GOVT. OF ASSAM
OFFICE OF THE CHIEF ENGINEER
WATER RESOURCES DEPARTMENT, ASSAM WATER CENTRE
BASISTHA, GUWAHATI-29

NO. CE/CC/WR/NIQ/2021-22/1030/13 Dated : 03/06/2022

NOTICE INVITING QUOTATION

Sealed quotation affixing court fee stamp of Rs.8.25 (Rupees Eight and paise Twenty Five) only is hereby invited from registered firms/ agency providing cross section survey works for fixation of rates for comprehensive and high resolution cross section survey for Beki, Buridehing and Jiadhal River under AIRBMP as detailed in the schedule enclosed and will be received by the undersigned up to 2:00 pm of 13/06/2022 at his office. The quotation will be opened at 2:30 pm on the same date and place. If the last day of receiving of quotation happens to be an unscheduled holiday/ bandha, the next working day will be considered as the date of receiving quotation.

Detailed quotation papers may be obtained from the official website **https://waterresources.assam.gov.in/**

The quotationers or their authorized agents may present at the time of opening of quotation, if they desire so.

Special terms and conditions are given below:

1) The quotation is invited for fixation of estimated rates only.
2) No work shall be allotted against this quotation.
3) Firms/ Agency submitting quotation should submit proof regarding incorporation of their organization and survey facilities.
4) Firms/ Agency should submit proof regarding availability of equipment/ machineries to execute cross section survey.
5) Rates should be quoted inclusive of all taxes as applicable.
6) Rates should be quoted For Guwahati.
7) Any correction of quoted rates should bear dated initial of the quotationer.
8) No quotation shall be received via e-mail.
9) Quotation may be submitted by speed post/Courier service, but it should reach the office of the undersigned within the stipulated date and time.
10) For any query Firms/ Agency may contact the undersigned via email id - ***eoicewrd@gmail.com***

Sd/-
Director Design
Water Resources Department
Assam Water Centre
Basistha, Cuwahati-29

PRICE SCHEDULE

Annexure 1

Name of the Project: Services for Cross section survey Beki, Burhidihing and Jiadhal River under AIRBMP.

Sr. No.	***Brief Descriptionof the Works***	***Unit***	***Quantity***	***Unit Rate (in Rs.)***	***Amount (in Rs.)***
1	*Preparation of Planning Report as per the scope and objective of the assignment covering the output of Task-1: Review of Current Methodology of Ground survey such as Map and Table of Benchmarks, proposed cross section alignments, methodology to be used in conducting the survey approach, including progress report of consultations and actions taken under Tasks and Deliverables defined in Description of Services at Annexure 2.*	*Task*	*01*		
For River Burhidihing					
2	*Establishment of Musto type Bench Mark of standard specification conforming relevant BIS Code and as per drawing as described in Description of Services at Annexure 2 including its painting, engraving etc all complete including cost of manpower, material, labour as per direction of Engineer-in-charge.*	*Each*	*08*		
3	*River cross-section survey and preparation of maps in requisite scales to supply them both in soft and hard formats as described & defined in Description of Services at Annexure 2 with five hard copies complete including cost of manpower, labour, surveying, instruments, camp equipage, transportation etc as per direction of Engineer-in Charge.*				
	a) Land Portion	*Per km*	*85.75*		
	b) River Portion	*Per km*	*28.95*		
4	*Survey of Structures located across the river as well as on the Embankments/Banks of river (Cross-drainage works, Bridges, Culverts, Anti Flood Sluice etc) as defined in Description of Services and preparation of report in both soft as well as hard copy with five copies covering the detailed of structures i.e its locations, dimension, Geotagged digital photograph all complete including the cost of manpower, labour, instruments, transportation etc as per direction of Engineer-in Charge.*	*Each*	*10*		
For River Beki					
5	*Establishment of Musto type Bench Mark of standard specification conforming relevant BIS Code and as per drawing as described in Description of Services at Annexure 2 including its painting, engraving etc all complete including cost of manpower, material,*	*Each*	*04*		

