



GARDEN REACH SHIPBUILDERS & ENGINEERS LIMITED
गार्डन रीच शिपबिल्डर्स एण्ड इंजीनियर्स लिमिटेड
(A GOVERNMENT OF INDIA UNDERTAKING)
(भारत सरकार का प्रतिष्ठान)

Registered & Corporate Office Address: GRSE Bhavan, 61, Garden Reach Road, Kolkata – 700 024
 Web site वेब: www.grse.in, CIN सी आई एन: L35111WB1934GOI007891

NOTICE INVITING TENDER (NIT)

निविदा आमंत्रण सूचना

To,

M/s. Indian Institute of Technology Kharagpur

Garden Reach Shipbuilders & Engineers Limited is a **leading Warship Builders and Engineering Product Company**, invites offer from M/s. Indian Institute of Technology Kharagpur to submit **single stage two part (Part I- Techno-Commercial & Part II- Price) bid** for the work package as per following bid document:

NIT No निविदा संख्या:	SCC/AKD/ST/CFD/MODEL TESTS/MT-068 Dated: 04/07/2025
Job Title कार्य का नाम:	"SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES"
Tender issuing Dept. बिभाग द्वारा जारी:	Contract Cell (संविदाबिभाग), GRSE (61 Park)

Bids are to be submitted in 02 separate envelopes each for Part-I & Part-II duly sealed and super scribing the NIT no. and Job Title.

All the 02 envelops, thereafter to be duly sealed and put in a third envelop and duly sealed, super scribing "SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES"

- i) Techno Commercial Offer (duly signed and stamped) - PART-I
 ii) Price Bid - In Original only. (Rate to be quoted as per Price Format enclosed) (ANNEXURE – 6) - PART- II.

The Bid has to be submitted in physical form to:

Mr. Ashim Kumar Dey
 Senior Manager (Contract), Contract Cell
 Garden Reach Shipbuilders & Engineers Limited
 61 Park Unit, 61, Garden Reach Road, Kolkata – 700 024
 Mobile: +91 75960 23717
 Mail Id: Dey.Ashimkumar@grse.co.in

ARTICLE 1 अनुच्छेद-1: SCHEDULE OF CALENDAR DATES समायावली की अनुसूची:

SCHEDULE सारणी		
Tender Due Date निविदा जमा की अंतिम तिथी	14/07/2025	14:00 hrs.
*Tender Opening Date (Part I) निविदा खुलने की तिथी (तकनीकी- वाणिज्यिक बोली भाग-I)	15/07/2025	14:00 hrs.
Offer Validity Period minimum ऑफर की न्युनतम वैधता अवधी	90 days from date of opening of Tender (Part – I)	

***Note:** However, actual date of opening of bid document will be communicated to the participated bidder. The Bidder intending to witness the opening, may depute their authorized representative during opening of bids as per schedule.

ARTICLE 2 अनुच्छेद-2: COMMERCIAL REQUIREMENT FOR THE NIT निविदा की ब्यवसायिक आवश्यकता:

FEES / DEPOSITS	
Tender Fee निविदा प्रपत्र मूल्य (स्टैंक के परिच्छेद 03 में उद्धृत)	Rs. 500/-
Bid Security Declaration	To be submitted as per format at Annexure-7
Security Deposit (SD) प्रतिभूति	5% of Work Order Value (inclusive of GST)
Liquidated Damages परिनिर्धारित नुकसान	0.5 % per week, Max 5% of unexecuted job
Billing Frequency बिल करने की अवधी	On Completion of job

Note: - If any vendor other than **M/s. Indian Institute of Technology Kharagpur** participates in this tender, then their offer will be **Rejected** outright.

ARTICLE 3 अनुच्छेद-3: ANNEXURES ENCLOSED FORMING PART OF THIS e-TENDER ई-निविदा अंतर्गत संलगित परिच्छेद:

ANNEXURES	DOCUMENT DESCRIPTION
Annexure 1 संलग्नक-1	Statement of Technical Requirement (SOTR) (attached with NIT)
Annexure 2 संलग्नक-2	Acceptance format (matrix) of SOTR
Annexure 3 संलग्नक-3	Technical offer
Annexure 4 संलग्नक-4	Acceptance format (matrix) of NIT / STAC
Annexure 5 संलग्नक-5	Commercial offer
Annexure 6 संलग्नक-6	Price bid
Annexure 7 संलग्नक-7	GRSE Standard Terms and Conditions (STAC) (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)
Annexure 8 संलग्नक-8	Format for Bid Security Declaration (attached with NIT)
Annexure 9 संलग्नक-9	Fire & Safety Guidelines (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)
Annexure 10 संलग्नक-10	Special condition of contract (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)
Annexure 11 संलग्नक-11	Contractors Responsibility (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)
Annexure 12 संलग्नक-12	General Requirement (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)

Annexure 13 संलग्नक-13	PF, ESI declaration form (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)
Annexure 14 संलग्नक-14	Format for – Bank Guarantee Format for SD (please refer www.grse.in → Tender → Enclosures Related to tenders of Sub-Contracting Activities)

ARTICLE 4 अनुच्छेद-4: DOCUMENTS TO BE SUBMITTED WITH TECHNICAL BID:

Self-Attested documents are to be submitted with Part I of bid	
1	Valid MSE/NSIC certificate (if any)
2	Bid Security Declaration as per format at Annexure 7
3	Tender Fee
4	Technical Acceptance Format as attached with NIT
5	Commercial Acceptance Format as attached with NIT
6	Signed and Stamped NIT document

Note: In case of non-submission of documents as mentioned above, the bidder may liable to be considered as disqualified.

