

INVITATION FOR TENDER FOR SUPPLY OF EQUIPMENT

Sealed tender offers are invited in two separate sealed covers (Technical and Commercial offers) from eligible manufacturers/suppliers or their direct Indian agents for the supply of the following equipment.

Wave flume and accessories

Please send offers, ALONG WITH DESCRIPTIVE CATALOGUE/ BROCHURE. The validity of the bid should be at least four months (120 days) or more from the date of the opening of this tender. Please ensure that your quotation reaches not later than **23.09.2019 at 15:00Hrs** at the following address:

Dr. Ritwik Ghoshal
Assistant Professor Grade I
Department of Ocean Engineering & Naval Architecture,
Indian Institute of Technology Kharagpur,
Pin-721 302, West Bengal, India

Earnest money of **Rs. 20,000/-** is to be deposited in the form of Account payee Demand Draft in favour of IIT Kharagpur, payable at Kharagpur, India. Any bid which is not accompanied with an EMD shall be summarily rejected. Earnest money deposited will be forfeited if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. No interest will be paid on the earnest money of the unsuccessful bidders.

Tender Reference	IIT/SRIC/NA/RVF/RGH/19-20/EQ1; Dated: 29.08.2019
Price of Tender Document	NIL
Last Date and Time for submitting the tender document	23.09.2019 at 15:00 Hrs (Indian time)
Time and Date of Opening of Technical Bids	23.09.2019 at 16:00 Hrs (Indian time)
Place of Opening Tender	Department of Ocean Engineering & Naval Architecture, Indian Institute of Technology Kharagpur – 721 302, West Bengal, India
Address of Communication	As stated above
Contact Telephone Numbers	+91- 3222 - 283794
E-mail	ritwik@naval.iitkgp.ac.in

DETAILED TECHNICAL SPECIFICATIONS FOR
WAVE FLUME AND ACCESSORIES

1. Flume description

- Dimension: 12 m long x 1.2 m high x 1 m wide. For others refer Fig. 1 below.
- Fixed bed flume with wet back.
- Trolley arrangement with scaling and x-y movement facility.
- Water supply sump, sufficiently big to fill the flume. Sump is to be fitted on the floor and flume should be above the sump.

- Flume base steel plate thickness = based on strength requirement + 4mm corrosion allowance. All steel members should be painted with anti-corrosion paints (Epoxy marine quality paint) after applying base coating.

- The sides of the flume are made of clear anti abrasive (e.g. toughened Borosilicate) glass sheet (which are supported by fabricated steel frames) sufficiently thick (more than 15mm) to withstand water pressure and small impact loads.

- A wave maker (details given in point 2).

- An adjustable inclined beach sufficiently long to achieve zero wave reflection.

- Pump for circulating water in the flume from both the direction. Capable of generating flow velocity up to 0.5 m/s (ranging from 0-0.5 m/s). Entry and exit geometry should be such that it should not affect the free-surface.

- The structure should not vibrate during operation. If vibration appears above acceptable limit, the structure should be modified accordingly.

- A provision should be there to place/clamp model scale structures in the flume bed.

- **All design calculations has to be submitted before 30 days of manufacturing/sending purchase order for the material. Technical discussion with PI showing compliance of all technical details should be carried out before freezing any concept/dimension.**