	labour as per direction of Engineer-in-charge.				
6	*River cross-section survey and preparation of maps in requisite scales to supply them both in soft and hard formats as described & defined in Description of Services at Annexure 2 with five hard copies complete including cost of manpower, labour, surveying, instruments, camp equipage, transportation etc as per direction of Engineer-in Charge.*				
	a) Land Portion	*Per km*	*66.10*		
	b) River Portion	*Per km*	*63.35*		
7	*Survey of Structures located across the river as well as on the Embankments/Banks of river (Cross-drainage works, Bridges, Culverts, Anti Flood Sluice etc) as defined in Description of Services and preparation of report in both soft as well as hard copy with five copies covering the detailed of structures i.e its locations, dimension, Geotagged digital photograph all complete including the cost of manpower, labour, instruments, transportation etc as per direction of Engineer-in Charge.*	*Each*	*04*		
For River Jiadhal					
8	*Establishment of Musto type Bench Mark of standard specification conforming relevant BIS Code and as per drawing as described in Description of Services at Annexure 2 including its painting, engraving etc all complete including cost of manpower, material, labour as per direction of Engineer-in-charge.*	*Each*	*04*		
9	*River cross-section survey and preparation of maps in requisite scales to supply them both in soft and hard formats as described & defined in Description of Services at Annexure 2 with five hard copies complete including cost of manpower, labour, surveying, instruments, camp equipage, transportation etc as per direction of Engineer-in Charge.*				
	c) Land Portion	*Per km*	*38.15*		
	d) River Portion	*Per km*	*16.25*		
10	*Survey of Structures located across the river as well as on the Embankments/Banks of river (Cross-drainage works, Bridges, Culverts, Anti Flood Sluice etc) as defined in Description of Services and preparation of report in both soft as well as hard copy with five copies covering the detailed of structures i.e its locations, dimension, Geotagged digital photograph all complete including the cost of manpower, labour, instruments, transportation etc as per direction of Engineer-in Charge.*	*Each*	*03*		

Annexure 2

DESCRIPTION OF SERVICES

Tasks and Deliverables:

The service provider is expected to accomplish the following major tasks:

Task 1: Review of Current Methodology of Ground survey

The various activities in Task 1 include a review of current methodology and approach of ground survey with all pros and cons. The service provider has to carry out the reconnaissance survey of the area of interest by visual observation supported with high-resolution satellite imageries to collect information and prepare a survey plan to finalize the complete sequence of working, establishment of control pillars and has to submit a Planning Report on appropriately scaled index maps. The service provider is required to select appropriate Survey of India GTS/GCP (Great Trigonometrically Survey/ Ground Control Point) benchmarks from the existing one and prepare a table of both the GTS/GCP benchmark and additional to be established benchmarks (Both Musto Type and Temporary benchmarks) for the whole survey area. This survey plan would also reflect to ensure survey for timely job completion with desirable accuracy as per design norms using the most suitable latest modern technology. The indicative cross-section survey plan of all the rivers has been annexured as Annexure-3A. The services provider has to prepare the report in reference to the survey plan after doing the reconnaissance survey of the area of interest. The service provider would also prepare a report that will consist of the project appreciation, detailed scheduling of activities, work output and critical man power deployment schedule, Performa for data collection, identification of social and environmental sensitive areas, key plan of the area Quality Assurance Plan (QAP) documents and clearances, if needed. A general overview of conducting X-section survey with their technology, methodology and accuracy level is to be provided.

Outputs:

Planning Report: Reflecting Task 1 assignment and findings, Map and Table of Benchmarks, proposed cross section alignments, methodology to be used in conducting the survey approach, including progress report of consultations and actions taken.

Task 2: Establishment of Musto Type Benchmark

The details activities under this Task-2 include:

Selection and fixation of additional permanent benchmarks based on prepared survey plan. There are many benchmarks, established by Survey of India in this area. The service provider is required to select appropriate benchmarks from the existing one, extend to survey area, validate for accuracy and reliability, establish additional benchmarks, and erect Musto type permanent benchmarks as primary benchmarks. They are required to prepare a table of Geographic co-ordinates and elevation of these benchmarks for storage as well as future reference. A work plan in map form shall be prepared before conducting actual benchmark survey so that Field officers under Water Resources Department, Assam could check with its suitability for achieving the objective of such a detailed survey. The service provider would establish the benchmarks throughout the survey area at an interval of about 50 Km in a manner that the detail 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 benchmark (Primary Benchmarks) as adopted by Central Water Commission is enclosed at *Annexure 3B* . Secondary benchmarks may be marked on permanent structures like bridge piers, HT transmission line poles, culverts etc. French (Seno Markers) pegs may be used wherever a permanent structure is not available. Markings on concrete structures may be slightly engraved and those on iron/steel structures may be painted with good quality paint. However, any other better

options are always welcome. The drawing of layout plan would be prepared in ArcGIS showing River Plan, Cross-section, Gauge location, all structures, reference points and other salient features along with the river and Flood plain.

