

**GOVERNMENT OF KARNATAKA
(Water Resources Department)**

**PROJECT: DAM REHABILITATION AND IMPROVEMENT PROJECT
PHASE –II (DRIP-II)**

REQUEST FOR BIDS NO:04/2022-23

REQUEST FOR QUOTATION (RFQ)/ SHOPPING PROCEDURES

(Single Envelope For Non-Consultancy Services)

Name of Work: Conducting Underwater Videography on the upstream face of the Vani Vilas Sagar Dam using ROV(Remotely Operated Vehicle)

**Executive Engineer,
VJNL,UBP, Division No.07
Hiriyur camp, Chitradurga**

JULY 2022

REQUEST FOR QUOTATIONS
Procurement of Non-Consulting Services under RFO/Shopping Procedures
E-Procurement Notice

Employer: Government of Karnataka water resources department

Contract title: Conducting Underwater Videography on the upstream face of the Vani Vilas Sagar Dam using ROV(Remotely Operated Vehicle).

RFQ No: [No:V.J.N.L/UBP/E.E/D.7/HYR/Tender notification/2022-23/04]

Date: [Dt:12.07.2022]

Applicable Procurement Regulations Date: World Bank's Guidelines For Procurement Of Goods, Works, and Non-Consulting Services Under IBRD Loans and IDA Credits & Grants By World Bank Borrowers January 2011, Revised July 2014.

1. Government of India has received financing from the World Bank towards the cost of the **Dam Rehabilitation and Improvement Project (DRIP)** Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this request for quotations is issued. **Government of Karnataka Water Resources Department** invites quotations from eligible bidders for procurement of the following non-consultancy services:

| Sl. No. | Brief Description of the Non-Consultancy Services | Deliverables | Period of Completion |
|----------------|--|---------------------|-----------------------------|
| 1 | Conducting Underwater Videography on the upstream face of the Vani Vilas Sagar Dam using ROV(Remotely Operated Vehicle) Scope of work also includes submission of a.Post inspection Visual Analysis of raw video including depth and position tagging and identification of any visible concerning points. b. Processed HD Videos in a pen-drive along the soft copy report c. Engineering Analysis of Inspection Data and Software Based Visualization of Data d. Software Report and Hard Copy Report | As per ToR | 2 Months |

2. The Bidders may submit Quotations for all the items specified in ToR.
3. This Procurement notice includes the terms and conditions applicable to submission of quotations; criteria for qualification, evaluation, and for award of Contract for Non-Consultancy Services; and relevant forms to be filled by the bidders.

Implementing Agency has not issued a separate RFQ document for procurement of these services. The Procurement notice will be displayed in the office of Executive Engineer, VJNL, UBP Division No.07 Hiriyur camp, Chitradurga. The same documents and forms to be filled etc. can be downloaded free of cost by logging on to the website www.waterresources.karnataka.gov.in & submit the duly quoted rates quotation in sealed cover to the office of Executive Engineer, VJNL, UBP Division No.07 Hiriyur camp, Chitradurga. Any further information Or Clarification for the above said work including last date, opening date, technical specification Etc., can be obtained from below mentioned office (SIno. 5) during the office hours & in notice board. The last date for submission of quotation to the below office dated 11-08-2022 by 5.30 pm, opened the quotation by next day i.e, 12-08-2022 will be at 5.30 pm

4. If the Employer's office happens to be closed on the date of opening of the Quotations as specified, the Quotations will be opened on the next working day at the same time. Each Bidder shall submit only one quotation.

Validity of Quotation

Quotation shall remain valid for a period not less than 60 days after the deadline date specified for submission.

1. Evaluation of Quotation

The Department will evaluate and compare the quotations determined to be substantially responsive i.e., which

- a) Are properly signed and
- b) Conform to the Terms & Conditions and Specifications.

The Quotation would be evaluated for all the item together.

2. Award of Contract

The Department will award the contract to the Bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

Notwithstanding the above, the Department reserves the right to accept or reject any quotation and to cancel the Bidding process and reject all quotations at any time prior to the award of contract.