ARTICLE 5 अनुच्छेद-5: DOCUMENTS IN PHYSICAL FORM TO SUBMIT वास्तविक प्रपत्र जो जमा करने हैं:

PHYSICAL SUBMISSION		
1	Tender Fee Instrument	Within 03 days from opening of Part I bid
NOTE:	If instruments submitted through demand draft, the same to be drawn in favour of:	GARDEN REACH SHIPBUILDERS & ENGINEERS LIMITED
	The demand drafts should be payable at	<u>Kolkata</u>

ARTICLE 6 अनुच्छेद-6: JOB EXECUTION SCHEDULE कार्य निष्पादन सूची

(A) Mobilisation Period लामबंदी अवधी- 07 days from the date of placement of LOA/Purchase Order will be given for commencement of work.

(B) Job Starting Date कार्य आरम्भ तिथी - The job has to be commenced immediately after mobilisation as per instruction of CDO dept.

(C) Job Completion date कार्य समाप्ती तिथी- The CFD analysis and preliminary design studies report to be completed within 5 weeks from date of placement of PO. Entire scope of work including model tests and final report need to be completed and submitted within 10 weeks from the date of placement of PO.

(D) Place of Work - In the premises of M/s. Indian Institute of Technology Kharagpur.

ARTICLE 7 अनुच्छेद-7: JOB EXECUTION कार्य निष्पादन -

Job is to be carried out strictly as per **SOTR** (SOTR No: **CDO/FD/MODEL TEST/25-26/01**) at **Annexure 1**, Drawings, GRSE requirement and in case of doubt, instructions of HOD of CDO dept. / DGM (CDO) / SM (CDO) / their nominated representative are to be followed.

ARTICLE 8 अनुच्छेद-8: GUARANTEE & WARRANTY गारंटी एवं वारंटी – Not Applicable

ARTICLE 9 अनुच्छेद-9: PRICE मूल्य –

Price quoted will be firm and fixed for the entire contract period till completion of work awarded during valid contract period. Price is to be quoted considering all Taxes & duties except GST. GST is to be indicated separately in the Price Bid and will be paid extra as per ruling rate. No escalation whatsoever will be considered under any circumstances within the valid tenure of contract.

ARTICLE 10 अनुच्छेद - 10: ESCALATION मूल्य वृद्धि: Not Applicable.

ARTICLE 11 अनुच्छेद- 11: UNREASONABLE QUOTES अतर्कसंगत भाव: Not Applicable.

ARTICLE 12 अनुच्छेद -12: OFFER VALIDITY प्रस्ताव की वैधता-

Offer should be valid for **90 days** from the date of opening of Part-I bid i.e. Techno-commercial bid. Under exceptional circumstances GRSE may request for extension of price validity, beyond **90 days** against valid reason.

ARTICLE 13 अनुच्छेद-13: CONDITIONAL OFFER सशर्त प्रस्ताव -

Conditional offers w.r.t. this tender shall not be accepted.

ARTICLE 14 अनुच्छेद-14: DETERMINATION OF L1 एल-1 का चयन -

Not Applicable as the job will be awarded to **M/s. Indian Institute of Technology Kharagpur** only.

ARTICLE 15 अनुच्छेद-15: BOQ बी ओ क्यू -

BOQ as part of SOTR given in the tender is tentative. It may vary according to actual requirement of job during the period of contract. The Bidder has to execute the required quantity at same Rate, Terms & Conditions. However, the Contractor will be paid based on actual quantity executed as per GRSE certification.

BOQ as per SOTR is given below:

Sl. No.	Description	UOM	Qty
1.	CFD ANALYSIS OF HULL FORM	LS	1
2.	MODEL TEST OF HULL FORM	LS	1

NB: i) UOM = Unit of Measurement, ii) LS = Lump sum, Details as per SOTR

ARTICLE 16 अनुच्छेद-16: OPENING OF BIDS निविदा खुलना-

Part I (Techno-commercial) bid will be opened on the date declared in NIT. Part II bid will be opened post techno-commercial evaluation by GRSE. Price bid of only those who qualify techno-commercially will be opened. Opening date of Price Bid will be intimated accordingly to all qualified bidders. Disqualified bidders, either during technical assessment or commercial discussion or both techno-commercial evaluation will also be intimated about their non-consideration for further processing.

ARTICLE 17 अनुच्छेद-17: MICRO& SMALL ENTERPRISES सूक्ष्म एवं छोटे उद्योग - Not Applicable.

ARTICLE 18 अनुच्छेद-18: ASSESSMENT OF VENDORS AND DISTRIBUTION OF JOBS TO MULTIPLE BIDDER विक्रेताओं का आंकलन एवं विविध बोली लगाने वालों में कार्य वितरण - Not Applicable as the job will be awarded to M/s. Indian Institute of Technology Kharagpur.

ARTICLE 19 अनुच्छेद-19: ELIGIBILITY CRITERIA पात्रता के मापदंड – Not Applicable.