Approximate numbers of Musto Type Benchmarks are to be established is 16 to be constructed as per Schematic Plan for Musto Type Benchmark at Annexure-3B. This will be established at selected location with the prior approval from the Client.

Outputs:

Report on Establishment of Musto type Benchmarks reflecting Task 2 assignment and findings, Map and Table of Benchmarks (including temporary benchmarks) with proposed cross section alignments,

Task 3: Detail Topographic and X-section Survey

a. Task-3 is to collect precise elevation and location data at an interval necessary to generate cross-sections for use in hydraulic models. The tolerance for vertical accuracy should be **±5 cm or less**.

b. Carry out Cross-section Survey using modern technology with the Total Station and Auto Level instruments for the development of an accurate and realistic cross-section. The longitudinal river profile of the river through the deepest channel (thalweg zone) should also be prepared. The details of topographic and cross-section survey would include:

- The survey is to be conducted for both land as well as water portion of the specified rivers along with its tributaries in the river length of nearly 330 Kms. Approximate length of Rivers and numbers of cross-section in such stretches are given in the Annexure 3A and table below.
- The cross-sections in the mainstem and tributaries would be recorded in longitudinal intervals as mentioned in Annexure 3A. Sections shall extend to the country side toe (in case of embankment) or up to the overbank high-point or 25m above the water, whichever is lower. Survey points should be in an interval of at most **5m** apart along the transect lines. Breaks of slopes such as high land/structure, riverbank, river terraces (or khadar banks) etc. must be recorded. The section should be, as far as possible, nearly perpendicular to the flow of the channels. Start and end points of each section has to be marked clearly and precisely on a detail base map of the area under study.
- Bed level of spill channels, tributary junctions and canal outfalls (if any) must be surveyed as these are crucial to flood water routing exercises. The terrain under question is practically 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 a vertical accuracy of ± 5cm. Bed depths should be recorded with due attention and accuracy. **Thalweg of rivers must necessarily be recorded with bed elevations along the thalweg.**
- All topographic data should be acquired, stored, and processed in a georeferenced manner in standard format that can be accessed both by CAD programs such as AutoCAD and GIS programs such as ESRI ArcView or QGIS. File format should be attributed and georeferenced ESRI shapefiles including point type designation, feature description (e.g. top of bank, centerline, river bed, edge of water, etc.). Data should include completed **metadata fields** including date of collection, methods of collection, survey methods with vertical and horizontal accuracy, contact information for surveyors, and other relevant fields describing the provided dataset. Data should georeferenced in preferably same which is used by Survey of India for DEM and also WGS84 coordinate system.
- All processed field data collected should be provided to client as original ESRI Shapefile point files for both the overbank and river bathymetric and centerline survey data.

Detail of indicative running length of cross-section of the proposed river.

Table: River Buridihing, Beki and Jiadhal for survey

Sl. No.	River Name	River Length (km)	Number of Cross-Section (Nos)	Length of Cross-Section (km)		
				Land Portion	Water Portion	Total (5+6)
1	2	3	4	5	6	7
1	Burhidihing	220	111	85.75	28.95	114.70
2	Beki	80	53	66.10	63.35	129.45
3	Jiadhal	30	51	38.15	16.25	54.4
	Total	330	115	190	108.55	

Outputs:

Report on River Cross Section surveys in five nos. of hard copies along with its soft copies in the prescribed formats as mentioned in description of services.