The Bidder whose Bid is accepted will be intimated to the Contractor by the Department prior to expiration of the quotation validity period.

3. Payment shall be made after the satisfactory completion for the work.

4. You are requested to provide your offer latest by 05:30 PM hours on 11-08-2022. We look forward to receive your quotations and thank you for your interest in this event.

5. Other details can be seen in the RFQ document. The Employer shall not be held liable for any delays due to system failure beyond its control. A Bidder requiring any clarification of the RFQ Document may notify the Employer online email ubpee07@gmail.com, aeevvshyr@gmail.com or may visit the office of the Employer at the address given below.

Office of the Executive Engineer,

VJNL, UBP Division No.07

Hiriyur camp, Chitradurga.

Telephone : 08194-200187

e-mail : ubpee07@gmail.com

Website : www.waterresources.karnataka.gov.in

RFQ No: [No:V.J.N.L/UBP/E.E/D.7/HYR/Tender notification/2022-23/04/]

Date: [Dt:12.07.2022/]

Terms and Conditions

- 1. Eligibility:** A Bidder (a) shall not participate in more than one Quotation; (b) shall not have conflict of interest as defined in the Bank's Procurement Regulations; and (c) should not have been (i) temporarily suspended or debarred by the World Bank Group in compliance with the Bank's Anti-Corruption Guidelines and its Sanctions Framework

- 2. Clarifications & Amendments:** If the Employer receives any request for clarification of this RFQ Document, it will upload its response together with any amendment to this document, on the e-procurement portal for information of all Bidders. Bidders should check on the above office notice board or website www.waterresources.karnataka.gov.in , for any amendments to the terms and conditions.

- 3. The Quotation shall comprise the following:**
 - (a) Letter of Quotation;
 - (b) Confirmation that the offered Non-Consultancy Services conform to the required specifications/ ToR;
 - (d) Evidence in accordance with Clause 6 establishing Bidder's qualifications to perform the contract, if its quotation is accepted;
 - (e) Performance Statement of completion of similar Non-Consultancy Services made during the last 3 years, in the prescribed Format;
 - (f) Complete address and contact details of the Bidder having the following information:

Name of Firm
Address for communication
Telephone No(s): Office
Mobile No.
Facsimile (FAX) No.
Electronic Mail Identification (E-mail ID)

 - (g) Price Schedule (using the Schedule uploaded with the RFQ document) wherein the **total amount** shall be entered.

4. Quotation Prices

- a) The contract shall be for the entire scope of works **as specified in ToR**. Corrections, if any, can be carried out by editing the information before electronic submission.
- b) All duties, taxes and other levies payable shall be included in the total price.
- c) GST and any other taxes, which will be payable at the time of invoicing in connection with the Non-Consultancy Services, shall be shown separately. If these are only stated to be extra, such quotations are liable to be rejected.

Wherever these taxes are not shown, these will be assumed to have been included in the quoted price.

- d) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- e) The Prices shall be quoted in Indian Rupees only.

5. Conformity of Non-Consultancy Services: NA

6. Qualification of the Bidder:

(a) Bidder should have provided Non-Consultancy Services of “Similar Type” (&capacity) in any one of the last 5 years. Details of services provided during the last 5 years shall be submitted in the specified Proforma.

(b) A minimum 4000 Sqm of underwater investigation work by ROV done certificate in a year should be countersigned by not less than Executive Engineer / Engineer-in-charge/Project Manager of Government firms for eligibility of evaluation of bidder.

(c) The Bidder should have completed at least three underwater inspection by ROV works of dams with any Government division prior to bidding for this work. Documents of experience to be submitted in the form of work done and completion certificates. The contractor should submit an ROV OEM certificate or should have ownership certificate for the ROV. (Diver/Manual based inspections will not be considered)

7. Validity of Quotation: Quotation shall remain valid for a period not less than 60 days after the deadline date specified for submission.

8. Signing of Quotations: The name and position held by each person signing the quotation and related documents must be typed or printed below the signature.

9. Quotation Submission: The Letter of Quotation shall be filled, signed and scanned copies shall be submitted to the office of Executive Engineer, VJNL, UBP Division No.07 Hiriyur camp, Chitradurga.