ARTICLE 20 अनुच्छेद-20: INSTRUCTION TO THE BIDDERS बिडर हेतु अनुदेश -

1. Before submitting a bid, **M/s. Indian Institute of Technology Kharagpur** expected to examine the Bid Documents carefully, if they desire, may visit the work front, fully inform themselves of existing conditions and limitations including all items described in the Bid Documents. NO consideration will be granted for any alleged misunderstanding or the materials to be furnished, work to be performed or actual considerations to complete all work and comply with conditions specified in the Bid Document.
2. Any qualified deficiency, errors, discrepancies, omissions, ambiguities or conflicts in the Bid Documents, or there be any doubts as to the meaning of a provision or requirement, the same shall immediately brought to notice of GRSE Tendering Dept.in writing, not less than 02 days prior to bid closing date.
3. It is understood that in receiving this bid, GRSE assumes no obligation to enter into a contract for the WORK covered by this bid request. GRSE reserves the right to reject any and all unqualified proposals or waive irregularities therein. GRSE reserves the right to evaluate each and every proposal and accept the whole or any part of the tender and the Tenderer shall be bound to perform the same at the rates quoted.
4. GRSE also reserves the right to reject any or, all bids and accept the bid, which in its opinion, appears to be most advantageous to GRSE. Receipt and review of this Bid Request constitutes an agreement of confidentiality between GRSE and each of the contracting Firms preparing its Bid. GRSE reserves the right to change the form of this request to Bids, or make clarifications thereto, within a reasonable time before date of submission of Bids.
5. Generally, Contractor will assume all safety related responsibility for the site and will furnish and maintain its own safety program for itself and its subcontractors. Contractor are bound to comply with all applicable Environmental, Occupational Health & Safety rules, regulations, procedures and guidelines when performing work in the facility or site.
6. Bidders objecting on any grounds to any bid specification or legal requirements imposed by these bidding documents shall provide written notice to GRSE within 02 calendar days from the day bid document was made available to public. Failure of a bidder to object in the manner set forth in this paragraph shall constitute and irrevocable waiver of any such objection.
7. Job is to be carried out as per SOTR and instruction of the Engineer in-charge /his nominated representative.
8. Any Drawings or technical information attached / provided with this NIT is the Intellectual Property of the Company and will be governed by the specific Acts applicable thereto.
9. Post submission of Tender, such drawings and technical information are to be physically returned. Also, all soft copies are to be destroyed and a self-certification to be submitted during TNC, failing which the processing of bid will not be taken further.

10. Contractors are responsible to clean up the area of work w.r.t. all sort of debris generated on daily basis. If they fail to do so GRSE reserves the right to perform the cleaning activity and charge the contractor with penalty of up to 25%. As a part of National Mission of *Swachh Bharat*, GRSE has adopted *Swachh GRSE* and maintaining cleanliness of work area is an essential pre-requisite.
11. Bidder has to declare, in what capacity he is participating in the tender viz PSU, Limited Co, Pvt. Ltd. Co., Sole Proprietorship Organization, Partnership firm, Joint Venture etc. Supporting documents (scanned copy) confirming such status to be attachment to Part I bid.
12. A Bidder is allowed to submit only one Bid under any capacity / status.
13. Difficulty in submitting the bid:
 - a. Any query/difficulty in understanding of SOTR or other technical Terms may be got clarified from **Mr. Pawan Kumar, Mgr. (CDO)/ Main Unit, Mobile No. +91 88281 56394, e-mail: Kumar.Pawan@grse.co.in**
 - b. Any query/difficulty in understanding of Commercial Terms may be got clarified from and **Mr. Ashim Kumar Dey, SM (Contract)/ 61 Park Unit, Mobile No. 75960 23717, e-mail: Dey.Ashimkumar@grse.co.in** prior to submission of offer.
14. **E-mail Address for communication** संचार हेतु ई. मेल पता: Vendor to provide e-mail address to enable faster communication.
15. AMENDMENT OF TENDER DOCUMENT
 - i. Before the deadline for submission of the tender, the Tender Document may be modified by GRSE Ltd. by issue of addendum/corrigendum.
 - ii. Addendum/corrigendum, if any, shall become a part of the tender document.
 - iii. To give **M/s. Indian Institute of Technology, Kharagpur** reasonable time to consider the addendum/ corrigendum into account in preparing their tenders, extension of the deadline for submission of tenders may be given as considered necessary by GRSE.

ARTICLE 21 अनुच्छेद-21: BID REJECTION CRITERIA बिड अस्वीकृति के मापदंड –

Following bid rejection criteria may render the bids liable for rejection:

1. **M/s. Indian Institute of Technology Kharagpur** failure to furnish sufficient or complete details for evaluation of the bids within the given period which may range in between two to three weeks depending on the deficiencies noticed in the drawings / technical data which shall not however conflict with validity period.
2. Incomplete / misleading / ambiguous bid in the considered opinion of the Technical Negotiation Committee (TNC)/ Commercial Negotiation Committee (CNC) of GRSE.
3. Bid with technical requirements and/or terms not acceptable to GRSE / Customers / External agency nominated, as applicable.
4. Bid received without qualification documents, where required as per the Tender.
5. Bid not meeting the pre-qualification parameters / criteria stipulated in the Tender Enquiry.
6. Bid with validity expiry date shorter than that specified in the Tender Enquiry.

7. **M/s. Indian Institute of Technology Kharagpur** not agreed for the fixed price till the validity of the tender or have quoted the variable price.
8. **M/s. Indian Institute of Technology Kharagpur** not agreeing for furnishing of the required Security Deposit (SD).
9. **M/s. Indian Institute of Technology Kharagpur** submitted false/incorrect documents etc.
10. **M/s. Indian Institute of Technology Kharagpur** submitted **PRICE** along with Techno-Commercial Bid(Part-I).

ARTICLE 22 अनुच्छेद-22: POST AWARD APLLICABLE CLAUSES ठेका जारी करनेके पश्चात लागू उपधारा -

A. Security Depositप्रतिभूति जमा -

Interest free refundable security deposit of **5%** of individual work order value (inclusive of GST) is to be deposited in the manner elaborated in GRSE STAC.

B. Work Done Certificate (W.D.C.) कार्य पूर्ति प्रमाण-पत्र (डबल्यू.डी.सी.)-

Work done certificate to be submitted through OBPS portal. WDC to be certified by SM/DGM(CDO)/nominated Officer from CDO Dept. based on the acceptance report as applicable. W.D.C. is to include whether work has been completed as per delivery schedule or with delay [in days/weeks specified therein]. Any recovery towards usage of GRSE resources is also to be indicated. WDC will be issued as per the stages indicated in payment terms

C. Payment Terms भुगतान की शर्तें:

a. The Stage wise certified bill amount (with full GST) against actual work done will be paid on completion of job within 30 days of receipt of bill (in 03 copies) duly certified by Bill Certifying Authority supported with certified Work Done Certificate (WDC). Recoverable from contractor, if any, is to be adjusted from the payment as per certification of Bill Certifying Authority.