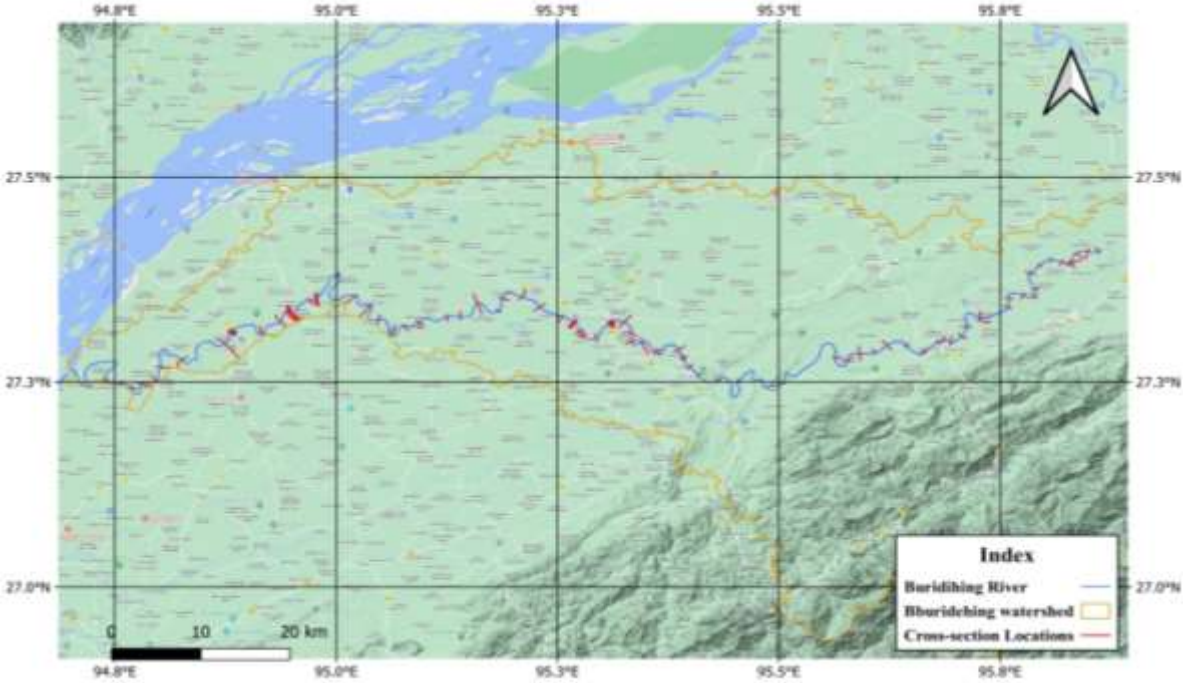
Task 4: River/Embankment Structure Survey

- During surveys it is required to collect information on structures such as cross-drainage works, culverts, road crossings, bridges, anti-flood sluice gates etc., with associated digital photographs with GPS information for each. Pertinent information such as location, design drawings of these structures as available from the different agencies, measurements of visible dimensions, current status (working, damaged, choked, repairable or not) should be recorded. All information, spatial in nature, should be located on map with appropriate symbols/notations in ArcGIS format. Any other relevant features, natural or man-made, found in the survey area shall be surveyed and documented. Water Level of the river during survey period with time and date must be recorded.
- **Total Nos. of structures for which the information has to be collected is estimated as 17 Nos.**

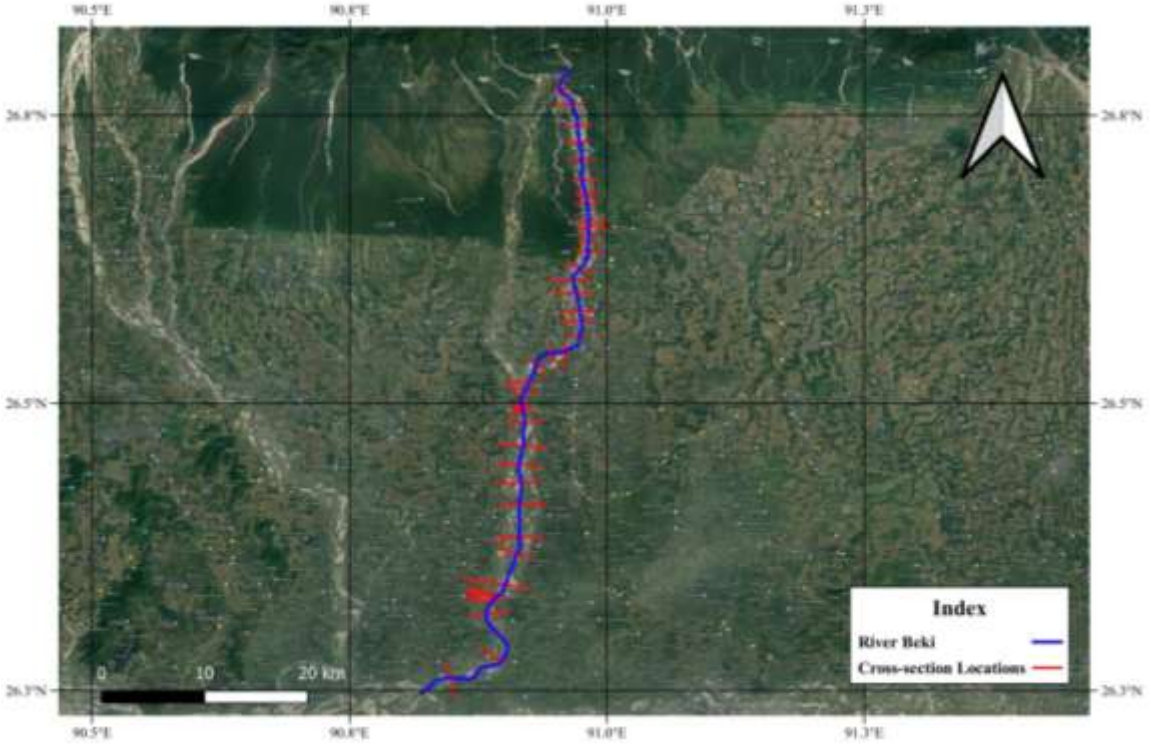
Outputs:

Report on various structures on the three sub basins and all its tributaries along with geotagged digital photographs of the various structures with its salient feature.

