By 8 th month			

Method Statement
(to be submitted by the bidder)

Work Plan

(to be submitted by the bidder)

Letter of Acceptance

[letterhead paper of the Employer]

[date]

To: *[name and address of the Service provider]*

This is to notify you that your Bid dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Special Conditions of Contract]* for the Contract Price of the equivalent of *[amount in numbers and words]* *[name of currency]*, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

Note: Insert one of the 3 options for the second paragraph. The first option should be used if the Bidder has not objected the name proposed for Adjudicator. The second option if the Bidder has objected the proposed Adjudicator and proposed a name for a substitute, who was accepted by the Employer. And the third option if the Bidder has objected the proposed Adjudicator and proposed a name for a substitute, who was not accepted by the Employer.

We confirm that *[insert name proposed by Employer in the Bidding Data]*,

or

We accept that *[name proposed by bidder]* be appointed as the Adjudicator

or

We do not accept that *[name proposed by bidder]* be appointed as Adjudicator, and by sending a copy of this letter of acceptance to *[insert the name of the Appointing Authority]*, we are hereby requesting *[name]*, the Appointing Authority, to appoint the Adjudicator in accordance with Clause 37.1 of the Instructions to Bidders

You are hereby instructed to proceed with the execution of the said contract for the provision of Services in accordance with the Contract documents.

Please return the attached Contract duly signed

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Agency: _____

Attachment: Contract

Form of Contract

[letterhead paper of the Employer]

LUMP-SUM REMUNERATION

This CONTRACT (hereinafter called the “Contract”) is made the *[day]* day of the month of *[month]*, *[year]*, between, on the one hand, *[name of Employer]* (hereinafter called the “Employer”) and, on the other hand, *[name of Service Provider]* (hereinafter called the “Service Provider”).

[Note: In the text below text in brackets is optional; all notes should be deleted in final text. If the Service Provider consist of more than one entity, the above should be partially amended to read as follows: “...(hereinafter called the “Employer”) and, on the other hand, a joint venture consisting of the following entities, each of which will be jointly and severally liable to the Employer for all the Service Provider’s obligations under this Contract, namely, [name of Service Provider] and [name of Service Provider] (hereinafter called the “Service Provider”).]

WHEREAS

- (a) the Employer has requested the Service Provider to provide certain Services as defined in the General Conditions of Contract attached to this Contract (hereinafter called the “Services”);
- (b) the Service Provider, having represented to the Employer that they have the required professional skills, and personnel and technical resources, have agreed to provide the Services on the terms and conditions set forth in this Contract at a contract price of..... ;
- (c) the Employer has received *[or has applied for]* a loan from the International Bank for Reconstruction and Development (hereinafter called the “Bank”) *[or a credit from the International Development Association (hereinafter called the “Association”)]* towards the cost of the Services and intends to apply a portion of the proceeds of this loan *[or credit]* to eligible payments under this Contract, it being understood (i) that payments by the Bank *[or Association]* will be made only at the request of the Employer and upon approval by the Bank *[or Association]*, (ii) that such payments will be subject, in all respects, to the terms and conditions of the agreement providing for the loan *[or credit]*, and (iii) that no party other than the Employer shall derive any rights from the agreement providing for the loan *[or credit]* or have any claim to the loan *[or credit]* proceeds;

NOW THEREFORE the parties hereto hereby agree as follows:

1. The following documents shall be deemed to form and be read and construed as part of this Agreement, and the priority of the documents shall be as follows:

- (a) the Letter of Acceptance;
- (b) the Service Provider’s Bid

- (c) the Special Conditions of Contract;
- (d) the General Conditions of Contract;
- (e) the Specifications;
- (f) the Priced Activity Schedule; and
- (g) The following Appendices: [**Note:** *If any of these Appendices are not used, the words “Not Used” should be inserted below next to the title of the Appendix and on the sheet attached hereto carrying the title of that Appendix.*]

Appendix A: Description of the Services

Appendix B: Schedule of Payments

Appendix C: Key Personnel and Subcontractors

Appendix D: Breakdown of Contract Price in Foreign Currency

Appendix E: Breakdown of Contract Price in Local Currency

Appendix F: Services and Facilities Provided by the Employer

Appendix G: Performance Incentive Compensation

2. The mutual rights and obligations of the Employer and the Service Provider shall be as set forth in the Contract, in particular:
- (a) the Service Provider shall carry out the Services in accordance with the provisions of the Contract; and
 - (b) the Employer shall make payments to the Service Provider in accordance with the provisions of the Contract.

IN WITNESS WHEREOF, the Parties hereto have caused this Contract to be signed in their respective names as of the day and year first above written.

For and on behalf of *[name of Employer]*

[Authorized Representative]

For and on behalf of *[name of Service Provider]*

[Authorized Representative]

[**Note:** *If the Service Provider consists of more than one entity, all these entities should appear as signatories, e.g., in the following manner:*]

For and on behalf of each of the Members of the Service Provider

[name of member]

[Authorized Representative]

[name of member]

[Authorized Representative]

Bid Security (Bank Guarantee)

[The Bank shall fill in this Bank Guarantee Form in accordance with the instructions indicated.]

Beneficiary: _____

Date: _____

BID GUARANTEE No.: _____

We have been informed that _____ (hereinafter called "the Bidder") has submitted to you its bid dated (hereinafter called "the Bid") for the execution of _____ under Invitation for Bids No. _____ ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we _____ hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or
- (b) having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity, (i) fails or refuses to execute the Contract Form; or (ii) fails or refuses to furnish the performance security, if required, in accordance with the Instructions to Bidders.

This guarantee will expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful bidder; or (ii) twenty-eight days after the expiration of the Bidder's Bid.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[signature(s)] _____

Section IV. Eligible Countries

Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement

In accordance with Para 1.10 of the Guidelines: Procurement under IBRD Loans and IDA Credits, dated January 2011 revised July 2014, the Bank permits firms and individuals from all countries to offer goods, works and services for Bank-financed projects. As an exception, firms of a Country or goods manufactured in a Country may be excluded if:

Para 1.10 (a) (i): as a matter of law or official regulation, the Borrower's Country prohibits commercial relations with that Country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of the Goods or Works required, or

Para 1.10 (a) (ii): by an Act of Compliance with a Decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from that Country or any payments to persons or entities in that Country.

2. For the information of borrowers and bidders, at the present time firms, goods and services from the following countries are excluded from this bidding:

(a) With reference to paragraph 1.10 (a) (i) of the Guidelines: none

(b) With reference to paragraph 1.10 (a) (ii) of the Guidelines: none

Part II – Activity Schedule

Section V. Activity Schedule

Conducting River Cross-Section in Ghaghra River system in UP and West Bengal river Systems including locations near AWLR installations of Jharkhand

1. BACKGROUND

Recurring floods in Ganga, Yamuna, Ramganga, Gomti, Sharda, Ghagra, Rapti and Gandak rivers in Uttar Pradesh State and that due to various River system in West Bengal annually affect huge area and a very large population and cause sizeable damage in these States. Recurrent floods are devastating to the State economy and undermine poverty alleviation efforts. Floods not only affect lives, livelihoods, and productivity and security of existing investments, but are also a disincentive for additional investments.

The Himalayan tributaries (and Ganga) and local rainfall are responsible for most of the flooding. Most of these tributaries have a substantial portion of their basins in Nepal and China and hydro-climatic data collection and sharing are major problems. Travel times for some tributaries are short, river discharge data is suspect due to lack of routinely updated rating curves in highly silt-laden rivers and during high-stages, stage data needs updating of datum due to river aggradation, hydrologic observations are still manually observed and not transmitted in real-time, no climate-based forecasts are available currently, and data sharing remains a serious issue. Even when short-lead warnings on river stages are received, issues remain on “last mile” connectivity, dissemination, and community and institutional preparedness.

Traditional efforts at flood management have focused on structural measures, mainly consisting of marginal embankments, drains, and town protection works, providing protection at a very huge cost i.e Billions of Rupees. These flood control structures are constructed to then-prevailing standards and technology, and not well maintained. Despite the largely structural solutions that have been the focus of flood management in the past decades, the threat of floods remains as high as ever to the economy and livelihoods in the States. The paradigm shift from flood control to management underlines the need to balance the historical emphasis on hardware investments such as embankments, with software solutions such as improved flood forecasting and warning systems. In this regard, these States can draw upon recent global advances in satellite-based climate and flood forecasting. There is an opportunity under NHP Project to improve State Government’s capacity to use state-of-the-art forecasts and to enhance last-mile connectivity for flood preparedness and management, and ii) to more effectively manage the Embankment assets to sustain flood protection.

The proposed River Cross section survey would focus on generating current information on alignment and cross-sections of Ghaghra river system in UP and Main River System in West Bengal and their major flood-prone tributaries in the basin.

For the purpose of preliminary estimation of the contract value, it has been attempted to prepare a list of the cross sections to be surveyed, including its number and width based on desk top study. However, being based on satellite images available on the Google Earth that often pertain to different dates of the past, these should be considered to be of indicative nature only. The actual number, location and extent of the cross sections to be surveyed considering practical limitations (e.g., presence of obstacles etc.) are to be finalized through the reconnaissance survey deploying the services of an experienced hydraulic modeler and presented in the survey plan. The payments would be made for actual number and extent

of cross sections surveyed based on the rates agreed upon in the contract. A committee will be constituted with members from the Survey of India and the concerned Implementing Agency (viz., Irrigation & Water Resources Department, Uttar Pradesh, Irrigation & Waterways Department, Government of West Bengal and the Bhakra Beas Management Board, as appropriate) for review and approval of the reconnaissance survey report and survey plan, and recommendation of necessary amendment to the contract, as necessary.

Cross Section Survey of Ghaghra Basin in Uttar Pradesh

River Ghaghra (better known as Saryu river in Ayodhya and nearby area) is a trans-border river traversing China (Tibet), Nepal (known as Karnali) and India. Some of its main tributaries in India are the Sharda, Saryu, Rapti, Little Gandak and Kuwano. Its main stem enters in India in Lakhimpur district of U P and flows south-east (length is approximately 630 km) to meet river Ganga at the eastern most point of U P at Balia. The river and its tributaries have a history of frequent flooding, inundating vast plain of the state (nearly 40000 km²) causing loss of life & property. Being the most flood devastating river basin of the state, flood management of the basin acquires highest priority.

Currently Flood management / River morphological modelling study and/ EAM of of Ghaghra Basin (for others rivers excluding Rapti) has been proposed under NHP . The most important and basic data required to develop flood management information activities is river and embankment cross sectional data invariably to be done by physical surveying with the use of echo sounders, auto levels, total station etc. The survey work request to be conducted by Survey of India. Being the premier organization and authority in surveying/leveling, stitching of LiDAR data with river cross section data will also be carried out after the survey. For this purpose UP state Water Resources Department has marked tentative CS sections on Google earth .The cross section marked at Google and shapefiles are as follows

The main river of this basin, the Ghaghra, has a stretch of 663 km approximate, on which a total of 341 cross sections have been marked. The River Sharda is approximately 232 km, Sarju is 145 km long and there are many tributaries of Ghaghara River on which a number of cross sections have been marked. Total 3297 cross sections have been demarcated along the length of river, having a minimum width 35 m (River Chauka) and a maximum width of 18 km (River Ghagra). The left and right end of each cross section extend into the countryside settlement or 1.5 km from the embankments/ elevated land, measured using the Google earth (needs to be stitched with LiDAR data in future). All the cross-sections marked are tentative (and where the CS have over lapped, it should be avoided). These cross-sections suffer from certain limitations, as they have been marked using the open source software Google Earth. Satellite images on google earth does not show satellite images pertaining to the same year for the entire area of interest, and also, the resolution is not the same all across. So it may possible that in some cases the river channels have shifted from their original path. Some places are covered by dense forest, and therefore, the analysts could not identify the correct channel path of the river. Thus, the demarcation of cross sections on the river channel are based on assumptions.

A Layout Map showing the river system to be surveyed, along with available/ proposed DEM with 3-5 m accuracy and DEM of 0.5 m accuracy prepared from Lidar data is shown in Figure 1. The DEM with higher resolution and accuracy covers the area nearer to the river. After the passage of high floods during the monsoon, it has been observed that the rivers sometimes change their courses within the floodplain. To ensure true capturing of the continuity of the deep channel, it is required that survey works for one reach of a river is completed in a continuous manner without a break imposed by the monsoon in-between. So, the entire work has been proposed to be divided into two lots –the western lot (upper part of the Ghaghra River and its tributaries) and the eastern lot (lower part of the Ghaghra River and its tributaries), as shown in Figure 2.

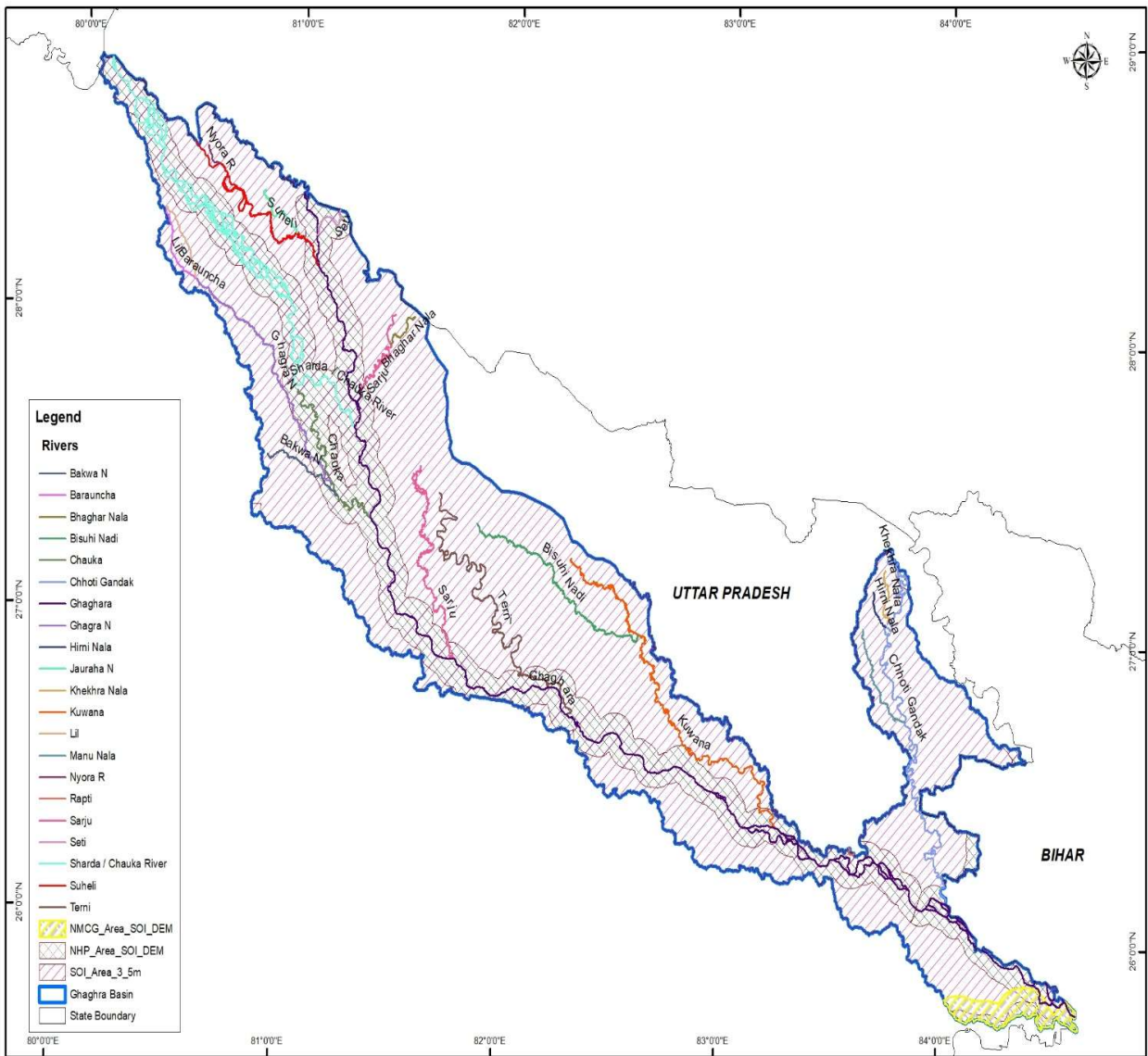


Figure 1: Map showing the Ghaghra River system to be surveyed and DEM proposed in the Ghaghra Basin

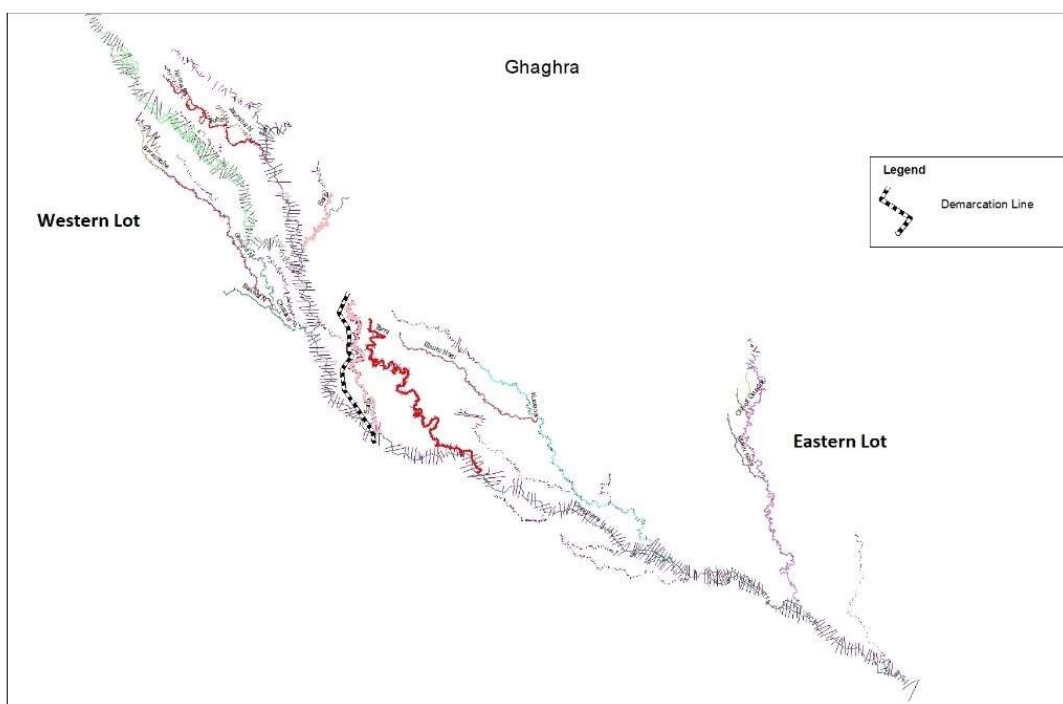


Figure 2: Map showing the eastern and western lots

Summary of the river name, Number of cross section on each river, Total width and average river width/ length of each CS is given in the Summary Table below. River length mentioned in the Summary table are tentative and have been received from the UP state govt. It should be checked and updated during the reconnaissance survey. All the information including River names in the summary table are from attribute table of the shape files provided by UP SW department. The break up into western and eastern lot has been shown in tabular form thereafter.