10. Opening and Evaluation of Quotations: The Quotations will be opened on 12-08-2022 will be at 5.30 Pm. The Department will evaluate and compare the quotations determined to be substantially responsive i.e., which are properly signed and Conform to the Terms & Conditions and Specifications.

The Quotation would be evaluated for the entire item together.

11. The Employer shall examine the quotation to determine whether the quotation (a) has been properly signed (Clause 8); b) meets the eligibility criteria (Clause 1); (c) conforms to all terms, conditions, technical specifications, warranty/guarantee etc.; and (d) the bidder has accepted the delivery schedule (Employer’s Requirement Form 1).

(a) Only Quotations that are substantially responsive to the RFQ document, and meet all Qualification Criteria shall qualify.

(b) The evaluation shall be based on the total price quoted for Non-Consultancy Services at project site, including GST and any other taxes, which will be payable on the submission of deliverables, at the time of invoicing.

12. Award of contract: The Employer will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

(c) Notwithstanding the above, the Employer reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.

(d) The bidder whose quotation is accepted will be notified of the award of contract by the Employer prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the Contract Agreement (sample form attached).

(e) **Payment:**

Conducting preliminary inspection with Remote Operated Vehicle (ROV) for identification of defects, critical areas of the dam U/S surface the work including all below aspects

1) 10% of Payment shall be made within fourteen (14) days after Signing of the Contract. For Mobilization of ROV, ROV Operating Crew and other operational requirements to carry out the underwater inspection against Bank Guarantee.

2) 10% of payment shall be made against submission of Inception Report.

3) 70% of payment shall be made against inspection, submission and approval of :

➤ Underwater detail inspection and survey using ROV to identify scars, scouring, cracks etc including measurements and mapping of the defects with Dam chainage and RL upto a water depth of 45 meters

➤ Submission of draft reports in soft and hard copies (3 sets)

➤ Submission of final report along with Auto-cad drawings or Software based grid visualization of data showing the defects in 3m x 3m as per actual chainage and RL of the Dam in hard and soft copies (3 sets)

➤ Submission on repair proposal based on the defects identified during inspection including repair methodology, material specification and detail BOQ

4) 10% of payment against approval of the final report and above mentioned submission in required three numbers of soft and three numbers of hard paper copies.

Payment of GST and other taxes payable for the services at the time of invoicing, although already included in the total cost, will be at actual or the rate/amount of these taxes specified in the Contract Agreement, whichever is lower.

- d) **Normal commercial warranty/ guarantee : NA**

Quotation Forms

Letter of Quotation

The Bidder must prepare the Letter of Quotation on stationery with its letterhead clearly showing the Bidder's complete name and address. The italicized text is for Bidder's guidance in preparing these forms and shall be deleted from the final products.

RFQ No.

Our Reference: No..... Dated.....

To:

(Employer's name and address)

Subject: Quotation for conducting Underwater Videography on the upstream face of the Vani Vilas Sagar Dam using ROV(Remotely Operated Vehicle).

Sir,

1. We, the undersigned, hereby submit our Quotation. In submitting our Quotation, we make the following declarations:

- (a) **No reservations:** We have examined and have no reservations to the RFQ Document;
- (b) **Conformity:** We offer to provide the following Non-Consultancy Services in conformity with the RFQ Document and in accordance with the Schedule of Requirements/ Terms of Reference (ToR)

[insert a brief description of the Non-Consultancy Services and Related Services];

- (c) The total price of our Quotation, including any unconditional discounts offered is:
Total price of the Quotation **Rs 25,00,000.00/- twenty five lakhs only** **[insert the total price of the quotation including GST and any other taxes, which will be payable on the finished Non-Consultancy Services, in words and figures];**
- (d) **Commissions, gratuities and fees:** We have paid, or will pay the following commissions, gratuities, or fees 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. If none has been paid or is to be paid, indicate "none."]*
- (e) **Quotation Validity Period:** Our Quotation shall be valid for the period of 60 days, from the deadline fixed for the Quotation submission;
- (f) **Eligibility:** We meet the eligibility requirements and have no conflict of interest, we are not participating in more than one quotation in this bidding process, and we have not been temporarily suspended or debarred by the World Bank.
- (e) **Fraud and Corruption:** 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 corrupt, fraudulent, collusive, coercive, or obstructive practices.