Clearance of statutory liabilities (PF, ESI, etc.) are not required for release of payment.

b. Stages of payment are tabulated below:

Stage	Job Description	Percentage (%)
1	On submission of CFD Analysis and preliminary design studies	100%
2	On completion of Model Test and submission of final report	100%

c. Payment will be made on actual certification basis.

d. **Bill Certifying Authority:** PL of respective Ship or their nominated Officer.

e. **Bill Submission:** Payment to be made as per payment terms as stated above through ECS/NEFT within 30 days against online submission of GST e-invoice through OBPS portal with work done / completion certificate or training completion certificate duly certified by GRSE/WOT/SS (whichever is applicable) for the respective services and subject to compliance of labour laws and statutory dues where ever applicable.

Note:

- (i) All Vendors having turnover above Rs. 5 Crore have to mandatorily submit Invoice.
- (ii) All Vendors having turnover below Rs. 5 Crore are also to submit E-Invoice/digitally signed invoice. (Vendors having turnover under Rs. 5 Crore have option to created E-Invoice).
- (iii) Invoice in hard copy is not desirable.
- (iv) Gate in entry date will be treated as gate stamped date.
- (v) Work Done/Completion certifying authority must be at least at the level of Dy. Manager.

D. Liquidated Damages निर्णीत हर्जना - The vendor will be liable to pay minimum Liquidated Damages @ ½ % per week or part thereof on the undelivered work subject to a maximum of 5 % of the value of the order for delayed part. The amount of L.D. may be adjusted or set-off against any sum payable to the Contractor under this Contract.

E. Risk Purchase: - जोखिम खरीद -

In case the progress of work is not satisfactory and the contractor fails to maintain the schedule, GRSE reserves the right to get the work done by alternative source at the risk and cost of sub-contractor.

GRSE shall be at liberty to purchase/obtain the service from the alternative source as it deems fit, to make good such default and or in the event of the contract being terminated, the balance of the remaining service to be delivered there under. Any excess over the job price / service rates, paid and incurred by GRSE, as the case may be, over the contract price shall be recoverable from the firm. To make good the recoverable excess amount paid, GRSE shall be at liberty to invoke Bank Guarantee and/or with other available dues of the firm.

F. Damage of Materials/ Equipment: - The Subcontractor will ensure that **NO Damage** is caused to the Materials, Equipment's or any other property of GRSE during execution of the work due to negligence and/ or any reason whatsoever by the subcontractor. The cost of damage will be suitably recovered from Subcontractor's Bill.

G. Fire & Safety Precautions (for working inside GRSE): -

The Vendor/Contractor shall abide by the Safety regulations/rules of the GRSE as detailed in Fire & Safety Guidelines (please refer www.grse.in). The Vendor/Contractor should take all safety precautions and provide adequate supervision & control for their workmen in order to carry out the job safely. In case of any violation of safety precaution and non-usage of safety equipment, Contractor shall be liable for a penalty which is detailed in Fire and Safety Guidelines (please refer www.grse.in). Penalty amount depends on the type and frequency of violation mentioned in the safety guideline and the same will be deducted from the defaulter's bill.

H. Mandatory use of ISI marked PPE by Contractor Employees: - The Contractor shall ensure the use of ISI marked PPE by their engaged Employees. An indicative list of ISI marked Personal Protective Equipment, is appended below for mandatory compliance by the vendors without any deviation:

LIST OF PPES

Sl. No.	Name of PPE	Standard
(a)	Safety Helmet	IS: 2925 / EN 397.
(b)	Safety Footwear	IS 15298 / EN ISO 20345
(c)	Safety Goggles	ANSI Z87.1 / EN166.
(d)	Ear Plug	IS: 9167/ EN 352
(e)	Hand Gloves	(i) IS 4770 for electrical work (ii) EN 420 for general requirement (iii) EN 388 for mechanical hazard (iv) IS:6994 / EN 407 for heat applications (gas cutting / welding).
(f)	Welding Fume Respirator & Dust mask	IS: 9473 / EN: 149
(g)	Double lanyard Safety Belt & harness, automatic fall arrestor	IS: 3521
(h)	Cotton Boiler Suit Cloth	IS: 177 - 1989 (Amended up to date), Variety 3

Note: Apart from the above-mentioned PPE, vendors may consider any other type of standardized PPE as per job requirement, in consultation with GRSE Safety Department.

- I. Contractor's Safety Personnel (संविदाकार के बचाव कर्मचारी) (for working inside GRSE):** - One fully specialist and certified Safety Personnel has to be posted at the site during progress of work. The responsibility of the safety personnel is to supervise and monitor the site safety obligations of all work places and to comply all laid down Fire & Safety Rules of GRSE. He also ensures all workmen working under the sub-contractor at site are made aware of and comply with all the safety norms.

ARTICLE 23 अनुच्छेद 23: SUBMISSION OF BIDबिड की पेशी –

- Bids are to be submitted in two separate sealed envelopes
 - Technical commercial offer (Part-I Bid) in duplicate
 - Price Offer only in original (Part-II Bid).

Both the sealed envelopes should be put in the third envelope and the third envelope should be sealed. Enquiry No./ Date, Due Date and Title should be superscripted on all the envelopes and to be submitted to:

Mr. Ashim Kumar Dey
SM (Contract), Contract Cell
Garden Reach Shipbuilders & Engineers Limited
61 Park Unit, 61, Garden Reach Road, Kolkata – 700 024
Mobile: +91 75960 23717
Mail Id: Dey.Ashimkumar@grse.co.in

- Last date of submission of Bid / Date of opening of bid is indicated in Tender Document. Tender is liable to be rejected if all the requisite documents are not enclosed with the Part I, Techno-Commercial offer.