Sl no	Name of river	Approximate total River length (Km)	No. of CS	Width of CS (KM)	Average width of CS
1	UL	34.78	23	81.53	3.54
2	Tonri	100.12	146	80.22	0.55
3	Sarju	170.54	179	374.83	2.09
4	Sarju_Suheli	189.78	97	115.12	1.19
5	Sarda	20.31	10	49.41	4.94
6	Sotia	38.24	42	31.45	0.75
7	Sutiya	18.39	20	21.93	1.10
8	Terni	244.97	114	254.05	2.23
9	Tirwa Nadi	45.63	98	64.82	0.66
10	Little Gandak	286.68	190	196.75	1.04
11	Katnehia	21.04	39	28.79	0.74
12	Kuwano	272.36	324	279.94	0.86
13	Kandwa	51.73	47	28.81	0.61
14	Jauraha nadi	33.77	26	38.29	1.47
15	Gobariha	54.12	45	77.66	1.73
16	Ghaghi	20.74	35	16.82	0.48
17	Daha_Sandi	112.37	121	35.39	0.29
18	Chauka	115.95	465	279.54	0.60
19	Bisuhi nadi	169.87	155	68.46	0.44

Sl no	Name of river	Approximate total River length (Km)	No. of CS	Width of CS (KM)	Average width of CS
20	Bakwa	51.06	41	14.36	0.35
21	Barauncha	34.52	10	13.83	1.38
22	Babai	68.05	48	90.77	1.89
23	Bahatiya	17.69	10	14.59	1.46
24	Manorama	109.35	110	83.76	0.76
25	Mohan	81.07	43	116.96	2.72
26	Nyora	11.45	13	22.90	1.76
27	Pikia nadi	41.86	49	37.66	0.77
28	Ghagra	817.11	257	1839.30	6.86
29	Sharda	611.82	93	578.32	7.16
30	Seti	22.06	6	32.52	5.42
	Total	3867.43	2856	4968.80	1.74

The cross sections in the eastern lot are shown in the table below:

Sl. No.	Name of river	Approximate total River length (Km)	No. of CS	Width of CS (KM)	Average width of CS
1	Tonri	100.12	146	80.22	0.55
2	Sarju	170.54	179	374.83	2.09
3	Terni	244.97	114	254.05	2.23
4	Tirwa Nadi	45.63	98	64.82	0.66
5	Little Gandak	286.68	190	196.75	1.04
6	Katnehia	21.04	39	28.79	0.74
7	Kuwano	272.36	324	279.94	0.86
8	Daha_Sandi	112.37	121	35.39	0.29
9	Bisuhi nadi	169.87	155	68.46	0.44
10	Manorama	109.35	110	83.76	0.76
11	Pikia nadi	41.86	49	37.66	0.77
12	Ghagra	523.76	142	974.79	7.06
	Total	2098.55	1667	2479.46	1.49

The cross sections for the eastern lot by the width class are shown in the table below:

Eastern Lot	
Cross Section widths	Nos
0-250	206
251-500	289
501-750	338
751-1000	206
1001-1500	189
1501-2000	79
2001-3000	178
3001-4000	49
4001-5000	25
5001-6000	13
6001-7000	16

7001-8000	19
8001-9000	25
9001-10000	35
Sum	1667

The cross sections in the western lot are shown in the table below:

Sl. No.	Name of river	Approximate total River length (Km)	No. of CS	Width of CS (KM)	Average width of CS
1	UL	34.78	23	81.53	3.54
2	Sarju_Suheli	189.78	97	115.12	1.19
3	Sarda	20.31	10	49.41	4.94
4	Sotia	38.24	42	31.45	0.75
5	Sutiya	18.39	20	21.93	1.10
6	Kandwa	51.73	47	28.81	0.61
7	Jauraha nadi	33.77	26	38.29	1.47
8	Gobariha	54.12	45	77.66	1.73
9	Ghaghi	20.74	35	16.82	0.48
10	Chauka	115.95	465	279.54	0.60
11	Bakwa	51.06	41	14.36	0.35
12	Barauncha	34.52	10	13.83	1.38
13	Babai	68.05	48	90.77	1.89
14	Bahatiya	17.69	10	14.59	1.46
15	Mohan	81.07	43	116.96	2.72
16	Nyora	11.45	13	22.90	1.76
17	Ghagra	293.35	115	864.51	7.52
18	Sharda	611.82	93	578.32	7.16
19	Seti	22.06	6	32.52	5.42
	Total	1768.88	1189	2489.34	2.09

The cross sections for the western lot by the width class are shown in the table below:

Western Lot	
Cross Section widths	Nos
0-250	135
251-500	215
501-750	175
751-1000	116
1001-1500	134
1501-2000	74
2001-3000	90
3001-4000	35
4001-5000	25
5001-6000	49
6001-7000	32
7001-8000	34
8001-9000	27
9001-10000	48
Sum	1189

Cross Section survey of West Bengal river systems

There are 14 river systems in West Bengal which are to be surveyed for obtaining river cross section. In general, the CS are planned be taken at a longitudinal interval of 2 km along the river. Additional sections should be taken at bridges, hydraulic structure, confluence of tributaries or distributaries as also at the meander locations or river bends. A map showing all river systems for CS survey along with various proposed DEMs is given in Figure 3.

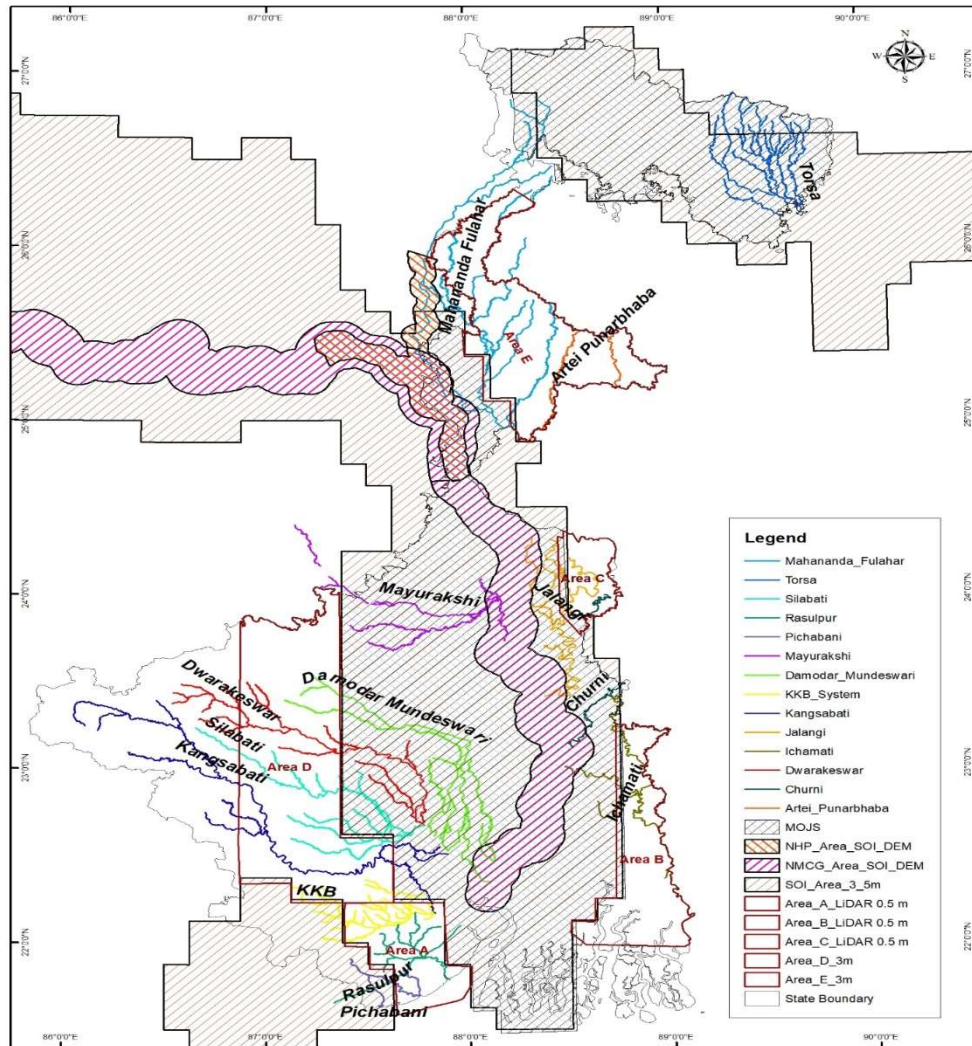


Figure 3 : MAP of River system with various proposed DEM

Details of all the river systems where cross section survey is to be carried out in West Bengal is shown in the table below:

S.No.	River System Name	Total No. of river	Total Length of the River	Approx. No. of Cross-Sections	Total width of CS	Average width of CS
			(in Km)	Nos	(in Km)	(in km)
1	Kangsabati	11	689.38	380	43.69	0.11
2	Dwarakeswar	17	674.85	928	78.4	0.08
3	Shilabati	11	652.82	511	15.43	0.03
4	KKB (Keleghai-	24	500.86	463	14.13	0.03

S.No.	River System Name	Total No. of river	Total Length of the River	Approx. No. of Cross-Sections	Total width of CS	Average width of CS
	Kapaleswari-Baghai)					
5	Rasulpur	10	263.15	222	10.26	0.05
6	Mayurakshi	11	434.98	261	38.22	0.15
7	Atrei-Punarbhaba	8	147.79	112	8.18	0.07
8	Mahananda-Fulahar	15	1310.14	1132	215.73	0.19
9	Torsa	19	812.01	494	108	0.22
10	Jalangi	7	502	334	21.08	0.06
11	Churni	2	132.24	77	5.37	0.07
12	Ichamati	3	357.91	211	21.61	0.10
13	Damodar-Mundeshwari	15	709.38	499	41.95	0.08
14	Pichabani	4	115.52	154	7.18	0.05
	Total	157	7303.02	5778	629.23	0.11

Note section @ 2 km

In view of the anticipated change in river channel during the monsoon, it is required to ensure the capture one river reach without a break due to monsoon in-between. So, the entire area has been divided into two lots the southern lot comprising the river systems Kangsabati, Dwarakeswar, Silabati, KKB (Keleghai-Kapaleswari-Baghai), Rasulpur, Churni, Ichamati, Damodar and Pichabani and the northern lot including the river systems Mayurakshi, Jalangi, Atrei-Punarbhaba, Mahananda-Fulahar and Torsa. A map showing the demarcation of the lots has been presented in Figure 4.

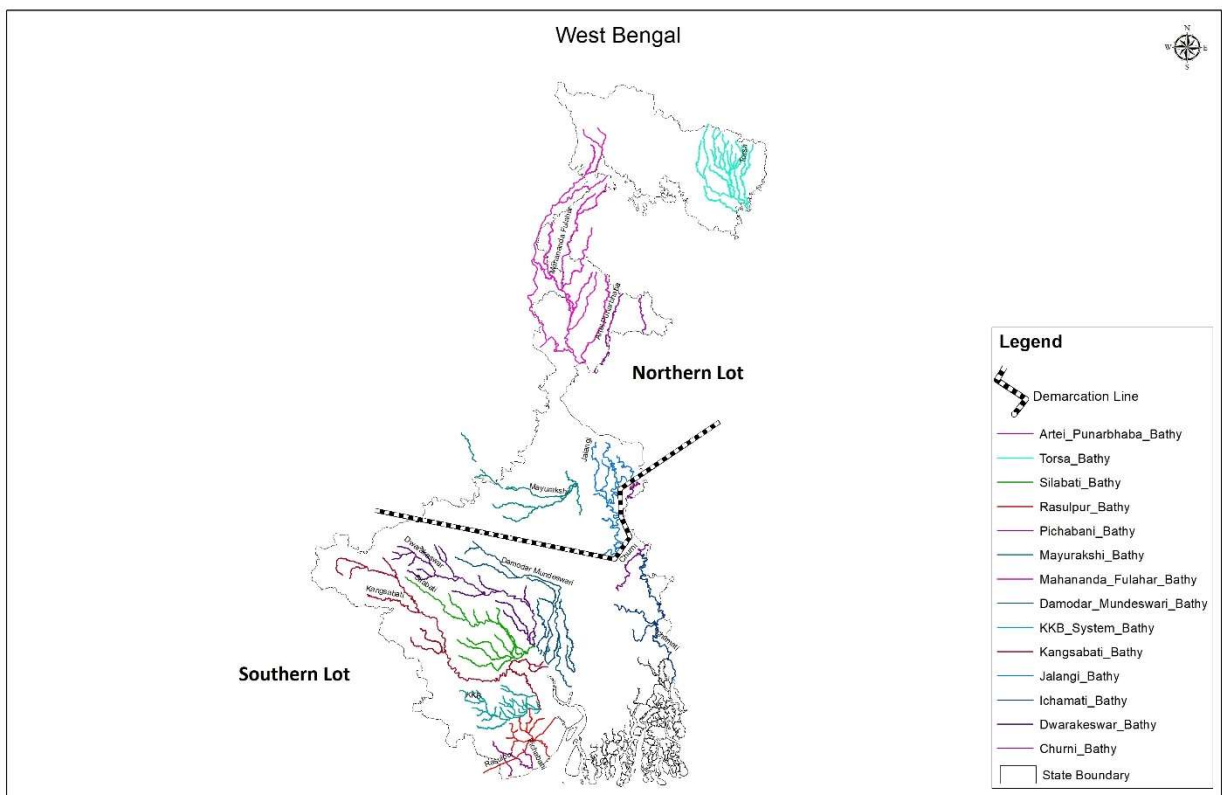


Figure 4 : Map showing the northern and southern lots

The summary for the river systems in the northern lot is given below:

Northern Lot	
Field Charges for Cross Section widths	Nos
0-250	2012
251-500	160
501-750	62
751-1000	33
1001-1500	26
1501-2000	19
2001-3000	20
3001-4000	1
Sum	2333

The details of cross sections for the different river systems in the northern lot are given below.

S.No.	River System Name	Total No. of river	Total Length of the River (km)	Approx. No. of Cross-Sections	Total width /length of CS (km)	Approx. Average of the Width of the Cross-Section (km)
1	Mayurakshi	11	434.98	261	38.22	0.22
2	Jalangi	7	502.00	334	21.08	0.05
3	Atrei-Punarbhaba	8	147.79	112	8.18	0.06
4	Mahananda-Fulahar	15	1310.14	1132	215.73	0.20
5	Torsa	19	812.01	494	108.00	0.19
	Total	60	3206.92	2333	391.21	0.72

Summary of CS required for each river system is given below:

Mayurakshi River System : Mayurakshi River (also called Mor River) is a major river in Jharkhand and West Bengal, India, with a long history of devastating floods. It has its source on Trikut hill, about 16 Km from Deoghar in Jharkhand state.[1] It flows through Jharkhand and then through the districts of Birbhum and Murshidabad in West Bengal before flowing into the Hooghly River. The river is about 250 Km long

S.No.	River Name	Length of the River (Km)	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section (in KM)
1	Babla River	67.343	36	2.83
2	Bakreshwar Manurakshi	65.388	46	3.55
3	Beli River_	26.054	14	0.78
4	Kopai River_	56.912	33	2.31
5	Kuye	69.002	53	3.93
6	Mayurakshi dam ds	7.853	4	1.23
7	Mayurakshi barrage ds	62.477	33	10.31
8	Mayurakshi barrage ds_2	11.611	6	2.35

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
9	Mayurakshi barrage us	19.350	9	5.91
10	Mayurakshi dam us	37.051	22	4.27
11	Sidheshwari-Noonbeel	11.944	5	0.75
	Total	434.98	261	38.22

Jalangi River System : It is a branch of the Ganges river in Murshidabad and Nadia districts in the Indian state of West Bengal. It flows into the Bhagirathi river and strengthens its lower channel, the Hooghly. Total 7 nos of branches are considered for the CS survey.

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width/length of the Cross-Section
		(Km)	Nos	(in KM)
1	Bhandardaha River	65.35	42	3.51
2	Choto Bhairab River	39.40	33	1.44
3	Jalangi River	258.76	149	10.86
4	Machpota River	22.20	19	0.65
5	Shialmari River	79.12	52	3.30
6	Suti River	22.15	27	0.92
7	Suti Tributary	15.02	12	0.40
	Total	502.00	334	21.08

Atrei-Punarbhaba River System: The Phunababa (Poonorvoba) is a river of Bangladesh and West Bengal, of total length about 160 km and width more than 3 km during rain and a mean depth of 1.96 m. It originates from the lowlands of Thakurgaon District of Bangladesh. The river's upper part is a few km west of Atrai. Dinajpur town of Bangladesh is situated on the east bank of the river. It flows through Gangarampur and Tapan community development blocks of Dakshin Dinajpur district of West Bengal. After flowing to the south, this river meets with the Dhepa River. Ultimately it flows into the Ganges. Two major tributaries Atrei and Punarbhaba of approximate 147 km of length is proposed to be surveyed for river Cross section (CS) . Details of the proposed CS survey is given below

S. No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. Total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Atreyee River	44.77	25	3.65
2	Punarbhaba River_4	17.44	18	0.65

S. No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. Total width of the Cross-Section
3	Punarbhaba River_2	5.59	8	0.02
4	Punarbhaba River_3	13.45	11	0.38
5	Punarbhaba River_5	51.81	39	2.76
6	Punarbhaba River at border_1	0.82	1	0.04
7	Punarbhaba River at border_2	11.14	7	0.32
8	Punarbhaba river_1	2.77	3	0.19
	Total	147.79	112	8.18

Mahananda-Fulahar River System: The Mahananda River is a trans-boundary river that flows through the Indian states of West Bengal and Bihar, and Bangladesh. 15 rivers of approximate 1310 km is added in this river system and proposed to be surveyed for CS

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Balason River	24.84	15	9.80
2	Dauk	63.92	45	6.20
3	Fulahar River	104.78	123	103.47
4	Kulik	90.85	112	6.03
5	Mahananda ds	167.50	111	12.93
6	Mahananda tributary	47.92	48	2.88
7	Mahananda upstream	155.91	60	25.21
8	Nagar	151.51	117	16.25
9	Pitani	35.40	47	2.67
10	Sudhani	122.61	117	5.97
11	Sui	43.79	47	4.13
12	Mahananda Kalindri River	48.20	37	2.96
13	Mahananda Gamari River	51.62	71	2.12
14	Mahananda Chiramati River	65.51	66	6.41
15	Dwarakeswar Tangon	135.76	116	8.71
	Total	1310.14	1132	215.73