Yours faithfully,

Authorized Signature

Name & Title of Signatory _____

In the capacity of *[insert legal capacity of person signing the Letter of Quotation]*

Name of Bidder _____

Address _____

Dated on _____ day of _____, _____ *[insert date of signing]*

FORMAT OF QUOTATION

| Sl No | Item Description | Approximate Quantity in Figures and in Words | Quoted Lump sum Price in Rs. | GST and similar other taxes applicable | *Total Lump sum Price - inclusive of discounts, all taxes and duties |
|-------|---|--|------------------------------|--|--|
| 1 | 2 | | (A) | (B) | (A)+(B) |
| | DRIP Phase II – PIP - Conducting Underwater videography on the upstream face of Vani Vilas Sagar Dam (approx 8000 sqm area) using ROV (Remotely Operated Vehicle) including fitted with; Data capturing equipment, low light HD cameras, depth sensors, altimeter, laser for quantifying the defects details, geo-tagging of every frame and display screen at top of dam with reference to marking grids on the face of dam including mobilization and demobilization of equipment and crew. Scope of work also includes submission of a. Post inspection Visual Analysis of raw video including depth and position tagging and identification of any visible concerning points. b. Processed HD Videos in a pen-drive along the soft copy report c. Engineering Analysis of Inspection Data, Detail BOQ and Software Based Visualization of Data d. Software Report and Hard Copy Report | 8000 Sqm (eight thousand Sqm) | | | |

Note:

1. Evaluation shall be done for all the items together
2. *Payment of GST and other taxes payable for the Non-Consultancy Services at the time of invoicing, although already included in the total cost, will be at actuals or the rate/amount of these taxes specified in the Letter of Award, whichever is lower.

We agree to provide the above Non-Consultancy Services in accordance with the technical specifications/ ToR for a total contract price (including all taxes and duties) of Rs..... (Amount in figures) (Rs... amount in words) within the period specified in the Request for Quotations.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf has engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices (as defined in the prevailing World Bank's sanctions procedures) in competing for or in performing the Contract.

Signature of Bidder

PROFORMA FOR PERFORMANCE STATEMENT*

Proforma for Performance Statement (for a period of last 3 years)

RFQ No. _____
_____ Hours

Date of opening _____ Time

Name of the Bidder _____

| <u>Order placed by (full address of Employer)</u> | <u>Order No. and date</u> | <u>Description of Services</u> | <u>Value of order</u> | <u>Date of completion of delivery</u> | |
|---|-------------------------------|------------------------------------|---------------------------|---|------------------------|
| | | | | | As per contract Actual |
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> |

*This proforma shall be deleted if requirement of Performance Statement is deleted in Clause 4.

Signature and seal of the Bidder

TERMS OF REFERENCE (ToR)

I. DESCRIPTION OF SERVICES

A. Background

The VV Sagar Dam is constructed across Vedavathi river near Marikanive village in Hiriyur Taluk of Chitradurga district during the year 1895 to 1907. The Vedavathi river is a tributary to Krishna river. The main object of VV Sagar Project is to provide irrigation facility in the drought prone areas of Chitradurga district. This Project provides irrigation to 25,000 acres of land by constructing a non-over flow Dam of 43.28 m height (142 ft) above the lowest river bed spanning between hill abutments for a length of 405.50 m (1330 ft). The irrigation is proposed under high level canal taking-off from the main dam on the left bank and, left bank and right bank canals taking –off from Kathrikeyanahalli Anicut constructed 8 kms below the Dam.

The gross storage capacity of the Reservoir formed by the construction of the Dam is 850.30 mcum (30 tmc). The utilisation contemplated under the Project is 148.32 mcum (5.25 tmc).