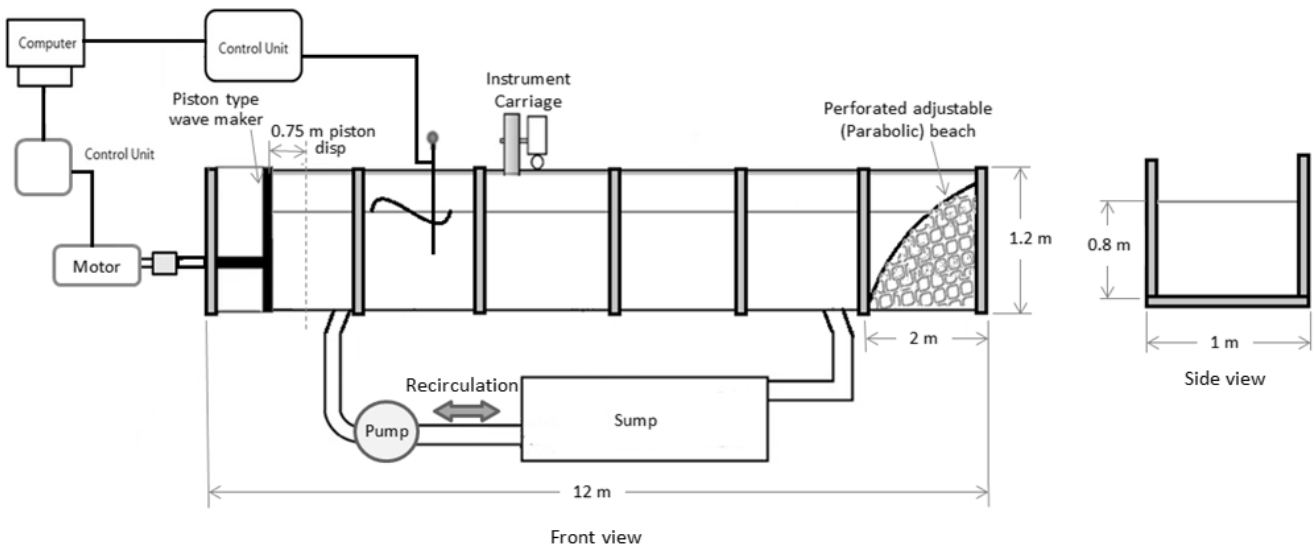


Fig. 1: Schematic description of the wave flume

2. Wave generating system should include the following complete set

- A wave maker of piston type, electric operated.
- Wave synthesizer for control and data acquisition with PC
- Both regular and random waves
- Random waves of based on any given mathematical spectrum is to be generated.
- It should have the capability of generating any given time history of wave height.
- It should also generate the random waves, if a spectral density details are given as input.
- Feed-back controller loop between piston and the wave gauge should be provided to get the intended wave height.
- Wave height calibration for different water depth should be provided.

3. Wave generation capability of the wave maker (at water depth of 0.8 m)

- Maximum displacement of the piston is 0.75 m. Time period of the wave should range from 0.5 sec to 4 sec.

4. Accuracy of intended wave height generation

- The machine should generate the intended wave height within $\pm 1\%$. The transfer function for the wave paddle should take care of this requirement. The machine should be capable of generating a specific wave height for different wave periods with less than $\pm 1\%$ deviation from the intended wave height.

5. Software package

- Wave generation software
- Data Acquisition package
- Data Analysis package consisting of time domain analysis, Frequency domain analysis, Statistical analysis, Reflection analysis etc.
- Suitable Graphics package for presenting the analyzed results.
- 16 bit system, Sampling speed 250kS/s, 12 differential Analog channels, USB interface for PC

6. Safety control

- The system should contain automatic warning system, if selection of wave height is beyond the limit of the machine.

7. Sensors

- Standard wave gauge 3sets along with accessories to be recorded by computer.
- Digital flow sensor: - Type: - magnetic flow meter (mag flowmeter) for discharge measurement.
- Displacement sensor for piston movement of wave-maker.
- Pressure transducers.
- All above mentioned sensors along with accessories to be connected to the computer.
- Precision of all the instruments should be within $\pm 1\%$.

8. Other details

- The quote should include shipment, installation and training of staffs on wave generation, data acquisition, analysis and presentation of results.
- The training should cover the details of routine and periodic maintenance and a maintenance schedule must be provided.
- The details of do/don't with respect to operation and maintenance of the system must be provided for safe operation of the system.
- The quote should cover the essential spare parts / maintenance items / Electrical parts required for replacement at short intervals and for a period of at least 3 years.

GENERAL TERMS & CONDITIONS

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HEREUNDER:-

1. TENDERS ARE INVITED COMPLYING THE REQUIREMENT FOR TENDER AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY'S / FIRM'S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPES CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPES SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOPE.

THE FOLLOWING DOCUMENTS ARE REQUIRED FROM THE INDIAN AGENTS OF FOREIGN FIRMS:

1.1 FOREIGN PRINCIPAL'S PROFORMA INVOICE INDICATING THE COMMISSION PAYABLE TO THE INDIAN AGENT AND NATURE OF AFTER SALES SERVICE TO BE RENDERED BY THE INDIAN AGENT.

1.2 COPY OF THE AGENCY AGREEMENT WITH THE FOREIGN PRINCIPAL INDICATING THE NATURE OF AFTER SALES SERVICES, PRECISE RELATIONSHIP BETWEEN THEM AND THEIR MUTUAL INTEREST IN THE BUSINESS.

2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.
3. PLEASE CONFIRM WHETHER YOU ARE AUTHORISED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.
4. THE BIDS MUST BE SUBMITTED BY OEM'S OR OEM SUPPORTED SINGLE VENDORS ONLY WITH ORIGINAL AUTHORIZATION CERTIFICATES FROM THE OEMS.
5. **PRICE BIDS FOR FOREIGN FIRMS:** PRICES ARE TO BE QUOTED ON 'EX-WORKS' DULY PACKED OR ON "FCA/FOB" INTERNATIONAL PORT" BASIS AND ALSO INCLUDING AGENCY COMMISSION PAYABLE TO YOUR INDIAN AGENTS, IF ANY SHOWING CLEARLY THE FOLLOWING BREAK UP:-

- I) EX-WORKS PRICE
- II) PACKING & FORWARDING
- III) FREIGHT
- IV) ANY OTHER RELEVANT EXPENSES.
- V) TAXES PAYABLE BY THE INSTITUTE

INSURANCE WILL BE PAID BY OUR INSTITUTE SEPARATELY AND SHOULD NOT FORM PART OF THE QUOTED PRICE.