Torsa system: Torsa River (also spelt Torsha and also known as Kambu Maqu, Machu and Amo Chhu) rises from the Chumbi Valley in Tibet, China, where it is known as Machu. It flows into Bhutan, where it is known as the Amo Chu. It has total length of 358 kilometres (222 mi), out of which 113 kilometres (70 mi) is in China and 145 kilometres (90 mi) in Bhutan before flowing into the northern part of West Bengal in India. It flows past the important border towns of Phuntsholing (in Bhutan) and Jaigaon (on the Indian side of the border) and past the great tea estate of Dalsingpara and the Jaldapara National Park. a tributary known as Buri Torsa meets Jaldhaka. Ghargharia river meets with Torsa in the Tufanganj subdivision, near Deocharai and Balarampur Torsa meets with Kaljani and it then flows into Bangladesh by the name of Kaljani and meets with Brahmaputra in BD. Total 19 rivers (812 km) are included for CS survey of Torsa system

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Bala	36.92	24	1.76
2	Bania	15.84	15	0.61
3	Cheko	17.76	15	0.33
4	Chunia	9.02	4	0.58
5	Dhaksi	33.38	21	1.40
6	Dharla River	56.03		
7	Dima	35.04	22	3.22
8	Gabur Bosra	15.17	7	3.30
9	Gadadhar	80.28	46	2.83
10	Garam	26.52		
11	Ghargharia	63.85	47	1.88
12	Holong	49.61	29	1.63
13	Jayanti	32.96	10	2.23
14	Kaljani	85.44	52	9.02
15	Nonai	28.42	31	1.10
16	Pana	11.07	5	2.50
17	Raidak -I	83.19	47	3.85
18	Raimatang	14.18	8	1.14
19	Torsa	117.31	61	60.98
	Total	812.01	444+50	98.36+10 ≈108.00

Note : (CS nos are already approximately added in estimation due to some projection problem at google for the rivers Garam and Dharla, for which 50 cross sections and 10 km have been added in the summary)

The summary for the river systems in the southern lot is given below:

Southern Lot	
Field Charges for Cross Section widths	Nos
0-250	3290
251-500	108
501-750	29
751-1000	5
1001-1500	9
1501-2000	2
2001-3000	1
3001-4000	0
4001-5000	1
Sum	3445

The details of cross sections for the different river systems in the southern lot are given below:

S.No.	River System Name	Total No. of river	Total Length of the River (km)	Approx. No. of Cross-Sections	Total width /length of CS (km)	Approx. Average of the Width of the Cross-Section (km)
			(in Km)	Nos	(in Km)	(in Km)
1	Kangsabati	11	689.38	380	43.69	0.08
2	Dwarakeswar	17	674.85	928	78.40	0.06
3	Silabati	11	652.82	511	15.43	0.03
4	KKB (Keleghai-Kapaleswari-Baghai)	24	500.86	463	14.13	0.03
5	Rasulpur	10	263.15	222	10.26	0.03
6	Churni	2	132.24	77	5.37	0.07
7	Ichamati	3	357.91	211	21.61	0.08
8	Damodar	15	709.38	499	41.95	0.13
9	Pichabani	4	115.52	154	7.18	0.05
	Total	97	4096.10	3445	238.02	0.07

Summary of CS required for each river system is given below:

Kangsabati River System: Kangsabati River (also known as the Kasai) rises from the Chota Nagpur plateau in the state of West Bengal, India and passes through the districts of Purulia, Bankura and Paschim Medinipur in West Bengal before draining in the Bay of Bengal. Total 11 nos tributaries and branches are proposed to be surveyed under this system

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Bandhu	26.82	20	1.08
2	Bhairabbanki	53.70	30	1.27
3	Durbachatii	26.71	21	1.02
4	Kangsabati	292.05	141	27.84
5	Kumari	70.28	28	2.73
6	New Cossey	70.10	42	2.90
7	Old Cossey	31.98	20	1.46
8	Palaspai	19.60	15	0.42
9	Patloi	32.57	21	1.70
10	Saharajore	21.06	12	1.53
11	Tarafeni	44.52	30	1.73
	Total	689.38	380	43.69

Dwarakeswar River System: The river originates near Madhabpur in Purulia district and enters Bankura district near Chhatna. It cuts across the district flowing past the district headquarters and enters the southeastern tip of East Bardhaman District. It then passes through Hooghly District. The Silai joins it near Ghatal and the two together are known as Rupnarayan River, which flows into the Hooghly River near Gadiara in Howrah District. Dwarakeswar River has much sedimentation from low water (any season). In

rainy seasons it is filled up with water; then huge sedimentations are blocked the channel, even near Arambagh the channel basin reduced by garbage and anthropogenic (manmade) activities.

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Amodar-River-	66.41	64	1.63
2	Arkusha-River	39	41	2.11
3	Beko-River-	19.18	31	1.74
4	Bera-River-	36.69	47	2.59
5	Dangra-River-	23.24	40	2.38
6	Dev-River	32.36	40	1.18
7	Dudhibheria-River-	14.63	26	1.45
8	Dwarakeswar-River-	219.89	258	48.62
9	Futiary-River-	12.26	28	1.92
10	Gandheswari_L_upper-River-	25.73	83	3.18
11	Gandheswari_R_upper-River-	23.05	40	1.65
12	Gandheswari	22.36	27	3.15
13	Harinamuri-River-	37.89	61	1.58
14	Kana-River-	17.7	27	1.54
15	Kansachor-River	20.03	34	1.07
16	Shankari-River-	9.24	16	0.74
17	Tarajuli-River-	55.2	65	1.87
	Total	674.85	928	78.4

Shilabati System_: The Shilabati River (also known as Shilai) originates near Chak Gopalpur village of in the Purulia district of the Indian state of West Bengal. It flows in an almost southeasterly direction through the districts of Bankura and Paschim Medinipur. The Shilabati joins the Dwarakeswar near Ghatal and afterwards is known as Rupnarayan. It finally joins the Hooghly River, which empties into the Bay of Bengal.

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Bifurcation_River_	3.72	4	0.19
2	Champayan_River_	11.84	12	0.29
3	Donai_River_	30.35	26	0.66
4	Joyponda_River	37.90	28	0.80
5	Katan_River_	16.09	21	0.46
6	Kubai_River_	72.65	70	1.46
7	Ketia_	71.25	58	1.50

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
8	Parang_River_	89.45	79	1.42
9	Puratan_River	14.53	13	0.27
10	Silabati_River_	242.95	155	7.02
11	Tamal_River_	62.08	45	1.37
	Total	652.82	511	15.43

KKB (Keleghai-Kapaleswari-Baghai) River System: It is combination of 3 major river system combined 24 nos streams / branches. combined river length is approximate 500 km

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Ahir River	6.14	3	0.08
2	Amrakhali River	11.56	13	0.44
3	Baghai River	50.54	44	0.79
4	Bagla River	11.23	8	0.26
5	Banskhana	5.31	10	0.20
6	Brahamachari	19.09	18	0.49
7	Chandia	41.06	38	0.98
8	Deuli	18.90	20	0.37
9	pezwar	10.20	9	0.30
10	Dokhali	11.42	11	0.26
11	Dudhia	16.92	19	0.29
12	Ganapat	11.03	14	0.30
13	Kapaleswari	38.36	34	1.20
14	Katakali	19.71	18	0.39
15	Keleghai	121.27	91	4.68
16	Moyna New Cut	8.68	14	0.67
17	Notura	16.19	20	0.54
18	Pairachali	5.71	6.00	0.11
19	Panchthupi	10.78	10	0.20
20	Pocha	28.80	27	0.52
21	Potua	11.97	17	0.32
22	Pursa	1.80	2	0.08
23	Shrikontha	9.36	7	0.18
24	Soti	14.83	10	0.51
	Total	500.86	463	14.13

Rasulpur River system: The Rasulpur River (also spelt Rasalpur) is a tributary of the Hooghly River. The Rasulpur flows through Paschim Medinipur and Purba Medinipur districts. It flows as Bagda River until Kalinagar and then flows as Rasulpur River. Ten rivers of approx. 263 km length are proposed to be surveyed under this .

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Balighai Diversion	13.31	10	0.18
2	Deriadighi	27.14	22	0.58
3	Ghatua	8.85	7	0.14
4	Itaberia	20.33	16	0.40
5	Kalaberia	24.46	23	0.57
6	HTC	27.70	26	1.01
7	OCC	58.73	44	2.19
8	Pania	5.23	3	0.07
9	Rasulpur Rivers	65.06	62	4.70
10	Sadar	12.34	9	0.41
	Total	263.15	222	10.26

- Churni River System:** River Churni is a stream in the Nadia district of the Indian state of West Bengal. It is a distributary of the Mathabhanga River which is a distributary of Padma. The Churni flows through Shibnivas, Hanskhali, Birnagar, Aranghata, and Ranaghat, and finally joins River Bhagirathi-Hooghly near Chakdaha. According to an article in the International Journal of Current Research, the river is in part the remnants of an artificial canal ordered dug by a 17th-century maharajah (king). Changes to a nearby distributary of the Jalangi River resulted partly from water diversion down the canal. Sedimentation eventually dried up the upper part of the distributary, called the Anjana, while the canal and the lower Anjana formed the Churni. Another name for the Churni is Kata Kal or "dug river". Two rivers, Anjana and Churni, are proposed to be surveyed under this system. Details of the proposed CS survey is given below

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Anjana Branch	45.28	31	2.97
2	CHURNI	86.95	46	2.40
	Total	132.24	77	5.37

- Ichamati River System:** Ichamati River is now in three parts: (1) The longer part flows from the Mathabhanga River, a distributary of the Padma, and after flowing for 208 kilometres joins the Kalindi River near Hasnabad in North 24 Parganas and Debhata in Satkhira District. (2) the main river west of Dhaka and (3) Ichamati of Dinajpur. Part of this river is considering for survey. Three major tributaries has been considered for CS survey.

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
1	Ichamati_	246.07	129	17.08
2	Jamuna	70.52	54	2.57
3	Padma N	41.31	28	1.95
	Total	357.91	211	21.61

3. **Damodar Mundeshwari River System** : Damodar River is a river flowing across the Indian states of Jharkhand and West Bengal. Rich in mineral resources, the valley is home to large-scale mining and industrial activity. Earlier known as the Sorrow of Bengal because of its ravaging floods in the plains of West Bengal, many areas of Bardhaman, Hooghly, Howrah and Medinipur districts. Mundeshwari river is a small river in West Bengal which causes floods in Hooghly, Purba Medinipur and Howrah districts during the monsoons. Floods are mostly depending on its outfall conditions at on the outfall condition of the Mundeshwari at Harinkhola. This system has 15 rivers of approx. 709 km of length

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Baksi_	38.21	40	1.29
2	Banspati_	29.2	34	0.98
3	Branch_of_Mundeshwari_	11.31	10	0.95
4	Dakatia_	92.7	89	2.95
5	Damodar	203.72	56	18.53
6	DamodarUSofBarrage_	8.02	3	2.82
7	Hurhura_	8.33	9	0.8
8	Jagatpur_	4.64	8	0.13
9	KanaDamodar_	60.7	55	1.35
10	Kata_	29.68	22	0.81
11	Maliarajor_	17.92	16	0.46
12	Mundeshwari_	58.71	27	6.43
13	Nuna_	54.93	56	1.49
14	Shali_	74.09	53	2.65
15	Tributory of Nuna_	17.21	21	0.31
	Total	709.38	499	41.95

4. **Pichabani_River-System**: This river mostly flows through Midnapur district. 4 major rivers are included in this system and those rivers are

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
		(Km)	Nos	(in KM)
1	Contai Nallah	23.920	39	1.26

S.No.	River Name	Length of the River	Approx. No. of Cross-Sections	Approx. total width of the Cross-Section
2	Negua	23.422	38	0.83
3	Pichabani	42.316	46	1.99
4	Ramnagar	25.859	31	3.10
	Total	115.52	154	7.18

Cross Section survey for rivers near AWLR installations on Rivers in Jharkhand

Under the National hydrology project, the Chief Engineer Design Master Planning & Hydrology, Jharkhand wants to carry out river cross section survey of 26 AWLR stations at predetermined locations of Jharkhand. The list of the locations is given in the Table below and shown in the figure. The objective of obtaining the cross sections is to estimate the present discharge carrying capacity of the channel/ rivers, and also to mark the HFL and other important water levels on the cross sections. These cross sections are further to be used for finding out wet area corresponding to different water levels and subsequent estimation of the discharge by multiplying with the current meter readings. Three cross sections are proposed for each AWLR locations, one at AWLR site at bridge location, one at 200 m upstream of AWLR station and one cross section at 100 m downstream. Locations and tentative widths of the cross sections were obtained on the basis of satellite images available on the Google Earth. Taking a cross section on the river bend and at places where the channel is not defined has been avoided as much as possible, instead the cross sections have been marked at suitable upstream and down stream locations. Cross sections have mostly been extended up to 50 m from both the banks, or up to a suitable width on the flood plain where banks are not well defined. The cross section survey is also envisaged to include the Establishment of GTS permanent Bench mark at 26 AWLR sites and preparation of Area elevation table with distance between successive elevation points as 25 cm or 1 m maximum, as may be required for effective estimation of the discharge, depending on the field situation. All data should be submitted in required soft and hard copy in AutoCAD, excel , shape files and KML format

SI No	Name of the station	River / tributary	Basin	District	Latitude	Longitude
1	Chaliyama (chaliyama-Cgaibasa Road)	Kharkai	Subernarekha	West singbhum	22.560583	85.876722
2	Tamar (Ranchi -Tata Road	Karkari	Subernarekha	Ranchi	23.024028	85.735722
3	Chakardharpur (Chakardharpur (Chakardharpur Chaibasa Road)	Sanjay	Subernarekha	West singbhum	22.663056	85.660694
4	Chaibasa	Roro	Subernarekha	West singbhum	22.559806	85.798028
5	Daltonganj Road Bridge	North koel	North koel	Palamu	24.033911	84.062606
6	Rahala (Garhwa-Daltonganj Road)	North koel	North koel	Palamu	24.2125	83.874306
7	Singra (Daltonganj-Barwadih Road)	Amanat	North koel	Palamu	24.11025	84.075028
8	Kechki	Auranga	North koel	Latehar	23.940833	84.151111
9	Bhaluachatti	Mohane	Falgu	Hazaribagh	24.45505556	85.14163889

SI No	Name of the station	River / tributary	Basin	District	Latitude	Longitude
10	Tahle Garhwa (Daltonganj -Garhwa Road)	Tahle	North koel	Garhwa	24.098889	83.909444
11	Kharaundhi(Bhawnathpur-kharaundhi road)	Domni nala	North koel	Garhwa	24.421944	83.438611
12	Damye Banki -Untari Road	Danye banki	North koel	Palamu	24.32724	83.846905
13	Hunterganj	Lilajan	Falgu	Chatra	24.432528	84.818556
14	Ramanujganj(Garhwa-Ambikapur Road)	Kanhar	Sone	Garhwa	23.80825	83.705
15	Dumka Masalia RD (Vijaypur)	Mayurakshi	Mayurakshi	Dumka	24.282056	87.206778
16	Maheshpur Hiranpur RD (Gwalpara)	Mayurakshi	Bansloi	Pakur	24.478556	87.755833
17	amrapara -dumka RD	Mayurakshi	Basane	Dumka	24.515861	87.56925
18	Sarath (Madpu Rsarath RD)	Ajay	Patro	Deoghar	24.228528	86.789861
19	Dhakwa (Deoghar	Ajay	Jayanti	Deoghar	24.201207	86.684021
20	Budhai (Budhai	Ajay	Patro	Deoghar	24.357333	86.541444
21	PUNASI (Deoghar	Ajay	Ajay	Deoghar	24.477174	86.539685
22	Barhet (Barhet-Barharwa)	Gumani	Gumani	Sahebganj	24.894861	87.599222
23	Poraiyahat	Chandan bilasi Chir	Chir	Godda	24.672944	87.16725
24	Hatjamini(jamini)	Chandan bilasi Chir	Kajhia	Godda	24.802167	87.245139
25	Tenughat Banaso RD	Damodar	Ganga	Bokaro	23.782361	85.815833
26	Banaso-Tenughat RD	Damodar	konar	Bokaro	23.843944	85.822278

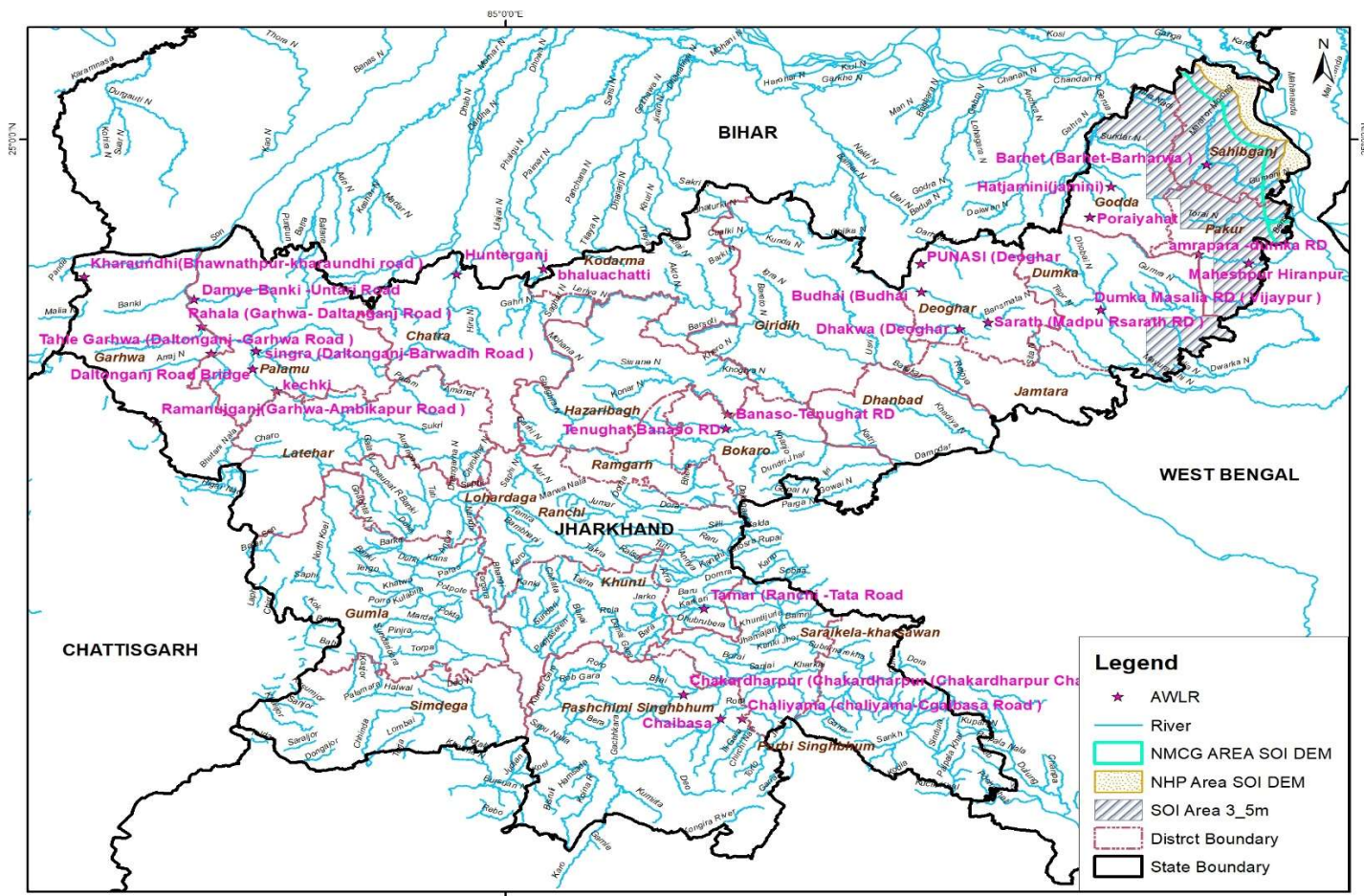


Fig 5 Map showing Location of 26 AWLR stations and various District of Jharkhand , SOI DEM location

Summary of the C/s of Jharkhand 26 AWLR site are given below .