3. Date of opening of Part II offer i.e. Price Bid will be notified in due course after conclusion of TNC/CNC meetings and acceptance of Techno-Commercial offer. **M/s. Indian Institute of Technology Kharagpur** are requested to depute their authorized representative during opening of Price bids as per schedule promulgated.
4. GRSE reserves the right to accept / reject any Tender in full or in part without assigning any reason.

Ashim Kumar Dey
SM (Contract), Contract Cell
Garden Reach Shipbuilders & Engineers Limited
61 Park Unit, 61, Garden Reach Road, Kolkata – 700 024
Mobile: +91 75960 23717
Mail Id: Dey.Ashimkumar@grse.co.in



GARDEN REACH SHIPBUILDERS AND ENGINEERS LIMITED

Statement of requirement for design studies at higher displacement

SOR NO: CDO/FD/MODELTEST/25-26/01

Prepared by: Pawan Kumar Manager (FD)	Checked by: Cdr Rohit Kumar (Retd.) Sr. Manager (FD)	Approved by: Cmde Vinith Aerat (Retd.) GM (Design)

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 2 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

**STATEMENT OF REQUIREMENTS (SOR) FOR DESIGN STUDIES AND MODEL
TEST OF ASW SWC AT HIGHER DISPLACEMENT**

1. **GENERAL & SCOPE**. This statement of requirements (SOR) pertains to Design studies for optimization of drag and Hydrodynamic Model Tests to be conducted for ASW SWC vessel at as built displacement. Ship particulars are placed at Appendix – A and general requirements governing the model tests and submission of results are placed at Appendix – B and Model preparation requirements are placed at Appendix – C.

During the course of construction of ASW SWCs Ships, lightship weight of the vessel has increased substantially. Deep displacement in as built condition is 1360 Tons. This entails design optimization studies to be conducted and model test to prove the following:

(a) CFD analysis of hull form and model tests at higher displacement for repositioning/ realigning of appendages and optimization of bulbous bow to reduce Total resistance of vessel.

i. Computational analyses of vessels' performance to evaluate effect of, Re-positioning of spray rail and its effect on deck wetness and resistance.

ii. Bilge keels and ventral fins re-alignment.

iii. Optimization of Trim Wedge angle for increased displacement

iv. Bulbous Bow optimization to suit increased displacement.

(b) Verification of vessel's manoeuvring characteristics at increased displacement and mitigation measures, if any, based on the sea trial report to reduce heel during high speed turn.

(c) Verification of vessel's seaworthiness at the increased displacement and mitigation measures for observations/ shortfalls observed during analysis/ tests, if any, with respect to seakeeping criteria using CFD Software.

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 3 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

2. **RANGE OF MODEL TESTS TO BE UNDERTAKEN:** The various tests to be conducted are enumerated below to evaluate Ship resistance & propulsion behavior of the given Hullform.

2.1 **RESISTANCE TESTS.** These tests are conducted to determine the total resistance of the ship. The sequence of tests and conditions to be tested are indicated below. A roughness correction factor needs to be applied for model to ship correlation as per ITTC conventions.

2.1.1 **Bare Hull Resistance Tests.** These tests are required to be undertaken for the barehull at two displacements; from 10 knots to 25 knots ship speed and including speeds (at least 8 speeds) as required to capture the hump and hollow if any and accurately determine the form factor of the vessel.

2.1.2 **Appended Hull Resistance Tests.** Appended hull resistance tests are to be undertaken using the selected configuration of appendages like Waterjets, Fin stabilizers, Bulbous bow, Sonar dome, bilge keels, spray rails etc. as obtained from CFD analysis. These tests are required to be undertaken at two displacements for speeds corresponding to those considered for barehull test (2.1.1). The hull form fitted with following appendages would be used for these tests.

2.1.3 **Presentation of Results.** The test results should provide the following information in form of tabulated data and graphs both for model and scaled up for ship along with the correlation factor.

- (a) Plots of effective horsepower against ship's speed for all conditions for barehull at 30-degree Centigrade sea water temperature.
- (b) Plots of effective horsepower against ship's speed for fully appended hull at 30-degree Centigrade sea water temperature.
- (c) Tabulated values of running trim and sinkage for all test conditions.
- (d) Videos and photographs of model at various test conditions.
- (e) Tabulated values of coefficient (C_f , C_r , C_a , form factor & C_t) for barehull at 30-degree Centigrade sea water temperature.

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 4 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

- (f) Tabulated values of coefficient (Cf, Cr, Ca, Capp, form factor & Ct) for fully appended hull at 15-degree Centigrade and 30-degree Centigrade water temperature.

3. SCHEDULE OF DELIVERY:

On receipt of formal P.O. from GRSE, test agency shall, within seven working days, propose to GRSE a detailed time schedule. The CFD analysis and preliminary design studies report to be completed within 5 weeks from date of placement of PO. Entire scope of work including model tests and final report need to be completed and submitted within 10 weeks from the date of placement of PO.

4. SCHEDULE OF PAYMENT:

- a. Stage 1 - After submission of CFD Analysis and preliminary design studies report.
- b. Stage 2 - After completion of Model Test and submission of final report.

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 5 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

Appendix-A

- 1. Description of the vessel:** Particulars given in the subsequent paras are indicative in nature. Actual values will be confirmed after placement of purchase order.