The Dam has a catchment area of 5374 sq km (2075 sq miles) which includes an intercepted catchment area of 3820 sq km (1475 sq miles). The annual yield expected at the Dam site varies from a minimum of 48 mcum to a maximum of 455 mcum. The main Dam built across the Vedavathi river consists of non-overflow Dam. The surplussing arrangement consists of a waste-weir located at 2.40 km to North of Dam by cutting the saddle. The length of the weir is 143 m (468 ft) and is designed to pass the designed flood discharge of 991 cumecs (35,000 cusecs) under a spillage depth of 1.82 m (6 ft).

SAILENT FEATURES OF THE PROJECT

| | |
|----------------------------|--|
| Name of the Project | Vani Vilasa Sagar Dam. |
| Name of the River | Vedavathi |
| Location of dam | Near Marikanive village of Hiriyur taluk in Chitradurga District |
| Longitude | 75° 01' 0" N |
| Latitude | 13° 20' 0" N |
| Total catchment Area | 5374 Sqkm |
| Independent catchment area | 1554.00 Sqkm |
| Intercepted catchment area | 3820 Sqkm |
| Yeld at Dam Site | Yield varies from minimum of 48 mcum to a maximum 455 mcum |
| Reservoir Details | |
| Gross storage capacity | 850.30 mcum (30 tmc) |

| | |
|---|---|
| Dead storage capacity | 47.80 mcum (1.875 tmc) |
| Live storage capacity | 802.50 mcum (28.125 tmc) |
| Lowest river bed level | RL 612.80 m (RL 2010.50 ft) |
| Dead storage level | RL 631.09 m (RL 2070.50 ft) |
| Full reservoir level | RL 652.43 m (RL 2140.50 ft) |
| Maximum water level | RL 654.25 m (RL 2146.50 ft) |
| Top of dam | RL 656.08 m (RL 2152.50 ft) |
| Water spread area (at FRL) | 8763 ha (21,645 acres) |
| Dam | |
| Type of Dam | A Non Overflow dam built in rubble masonry in lime surki mortar |
| Length of the dam | 405.40 m |
| Deepest Foundation Level | RL 606.700 m |
| Lowest river bed level | RL 612.80 m |
| Max height of dam above lowest foundation level | 49.38 m |
| Max height of dam above lowest river bed level | 43.28 m |
| Top width of Dam | 4.57 m |
| Spillway | |
| Type | Broad Crested Weir |
| Location | 2.40 km to North of Dam in the saddle cutting |
| Length | 143 m |
| Crest width | 1.20 m |
| Crest Elevation | RL 652.43 m |
| Maximum water level | RL 654.25 m |
| Spillage | 1.82 m |
| Design flood discharge | 991 cumecs |
| Irrigation Sluice | |
| Discharge | 28.91 cumecs |
| Vent size | 1.67 x 3.90 m |
| Atchkat | 10117 Ha |

(Source : <http://vjnl.in/en/vanivilas-sagar-dam/>)

II. LIST OF SERVICES/JOB WORK

| Sl No | Item Description | Approximate Quantity in Figures and in Words |
|-------|---|--|
| 1 | 2 | |
| 1 | <p>Conducting Underwater videography on the upstream face of Vani Vilas Sagar Dam (approx 8000 sqm area) using ROV (Remotely Operated Vehicle) including fitted with; Data capturing equipment, low light HD cameras, depth sensors, altimeter, laser for quantifying the defects details, geo-tagging of every frame and display screen at top of dam with reference to marking grids on the face of dam including mobilization and demobilization of equipment and crew.</p> <p>Scope of work also includes submission of</p> <ol style="list-style-type: none"> Post inspection Visual Analysis of raw video including depth and position tagging and identification of any visible concerning points. Processed HD Videos in a pen-drive along the soft copy report Engineering Analysis of Inspection Data, Detail BOQ and Software Based Visualization of Data Software Report and Hard Copy Report | 8000.00 sqm (eight thousand sqm) |

Brief methodology: :

SCOPE OF WORK

Conducting Underwater videography on the upstream face of Vani Vilas Sagar Dam (approx 8000 sqm area) using ROV (Remotely Operated Vehicle) including fitted with; Data capturing equipment, low light HD cameras, depth sensors, altimeter, laser for quantifying the defects details, geo-tagging of every frame and display screen at top of dam with reference to marking grids on the face of dam including mobilization and demobilization of equipment and crew.