Range (metre)	No. of CS
0-250	55
251-500	20
501-750	3
Total	78

Cross Section survey for rivers under the Bhakra Beas Management Board

The Bhakra Beas Management Board (BBMB) was set up by the Ministry of Power in terms of the provisions of the Punjab Reorganization Act, 1966 for the administration, maintenance and operation of the Bhakra Nangal project. As per the Indus Water Treaty, 1960 signed between India and Pakistan, the waters of three eastern rivers namely the Sutlej, the Beas and the Ravi were allotted to India for exclusive use. A Master Plan was drawn to harness the potential of these rivers for providing assured irrigation, power generation and flood control. Projects on the Bhakra and Beas form the major part of the plan, and were established as a joint-venture of the erstwhile states of Punjab and Rajasthan.

Later, Bhakra Management Board (BMB) was constituted and the administration, maintenance and operation of Bhakra Nangal Project were handed over to Bhakra Management Board. The Beas Project Works, on completion, were transferred by Government of India from Beas Construction Board (BCB) to Bhakra Management Board later renamed as Bhakra Beas Management Board. Since then, the Bhakra Beas Management Board is dedicated to the service of nation and is engaged in regulation of the supply of Water & Power from Bhakra Nangal and Beas Projects to the states of Punjab, Haryana, Rajasthan, Himachal Pradesh, Delhi and Chandigarh. BBMB regulates supply of water from Satluj, Ravi and Beas to the States

of Punjab, Haryana and Rajasthan and supply power generated from Bhakra-Nangal and Beas Projects. Under the National Hydrology Project, in total 24 gauge and discharge sites on River Beas, tributaries of Beas, River Satluj, tributaries of Satluj, and River Ravi will be installed by the BBMB. Hence, 72 Cross-sections (3 cross-section per site) 1 upstream, 1 downstream & 1 at the gauge-discharge site are proposed, which are located in the states of Punjab and Himachal. The locations are shown in the figure and the table below.

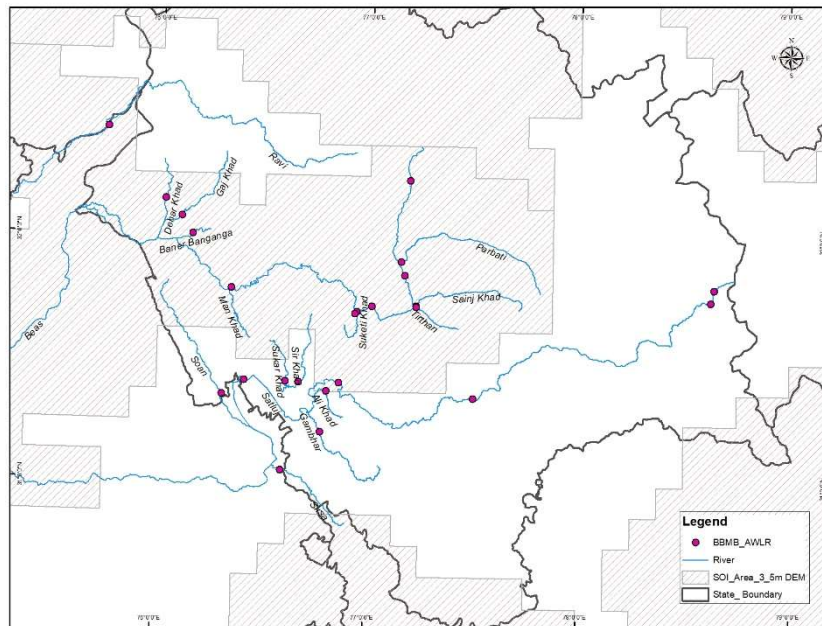


Figure 5 : Map showing the locations of cross sections under the BBMB

Summary table for the cross sections under the BBMB

Sl_No	Station	Width of CS (Metre)	No. of CS	State	Basin	Latitude (N)	Longitude (E)	Type of station
1	Bhunter (Beas)	147.74	3	Himachal Pradesh	G&D station on Beas River	31.851	77.170	AWLR (New 35
2	Manali	158.78	3	Himachal Pradesh	G&D station on Beas River	32.234	77.188	AWLR (Radar)
3	Pandoh (seogi)	120.26	3	Himachal Pradesh	G&D station on Beas River	31.723	77.015	AWLR (New 35
4	Mandi	150.21	3	Himachal Pradesh	G&D station on Beas River	31.701	76.944	AWLR (Radar)
5	Nadaun	414.84	3	Himachal Pradesh	G&D station on Beas River	31.789	76.347	AWLR (Radar)
6	Bhunter on Parvati River	75.33	3	Himachal Pradesh	G&D station on Tributary of Beas River	31.905	77.153	AWLR (Bubbler)
7	Sainj	70.21	3	Himachal Pradesh	G&D station on Tributary of Beas River	31.727	77.226	AWLR (Radar)
8	Tirthan	55.90	3	Himachal Pradesh	G&D station on Tributary of Beas River	31.723	77.227	AWLR (Bubbler)

Sl_ No	Station	Width of CS (Metre)	No. of CS	State	Basin	Latitude (N)	Longitude (E)	Type of station
9	Juni	127.15	3	Himachal Pradesh	G&D station on Tributary of Beas River	31.411	76.864	AWLR (New 70 meter radar)
10	Sukheti	99.40	3	Himachal Pradesh	G&D station on Tributary of Beas River	31.692	76.936	AWLR (Radar)
11	Jawali	299.01	3	Himachal Pradesh	G&D station on Tributary of Beas River	32.147	76.024	AWLR (Radar)
12	Guler	142.62	3	Himachal Pradesh	G&D station on Tributary of Beas River	32.076	76.103	AWLR (Radar)
13	Nagrota Surian	178.98	3	Himachal Pradesh	G&D station on Tributary of Beas River	32.006	76.156	AWLR (Radar)
14	Khab	247.72	3	Himachal Pradesh	G&D station on Satluj River	31.804	78.643	AWLR (Radar)
15	Rampur	135.52	3	Himachal Pradesh	G&D station on Satluj River	31.354	77.501	AWLR (New 35
16	Olinda	180.63	3	Himachal Pradesh	G&D station on Satluj River	31.414	76.415	AWLR (Radar)
17	Leo	90.69	3	Himachal Pradesh	G&D station on Satluj River	31.753	78.627	AWLR (New 120
18	Kuddi	56.79	3	Himachal Pradesh	G&D station on Tributary of Satluj River	31.376	76.805	AWLR (Radar)
19	Kahu	80.03	3	Himachal Pradesh	G&D station on Tributary of Satluj River	31.209	76.779	AWLR (Bubbler)
20	Nihan	88.00	3	Himachal Pradesh	G&D station on Tributary of Satluj River	31.410	76.673	AWLR (Radar)
21	Ballu Raina	123.05	3	Himachal Pradesh	G&D station on Tributary of Satluj River	31.413	76.611	AWLR (Radar)
22	D/s Thein Dam (Gammon	188.57	3	Punjab	G&D station on Ravi River	32.434	75.743	AWLR (Radar)
23	Sirsa Khad	35.85	3	Punjab	G&D station on Tributary of Satluj River	31.050	76.596	AWLR (Radar)
24	Swan Khad	457.51	3	Punjab	G&D station on Tributary of Satluj River	31.357	76.310	AWLR (Radar)
	Total	3724.79	72					

By the width of the cross sections, the cross sections can be classified into:

Range	CS No.
0-250	63
251-500	9
Total	72

1. Project Objectives

This river cross section data obtained through the current assignment will enable flood inundation modeling and planning drainage management in the flood-prone areas of the basin which would help in improved flood hazard mapping, flood risk management and other planning purposes, to be achieved through the application of mathematical (hydraulic) modelling. The objective of this assignment is to collect precise level data at close intervals across the selected river reaches and the associated embankments for creating precise river cross sections from countryside Natural Surface Levels (NSL) on one bank to countryside NSL on the other bank including channel bed profile. This has to be done for all embankments and associated structures within the river basins mentioned. This will provide latest data on river channel, embankment, disposition of associated structures etc. in a strip pattern which will become an integral part of the flood modeling systems for scientifically supporting flood management functions in the states, including generation of necessary alerts/ warning system for the people, maintenance of existing embankments, planning of new embankments in unprotected vulnerable areas, river training and flood fighting works, if required. It will also support the strengthening of national and sub-national water information centres with web-enabled WRIS (Water Resources Information System).

The DEM, after rectification with the observed cross section data, can be readily used for carrying out flood modelling exercises. Along with observed rainfall and discharge information, the flood model can be used for flood forecasting. Maps and details of all primary and secondary Bench Marks established during survey work along with photographs, address details and Geo co-ordinates of each photograph have to be provided. This uniform distribution of pre-checked and established benchmark will also help in keeping closing errors under control.

Standardized WRIS will enable stakeholders to make comprehensive, timely, and integrated water resources information available to decision makers for effective planning, decision making, and operations.

The project work would deliver:-

2. Reports and Deliverables

The activities described earlier and the outputs described below for each lot shall be

completed within a period of Eighteen months. Key reporting requirements have already been mentioned under the section on price schedule and **has been repeated here:**

Reports	Covering	Time /Month
Survey Planning Report	including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc; iii) diagrams of the proposed survey area and cross-sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract .	At the end of first month

	vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001	
Report on sample processed survey data	Report and delivery of sample data for at least 10% of the cross sections in a lot including related office and field observation data for evaluation and acceptance	By third month.
Post-Survey Report	<p>i) Survey report documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody.</p> <p>ii) Ground control report that includes, at a minimum, all pertinent base station information and mission notes, including information on additional control station monument names and stability.</p>	Progress report in first week of every month after start of survey, and final survey completion report by end of thirteen month

Product Delivery Report	Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. Also report on generation of supplementary cross-sections from LiDAR DEM.	by 15 th month
Final consolidated Project Completion Report	including all previous reports, comments by TAC and Contractor response and actions taken,	By 18 th month

3. Monitoring and administration of the contract

For monitoring the progress of the work and ensuring its satisfactory conduct, a monitoring committee will be constituted by induction of members from the Survey of India as well as the concerned implementing agency of the state (i.e., the Irrigation & Water Resources Department, Uttar Pradesh, the Irrigation & Waterways Department, Government of West Bengal and the Bhakra Beas Management Board, as applicable). The committee will have the responsibility to review the progress and ensure that the quality of works as related to its suitability for hydraulic modelling to be carried out at a subsequent stage are up to the satisfactory level, and recommend the release of payment at each stage.

Description of Services

General guidelines/ requirement for surveying the CS

Refer Appendix A

Part III – Conditions of Contract and Contract Forms

Section VI. General Conditions of Contract

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Section V. General Conditions of Contract

A. General Provisions

1.1 Definitions

Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

- (a) The Adjudicator is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in Sub-Clause 8.2 hereunder.
- (b) “Activity Schedule” is the priced and completed list of items of Services to be performed by the Service Provider forming part of his Bid;
- (c) “Bank” means the International Bank for Reconstruction and Development, Washington, D.C., U.S.A.;

or

- (c) “Association” means the International Development Association, Washington, D.C., U.S.A.;
- (d) “Completion Date” means the date of completion of the Services by the Service Provider as certified by the Employer
- (e) “Contract” means the Contract signed by the Parties, to which these General Conditions of Contract (GCC) are attached, together with all the documents listed in Clause 1 of such signed Contract;
- (f) “Contract Price” means the price to be paid for the performance of the Services, in accordance with Clause 6;
- (g) “Dayworks” means varied work inputs subject to payment on a time basis for the Service Provider’s employees and equipment, in addition to payments for associated materials and administration.
- (h) “Employer” means the party who employs the Service Provider
- (i) “Foreign Currency” means any currency other than the currency of the country of the Employer;
- (j) “GCC” means these General Conditions of Contract;
- (k) “Government” means the Government of the Employer’s country;
- (l) “Local Currency” means the currency of the country of the

Employer;

- (m) “Member,” in case the Service Provider consist of a joint venture of more than one entity, means any of these entities; “Members” means all these entities, and “Member in Charge” means the entity specified in the SC to act on their behalf in exercising all the Service Provider’ rights and obligations towards the Employer under this Contract;
- (n) “Party” means the Employer or the Service Provider, as the case may be, and “Parties” means both of them;
- (o) “Personnel” means persons hired by the Service Provider or by any Subcontractor as employees and assigned to the performance of the Services or any part there of;
- (p) “Service Provider” is a person or corporate body whose Bid to provide the Services has been accepted by the Employer;
- (q) “Service Provider’s Bid” means the completed bidding document submitted by the Service Provider to the Employer
- (r) “SCC” means the Special Conditions of Contract by which the GCC may be amended or supplemented;
- (s) “Specifications” means the specifications of the service included in the bidding document submitted by the Service Provider to the Employer
- (t) “Services” means the work to be performed by the Service Provider pursuant to this Contract, as described in Appendix A; and in the Specifications and Schedule of Activities included in the Service Provider’s Bid.
- (u) “Subcontractor” means any entity to which the Service Provider subcontracts any part of the Services in accordance with the provisions of Sub-Clauses 3.5 and 4.

1.2 Applicable Law The Contract shall be interpreted in accordance with the laws of the Employer’s country, unless otherwise **specified in the Special Conditions of Contract (SCC).**

1.3 Language This Contract has been executed in the language **specified in the SCC**, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

1.4 Notices Any notice, request, or consent made pursuant to this Contract shall be in writing and shall be deemed to have been made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent by registered mail, telex,

telegram, or facsimile to such Party at the address **specified in the SCC.**

1.5 Location

The Services shall be performed at such locations as are specified in Appendix A, in the specifications and, where the location of a particular task is not so specified, at such locations, whether in the Government's country or elsewhere, as the Employer may approve.

1.6 Authorized Representatives

Any action required or permitted to be taken, and any document required or permitted to be executed, under this Contract by the Employer or the Service Provider may be taken or executed by the officials **specified in the SCC.**

1.7 Inspection and Audit by the Bank

The Service Provider shall permit the Bank to inspect its accounts and records relating to the performance of the Services and to have them audited by auditors appointed by the Bank, if so required by the Bank.

1.8 Taxes and Duties

The Service Provider, Subcontractors, and their Personnel shall pay such taxes, duties, fees, and other impositions as may be levied under the Applicable Law, the amount of which is deemed to have been included in the Contract Price.

2. Commencement, Completion, Modification, and Termination of Contract

2.1 Effectiveness of Contract

This Contract shall come into effect on the date the Contract is signed by both parties or such other later date as may be **stated in the SCC.**

2.2 Commencement of Services

2.2.1 Program

Before commencement of the Services, the Service Provider shall submit to the Employer for approval a Program showing the general methods, arrangements, order and timing for all activities. The Services shall be carried out in accordance with the approved Program as updated.

2.2.2 Starting Date

The Service Provider shall start carrying out the Services thirty (30) days after the date the Contract becomes effective, or at such other date as may be **specified in the SCC.**

2.3 Intended Completion Date

Unless terminated earlier pursuant to Sub-Clause 2.6, the Service Provider shall complete the activities by the Intended Completion Date, as is **specified in the SCC.** If the Service Provider does not complete the activities by the Intended Completion Date, it shall be liable to pay liquidated damage as per Sub-Clause 3.8. In this case,

the Completion Date will be the date of completion of all activities.

2.4 Modification

Modification of the terms and conditions of this Contract, including any modification of the scope of the Services or of the Contract Price, may only be made by written agreement between the Parties and shall not be effective until the consent of the Bank or of the Association, as the case may be, has been obtained.

2.5 Force Majeure

2.5.1 Definition

For the purposes of this Contract, “Force Majeure” means an event which is beyond the reasonable control of a Party and which makes a Party’s performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances.

2.5.2 No Breach of Contract

The failure of a Party to fulfill any of its obligations under the contract shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the Party affected by such an event (a) has taken all reasonable precautions, due care and reasonable alternative measures in order to carry out the terms and conditions of this Contract, and (b) has informed the other Party as soon as possible about the occurrence of such an event.

2.5.3 Extension of Time

Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

2.5.4 Payments

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Service Provider shall be entitled to continue to be paid under the terms of this Contract, as well as to be reimbursed for additional costs reasonably and necessarily incurred by them during such period for the purposes of the Services and in reactivating the Service after the end of such period.

2.6 Termination

2.6.1 By the Employer

The Employer may terminate this Contract, by not less than thirty (30) days’ written notice of termination to the Service Provider, to be given after the occurrence of any of the events specified in paragraphs (a) through (d) of this Sub-Clause 2.6.1:

- (a) if the Service Provider does not remedy a failure in the performance of its obligations under the Contract, within thirty (30) days after being notified or within any further period as the Employer may have subsequently approved in

writing;

- (b) if the Service Provider become insolvent or bankrupt;
- (c) if, as the result of Force Majeure, the Service Provider is unable to perform a material portion of the Services for a period of not less than sixty (60) days; or
- (d) if the Service Provider, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purposes of this Sub-Clause:

- (i) “corrupt practice”⁷ is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- (ii) “fraudulent practice”⁸ is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (iii) “collusive practice”⁹ is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) “coercive practice”¹⁰ is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) “obstructive practice” is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt,

⁷ For the purpose of this Contract, “another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

⁸ For the purpose of this Contract, “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

⁹ For the purpose of this Contract, “parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, noncompetitive levels.

¹⁰ For the purpose of this Contract, “party” refers to a participant in the procurement process or contract execution.

fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

(bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under para. 1.14 (e) of the Bank's Procurement Guidelines.

2.6.2 By the Service Provider

The Service Provider may terminate this Contract, by not less than thirty (30) days' written notice to the Employer, such notice to be given after the occurrence of any of the events specified in paragraphs (a) and (b) of this Sub-Clause 2.6.2:

- (a) if the Employer fails to pay any monies due to the Service Provider pursuant to this Contract and not subject to dispute pursuant to Clause 7 within forty-five (45) days after receiving written notice from the Service Provider that such payment is overdue; or
- (b) if, as the result of Force Majeure, the Service Provider is unable to perform a material portion of the Services for a period of not less than sixty (60) days.