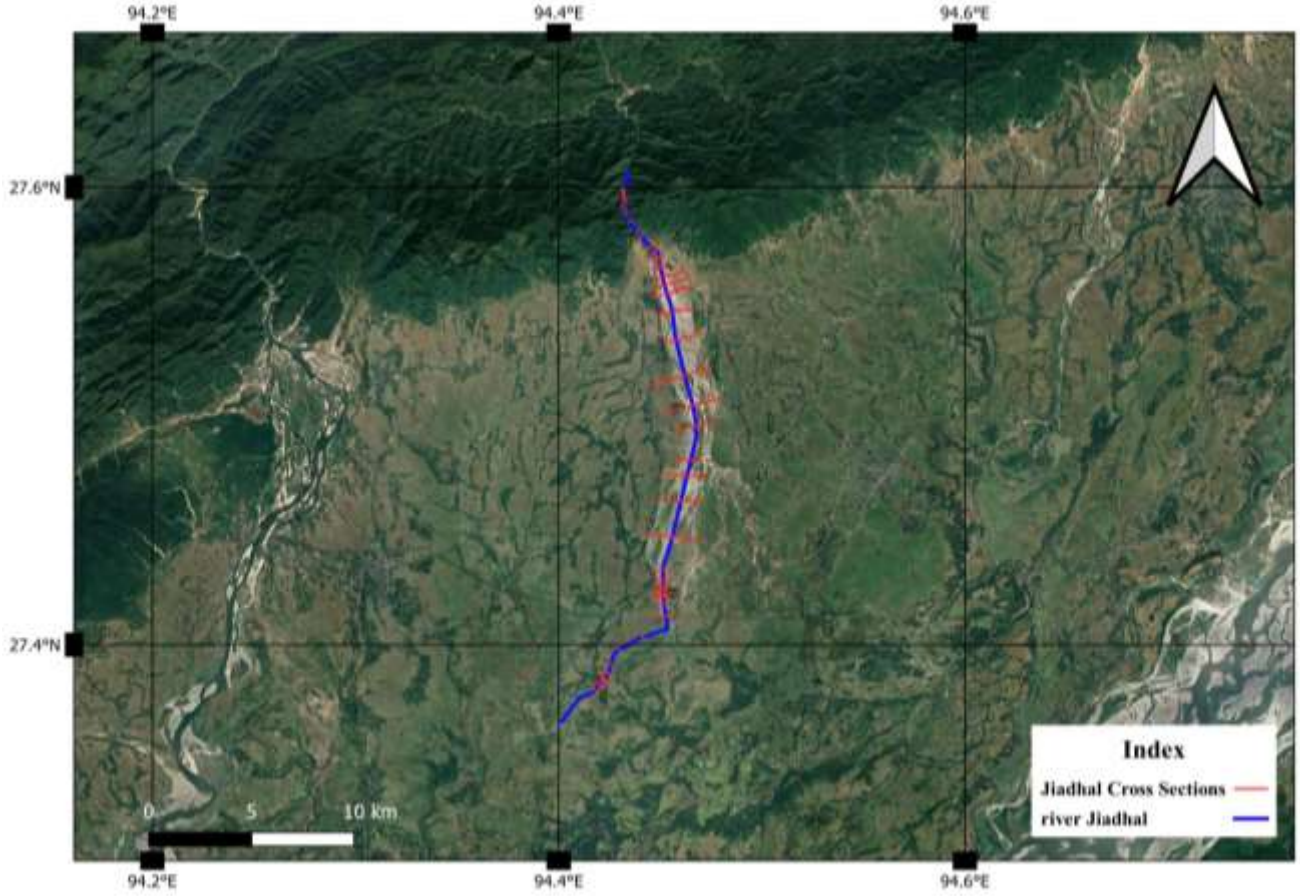
Annexure 3A



Proposed location for cross sectional survey in river Burhidihing



Proposed location for cross sectional survey in river Beki



Proposed location for cross sectional survey in river Jiadhal

Annexure 3B

Schematic Plan for Musto Type Benchmark