Post Processing and Report Generation

- a. Submission of Post inspection Visual Analysis of raw video including depth and position tagging and identification of any visible concerning points.
- b. Submission of Processed HD Videos in a pen-drive along the soft copy report
- c. Submission of Engineering Analysis of Inspection Data, Detail BOQ and Software Based Visualization of Data
- d. Submission of Software Report and Hard Copy Report

Inspection Methodology and Guidelines

General Guidelines

- Surveying to be carried out by ROV as mentioned in the scope of work.
- Detection of major cracks on the surface of Dam
- Openings in block joints and lift joints and their extent of opening to be inspected
- Identifying and quantifying damages on the surface like honey combings, spalls, cracks, efflorescence, holes, abrasion etc
- Position of damage with respect to height and length to be included in the final report
- Image processing/enhancement technique to be applied in the video where water is turbid and visibility is bad.
- Detection of unnecessary leftover of embedded steel rods or elements resulting in seepage due to their corrosion.
- A formal report of damages, repair methodology and suggested repair materials should be also prepared if requested.

Equipment & Tools to be Used

- The Contractor shall only employ Remotely Operated Vehicles (ROVs) to inspect the underwater portion. Videography using divers will not be acceptable.
- ROV should have a minimum depth rating of 100m and tether length not less than 300m.
- The ROV should record the depth (with an accuracy of 0.1m) and heading of the ROV during inspection and this should be overlaid to the submitted video.
- ROV should be compact enough to fit within dimensions of 50cmx50cmx50cm for ease of portability, deployment and maneuverability
- ROV should have minimum 2 HD 1080p Live Streaming Cameras and a minimum of 6000+ lumen Lighting. One camera should be front looking and the second camera should be bottom looking. It should have capability for capturing videos in low light areas.
- Bottom mapping Camera should be provided to identify the features at the River Bed.
- The ROV should be powered both by a battery (standby) and AC Power to work for long durations.

- The system should be capable of capturing high definition video footage. The contractor should furnish the specification and ownership documents of such ROV
- For underwater inspection, a reliable ROV has to be used with exceptional altitude stability. Heading and depth holding capabilities are necessary for best videography and close outputs
- Camera and lighting should be strategically positioned for optimal full area illuminations without shadow casts on the area of inspections from the ROV body.
- Site-specific customizations are to be done in order to execute the inspection as per water condition and visibility of a particular project.
- ROV should be equipped with a Side Scan Sonar system to map necessary areas as and when required for boulder mapping, scour mapping etc...
- ROV Should be equipped with Imaging Sonar to navigate in very turbid conditions
- ROV should have the following payloads
 - One additional camera
 - Laser Scalar
 - Side Scan Sonar
 - Imaging Sonar

Inspection Methodology

- ROV is to be employed to map the structural integrity of the Dam in a systematic manner.
- Lawn Mower technique is to be used to maximize the area coverage and negate any error factors.

ROV should dive from water surface to the bottom using its powerful diving thrusters delivering powerful down thrust. A "LAWN MOWER" pattern parallel surveying dive lines (Refer Fig. 1) with each line in the grid having 2 meters spacing and appropriately spaced from the wall surface for best visibility conditions should be executed.