2.6.3 Suspension of Loan or Credit

In the event that the World Bank suspends the loan or Credit to the Employer, from which part of the payments to the Service Provider are being made:

- (a) The Employer is obligated to notify the Service Provider of such suspension within 7 days of having received the World Bank's suspension notice.
- (b) If the Service Provider has not received sums due to by the due date stated in the SCC in accordance with Sub-Clause 6.5 the Service Provider may immediately issue a 14 day termination notice.

2.6.4 Payment upon Termination

Upon termination of this Contract pursuant to Sub-Clauses 2.6.1 or 2.6.2, the Employer shall make the following payments to the Service Provider:

- (a) remuneration pursuant to Clause 6 for Services satisfactorily performed prior to the effective date of termination;
- (b) except in the case of termination pursuant to paragraphs (a), (b), (d) of Sub-Clause 2.6.1, reimbursement of any reasonable cost incident to the prompt and orderly termination of the

Contract, including the cost of the return travel of the Personnel.

3. Obligations of the Service Provider

3.1 General

The Service Provider shall perform the Services in accordance with the Specifications and the Activity Schedule, and carry out its obligations with all due diligence, efficiency, and economy, in accordance with generally accepted professional techniques and practices, and shall observe sound management practices, and employ appropriate advanced technology and safe methods. The Service Provider shall always act, in respect of any matter relating to this Contract or to the Services, as faithful adviser to the Employer, and shall at all times support and safeguard the Employer's legitimate interests in any dealings with Subcontractors or third parties.

3.2 Conflict of Interests

3.2.1 Service Provider Not to Benefit from Commissions and Discounts.

The remuneration of the Service Provider pursuant to Clause 6 shall constitute the Service Provider's sole remuneration in connection with this Contract or the Services, and the Service Provider shall not accept for their own benefit any trade commission, discount, or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations under the Contract, and the Service Provider shall use their best efforts to ensure that the Personnel, any Subcontractors, and agents of either of them similarly shall not receive any such additional remuneration.

3.2.2 Service Provider and Affiliates Not to be Otherwise Interested in Project

The Service Provider agree that, during the term of this Contract and after its termination, the Service Provider and its affiliates, as well as any Subcontractor and any of its affiliates, shall be disqualified from providing goods, works, or Services (other than the Services and any continuation thereof) for any project resulting from or closely related to the Services.

3.2.3 Prohibition of Conflicting Activities

Neither the Service Provider nor its Subcontractors nor the Personnel shall engage, either directly or indirectly, in any of the following activities:

- (a) during the term of this Contract, any business or professional activities in the Government's country which would conflict

with the activities assigned to them under this Contract;

- (b) during the term of this Contract, neither the Service Provider nor their Subcontractors shall hire public employees in active duty or on any type of leave, to perform any activity under this Contract;
- (c) after the termination of this Contract, such other activities as may be **specified in the SCC**.

3.3 Confidentiality

The Service Provider, its Subcontractors, and the Personnel of either of them shall not, either during the term or within two (2) years after the expiration of this Contract, disclose any proprietary or confidential information relating to the Project, the Services, this Contract, or the Employer's business or operations without the prior written consent of the Employer.

3.4 Insurance to be Taken Out by the Service Provider

The Service Provider (a) shall take out and maintain, and shall cause any Subcontractors to take out and maintain, at its (or the Subcontractors', as the case may be) own cost but on terms and conditions approved by the Employer, insurance against the risks, and for the coverage, as shall be **specified in the SCC**; and (b) at the Employer's request, shall provide evidence to the Employer showing that such insurance has been taken out and maintained and that the current premiums have been paid.

3.5 Service Provider's Actions Requiring Employer's Prior Approval

The Service Provider shall obtain the Employer's prior approval in writing before taking any of the following actions:

- (a) entering into a subcontract for the performance of any part of the Services,
- (b) appointing such members of the Personnel not listed by name in Appendix C ("Key Personnel and Subcontractors"),
- (c) changing the Program of activities; and
- (d) any other action that may be **specified in the SCC**.

3.6 Reporting Obligations

The Service Provider shall submit to the Employer the reports and documents specified in Appendix B in the form, in the numbers, and within the periods set forth in the said Appendix.

3.7 Documents Prepared by the Service Provider to Be the Property of the Employer

All plans, drawings, specifications, designs, reports, and other documents and software submitted by the Service Provider in accordance with Sub-Clause 3.6 shall become and remain the property of the Employer, and the Service Provider shall, not later than upon termination or expiration of this Contract, deliver all such documents and software to the Employer, together with a

detailed inventory thereof. The Service Provider may retain a copy of such documents and software. Restrictions about the future use of these documents, if any, shall be **specified in the SCC**.

3.8 Liquidated Damages

3.8.1 Payments of Liquidated Damages The Service Provider shall pay liquidated damages to the Employer at the rate per day **stated in the SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the SCC**. The Employer may deduct liquidated damages from payments due to the Service Provider. Payment of liquidated damages shall not affect the Service Provider's liabilities.

3.8.2 Correction for Over-payment If the Intended Completion Date is extended after liquidated damages have been paid, the Employer shall correct any overpayment of liquidated damages by the Service Provider by adjusting the next payment certificate. The Service Provider shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in Sub-Clause 6.5.

3.8.3 Lack of performance penalty If the Service Provider has not corrected a Defect within the time specified in the Employer's notice, a penalty for Lack of performance will be paid by the Service Provider. The amount to be paid will be calculated as a percentage of the cost of having the Defect corrected, assessed as described in Sub-Clause 7.2 and **specified in the SCC**.

3.9 Performance Security The Service Provider shall provide the Performance Security to the Employer no later than the date specified in the Letter of acceptance. The Performance Security shall be issued in an amount and form and by a bank or surety acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The performance Security shall be valid until a date 28 days from the Completion Date of the Contract in case of a bank guarantee, and until one year from the Completion Date of the Contract in the case of a Performance Bond.

4. Service Provider's Personnel

4.1 Description of Personnel The titles, agreed job descriptions, minimum qualifications, and estimated periods of engagement in the carrying out of the Services of the Service Provider's Key Personnel are described in Appendix C. The Key Personnel and Subcontractors listed by title as well as

by name in Appendix C are hereby approved by the Employer.

4.2 Removal and/or Replacement of Personnel

- (a) Except as the Employer may otherwise agree, no changes shall be made in the Key Personnel. If, for any reason beyond the reasonable control of the Service Provider, it becomes necessary to replace any of the Key Personnel, the Service Provider shall provide as a replacement a person of equivalent or better qualifications.
- (b) If the Employer finds that any of the Personnel have (i) committed serious misconduct or have been charged with having committed a criminal action, or (ii) have reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Service Provider shall, at the Employer's written request specifying the grounds thereof, provide as a replacement a person with qualifications and experience acceptable to the Employer.
- (c) The Service Provider shall have no claim for additional costs arising out of or incidental to any removal and/or replacement of Personnel.

5. Obligations of the Employer

5.1 Assistance and Exemptions

The Employer shall use its best efforts to ensure that the Government shall provide the Service Provider such assistance and exemptions as specified in the SCC.

5.2 Change in the Applicable Law

If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost of the Services rendered by the Service Provider, then the remuneration and reimbursable expenses otherwise payable to the Service Provider under this Contract shall be increased or decreased accordingly by agreement between the Parties, and corresponding adjustments shall be made to the amounts referred to in Sub-Clauses 6.2 (a) or (b), as the case may be.

5.3 Services and Facilities

The Employer shall make available to the Service Provider the Services and Facilities listed under Appendix F.

6. Payments to the Service Provider

6.1 Lump-Sum Remuneration

The Service Provider's remuneration shall not exceed the Contract Price and shall be a fixed lump-sum including all Subcontractors' costs, and all other costs incurred by the Service Provider in carrying out the Services described in Appendix A. Except as provided in Sub-Clause 5.2, the Contract Price may only be increased above the

amounts stated in Sub-Clause 6.2 if the Parties have agreed to additional payments in accordance with Sub-Clauses 2.4 and 6.3.

6.2 Contract Price (a) The price payable in local currency is **set forth in the SCC.**

(b) **The price payable in foreign currency is set forth in the SCC.**

6.3 Payment for Additional Services, and Performance Incentive Compensation For the purpose of determining the remuneration due for additional Services as may be agreed under Sub-Clause 2.4, a breakdown of the lump-sum price is provided in Appendices D and E.

If the SCC so specify, the service provider shall be paid performance incentive compensation as set out in the Performance Incentive Compensation appendix.

6.4 Terms and Conditions of Payment Payments will be made to the Service Provider according to the payment schedule **stated in the SCC. Unless otherwise stated in the SCC,** the advance payment (Advance for Mobilization, Materials and Supplies) shall be made against the provision by the Service Provider of a bank guarantee for the same amount, and shall be valid for the period **stated in the SCC.** Any other payment shall be made after the conditions **listed in the SCC** for such payment have been met, and the Service Provider have submitted an invoice to the Employer specifying the amount due. The calculations for payment will be made as per actual number and width of cross sections surveyed and the rates agreed upon in the contract for the different categories of widths.

6.5 Interest on Delayed Payments If the Employer has delayed payments beyond fifteen (15) days after the due date stated in the SCC, interest shall be paid to the Service Provider for each day of delay at the rate stated in the SCC.

6.6 Price Adjustment 6.6.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC.** If so provided, the amounts certified in each payment certificate, after deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency:

$$P_c = A_c + B_c L_{mc}/L_{oc} + C_c I_{mc}/I_{oc}$$

Where:

P_c is the adjustment factor for the portion of the Contract Price payable in a specific currency “c”.

A_c , B_c and C_c are coefficients specified in the SCC, representing: A_c the nonadjustable portion; B_c the adjustable portion relative to labor costs and C_c the adjustable portion for other inputs, of the Contract Price payable in that specific currency “c”; and

Lmc is the index prevailing at the first day of the month of the corresponding invoice date and Loc is the index prevailing 28 days before Bid opening for labor; both in the specific currency “c”.

Imc is the index prevailing at the first day of the month of the corresponding invoice date and Ioc is the index prevailing 28 days before Bid opening for other inputs payable; both in the specific currency “c”.

If a price adjustment factor is applied to payments made in a currency other than the currency of the source of the index for a particular indexed input, a correction factor Z_o/Z_n will be applied to the respective component factor of pn for the formula of the relevant currency. Z_o is the number of units of currency of the country of the index, equivalent to one unit of the currency payment on the date of the base index, and Z_n is the corresponding number of such currency units on the date of the current index.

- 6.6.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.

6.7 Dayworks If applicable, the Daywork rates in the Service Provider’s Bid shall be used for small additional amounts of Services only when the Employer has given written instructions in advance for additional services to be paid in that way.

All work to be paid for as Dayworks shall be recorded by the Service Provider on forms approved by the Employer. Each completed form shall be verified and signed by the Employer representative as indicated in Sub-Clause 1.6 within two days of the Services being performed.

The Service Provider shall be paid for Dayworks subject to obtaining signed Dayworks forms as indicated in Sub-Clause

6.7.2

7. Quality Control

7.1 Identifying Defects

The principle and modalities of Inspection of the Services by the Employer shall be as **indicated in the SCC**. The Employer shall check the Service Provider’s performance and notify him of any Defects that are found. Such checking shall not affect the Service

Provider's responsibilities. The Employer may instruct the Service Provider to search for a Defect and to uncover and test any service that the Employer considers may have a Defect. Defect Liability Period is as **defined in the SCC**.

7.2 Correction of Defects, and Lack of Performance Penalty

- (a) The Employer shall give notice to the Service Provider of any Defects before the end of the Contract. The Defects liability period shall be extended for as long as Defects remain to be corrected.
- (b) Every time notice a Defect is given, the Service Provider shall correct the notified Defect within the length of time specified by the Employer's notice.
- (c) If the Service Provider has not corrected a Defect within the time specified in the Employer's notice, the Employer will assess the cost of having the Defect corrected, the Service Provider will pay this amount, and a Penalty for Lack of Performance calculated as described in Sub-Clause 3.8.

8. Settlement of Disputes

8.1 Amicable Settlement

The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or its interpretation.

8.2 Dispute Settlement

If any dispute arises between the Employer and the Service Provider in connection with, or arising out of, the Contract or the provision of the Services, whether during carrying out the Services or after their completion, the matter shall be referred to the Adjudicator within 14 days of the notification of disagreement of one party to the other.

The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

The Adjudicator shall be paid by the hour at the rate **specified in the BDS and SCC**, together with reimbursable expenses of the types **specified in the SCC**, and the cost shall be divided equally between the Employer and the Service Provider, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision will be final and binding.

The arbitration shall be conducted in accordance with the arbitration procedure published by the institution and in

the place **shown in the SCC**.

- 8.2.5 Should the Adjudicator resign or die, or should the Employer and the Service Provider agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator will be jointly appointed by the Employer and the Service Provider. In case of disagreement between the Employer and the Service Provider, within 30 days, the Adjudicator shall be designated by the Appointing Authority **designated in the SCC** at the request of either party, within 14 days of receipt of such request.

Section VII. Special Conditions of Contract

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
1.1	The words “in the Government’s country” are amended to read “in <i>Government of India</i> ”.
1.1(a)	The Adjudicator is Shri Mahatma Prasad Bhartari, Retd. Chief Engineer and Technical Advisor to Ministry of Energy Govt, of Uttarakhand.
1.1(e)	The contract name is Bathymetry survey in River cross section
1.1(h)	<p>The Employer is : <i>Project Director, NHP</i></p> <p>Address: <i>NGDC, Survey Of India, Block No. 6, Hathibarkala Estate</i></p> <p>Post Box: <i>200</i></p> <p>City: <i>Dehradun</i></p>
1.1(m)	The Member in Charge is <i>not applicable</i>
1.1(p)	The Service Provider is _____
1.2	The Applicable Law is: Laws of Union of India.
1.3	The language is <i>English</i>
1.4	<p>The addresses are:</p> <p>Employer: <i>NGDC, Survey Of India, Block No. 6, Hathibarkala Estate</i></p> <p>Post Box: <i>200</i></p> <p>City: <i>Dehradun</i></p> <p>Attention:</p> <p>Telex: <i>+91-135-2747623</i></p> <p>Facsimile: <i>+91-135-2747623</i></p> <p>E-mail <i>pd.nhp.soi@gov.in</i></p>

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
1.6	<p>The Authorized Representatives are:</p> <p>For the Employer: <i>Project Director, NHP</i></p> <p>For the Service Provider: _____</p>
2.1	<p>The date on which this Contract shall come into effect is <i>the date of signing of the contract by both the parties.</i></p>
2.2.2	<p>The Starting Date for the commencement of Services is 01st November 2020.</p>
2.3	<p>The Intended Completion Date is Eighteen months from date of signing of Contract</p>
2.4	<p>Replace Clause GCC 2.4 with the following:</p> <p>Modification of the terms and conditions of this Contract, including any modification of the scope of the Services or of the Contract Price, may only be made by written agreement between the Parties and shall not be effective until the consent of the Bank or of the Association, as the case may be, has been obtained. The Contract Amount will be varied by no more than 15% of the Original Amount.</p>
3.2.3	<p>Activities prohibited after termination of this Contract are: Use or transmit in any form of maps/data supplied by employer or data/services provided by the contractor/service provider to the employer. The Service Provider will not use, transfer, propagate any of the deliverables, information etc.____</p>
3.4	<p>The risks and coverage by insurance shall be:</p> <ul style="list-style-type: none"> (i) Third Party motor vehicle <i>in accordance with the applicable law in India</i>; (ii) Third Party liability <i>in accordance with the applicable law in India</i>; (iii) Employer's liability and workers' compensation <i>in accordance with the applicable law in India</i>; (iv) Professional liability INR 3.5 Million for each lot (v) Loss or damage to equipment and property INR 2.0 Million for each lot
3.5(d)	<p>The other actions are: <i>None</i></p>
3.7	<p>Restrictions on the use of documents prepared by the Service Provider are:</p> <p>As per Clause 3.2.3</p>

3.8.1	The liquidated damages rate is as specified below: -				
	Milestone	Deliverables	Time period	Liquidated Damages	

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract for Lot 1 to 4			
	1	Final deliverables of 10% of the cross Sections in the lot	Within 4 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	2	Final deliverables of 30% of the cross Sections in the lot	Within 7 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	3	Final deliverables of 50% of the cross Sections in the lot	Within 10 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	4	Final deliverables of 70% of the cross Sections in the lot	Within 13 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	5	Final deliverables of 90% of the cross Sections in the lot	Within 16 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	6	Final deliverables of 100% of the cross Sections in the lot	Within 18 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	The maximum amount of liquidated damages for the whole contract is 10 percent of the final Contract Price.			
	Amendments of, and Supplements to, Clauses in the General Conditions of Contract for the rivers under Lot 5			
	1	Final deliverables of 10% of the cross Sections in the lot	Within 3 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.