PRICE BIDS FOR INDIAN FIRMS: PRICES ARE TO BE QUOTED ON F.O.R., IIT KHARAGPUR, ON DOOR DELIVERY BASIS CLEARLY SHOWING THE BREAK UP.

6. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 120 DAYS FROM THE DATE OF OPENING.
7. INDIAN AGENTS ADDRESS AND PERCENTAGE OF AGENCY COMMISSION INCLUDED IN ABOVE F.O.B./EX-WORKS PRICE. (THIS WILL BE PAID TO THE INDIAN AGENTS IN INDIAN RUPEES ONLY AND NOT IN **FE**). PLEASE ENCLOSE COPY OF AGENCY AGREEMENT ENTERED INTO WITH YOUR

PRINCIPALS INDICATING THE NATURE OF AFTER SALES SERVICES OF INDIAN AGENTS, PRECISE RELATIONSHIP & MUTUAL INTEREST IN THE BUSINESS.

8. **MEASUREMENTS/WEIGHT:** NETT/GROSS OF THE CONSIGNMENT. IN CASE OF AN ORDER, YOU SHALL USE AIR WORTHY PACKAGE (AS APPLICABLE) DULY CERTIFIED WITH DOCUMENTS – PLYTO – SANITARY CERTIFICATE (AS PER QUARANTINE ORDER 2003).
9. **SCOPE OF SUPPLY:** SHOULD INCLUDE FREE INSTALLATION AND COMMISSIONING
10. **PAYMENT TERMS FOR FOREIGN FIRMS**

The offer will be made on a single currency and only one PO will be issued for the entire scope of the supply.

A) 90% PAYMENT THROUGH SIGHTDRAFT/FORIGN DEMAND DRAFT/LC (EXCEPTIONAL CASES)/SWIFT TELE TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER AND CONDITION AND 10% AFTER SUCCESSFUL INSTALLATION & COMMISSIONING.

B) BANK CHARGES ON LC/SD (WITHIN INDIA APPLICANT ACCOUNT AND OUTSIDE INDIA TO BENEFICIARY ACCOUNT).

PAYMENT TERMS FOR INDIAN FIRMS

A) 100% PAYMENT THROUGH CROSSED ACCOUNT PAYEE CHEQUE / ELECTRONIC TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER & CONDITION AND SUCCESSFUL INSTALLATION & COMMISSIONING.

B) ENSURE MENTIONING

i) BANK DETAILS OF THE BENEFICIARY, GST NO. AND PAN NUMBER

ii) FULL NAME AND ADDRESS OF THE BENEFICIARY ON WHOM ORDER HAS TO BE PLACED

11. WHETHER ANY EXPORT LICENCE IS REQUIRED FROM YOUR GOVERNMENT, IF SO, PLEASE CONFIRM WITH DETAILS.
12. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.
13. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXCEMPTION IN TERMS OF GOVT. NOTOFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.
14. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IT THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER MONTH OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.
15. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.

16. ONLY THOSE BIDDERS WHO'S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.
17. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.
18. CONDITIONAL OFFER WILL NOT BE ACCEPTED.
19. LATE TENDERS I.E. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.
20. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-

A) INCOME TAX RETURN (3 YRS) AND LATEST SALES TAX RETURN (GST No.), AND PAN NO.

B) BANKER'S SOLVENCY CERTIFICATE

C) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY'S KEY PERFORMANCE

DESCRIPTION	JAN. TO MARCH	APRIL TO JUNE	JULY TO SEPT.
GROSS REVENUE			
PROFIT BEFORE TAX			
PROFIT AFTER TAX			
RETURN ON INVESTED			
CAPITAL (ROIC)			

- D) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.
- E) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SUCH EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.

21. **WARRANTY / GUARANTEE:** THIS COMPREHENSIVE WARRANTY / GUARANTEE SHALL REMAIN VALID FOR **36 MONTHS** AFTER THE GOODS HAVE BEEN DELIVERED AND COMMISSIONED TO THE FINAL DESTINATION.
22. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO'S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.
23. ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO **DR.RITWIK GHOSHAL, DEPARTMENT OF OCEAN ENGINEERING & NAVAL ARCHITECTURE, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR- 721302** AND ACKNOWLEDGEMENT TO BE OBTAINED.

IMPORTANT

1. IIT Kharagpur authority may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
2. Promptly make arrangements for repair and / or replacement of any damaged item (s) irrespective of settlement of claim.
3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
4. For any query pertaining to this bid document correspondence may be addressed to **Dr. Ritwik Ghoshal**, at the address mentioned above.

LAST DATE FOR SUBMISSION OF SEALED BIDS: 23.09.2019

- 1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.
 - 2) Fax, e-mail Tender will not be accepted.
 - 3) The General Terms and Conditions as stated above relate to supply of stores / equipment /assets etc. and for specific service other terms and conditions of the Institute will apply.
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