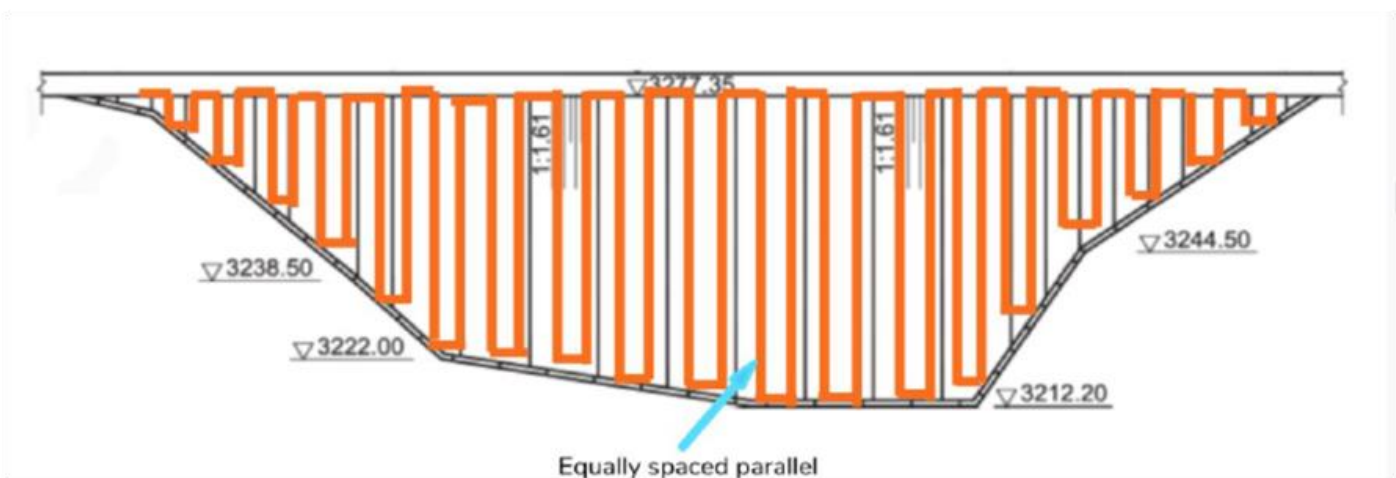


Fig 1.2. Sample of the Survey line pattern followed by the ROV in Dam Upstream Wall Side

Further all surveyed data should be delivered in a user-friendly software interface depicting inspection locations with depth, position tagging, defect heat map, key results and observations on a map. All data should be Post-processed with depth and structural position tagging using proprietary Visualization and Analytics software platforms. This Platform should further mark the observed defects on the layout drawing of the dam face. The Processed data must be submitted in pendrive or online format which is password protected.

All ROV dam survey data should be vetted by Dam Expert Veterans with 20+ years of experience. The report should have its initial inference and rehabilitation suggestions. These evaluations will be a key pointer in making next level decisions for dam owners.

- Specific standardized methods needed to be employed for distance maintenance between 2 lines.
- Spacing between 2 parallel lines should be a maximum of 2 m for maximum coverage and best overlap of images.
- Anomaly identification and size mapping should be done
- A detailed transcript of the entire inspection should be noted down

Execution team Capabilities/Requirements :

- Field/Project Supervisor: Minimum of 3 nos ROV underwater videographic inspection of Dams works execution experience in addition to 2 years or more of professional experience and who understands and executes the best safety standards throughout the inspection including successful submission of hard copy and soft copy reports.
- ROV pilot: An experienced ROV pilot with a minimum of 200 hours of piloting and having Civil structural inspections of Bridges and Dams is necessary
- Data Transcriber/ Copilot: A person with good experience in ROV piloting as well as Data transcription and firmware control software and application management. He understands Civil structures like Dams and its common defects with experience.
- Additional Support team members namely Mechanical, Electrical and Software specialists to maintain the ROV for a flawless work execution is necessary
- Furthermore, an emergency Diving support crew on standby is necessary.
- All the team members at the site should be insured by the contractor itself
- All the team members at the site should be equipped with necessary PPE and safety equipment.

Deliverables

Hardcopy

- Hard copy report should contain all minor & major anomalies found at the inspection with their enhanced images
- This should contain all anomalies tagged at the corresponding area with pictorial representation

Software Report/Analytics Report

- Dashboard with advanced analytics features like anomaly detection, defect area estimation, classification etc...
- Geo tagged anomaly mapping with “click to view” feature
- Depth, Time & Heading, custom scripts overlays on underwater inspection videos
- Video enhancement with advance algorithms for turbid waters
- Video player with Area of interest tagging and snapshot downloading options
- A software analytics report should be submitted consisting of Heat map of the defects plotted in Dam Elevation drawing
- Laser scaling techniques to be employed to get size estimates of defect/anomalies with the highest level of accuracies
- A side-scan sonar survey to find out large boulders and debris

The methodology described above is customized and may change depending on the situation and type of structure.