	2	Final deliverables of 50% of the cross Sections in the lot	Within 4 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
	3	Final deliverables of 100% of the cross Sections in the lot	Within 8 months from the award of contract	0.05% per day of the delayed services calculated on pro rata basis.
3.8.3	The percentage [of the cost of having a Defect corrected] to be used for the calculation of Lack of performance Penalty(ies) is 0.5%. <i>The Defects Liability Period is 10 days.</i>			
5.1	The assistance and exemptions provided to the Service Provider are: <i>Not Applicable.</i>			
6.2(a)	The amount in local currency is <i>Indian Rupees</i>			
6.2(b)	The amount in foreign currency or currencies is <i>Not Applicable</i>			

Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
6.3.2	The performance incentive paid to the Service Provider shall be: not Applicable.
6.4	<p><u>The payments would be made for actual number and extent of cross sections surveyed based on the rates agreed upon in the contract. The committee for contract monitoring and administration comprising members from the Survey of India and the respective implementing agency will approve the number, location and extent of the cross sections to be covered in the assignment, presented in the reconnaissance survey report. They will also recommend any amendment to the contract which may be necessitated due to the outcome of this exercise. This is to ensure the sufficiency of the outputs of this assignment for the hydraulic modelling to be taken up at a subsequent stage. This committee will also be responsible for periodic monitoring of progress and assuring the quality and suitability of work for the purpose mentioned, and recommend the payments at each stage.</u></p> <p>Payments shall be made according to the following schedule:</p> <p>Advance for Mobilization, Materials and Supplies: 10 percent of the Contract Price shall be paid on the commencement date against the submission of a bank guarantee for the same. subject to Submission and acceptance of Project Planning Report, including</p> <ul style="list-style-type: none"> • Details of Hardware, other infrastructure being mobilised with their specification and quantity • Details of the work methodology, relevant technical data, data processing regular reporting and monitoring mechanism etc; • Diagrams of the proposed survey locations • Description of the processes to produce the specified data products and how the specified accuracies will be met, • Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from effective contract date, • A Quality Assurance Plan that conforms to standard practices and generally complies with ISO9001. • Progress payments for the river cross section survey works From Lot 1 to 4 in accordance with the milestones established as follows, subject to certification by the Employer, that the Services have been rendered satisfactorily, pursuant to the performance indicators: <p>➤ 1st payment stage- 5% subject to submission and acceptance of final deliverables for 10% of the cross sections in the lot.</p> <p>➤ 2nd payment stage- 15% subject to submission and acceptance of final deliverables for 30% of the cross sections in the lot.</p> <p>➤ 3rd payment stage- 15% subject to submission and acceptance of final deliverables for 50% of the cross sections in the lot.</p> <p>➤ 4th payment stage- 15% subject to submission and acceptance of final deliverables for 70% of the cross sections in the lot.</p>

	<ul style="list-style-type: none"> ➤ 5th payment stage- 20% subject to submission and acceptance of final deliverables for 90% of the cross sections in the lot. ➤ 6th payment stage- rest 30% subject to submission and acceptance of final deliverables for 100% of the cross sections in the lot. Should the certification not be provided, or refused in writing by the employer within one month of the date of the milestone, or of the date of receipt of the corresponding invoice, the certification will be deemed to have been provided, and the progress payment will be released at such date. • Progress payments for the river cross section survey works for the rivers under the Lot 5 in accordance with the milestones established as follows, subject to certification by the Employer, that the Services have been rendered satisfactorily, pursuant to the performance indicators: ➤ 1st payment stage- 5% subject to submission and acceptance of final deliverables for 10% of the cross sections in the lot. ➤ 2nd payment stage- 30% subject to submission and acceptance of final deliverables for 50% of the cross sections in the lot. ➤ 3rd payment stage- rest 65% subject to submission and acceptance of final deliverables for 100% of the cross sections in the lot. Should the certification not be provided, or refused in writing by the employer within one month of the date of the milestone, or of the date of receipt of the corresponding invoice, the certification will be deemed to have been provided, and the progress payment will be released at such date.
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Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
	<ul style="list-style-type: none"> • The amortization of the Advance mentioned above for Lot 1 to 4 shall commence when the progress payments have reached 20% of the contract price and be completed when the progress payments have reached 75% as per schedule below: <ul style="list-style-type: none"> a. On 2nd payment Stage: 25% of the Advance payment b. On 3rd payment Stage: 25% of the Advance payment c. On 4th payment Stage: 25% of the Advance payment d. On 5th payment Stage: 25% of the Advance payment • The amortization of the Advance mentioned above for Lot 5 shall commence when the progress payments have reached 20% of the contract price and be completed when the progress payments have reached 75% as per schedule below: <ul style="list-style-type: none"> a. On 2nd payment Stage: 25% of the Advance payment b. On 3rd payment Stage: 75% of the Advance payment • The bank guarantee for the advance payment shall be released when the advance payment has been fully amortized. • “Payment of Local Taxes such as GST will be against valid Invoice as per GST ACT & Rules and submission of GST Registration Certificate along with declaration that GST Registration is valid and all liabilities towards GST have been discharged by the vendor. GST amount will be paid after 30 days of submission of valid Invoice and all required documents and declaration by vendor”.
6.5	<p>Payment shall be made within 45 days of receipt of the invoice and the relevant documents specified in Sub-Clause 6.4, and within 60 days in the case of the final payment.</p> <p>For local currency: The interest rate is 04%.</p> <p>For foreign currency: As per current LIBOR interest rate.</p>
6.6.1	Price adjustment is <i>not to be applied</i> in accordance with Sub-Clause 6.6.
7.1	<p>The principle and modalities of inspection of the Services by the Employer are as follows: <i>As per Appendix B and Quality Assurance/Quality Check in Section</i></p> <p>The Defects Liability Period is 10 days.</p>

8.2.3	The Adjudicator is Shri Mahatma Prasad Bhartari, Retd. Chief Engineer and Technical Advisor to Ministry of Energy Govt, of Uttarakhand, who will be paid according to rate governed by the Article 11 of “Arbitration and Conciliation (Amendment) Act, 2015”
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Number of GC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract
8.2.4	The arbitration procedures of UNCITRAL will be used for Foreign Bidders For Indian Bidders provisions of Arbitration and Conciliation Act 1996 amended up-to-date, will apply. Place of Arbitration proceedings shall be Dehradun
8.2.5	The designated Appointing Authority for a new Adjudicator is President, Institution of Engineers, New Delhi .

Appendices

Appendix A - Description of the Services

Description of Services

The survey will be managed and coordinated by Project Director, NHP, Survey of India's office, who will also monitor the survey progress, provide any field assistance required by the contractor, certify the survey data during progress and on delivery, and be part of the joint team to validate the survey products.

The scope of services include: (i) carry out reconnaissance survey to finalize exact location and extent of each cross section utilizing the services of an experienced hydraulic modeler, to ensure their suitability and sufficiency from the point of view of flood modelling (ii) prepare a survey plan along with selection and fixation of cross sections as well as additional Bench Marks, (iii) conduct survey of river cross section, (iv) conduct survey of embankment cross-section as part of the same, (v) validate survey products and certify compliance to specifications, (vi) deliver cross sectional data in standard GIS file format, Auto CAD file format and excel file format for integration in Flood inundation forecast model and create visualization and plots for verification by the department, (vii) Generate and deliver hard and soft copies of cross-sectional plots as per survey specifications, and (viii) submit a survey completion report.

It is expected that the contractor would be able to mobilize multiple parties to work in parallel to complete the work in eighteen months (18 months) for Uttar Pradesh and West Bengal and three months (3 months) for Himachal Pradesh. It is expected that the Contractor would be able to mobilize multiple parties to work in parallel to complete the work in twelve months.

1. General guidelines/ requirement for survey of the CS

- 1) Interval of CS: On a straight river reach, cross sections are proposed to be taken along the length of the river at 2 km interval in general. Apart from that, additional information should be collected from the following locations :-
 - Significant obstructions like, wherever there is a hydraulic structures (bridges/ dam/ barrages), river confluence , abrupt change(slope/ depth / width/ flood plain / roughness of the channel) , the cross section should be surveyed at closer intervals.
 - The details of all structural measures such as embankments, groynes, spurs may also be surveyed along with their shape files being provided separately.
 - All surveyed points within the cross-section should be Georeferenced
 - All the connected wetlands / Oxbow lakes may also be surveyed and their details should be fully Geo-referenced
 - Bank line should be clearly marked on the cross-section profile at every location
 - Wherever there is a braided river system, all the channels including

banks must be clearly marked on the cross-section map

- Generally cross section should span the island located within a channel. When the island is very large, the island should be separately surveyed to generate 0.5 m contours.
- Sections should be taken perpendicular to the direction of flow, but at no places cross sections should overlap each other

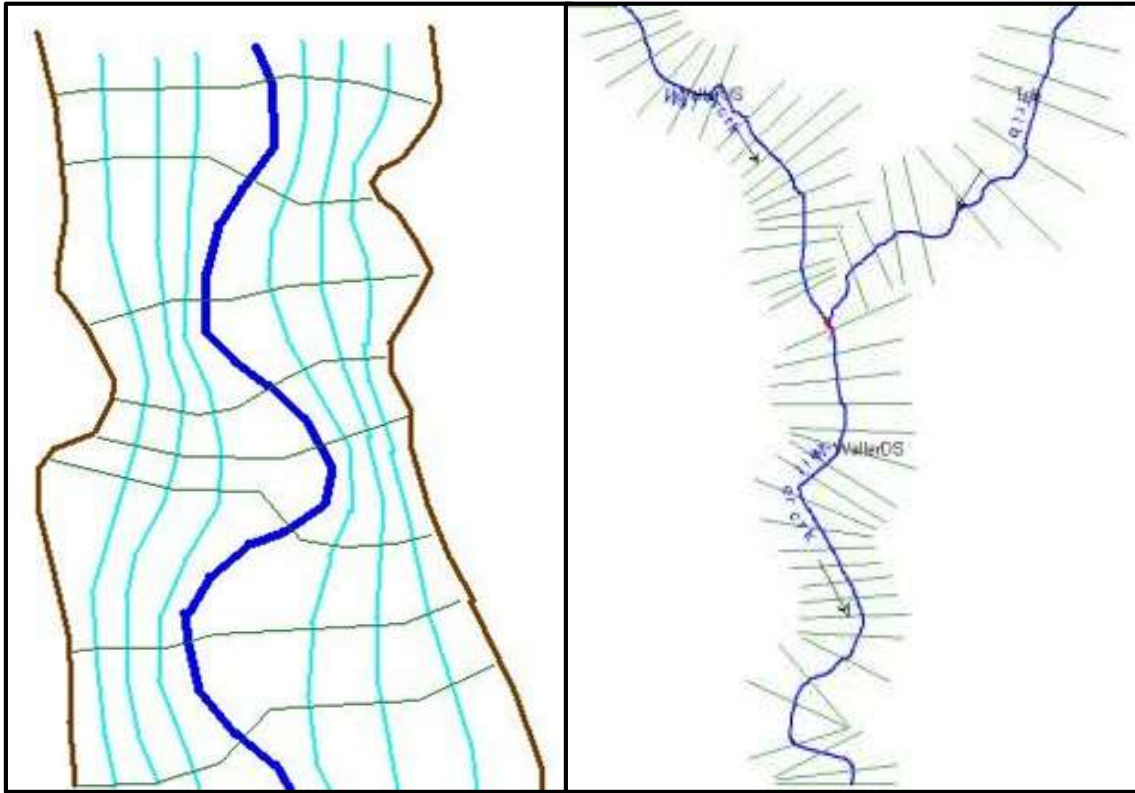


Figure showing the desired layout of cross sections (Source: web resources)

- Wherever there is a significant structure, clearly obstructing the channel, preferably 3 sections should be taken; one at upstream, one at downstream and one at structure (along the toe of abutment)
 - Cross section should be taken from Left to right, starting point being defined by looking at d/s
- 2) Since the Survey of India has already been entrusted to carry out preparation of high-resolution DEM under the NHP (1 m resolution with an accuracy of ± 0.5 m or less), consideration of the same has been made to arrive at the requirement for cross sections. Broadly cross section has been marked in the channel width carrying water (as per google image). But extension of CS beyond defined channel will be as mentioned hereafter.
- For the areas covered with DEM having a resolution of 1m (i.e., 0.5m accuracy), through NHP/NMCG,
 - the river cross section to be taken from left high bank to right high bank.

- For the areas where embankments exist, the river cross section survey needs to cover zones that extend to 50 m on the countryside from the embankments on either side of the river.
 - For the rest of the areas not covered by the DEM mentioned above, where there is no embankment, the CS should be extended up to 1-1.5m above HFL for the flat areas in Uttar Pradesh and West Bengal and 5 m for the hilly reaches of the rivers under the Bhakra Beas Management Board. HFL can be found from CWC, local PWD or another department. In the absence of such information, HFL can be found from local enquiry at bridge locations, either asking the locals or seeing the water mark and weed growth level at bridge piers or abutment.
 - For other areas, where the flood plain is not defined, the cross-section survey should cover zones between 500 m on the countryside on either side of the bank of the river
- 3) General guidelines for CS for hydraulic modelling say that CS should ensure that the entire width of the flood plain is covered, and should fully describe the area likely to be flooded under the 100 year flood. However, in the absence of 100 year flood data during survey, the following guide lines may be followed :-
- For other areas, where the flood plain is not defined, the cross-section survey should cover zones between 500 m on the countryside on either side of the bank of the river.
 - Preferably the Level should be taken at an interval @ 20 m along the country side and an interval @ 1/10 th of the width of channel in the river section. Distance between individual points on a cross section line should, in general, be less than 10m. Measurements are to be made at a sufficient number of points, so that the river bed profile is captured in detail. It should also include the elevation of the bank level and the water level for that day and capture the elevation wherever the ground / river bed changes abruptly, in order to get the correct river bed profile.
 - However, Thawleg (a line connecting the lowest points of successive cross-sections along the course of a valley or river.) must be captured to get longitudinal profile of river.

2.Guidelines/ requirement for survey of the CS under BBMB

- 1) Cross sections are proposed to be taken as: 1 at upstream, 1 at downstream and 1 at the location of the gauge site. Apart from that, additional specifications would be:-
- All surveyed points within the cross-section should be Georeferenced
 - Bank line should be clearly marked on the cross-section profile at every location
 - Wherever there is a braided river system, all the channels including banks must be clearly marked on the cross-section map
 - Sections should be taken perpendicular to the direction of flow, but at no places cross sections should overlap each other

- Cross section should be taken from Left to right, starting point being defined by looking at d/s

3.Detailed Tasks

A. Reconnaissance Survey

The locations and extent of river cross section survey has been prepared on the basis of desktop exercise using Google Earth images for the purpose. Owing to the limitation of non-uniform resolution and different dates of the images across the entire reach to be covered by the survey, it is possible that these may require some updates, based on practical conditions encountered at the field like the change in channel bed. The reconnaissance survey is required to finalize the exact location and extent of the river cross section survey to be carried out, access to that location to ensure that it is able to capture all the details required for successful inundation modelling based on these sections later.

N.B. This activity and the subsequent activity mentioned is envisaged to include the services of an experienced hydraulic modeler, to guide the definition of cross sections in terms of their direction and extent in a manner that these can be effectively utilized for one-dimensional (and later two-dimensional) flood modelling.

B. Survey Planning

- (i) Collection and compilation of existing data: Collect and compile available information on past river surveys, embankment surveys, etc.
- (ii) Preparation of survey plan: Prepare plan for conducting cross section survey on the basis of latest river configuration and embankment alignment mapped from latest satellite imagery available in the public domain and departmental maps, as well as reconnaissance survey. They should submit proposed plan in the form of a map as well as through a presentation, showing site location, reach represented, section width, etc. for approval by the client.

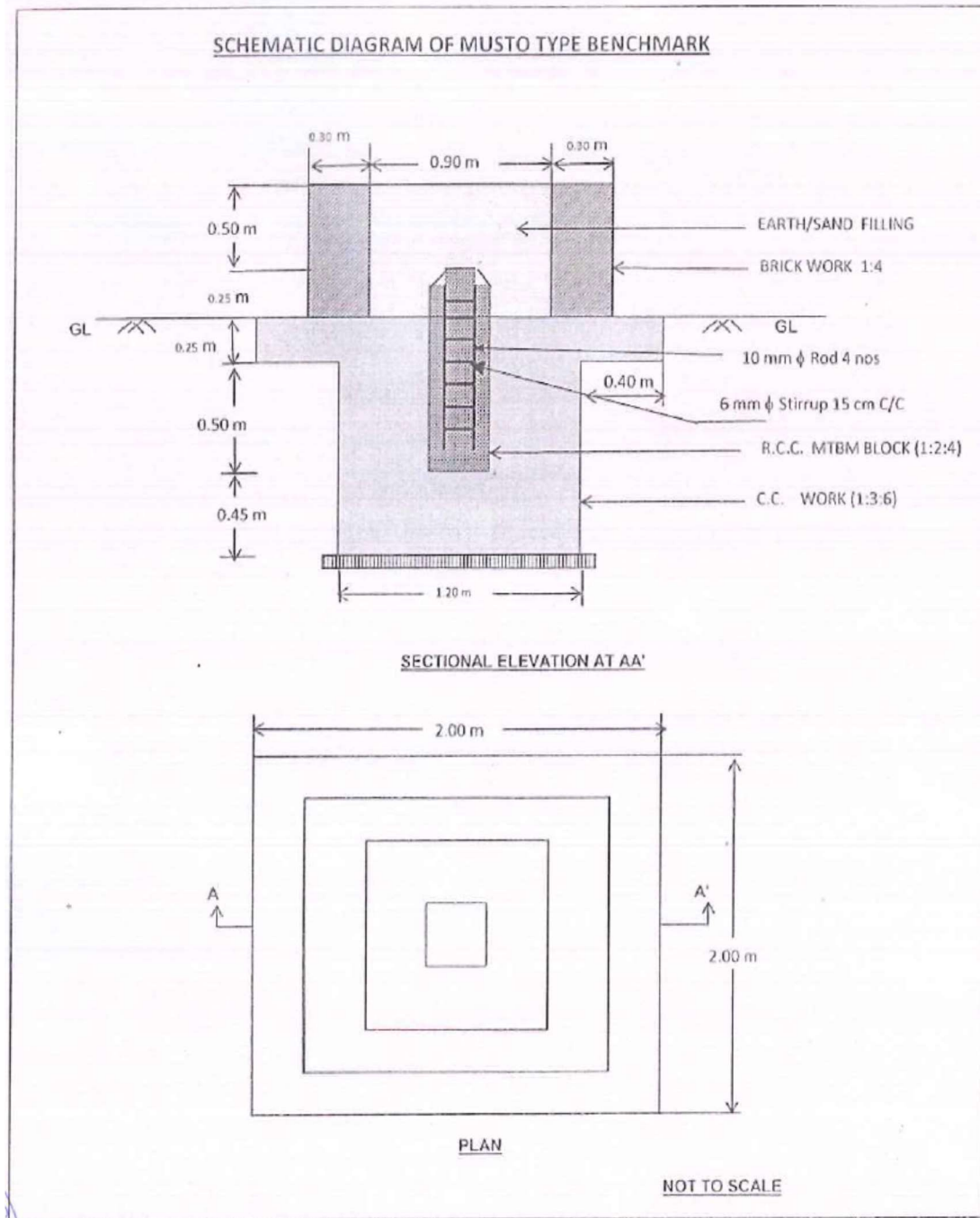
Output: Inception report detailing plan; detailed survey methodology including in the wetted portion; specifications of data collection including survey instruments proposed and accuracy specifications, processing, products in hard and soft copy, and quality assurance protocol, plan for ground control survey; work plan; and schedule of association of PD, NHP field personnel during survey.

C. Selection of Ground Control Points and establishing Benchmarks

Selection of GCPs and conduct of Ground Control Survey to establish temporary bench marks at adequate interval all along the river alignment and at pucca structures, and connecting these with GTS benchmarks. The contractor should select appropriate SoI benchmarks, extend to survey area, validate for accuracy and reliability, establish additional benchmarks, erect the benchmarks and label them properly for future use. They are required to prepare a table of Geographic co-ordinates and elevation of these benchmarks (using appropriate surveying techniques) for storage as well as future reference. A plan in map form shall be prepared before conducting actual benchmark survey so that the Employer could confirm the adequacy.

The contractor shall establish Musto type bench mark at suitable locations

throughout the survey area in a manner that the detailed survey for cross section could be initiated from any point to any point, drawing reference level from a nearby benchmark. Permanent Structure will have to be erected for primary BM as per standards laid out in survey manuals as per SOI and CWC norms and label them properly for future use. A typical drawing showing section of Musto type bench Mark (Primary Bench marks) as adopted by Central Water Commission is enclosed. This uniform distribution of pre-checked and established benchmark will also help in keeping “closing errors” under control.



Musto type permanent benchmark

Permanent structure will have to be erected for primary bench mark as per standards laid out in survey manuals and secondary benchmarks may be marked on permanent structures like bridge piers, HT transmission line poles, culverts etc.

Markings on concrete structures may be slightly engraved and those on iron/ steel structures may be painted with high quality paint. Any other better options are always welcome however. This exercise is basically to ensure easy access by future missions visiting the area for re-survey purposes.