1.1. The main particulars of the both variants are given below:

Length overall (LOA)	77.6 M
Length between perpendiculars (LBP)	69.54 M
Breadth moulded (Bmld)	10.4 M
Depth (upto Deck 1)	6.3 M
Draught at AP (Deep)	3.315 M
Draught at FP (Deep)	3.175 M
Draught at midship (Deep)	3.245 M
Complement	57
Propulsion	waterjets
Speed	22 Knots/ max achieved post optimisation of Appendages

- 1.2. Appendages: Waterjets, Fins, Bulbous bow, Sonar dome, bilge keels, spray rails etc. as necessary needs to be fitted to the model.

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 6 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

Appendix-B

GENERAL REQUIREMENT:

- 1.1. Required Inputs from GRSE: Test Agency shall indicate in their offer all necessary inputs required from GRSE for the proposed model tests. The geometry of the hull forms shall be provided by GRSE.
- 1.2. Deliverables: Resistance & Powering and design optimization recommendations
 - 1.2.1. Testing Agency shall immediately intimate GRSE, how the hull forms perform from resistance/powering point of view. In case, any modification is recommended in any portion of the selected hull, detailed offset table along with drawing in AutoCAD dxf format shall have to be forwarded by e-mail. Theoretical Speed-Power prediction shall also be intimated immediately by e-mail.
 - 1.2.2. After completion of all theoretical analyses and tests, a hard copy of the draft of the formal report of the results of all tests shall be submitted to GRSE for their acceptance/comments. The said draft report shall be complete with photographs of tests, screenshots from software and discussion on the study/test results. On accord of acceptance/comments of the draft report by GRSE, final report shall be submitted in triplicate in hard copies along with a soft copy. Three copies of DVD containing video recording of the tests shall also be submitted.
- 1.3. Visit of Representatives of GRSE and Owner: GRSE and Owner of the vessels shall have the right to depute total 2 representatives to witness the tests.
- 1.4. Documentation: The final report in English Language should be complete in all respects and should include: -
 - 1.4.1. Standard details of models of hull and specific emphasis on any deviations from the Standard Acceptance Criteria as explained later. The reason for the same is to be provided and the corrections, if any' should be explained. Interpretations of test results and conclusions drawn

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 7 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

based on the previous test report experience of the basin is to be forwarded by the Testing Agency. Positive recommendations to improve performance based on existing data on similar ships/past experience, is to be indicated in the report.

- 1.4.2. Details of test facilities and details of limitations, if any. The corrections for the same are to be explained. Procedure/rationale for undertaking the uncertainty analysis and tank correlation factors are to be clearly indicated.
- 1.4.3. The details stating temperature, salinity, viscosity etc of the Basin water be given and the effect of the same on the experiment be recorded. Procedure/rationale for undertaking uncertainty analysis and tank correlation factor used is to be clearly indicated. Procedures to comply with latest recommendations of ITTC.
- 1.4.4. Details of the instrumentation and limitations if any should be recorded.
- 1.4.5. Details of tests undertaken to be included and any deviation from the procedure explained in the document be recorded and the reason and corrections if any, be explained.
- 1.4.6. Observed readings and photographs.
- 1.4.7. At least one set of sample calculations for each type of test are to be provided.
- 1.4.8. Results in tabulated and graphical form as stated in latter chapters be provided.
- 1.4.9. All results should be reported in SI units.
- 1.4.10. Photographs and video films be provided as necessary.
- 1.4.11. The report of the model test should highlight, if any of the results appear to be significantly different from expected values and suggestions for

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 8 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

appropriate remedial measures for correcting or improving the same should be indicated in the report.

- 1.4.12. The testing agency is to take prior concurrence from the customer on any matter where their standard procedures of tests differ from the specifications provided.
- 1.4.13. The firm is required to store the model without any cost implication for a minimum period six months from the date when the tests are finished and final report delivered. Additional tests, if required, would be indicated to the firm prior completion of storage period. Requirement to deliver the hull models to GRSE would be decided post completion of additional model tests/storage period, as applicable.

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 9 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

Appendix-C

Model Preparation:

1. The design of the model should ensure geometric similarity to the actual design. In addition, it should also ensure similarity of various other properties which will be mentioned later. The model is to be constructed to moulded dimensions as per ITTC requirements. The various material that can be used for model making are mentioned in the succeeding paragraphs.
2. **Acceptance Criteria-Hull Model for Resistance Test:**
 - 2.1. **Surface finish.** The model surface should be smooth and equivalent to that achieved with a 300 to 400 grit wet and dry paper.
 - 2.2. **Stations spacing.** The spacing and numbering of stations and waterlines should be properly defined.
 - 2.2.1. A ten section system numbering from aft with station 0 at the AP is followed for the given vessel. The number of stations can also be 21 (20 equally sized intervals).
 - 2.2.2. Decimal fraction stations may be introduced at the ends as required (such as 9.5, 9.6, 9.7 etc.).
 - 2.2.3. Stations aft of the AP to be numbered negatively.
 - 2.3. **Waterlines.** Waterlines are identified as follows: -
 - 2.3.1. Waterlines should be spaced as required and identified by their height above the baseline.
 - 2.3.2. The baseline should be defined as per design.
 - 2.4. **Manufacturing Tolerances for Hull.** The basic requirements of the tolerances for the Hull model as per ITTC 7.5-01-01-01 are given below: -
 - 2.4.1. Model hull tolerances for breadth and draught should be within ± 1.0 mm and for length should be within $\pm 0.05\%$ of length or ± 1.0 mm, whichever is larger.