Recommended Parameters of ROV

| |
|---|
| Digital underwater survey with Live streaming of HD videos |
| Visual Inspection in Ultra-low light and High turbid waters |
| Weight less than 30kg,portable and carriable by 2 persons |
| Minimum Thrust 10 kgf in Surge and Sway Movement Omni directional movement with 4 DOF(Surge,Sway,Heave Yaw) |
| LED Light: Minimum 4x1500 Lumens with intensity controller (Min 6000 Lumens) |
| Two cameras : Primary camera - Low light 1080p HD, - 90 degree HFOV, - Sensitivity of minimum 0.1 lux, - Tilt movement -45° to +45° FOV Second camera - Full HD with low light sensitivity of 0.5 Lux |
| Depth rating 100 meters Tether length upto 300m |
| Power : Battery powered - endurance of 2 hours External Power(Min of 3kW,230 V,50 Hz AC source) - unlimited endurance |
| Data Analytics Software for Visualisation and Analysis of raw data, Overlay of custom data like date,time,depth,headingetc and overall user friendly interface |
| Data Analytics Software with Positional tagging of anomalies/areas of interest |
| Payload Capability : 1. LASER Scalar - Defect Size Estimation 2. Imaging SONAR - Navigating in Turbid Waters 3. Side SCAN SONAR - Map large boulders and debris 4. Additional Camera - Bottom looking |

ISO CERTIFICATIONS:

- The Bidder should be ISO Certified for 9001:2015 and 14001:2015. All processes and procedures should follow ISO Standards.

III. DETAILS OF KEY PERSONELS

| Sl. No | Position | Nos | Min Qualification | Min work Experience |
|--------|---|-----|--|---------------------|
| 1 | Team leader | 1 | M.E/M.Tech | 15+ years |
| 2 | Project Engineer | 2 | M.Tech/B.E (Mech/Civil) | 5+ years |
| 3 | Supervisor | 1 | M.Tech/B.E (EC) | 4 + years |
| 4 | Technician | 2 | Diploma(Mech/EEE/EC/Mechatronics Etc) | 2 + years |
| 5 | ROV Pilot | 2 | Diploma /BE (Mech/EEE/EC/Mechatronics Etc) | 1+ years |
| 6 | Data and Report Analyst (Cad draft Man) | 2 | BE (Civil) | 2+ years |
| 7 | Cad draft man | 1 | BE (Civil) | 2+ years |

ATTACHMENT

OFFICE OF
.....

LETTER OF AWARD

To:

M/s

Dear Sirs,

Sub:

Ref: Request for Quotation no..... dated

1. Your quotation no.....of(Date) for
has been accepted. You are requested to provide the following services at the rates quoted by you and specified against each as per the Terms of Reference (ToR) and terms & conditions specified hereunder:

| Sl. No. | Description of Non-Consultancy Services | Specifications/ Deliverables | Quoted Lump sum Price in Rs. | GST and similar other taxes applicable | *Total Lump sum Price - inclusive of discounts, all taxes and duties | | |
|---------|---|---------------------------------|------------------------------|--|--|------------|----------|
| | | | | | (A) | (B) | (A) +(B) |
| | | | | | | In Figures | In Words |
| 1 | Conducting Underwater Videography on the upstream face of the Vani Vilas Sagar Dam using ROV(Remotely Operated Vehicle) | As per Terms of Reference (ToR) | | | | | |

*GST and similar other taxes and duties applicable. Indicate each applicable tax separately.

2. Period of Completion..... days from the date of issue of this Letter of Award.
3. Place of Services
4. Employer's Address:
5. GST and other taxes and duties, if any will be reimbursed at actual rates paid on the date of supply or the rate/amount shown in 1. above, whichever is lower.

6. Payment shall be made as per terms and conditions specified in RFQ.

8. Other terms and conditions are as under:

.....
.....

(Employer)

Date:

Place:

Name:

Designation:.....