Output: Hard and soft copies (5 each) of report on ground control survey, including location map and tables of Benchmarks showing station Id, lat-long and elevation values and photographs along with address detail

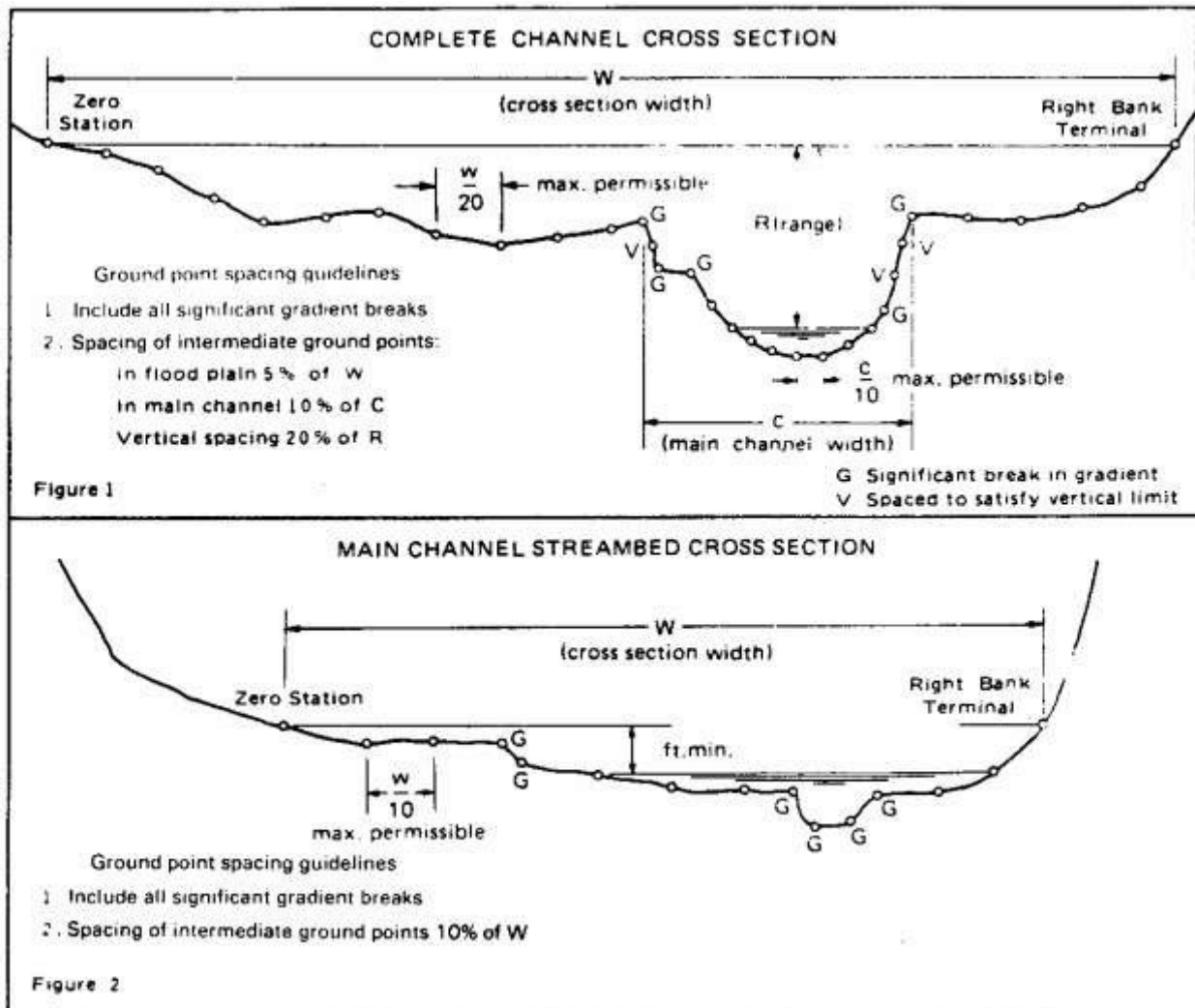
D. Strip Survey

- E. This covers topographic survey using latest survey techniques, for the cross sections of main stem and selected tributaries and all embankments, and details of all existing river and embankment structures.

In all cases the cross section width shall be enough to extend at least up-to 500 m beyond the toe of embankments in general for where there is embankment (or up to settlements where present) on either side. Cross section should well represent the river and embankment cross section. For non – embankment section the cross section should cover the river width up to 1-1.5 m above Highest Flood Level (HFL) or maximum 1 km on either side of the river for the main stem and appropriately along the tributaries (where HFL is not meeting the ground nearby due to very flat terrain) for the flat areas in Uttar Pradesh and West Bengal. For the hilly reaches of the rivers under the Bhakra Beas Management Board, the cross sections should cover a width extending up to 5 m above the highest flood level. In embanked reaches the cross-sectional survey shall be optimized to cover both river and embankment sections. The survey area in Uttar Pradesh and West Bengal is mostly flat with little highs and lows but this subtle difference in elevation is of utmost importance hence care must be taken to record such changes. This requires an accuracy of +/- 10 cm. The bed depths should be recorded with direct methods rather than echo-sounders as far as possible. Thalweg of rivers must necessarily be recorded.

Level reading interval should generally be 10 meters but may be adjusted depending on locations of breaks of slope. All breaks of slopes such as embankment toes, top edges, berm, river bank, river terraces (if any) etc. must be recorded. The section should be nearly perpendicular to the flow of the channel. Start and end points of each section has to be marked clearly and precisely on a detail base map of the area. Separation between cross-sections shall be 2 km but may be adjusted depending on river morphology, especially where a significant change in conveyance occurs between the cross-sections. The distance may be increased in straight approaches and a closer spacing would be advisable at meandering courses. The contractor is encouraged to refer to latest imagery (preferably those available in the public domain, as the cost will be deemed to be included in the contract value) to understand the current river morphology to establish appropriate interval between cross-sections. Bed level of spill channel, tributary junction and canal outfall (if any) must be recorded. Cross sections are to be surveyed immediately upstream and downstream of bridges and cross-drainage works. The data shall be stored in such manner as it can be easily updated, used for further spatial analysis, use for creating digital terrain model (DTM), flow analysis and other computer simulation.

⁸ The line connecting the deepest points along a stream



F. Product Specifications

All topographic data (cross-sections of rivers, temporary and permanent benchmarks and control points, locations of important river features, gauge sites, and embankment assets, etc.) should be acquired, stored and processed in a geo-referenced manner in user friendly standard format that can be accessed both by CAD programs such as Auto CAD and GIS programs such as ArcGIS.

The survey should be carried out by selecting observation points very carefully, so that at no occasion any point or ground at which ground slope change is left unmarked and its level not taken. The observation points should be such that the curves, slopes, cross section can be developed clearly and sufficiently reflect the relationship with general terrain and ground conditions. The survey team shall capture, record necessary data, and integrate digital photographs at appropriate resolution to document important river details, and the physical status of embankment and all assets at the survey location.

All information, spatial in nature, should be located on map with appropriate symbols/ notations. Any other relevant features, natural or man-made, found in the survey area shall be surveyed and documented.

In addition following administrative information will be collected from the respective field offices:

- Name of the embankment.
- Freeboard, Natural Soil level (NSL) and Highest Flood Level (HFL). Current data from recent embankment and river survey will be integrated.

Outputs: Post-survey report, detailing survey process, problems and solutions, data collected, post-processing, and products with compliance statement on specifications. Both hard and soft copies (5 each) will be provided.

G. Validation and delivery of survey data

The survey data in regard to river X-sections and river structures would be jointly verified on sample basis after a desk review of data products based on a statistically sound sampling plan. Any deviation of larger than 10 percent would be cause for rejection of whole survey. The survey data would be supplied in comma delimited ASCII II files, AutoCAD .dxf format and in standard georeferenced GIS file formats.

Outputs: QC/QA Report on joint validation and specifications achieved, and recommendations on delivery of products, survey data in ASCII file format and GIS format.

F. Delivery and Acceptance of survey data products (digital and analogue) and associated report The delivered data would be checked for compliance to survey and survey product specifications, and accepted as per agreed plan.

Outputs: Report on survey methodology, Report on data delivery, including survey specifications including ground control establishment planned and achieved, product specifications and validation results and any other relevant issues.

Appendix B—Schedule of Reporting Requirements

Reports:

	QCR	Format of QCR	Contractor production level	SOI inspection level (Sample)	Normal SOI Audit Stage
1	CV/Training certificate for (Survey Manager, Hydraulic modeler, GIS Specialist and surveyor)	Paper	-	Normal (100%)	During Tender Evaluation Stage / Start of Image Processing
2	Number of items rejected/reprocessed at each stage of internal QC	Progress report	Complete list	Normal (Fortnightly)	N/A
3	Survey Planning Report	Softcopy	100%	Normal (100%)	On submission for inspection.
4	Report on sample processed survey data	Softcopy/Digital	100%	Normal(100%)	End of completion of C.S of 5 reaches.
5	Post-Survey Report	Softcopy/Digital	100%	Normal(100%)	Cross section wise
6	Product Delivery Report	Softcopy/Digital	100%	Tightened(100%)	On submission of all the deliverables
7	Final consolidated Project Completion Report	Inspection Report	100%	Tightened (100%)	On submission of final output.
8	Final Acceptance Test	Inspection Report – Paper		5% Resampling and re-delivery in case product fails the specifications	On receipt of final deliverable.

Appendix C—Key Personnel per lot (minimum requirement)

Sl	Key staff	Responsibility	Minimum Qualification	Required Experience	Experience in Years
1	Team Leader/ Survey Manager (1 No.)	Plan and supervise and manage the river/embankment and ground control surveys. Submit sample products for joint validation Validate data accuracy and completeness before submission. Submit deliverables and reports as per contract	Bachelor's Degree in Civil Engineering. Computer proficiency.	He/ She should have experience in terrain survey and underwater survey, data collection using modern surveying techniques with experience in the use of GIS technology	at least 10 years
2	Hydraulic Modeller	Help in survey planning through contribution in reconnaissance survey and afterwards	Master's Degree in Hydrology/ Water Resources Engineering and knowledge of hydrologic and hydraulic modelling tools	He/ She should have extensive experience in one and two dimensional hydraulic modelling involving flood flow	at least 7 years
3	GIS Specialist (1 Nos.)	Plan submission of survey products in standard ArcGIS format Generate survey product in standard GIS format.	Masters in Geoinformatics/ Geography/ Bachelor Degree in Civil Engineering/ Geology/ Environmental Science. with Degree/Diploma in GIS/RS from a recognized institution.	He/she should have working experience in DEM processing, 3D analysis, etc. and experience in topographic survey data management	at least 5 years
4	Surveyors (4 Nos.)	Conduct survey under Team Leader's submission	- Certificate course in field surveying from recognized ITI.	- He/she should have working experience in precision survey in flat terrain as well as under water using Modern Electronic survey equipment like Electronic Total station, DGPS and Digital/Auto Level.	At least 3 years

{List under: C-1 Titles [and names, if already available], detailed job descriptions and minimum qualifications of Personnel to be assigned to work in India, and staff-months for each.

C-2 Same as C-1 for Key Personnel to be assigned to work outside India if applicable

C

Note: In case of replacement of key staff the qualification and experience shall be equal or better.

Appendix D—Breakdown of Contract Price in Foreign Currency(ies) –

US Dollar/Euro/Pound Sterling

List here the elements of cost used to arrive at the breakdown of the lump-sum price—foreign currency portion:

- 1. Rates for Equipment Usage or Rental or for Personnel (Key Personnel and other Personnel).*
- 2. Reimbursable expenditures.*

This appendix will exclusively be used for determining remuneration for additional Services.

Appendix E—Breakdown of Contract Price in Indian Rupees.

List here the elements of cost used to arrive at the breakdown of the lump-sum price—local currency portion:

- 1. Rates for Equipment Usage or Rental or for Personnel (Key Personnel and other Personnel).*
- 2. Reimbursable expenditures.*

This appendix will exclusively be used for determining remuneration for additional Services.

Appendix F—Services and Facilities Provided by the Employer

- a. Provide office space for the contractor staff for access to confidential data (Topo- sheets, LiDAR data etc) in secure environment, whenever needed.
- b. Provide available office data on embankment, satellite imagery and thematic GIS data, for reference.
- c. Facilitate access to Uttar Pradesh and West Bengal Irrigation Department headquarters , and field offices in the basin for data collection.
- d. Provide access to other consultancies on surveys, flood forecast modeling, Hydrological Information System, EAMS etc. and connected databases.
- e. Project Director, NHP, SoI will monitor the survey progress in the basin, and provide any assistance that may be required for successful conduct of ground surveys. The contractor shall work closely with the concerned UPID and West Bengal Irrigation & Waterways Department field offices during all field work.
- f. The employer shall post a full time engineer to coordinate the activities, and nominate field officers as needed and at appropriate times to work with the contractor, to facilitate collection of objective field data , joint verification of survey results, and acceptance of deliverables.
- g. Constitution of a Technical Review Committee to support the employer in interaction with the contractor on technical issues through the contract period, and in reviewing reports and recommending follow-on actions.
- h. Notification for entry to the land for surveying & authorization letter to civil authorities shall be given to the contractor.
- i. Any other facilities mutually agreed upon by contractor and the employer.

Appendix G—Performance Incentive Compensation Appendix

Not Applicable

APPENDIX H-Salient Features of Labour& Environment Laws

SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE (The law as current on the date of bid opening will apply)

Labour Laws	<p>(a) <u>Workman Compensation Act 1923</u>: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.</p> <p>(b) <u>Payment of Gratuity Act 1972</u>: gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years' service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.</p> <p>(c) <u>Employees P.F. and Miscellaneous Provision Act 1952 (since amended)</u>: The act Provides for monthly contribution by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are:</p> <p style="margin-left: 40px;">(i) Pension or family pension on retirement or death, as the case maybe.</p> <p style="margin-left: 40px;">(ii) Deposit linked insurance on the death in harness of the worker.</p> <p style="margin-left: 40px;">(iii) Payment of P.F. accumulation on retirement/death etc.</p> <p>(d) <u>Maternity Benefit Act 1951</u>: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.</p> <p>(e) <u>Contract Labour (Regulation & Abolition) Act 1970</u>: The Act provides for certain welfare measures to be provided by the Service Provider to contract labour and in case the Service Provider fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Service Provider is required to take license from the designated Officer. The Act is applicable to the establishments or Service Provider of Principal Employer if they employ 20 or more contract labour.</p> <p>(f) <u>Minimum Wage Act 1948</u>: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a schedule employment. Construction of Buildings,</p>
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	<p>Roads, Runways are schedule employments.</p> <p>(g) <u>Payment of Wages Act 1936</u>: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.</p> <p>(h) <u>Equal Remuneration Act 1979</u>: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.</p> <p>(i) <u>Payment of Bonus Act 1965</u>: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/- per month or less. The bonus to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.</p> <p>(j) <u>Industrial Disputes act 1947</u>: the Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations, a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.</p> <p>(k) <u>Industrial Employment (Standing Order) Act 1946</u>: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.</p> <p>(l) <u>Trade Unions Act 1926</u>: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.</p> <p>(m) <u>Child Labour (Prohibition & Regulation) Act 1986</u>: The</p>
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	<p>Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.</p> <p>(n) <u>Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979</u>: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home up to the establishment and bank etc.</p> <p>(o) <u>The Building and Other Construction works (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996</u>: All the establishments who carry on any building or other construction work and employs 10 or more workers and covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First –Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.</p> <p>(p) <u>Factories Act 1948</u>: the Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process</p> <p>(q) <u>Weekly Holidays Act-1942</u></p>
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SALIENT FEATURES OF SOME OF THE MAJOR LAWS THAT ARE APPLICABLE FOR PROTECTION OF ENVIRONMENT

Laws on protection of Environment	<ol style="list-style-type: none"> 1. The Water(Prevention and Control of Pollution) Act, 1974, This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water(whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms. 2. The Air (Prevention and Control of Pollution) Act, 1981, This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment. 3. The Environment(Protection) Act, 1986, This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter- relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro- organism and property. 4. The Public Liability Insurance Act, 1991, This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.
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Appendix I-Appointment of Adjudicator/Dispute Review Expert

Suggested Draft of Letter of Appointment of Adjudicators in contracts

Sub: _____(Name of the Contract)

To

Name and address of the Adjudicator

We hereby confirm your appointment as adjudicator for the above contract to carry out the assignment specified in this Letter of Appointment.

For administrative purpose _____(*name of the officer representing the employer*) has been assigned to administer the assignment and to provide the Adjudicator with all relevant information needed to carry out the assignment on behalf of both the employer and the Service Provider. The services will be required during the period of contract for the Services (Name of the Contract)_____.

The Adjudicator shall visit the site once in 3 (three) months till the completion of the Services indicated above or as specifically requested by employer/service provider for the period upto the end of defects liability period with prior intimation to the employer and the service provider. The duration of each visit shall ordinarily be for one day only. These durations are approximate and (*Name of the employer and Name of the Service Provider*) may find it necessary to postpone or cancel the assignment and/or shorten or extend the duration.

The appointment will become effective upon confirmation of letter by you. The appointment of Adjudicator shall be liable for termination under a 30 (thirty) days written notice from the date of issue of the notice, if both Employer and the Service Provider so desire. Also the appointment shall automatically stand terminated 14 days after the defect notice / correction period as stated in Clauses 7.1 of GCC/PCC is over.

The Adjudicator will be paid a fee of Rs. _____(Rupees _____only) per each day of visit at the worksite. The actual expenses for boarding and traveling in connection with the assignment will be reimbursed to the Adjudicator. The Adjudicator will submit a pre-receipted bill in triplicate to the employer indicating the date of the visit, fees for the visit and a proof in support of the actual expenditure[only for items valued above Rs200 each] incurred by him against boarding, lodging and traveling expenses after performing the visit on each occasion. The Employer will make the admissible payment (both the Employer's and the Service Provider's share) to the Adjudicator within 30 days of the receipt of the bill. The Service Provider's share on this account (half the paid amount) will be recovered by the Employer from the Service Provider's bills for the Services.

In accepting this assignment, the Adjudicator should understand and agree that he is responsible for any liabilities and costs arising out of risks associated with travel to and from the place of emergency repatriation, loss or damage to personal/professional effects and property. The Adjudicator is advised to effect personal insurance cover in respect of such risks if he does not already have such cover in place. In this regard, the Adjudicator shall maintain appropriate medical, travel, accident and third-party liability insurance. The obligation under this paragraph will survive till termination of this appointment.

Procedures for resolution of disputes by the Adjudicator is described in the contract of _____ (name of the contract) between the employer and the Service Provider vide clause 8 of GCC/PCC. Your recommendation should be given in the format attached, within 28 days of receipt of a notification of dispute.

The Adjudicator will carry out the assignment in accordance with the highest standard of professional and ethical competence and integrity, having due regard to the nature and purpose of the assignment, and will conduct himself in a manner consistent herewith. After visiting the site, the Adjudicator will discuss the matter with the Employer and if necessary with the Service Provider before arriving at any decision.