GRSE Ltd. CDO	STATEMENT OF REQUIREMENT FOR DESIGN STUDIES AT HIGHER DISPLACEMENT	Sheet 10 of 10
SOR No: CDO/FD/MODEL TEST/25-26/01		Revision: Nil

- 2.4.2. Openings in the hull should be manufactured to within ± 1.0 mm deviation. The dimensions of the hull model should not exceed the recommended manufacturing tolerances. As the dimensions of wax models can change appreciably with changes in temperature, wax models should be avoided as far as possible.
- 2.4.3. The midship sectional area of the model should not exceed 1/200 of the towing tank cross sectional area so as to prevent blockage effect. The blockage correction is to be carried as per ITTC Rules.
- 2.4.4. Manufacturing Tolerances for Appendages. Appendages in this context refer to items such as external shaft brackets, open propeller shafts, bossings, struts, pods of podded propulsors, Skeg, and rudders. The tolerance allowed for the model test are: -
- 2.4.5. Appendages should be built to the full external shape as designed.
- 2.4.6. The manufacturing tolerances of appendages should be within ± 0.2 mm.
- 2.4.7. Surface finish for the appendages should be the same as that recommended for the hull model.
- 2.4.8. Appendages should be located within ± 0.5 mm of their design position.
- 2.4.9. The model should be loaded as per the designed displacement and should be run within 0.2% tolerance.
- 2.4.10. Hog or sag deformation should not exceed acceptable tolerances, typically not > 2.0 mm.



गार्डन रीच शिपबिल्डर्स एण्ड इंजिनियर्स लिमिटेड
Garden Reach Shipbuilders & Engineers Limited

Annexure 2

(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)
(रक्षा मंत्रालय) (Ministry of Defence)

GRSE Bhavan, 61, Garden Reach Road, Kolkata – 700 024

ACCEPTANCE FORMAT (MATRIX) OF SOTR

SUB:- SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES

E- TENDER NO. SCC/AKD/ST/CFD/MODEL TESTS/MT-068 Dated: 04/07/2025

SOTR SI no	Bidder's Remarks	SOTR SI no	Bidder's Remarks	SOTR SI no	Bidder's Remarks
1. GENERAL & SCOPE		4. SCHEDULE OF PAYMENT		Appendix - C	
2. RANGE OF MODEL TESTS TO BE UNDERTAKEN		Appendix - A			
3. SCHEDULE OF DELIVERY		Appendix - B			

NAME	
DESIGNATION	
COMPANY NAME, ADDRESS & FAX/PH. NO.:	

- NOTE: 1. Bidders should read the SOR included in the Tender carefully prior to filling up this acceptance format.
2. This format should be properly filled, signed and returned along with your technical bid for considering your bid.
3. Please indicate : ACC- For accepted, NO – For not accepted and DEV – For deviation taken.
4. Separate sheet to be attached for any deviation taken by you.
5. SOR SI Numbers shown in the format includes the Sub SI No under them also.

		गार्डन रीच शिपबिल्डर्स एण्ड इंजिनियर्स लिमिटेड Garden Reach Shipbuilders & Engineers Limited		Annexure 3	
(भारत सरकार का उपक्रम) (A Govt. of India Undertaking) (रक्षा मंत्रालय) (Ministry of Defence) GRSE Bhavan, 61, Garden Reach Road, Kolkata – 700 024					
<u>TECHNICAL OFFER</u>					
SUB:- SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES					
E- TENDER NO. SCC/AKD/ST/CFD/MODEL TESTS/MT-068 Dated: 04/07/2025					
<u>NAME & ADDRESS OF THE BIDDER *</u>					
<u>BIDDER S OFFER REFERENCE NO./DATE *</u>					
<u>CONTACT NO., FAX NO, e-mail OF THE BIDDER*</u>					
Sl. No.	Job Description	UOM	QUANTITY	Technical Remarks	Accepted (Yes/No)*
1	CFD ANALYSIS OF HULL FORM	LS	1		
2	MODEL TEST OF HULL FORM	LS	1		
* -Mandatory Field					
NB: (i) Rate not to be quoted at this page.					
(ii) Write YES if quoted the rate OR No for not quoted					
(iii) Write Technical remarks only if any.					



गार्डन रीच शिपबिल्डर्स एण्ड इंजिनियर्स लिमिटेड
Garden Reach Shipbuilders & Engineers Limited

Annexure 4

(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)
(रक्षा मंत्रालय) (Ministry of Defence)

GRSE Bhavan, 61, Garden Reach Road, Kolkata – 700 024

ACCEPTANCE FORMAT (MATRIX) OF NIT / STAC

SUB:- SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES

E- TENDER NO. SCC/AKD/ST/CFD/MODEL TESTS/MT-068 Dated: 04/07/2025

NIT Clause no	Bidder s Remarks	NIT Clause No	Bidder s Remarks	NIT Clause No	Bidder s Remarks
NIT - Art.1		STAC		23	
Art.2		1		24	
Art.3		2		25	
Art.4		3		26	
Art.5		4		27	
Art.6		5		28	
Art.7		6		29	
Art.8		7		30	
Art.9		8		31	
Art.10		9		32	
Art.11		10		33	
Art.12		11		34	
Art.13		12		35	
Art.14		13		36	
Art.15		14		37	
Art.16		15		38	
Art.17		16		39	
Art.18		17		40	
Art.19		18		41	
Art.20		19		42	
Art.21		20		43	
Art.22		21			
Art.23		22			

DESIGNATION	
COMPANY NAME, ADDRESS & FAX/PH. NO.:	

NOTE:

- Bidders should read the SOR included in the Tender carefully prior to filling up this acceptance format.
- This format should be properly filled, signed and returned along with your technical bid for considering your bid.
- Please indicate : ACC- For accepted, NO – For not accepted and DEV – For deviation taken.
- Separate sheet to be attached for any deviation taken by you.
- SOR SI Numbers shown in the format includes the Sub SI No under them also.