The Adjudicator will agree that all knowledge and information not within the public domain, which may be acquired while carrying out this service shall be all time and for all purpose, regarded as strictly confidential and held in confidence, and shall not be directly or indirectly disclosed to any party whatsoever, except with the permission of the employer and the Service Provider. The Adjudicator's decision should be communicated in the form of a speaking order specifying the reasons.

The Adjudicator will agree that any manufacturing or construction or consulting firm with which he might be associated with, will not be eligible to participate in bidding for any goods or works or consultant services resulting from or associated with the project of which this consulting assignment forms a part

Read and Agreed

Name of Adjudicator
Signature

Place:

Date:

Name of Employer

Signature of authorized representative of Employer

Name of the Service Provider

Signature of authorized representative of Service Provider

Attachment: Copy of contract document between the employer and Service Provider and format for recommendation.

SUMMARY OF ADJUDICATOR'S RESPONSIBILITIES

The Adjudicator has the following principal responsibilities:

1. Visit the site periodically.
2. Keep abreast of job activities and developments.
3. Encourage the resolution of disputes by the parties.
4. When a dispute is referred to it, conduct a hearing (no legal presentation), complete its deliberations, and prepare a recommendations in a professional and timely manner(as per sample format)

Sample Format of Adjudicator's Recommendation

[Project Name] Recommendation of Adjudicator

Dispute No. XX [NAME OF DISPUTE]

Hearing Date: _____

Dispute

Description of dispute. A one or two sentence summation of the dispute.

Service Provider's Position

A short summation of the Service Provider's position as understood by the Adjudicator.

Employer's Position

A short summation of the Employer's position as understood by the Adjudicator.

Recommendation

The Adjudicator's specific recommendation for settlement of the dispute. (*The recommended course is consistent with the explanation*).

Explanation

(*This section could also be called Considerations, Rationale, Findings, Discussion, and so on.*)

The Adjudicator's description of how each recommendation was reached.

Respectfully submitted,

Date: _____

Date: _____

Date: _____

Appendix-J

Resume in Respect of Mahatma Prasad Bhartari Chief Engineer (Retd.) Irrigation Deptt. Uttarakhand

1. Name Mahatma Prasad Bhartari
2. Qualification :
 Educational B.S.C. Part I
 Technical B.E. CIVIL
3. Name of Institution M.B.M. Engineering College, JODHPUR
4. Technical Advisor Govt, of Uttarakhand Ministry of Energy
(2004 to 2008)
5. Chief Engineer Entrusted Construction of prestigious Maneri-Bhati
(2000 to 2004) Hydro Power Stations.
6. Superintending Engineer Planning & Design of Kishau Dam Project
(1989-98)
7. Executive Engineer Engaged in Construction of Khara Power House
(1989-98) and Parallel Ganga Canal Scheme (World Bank Project)
8. Assistant Engineer Entitled Construction & Design of Irrigation works
(1969-98) Irrigation Deptt. U.P.
9. Junior Engineer 1966-69 PWD Rajasthan
10. Engagements related to Arbitration :-
 1. Life Membership of The Indian Council of Arbitration :- MICA No.IL/ICA/5768
 2. The Institution of Engineers India:- Fellow F-116521-2
 3. I am on the panel of Arbitrators :- The Institution of Engineers India.
 4. I am on the Panel of Arbitrators :- ICA conferred with permanent status of 'FICA'
 5. I am on the panel of Dispute Board (DB) members No. DB/080000/0241

Section VIII. Performance Specifications and Drawings

1. Terms of references for Outputs and deliverables

General guidelines/ requirement for surveying the Cross Sections

- 2) *Interval of CS* : On a straight river reach, cross sections are proposed to be taken along the length of the river at 2 km interval in general. Apart from that, additional information should be collected from the following locations :-
 - Significant obstructions like, wherever there is a hydraulic structures (bridges/ dam/ barrages) , river confluence , abrupt change(slope/ depth / width/ flood plain / roughness of the channel) , the cross section should be surveyed at closer intervals.
 - The details of all structural measures for flood/ bank erosion protection such as embankments, groynes, spurs should also be surveyed along with their shape files being provided separately.
 - All surveyed points within the cross-section should be Georeferenced
 - All the connected wetlands / Oxbow lakes should also be surveyed and their details should be fully Geo-referenced
 - Bank line should be clearly marked on the cross-section profile at every location
 - Wherever there is a braided river system, all the channels including banks must be clearly marked on the cross-section map
 - Generally cross section should span the island located within a channel. When the island is very large, the island should be separately surveyed to generate 0.5 m contours.
 - Sections should be taken perpendicular to the direction of flow, but at no places cross sections should overlap or cross each other
 - Wherever there is a significant structure, clearly obstructing the channel, preferably 3 sections should be taken; one at upstream, one at downstream and one at structure (along the toe of abutment)
 - Cross section should be taken from Left to right, starting point being defined by looking at d/s

Since the Survey of India has already been entrusted to carry out preparation of high-resolution DEM under the NHP, consideration of the same has been made to arrive at the requirement for cross sections. Broadly cross section has been marked in the channel width carrying water (as per latest images available). But extension of CS beyond defined channel will be as follows :

- 3) General guidelines for CS for hydraulic modelling say that CS should ensure that the entire width of the flood plain is covered, and should fully describe the area likely to be flooded under the 100 year flood. However, in the absence of 100 year flood data during survey, the following guide lines may be followed :-
 - For the areas covered with DEM having a resolution of 1m (i.e., 0.5m accuracy), through NHP/NMCG, the river cross section to be taken from left high bank to right high bank.
 - For the areas where embankments exist, the river cross section survey needs to cover zones that extend to 50 m on the countryside from the embankments on either side of the river.
 - Where there is no embankment the CS should be extended up to 1-1.5m above HFL for the flat areas and 5 m above the HFL for the hilly areas of the rivers under the Bhakra Beas Management Board. HFL can be found from CWC, local PWD or another department. In the absence of such

information, HFL can be found from local enquiry at bridge locations, either asking the locals or seeing the water mark and weed growth level at bridge piers or abutment.

- For other areas, where the flood plain is not defined, the cross-section survey should cover zones between 500 m on the countryside on either side of the bank of the river.
- Preferably the Level should be taken at an interval @ 20 m along the country side and an interval @ 1/10 th of the width of channel in the river section, as demonstrated through typical figure earlier. Distance between individual points on a cross section line should, in general, be less than 10m apart. Measurements are to be made at a sufficient number of points, so that the river bed profile is captured in detail. It should also include the elevation of the bank level and capture the elevation wherever the ground / river bed changes abruptly, in order to get the correct river bed profile.
- However, Thawleg (a line connecting the lowest points of successive cross-sections along the course of a valley or river.) must be captured to portray longitudinal profile of river.

2. Feature Depiction

- | | |
|----------------------------|--|
| • Projection | : UTM (OSM) and customized LCC* |
| • Datum | : WGS 84 |
| • Height | : Above MSL |
| • Precision | : meter with 1 decimal places |
| • Sheet numbering & layout | : 1:25 K international sheet numbering |
| • Sheet size | : 7'30'' x 7'30' |
| • Graticule Lines | : 2'30'' x 2'30'' spacing |
| • Gridlines | : 1000m x 1000m (on UTM Grid) |
| • Annotation | : In English |
| • Units of precision | : cm (meter with 1 decimal places) |
| • Symbolology | : As per Survey of India standard |

* Parameters for customized LCC (separately for states and water basins) will be provided by the employer (shouldn't be mixed with DSM)

3. Cross section Generation and Editing

- | | |
|-----------------------|--|
| • DTM grid spacing | : 3 meter |
| • DTM height accuracy | : Better than 5 cm with 90% confidence interval. |
| • Projection | : LCC* |
| • Datum | : WGS 84 |
| • Height | : Above MSL |

* Parameters for customized LCC (separately for states and water basins) will be provided by the employer (shouldn't be mixed with DSM)

4. Topology rules for Depicted GIS Ready Dataset :

- **POINT**
 - ✓ Check cells overlaps with tolerances
 - ✓ Match cells with associated line features.
 - ✓ Proper snapping of cells(bridge + stream/canal+road/railway)
 - ✓ Snapping of cells with associated line features.
 - ✓ Match cell with text if any.

- **TEXT**
- ✓ Check text overlaps with tolerances.
- ✓ Text justifications to be maintained as per their associated features.
- ✓ Match text of height with Tag value.

- ✓ All text should be single element
- **LINE**
 - ✓ To ensure line of same feature class should be single element till nearest junction.
 - ✓ Intersection of lines with same feature class or different feature class should have common vertex.
- **AREA**
 - ✓ Match area with all its associated limits. (Dry River-Sand area, Perennial River- water area)
- **GENERAL**
 - ✓ Remove duplicate elements.
 - ✓ Correct similar elements.
 - ✓ Correct patterned elements if any.
 - ✓ Must not overlap (with same features / different features)
 - ✓ Must not have gap (with same features / different features)

The above mentioned list is not exhaustive, the service provider shall use standard QA/QC tools to generate GIS ready database compatible with proposed application under the NHP Project.

Major features to be depicted from Field Survey near the surveyed cross-section and included in GIS ready database are as below:

HYDROGRAPHY

RIVER_BANK
 STREAM_DRY
 WATER_CHANNEL_LINEAR
 WATER_CHANNEL_AREA
 STREAM_PERENNIAL
 RIVER_ISLAND
 CANAL_PERENNIAL
 FLOW_ARROW
 DRAIN_DRY
 DRAIN_PERENNIAL
 WATER_LOGGED_AREA
 WATER_TANK_SURVEYED
 LAKE
 EMBANKMENT_ONE_SIDE
 EMBANKMENT_BOTH_SIDE
 DAM
 WEIR
 JETTY
 TIDAL_CREEK
 TIDAL_RIVER_DRY
 TIDAL_WATER_LIMIT
 SAND
 CROSSING_SITE_RIVER

Note: All hydrologic structures to be captured during Field Survey and shall be digitized and classified in above mentioned Feature Class with attribute entry.

5. Reports and Deliverables

The activities described earlier and the outputs described below shall be completed within a period of Twelve months. Key reporting requirements follow:

Reports	Covering	Time /Month
Survey Planning Report	including i) details of ground survey equipment, and systems for data processing, ii) details on the survey methodology, system calibration, data processing etc; iii) diagrams of the proposed survey area and cross-sections for survey, iv) diagrams of the proposed survey area and location of planned ground control and check points, and the origin of points (e.g. field measurement for this project or state survey control), v) description of the processes to produce the specified data products and how the specified accuracies will be met, vi) Gantt chart or table describing tasks, milestones, deliverables and timeframes in weeks from award of contract .	At the end of first month

	vii) a Quality Assurance Plan that conforms to standard practices and generally complies with ISO 9001	
Report on sample processed survey data	Report and delivery of sample data for at least 10% of the cross sections in the lot including related office and field observation data for evaluation and acceptance	By third month.
Post-Survey Report	<p>iii) <u>Survey report</u> documenting date, time, cross-sections surveyed, and other information deemed pertinent. The report must include information about survey sections, and include ground truth and complementary reference data. One set of all raw data with associated documentation would be handed over to the Employer for safe custody.</p> <p>x) <u>Ground control report</u> that includes, at a minimum, all pertinent base station information and mission notes, including information on additional control station monument names and stability.</p>	Progress report in first week of every month after start of survey, and final survey completion report by end of thirteen month
Product Delivery Report	Product Delivery Report, detailing the survey data and office and field data collected, procedures, datum and projection, units, QC/QA report detailing spatial accuracy and general conformation to prescribed requirements, and description of survey products for delivery, and supply of deliverables specified in the contract, and statement of compliance against specified deliverables and specifications. pa	by 15 th month
Final consolidated Project Completion Report	including all previous reports, comments by TAC and Contractor response and actions taken,	By 18 th month

The reports will be reviewed by a Technical Review Committee constituted by the Employer .

The committee will review the report within 30 days after report submission by the Contractor.

Table.3 Data Supply Specifications

Deliverables		Specification
1	File naming	File naming as per requirements of Flood forecast modeling consultancies
2	Coordinate Origins for Gridded data Origins	UTM as defined under Open Series Map (OSM) Parameters for customized LCC (separately for states and water basins) as provided by the employer
3	Data Tiling	<ol style="list-style-type: none"> 1. All standard data sets should be supplied as single files where possible and tiled to manageable file sizes . 2. A Tile Index is to be provided by the contractor in ESRI shape file format. The tile name as specified above must be included as an attribute in the Tile Index file.
6	Data Delivery Reports	A delivery report describing the contents of the data supplied with every data delivery (interim, staged, final). The delivery report must also contain reference to the metadata supplied with the delivery.
7	Metadata	<p>No metadata standard is being specified. However, the contractor will chose any standard metadata style which confirms to international standards ISO 191152005 and ISO 19139 2007, and report the same along with their bid.</p> <p>For each supplied data product a complete metadata statement consistent with the chosen system must be provided in XML format.</p> <p>Metadata must be provided with every delivery including interim, partial and final deliveries.</p> <p>The job will not be signed off by SOI until the metadata is satisfactorily supplied.</p>
8	Delivery Media	<p>Data should be delivered on External Hard Drive (USB or FireWire). External hard drives will be retained by SOI.</p> <p>Data deliveries should be clearly labelled with name of Service Provider, date of supply and list of contents.</p>
9	Report Formats	All reports are to be provided in Word (.doc/.docx) format, Excel spreadsheet (.xls/.xlsx) or appropriate digital format approved by SOI.

6. Delivery Instructions:

- All products shall be delivered incrementally as per the approved plan and time schedule.
- All soft copies should be delivered in reliable USB port external hard disk media in three copies.

7. Quality Assurance/Quality Check

Quality Assurance and Quality Check (QA/QC) shall be carried out at all levels of project execution. QA/QC will be carried out in following two stages:-

- i. **In progress/ Internal QA/QC**-In-progress QA/QC shall be carried out during the generation of the product by product generation team. In addition SOI can depute its personnel to carry out pari passu examination during the Field survey . Contractor will allow SOI personnel or Team of expert deputed by SoI for pari passu examination at all stages of the work. In this process 100% of the work will be quality checked. Product generation team will maintain the record of QA/QC checks in required format as prescribed by SOI.
 - ii. **Final QA/QC**- Final QA/QC will be done in Field as well as that of reports and deliverables submitted by the contractor.. Contractor will carry out all the corrections marked by SOI. QA/QC of the final GIS database will also be carried out.
- Specifications, tolerances, QA/QC mechanism spelt out in the bid document shall be complied with. Any deviation is to be reported to the Employer immediately.

8. QAPlan:

- The SOPs and workflow leading to desired deliverables, specific to the equipment, hardware , software to be used and Field work to be done by the service provider, shall be prepared and submitted to Employer.
- While the Quality Audit will be carried out by the Employer or his representative, full responsibility for carrying out Quality Control shall rest with the service provider.
- The minimum QCRs that will be generated during execution of work is listed at Table 4 below
- The deliverables submitted by the service provider shall be subjected to Final Check for Acceptance. The exact sample size and the method of sampling will be decided by the employer. The methodology that shall be adopted for Final Check , is elaborated at clause 9 below in this section.
- The employer or its nominee may perform additional QC/QA testing if needed. Evaluation shall be carried out for accuracy and general conformation to prescribed requirements.

Table. 4

	QCR	Format of QCR	Contractor production level	SOI inspection level (Sample)	Normal SOI Audit Stage
1	CV/Training certificate for (Survey Manager, Hydraulic modeler, GIS Specialist and surveyor)	Paper	-	Normal (100%)	During Tender Evaluation Stage / Start of Image Processing
2	Number of items rejected/reprocessed at each stage of internal QC	Progress report	Complete list	Normal (Fortnightly)	N/A
3	Survey Planning Report	Softcopy	100%	Normal (100%)	On submission for inspection.
4	Report on sample processed survey data	Softcopy/Digital	100%	Normal(100%)	End of completion of C.S of 5 reaches.
5	Post-Survey Report	Softcopy/Digital	100%	Normal(100%)	Cross section wise
6	Product Delivery Report	Softcopy/Digital	100%	Tightened(100%)	On submission of all the deliverables
7	Final consolidated Project Completion Report	Inspection Report	100%	Tightened (100%)	On submission of final output.
8	Final Acceptance Test	Inspection Report – Paper		5% Resampling and re-delivery in case product fails the specifications	On receipt of final deliverable.

9. Final Quality check

Around 5-10% of output data delivered by the service provider will be subjected to Final Quality Check. Product files will be selected on as systematic basis to ensure that QC covers entire river basin/site area. Deliverables will be selected possibly on a random basis but also potentially to provide closer in section in are as where problems are anticipated. If more than 5% of the dataset that are subjected to external QC fail to meet the

specifications laid down in Tender Document, all products will be returned to the contractor for further QA. In effect, Employer will pass responsibility to the contractor to provide adequate and clear internal Quality Audits to identify the extent and cause of the problems so established. The contractor will be expected to rectify these problems ,and (where necessary to comply with the specification) make new products at his own cost.

10.1 Redelivery of products will be followed by a further independent check on a new sample of the products. This procedure will continue until the products become finally acceptable under the terms above. The acceptance report (Pass /Fail) shall be given by the Engineer within a fortnight of each delivery/re-delivery of the data made by the contractor.

Section IX. Contract Forms

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Performance Bank Guarantee (Unconditional)

To: _____

Whereas _____ (hereinafter called "the Service Provider") has undertaken, in pursuance of Contract No. _____ dated _____ to execute _____ (hereinafter called "the Contract");

And whereas it has been stipulated by you in the said Contract that the Service Provider shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

And whereas we have agreed to give the Service Provider such a Bank Guarantee;

Now therefore we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Service Provider, up to a total of _____, _____, such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of _____/ as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Service Provider before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Services to be performed there under or of any of the Contract documents which may be made between you and the Service Provider shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any such change, addition, or modification.

This Guarantee shall be valid until a date 28 days from the date of issue of the Certificate of Completion.

Signature and seal of the Guarantor _____

Name of Bank _____

Address _____

Date _____

Bank Guarantee for Advance Payment

To: _____

Gentlemen:

In accordance with the provisions of the Conditions of Contract, Sub-Clause 6.4 (“Terms and Conditions of Payment”) of the above-mentioned Contract, _____ (hereinafter called “the Service Provider”) shall deposit with _____ a Bank Guarantee to guarantee his proper and faithful performance under the said Clause of the Contract in an amount of _____

We, the _____, as instructed by the Service Provider, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____ on his first demand without whatsoever right of objection on our part and without his first claim to the Service Provider, in the amount not exceeding _____

We further agree that no change or addition to or other modification of the terms of the Contract or of Services to be performed there under or of any of the Contract documents which may be made between _____ and the Service Provider, shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any such change, addition, or modification.

This Guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until _____ receives full repayment of the same amount from the Service Provider.

Yours truly,

Signature and seal: _____

Name of Bank/Financial Institution: _____

Address: _____

Date: _____