गार्डन रीच शिपबिल्डर्स एण्ड इंजिनियर्स लिमिटेड
Garden Reach Shipbuilders & Engineers Limited
(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)
(रक्षा मंत्रालय) (Ministry of Defence)

Annexure 5

GRSE Bhavan, 61, Garden Reach Road, Kolkata – 700 024

COMMERCIAL OFFER

SUB:- SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES

E- TENDER NO. SCC/AKD/ST/CFD/MODEL TESTS/MT-068 Dated: 04/07/2025

1	NAME & ADDRESS OF THE BIDDER WITH REFERENCE NO./DATE*		
2	Currency		INR
3	GLOBAL DISCOUNT(Percentage)		
Commercial Term(s)			VENDOR TO CONFIRM
Sl. No.	ATTRIBUTE		OPTIONS
1	DESPATCH MODE		SELECT AN OPTION
2	TERM OF PRICE		SELECT AN OPTION
3	COMMERCIAL TERMS		
4	SECURITY DEPOSIT		SELECT AN OPTION
5	TECHNICAL COMMENTS (PLEASE INDICATE TECHNICAL DETAILS OF YOUR MANUFACTURE)		
6	DELIVERY SCHEDULE * (PLEASE CONFIRM/INDICATE YOUR DELIVERY SCHEDULE)		
7	TERMS OF PAYMENT:	Terms	Accepted (Yes/No)
	{ PAYMENT WILL BE MADE THROUGH ECS MODE }	AS PER INDICATED IN SPECIAL TERMS & CONDITION	
	IF DEVIATION PLEASE MENTION		
8	ORDER TO BE PLACED ON		
9	PAYMENT TO BE MADE TO (IF ANOTHER AGENCY) PLEASE INDICATE LATEST BANK DETAILS		
10	QUOTATION VALID TILL*		SELECT AN OPTION

11	UNIQUE GeM SELLER ID*			
COMMON COMMERCIAL AND TECHNICAL ATTRIBUTES (APPLICABLE FOR ALL ITEMS)				
Sl. No.	ATTRIBUTE	INDICATOR	OPTIONS	ENTRY
<u>COMMERCIAL TERM(S)</u>				
1	SAC CODE*			
2	NAME OF SUPPLY STATE/UT* (DROP DOWN TO BE SELECTED BY THE BIDDER)		SELECT AN OPTION	
3	GST* (BIDDER TO INPUT ONLY TOTAL APPLICABLE GST IN %, IRRESPECTIVE OF IGST, CGST,SGST OR COMBINATION OF TWO TYPES OF GST)	PERCENTAGE	SELECT AN OPTION	
ATTACH SUPPORTING DOCUMENTS (PRICE NOT TO BE MENTIONED HERE)				
NOTE: <u>PLEASE PUT VALUE FOR SELECT AN OPTION</u> 1) * Indicates Mandatory Fields. 2) ALL OTHER TERM(S) AND CONDITION(S) OF THE R F Q ARE ACCEPTABLE. DEVIATIONS, WHEREVER APPLICABLE HAVE BEEN INDICATED IN THE OFFER AS ABOVE.				

		गार्डन रीच शिपबिल्डर्स एण्ड इंजिनियर्स लिमिटेड Garden Reach Shipbuilders & Engineers Limited (भारत सरकार का उपक्रम) (A Govt. of India Undertaking) (रक्षा मंत्रालय) (Ministry of Defence) GRSE Bhavan, 61, Garden Reach Road, Kolkata – 700 024					Annexure 6		
<u>PRICE BID</u>									
SUB:- SERVICES FOR CFD ANALYSIS AND MODEL TESTS OF HULL FORM FOR UNDERTAKING DESIGN STUDIES									
E- TENDER NO. SCC/AKD/ST/CFD/MODEL TESTS/MT-068 Dated: 04/07/2025									
<u>NAME & ADDRESS OF THE BIDDER</u>									
<u>BIDDER'S OFFER REF. NO./DATE</u>									
Item Sl. No.	Job Description	UOM	QUANTITY	RATE (PER UNIT) (INR) WITHOUT GST	AMOUNT WITHOUT GST	SAC/HSN	GST PERCENTAGE	GST VALUE	AMOUNT INCLUDING GST
1	CFD ANALYSIS OF HULL FORM	LS	1	0.00	0.00		0.00%	0.00	0.00
2	MODEL TEST OF HULL FORM	LS	1	0.00	0.00		0.00%	0.00	0.00
TOTAL :-					0.00			0.00	0.00
NB: (i) UOM- Unit of Measurement (iii) LS = Lum Sum									

TO BE SUBMITTED WITH PART -II BID ONLY

Form for Bid Security Declaration

Date: DD/MM/YYYY

Bidder's Ref: _____

GeM Tender Ref: _____

To

M/s. Garden Reach Shipbuilders & Engineers Ltd.

61 Park, 61, Garden Reach Road,

Kolkata – 700 024

Kind Attn: *(Name & Designation of tender issuing officer)*

Dear Sir / Madam,

We the undersigned declare that:

We understand that, according to tender conditions, bids must be supported by a bid Security Declaration along with valid MSE/NSIC document.

We accept that we will automatically be suspended from being eligible for bidding in any contract with M/s. GRSE Ltd. for the period of 03 Years starting from date of opening of price bid, if we are in breach of our obligation(s) under the bid conditions, because we:

- (a) Have withdrawn our bid after opening of price bid and within the bid validity specified in the tender; or
- (b) Having been notified of the acceptance of our bid by M/s. GRSE Ltd. during the period of bid validity, (i) fail or refuse to execute the contract, if required, or (ii) fail or refuse to furnish the security deposit, in accordance with Article 22 (A) of tender.

We understand this bid security declaration shall expire if we are not the successful bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful bidder; or (ii) twenty-eight days after the expiration of our bid.

[Insert signature of authorized representative]

[Insert legal capacity of the person signing the declaration]

[Insert complete name of person signing the declaration]

Duly authorized to sign the bid for and on behalf of *[insert complete name of bidder]*

Date: DD/MM/YYYY

[Put corporate seal as appropriate]