

# **TENDER DOCUMENT**

**FOR DESIGN, CONSTRUCTION AND  
SUPPLY OF TWO NOS. RO-RO VESSELS  
FOR NW-2**

**TENDER NO. IWAI/MD/133/2015-16**

**JUNE 2015**



**Inland Waterways Authority of India**

**(Ministry of Shipping, Govt. of India)**

**A-13, Sector-1, Noida – 201 301 (UP)**

Tel (0120) 2543931, Fax (0120) 2544041

Web site: [www.iwai.nic.in](http://www.iwai.nic.in),

<https://eprocure.gov.in/eprocure/app>

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## NIT FOR PUBLICATION IN NEWSPAPER



**INLAND WATERWAYS AUTHORITY OF INDIA,  
A-13, SECTOR-1, NOIDA – 201301**

**TENDER NO. IWAI/MD/133/2015-16**

**E-Tender for Design, Construction and Supply  
of two nos. RO-RO vessels for NW-2**

Online bids/tenders are invited from experienced Shipbuilders for design, construction and supply of two nos. Ro-Ro vessels for NW-2 to be delivered at Dhubri. Tender cost: 5000/-. Date of download of Tenders is from 30.06.2015 (18:00 Hrs.) to 10.08.2015. A pre- bid meeting is scheduled at IWAI, A-13, Sector-1, Noida - 201301 on 17.07.2015 at 14:30 hours. Last date of submission of online bids/tender: 10.08.2015 up to 15:00 hrs. Date of online opening: 10.08.2015 at 15:30 hrs. For other details, terms & conditions please refer to IWAI website [www.iwai.nic.in](http://www.iwai.nic.in) and CPP Portal website <https://eprocure.gov.in/eprocure/app>

**CHIEF ENGINEER (P&M)**

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## **(SECTION-I)**

### **NOTICE INVITING E-TENDER (NIT)**



## INLAND WATERWAYS AUTHORITY OF INDIA

(Ministry of Shipping, Govt. of India)

A-13, Sector 1, Gautam Buddha Nagar, Noida 201 301

Tel (0120) 2543931, Fax (0120) 2544041

Web site: [www.iwai.nic.in](http://www.iwai.nic.in)

E-mail: [cepm.iwai@nic.in](mailto:cepm.iwai@nic.in) / [suvadandapat@gmail.com](mailto:suvadandapat@gmail.com)

<https://eprocure.gov.in/eprocure/app>

### NOTICE INVITING E-TENDER

The Inland Waterways Authority of India (IWAI) hereby invites online tenders/bids (Technical and Financial Bid) from experienced Shipbuilders for Design, Construction and Supply of *two nos. Ro-Ro Vessels for NW-2* to be delivered at Dhubri as per details given below. The Bids will be placed online at <https://eprocure.gov.in/eprocure/app>

Sl. No.	Description of work	Estimated cost (Rs. in lakh)	Bid Security (EMD) (Rs. in lakh)	Time of completion
Sch. A	Design, Construction & supply of one no. Ro-Ro vessel to carry 12 trucks of 25,000 kg each with two ramps and 200 passengers (100 seated) with following Principal dimension: <b>Ro-Ro Vessel:</b> Length – abt. 60.00, Breadth – abt. 16.00m, Depth 2.80/ 3.00 m, Draft max loaded – 1.80 m, Main engine – abt. 2 x 650 hp. Two ramps one at ford. and another at aft.	1680	26.80	15 months
Sch. B	Design, Construction & supply of one no. Ro-Ro vessel to carry 6 trucks of 25,000 kg each with one ramp and 100 passengers (50 seated) with following Principal dimension: <b>Ro-Ro Vessel:</b> Length – abt. 46.00, Breadth – abt. 15.50m, Depth 2.80m, Draft max loaded – 1.80 m, Main engine – abt. 2 x ..... hp. One ramp one at ford.	1260	22.60	12 months

### TERMS & CONDITIONS

- Interested bidders may download the bid document from IWAI's website <http://www.iwai.nic.in> and CPP Portal Website <https://eprocure.gov.in/eprocure/app> as per the schedule as given in Critical Date Sheet as under-

### **CRITICAL DATE SHEET**

<b>Publishing Date</b>	<b>29.06.2015</b>
<b>Document Download/Sale Start Date</b>	<b>30.06.2015</b>
<b>Document Download/Sale End Date</b>	<b>07.08.2015</b>
<b>Seek Clarification Start Date</b>	<b>01.07.2015</b>
<b>Seek Clarification End Date</b>	<b>25.07.2015</b>
<b>Pre Bid Meeting Date</b>	<b>17.07.2015 at 14.30 hrs</b>
<b>Bid Submission Start Date</b>	<b>05.08.2015</b>
<b>Bid Submission Closing Date</b>	<b>10.08.2015 upto 15.00 hrs</b>
<b>Bid Opening Date</b>	<b>10.08.2015 at 15.30 hrs</b>

Applicant submitting the downloaded version would need to pay the cost of tender document/bid along with the application non-refundable demand draft for Rs.5000/- drawn in favor of “IWAI FUND” payable at NOIDA/Delhi. Tender document will be available on the two above website from 30.06.2015 to 07.08.2015 between 1000 hours to 1700 hours (IST) .

A signed declaration stating that no alteration has been made in any form in the downloaded tender document/bid is to be enclosed with the tender by bidder for downloaded tenders. The amendment /clarification, if any, to the document will be available on the above website.

2. Tenderer shall agree to the terms & conditions of the tender and submit the tender online. ***A signed copy on each page may be submitted offline for reference.***

**3. Eligibility Criteria :**

The eligibility criteria for the participation in the tender for above work shall be as follows:

- (i) The bidder must have at least seven years' experience and satisfactory performance record for the design, construction and supply of inland/sea-going vessels particularly Ro-Ro vessels, tugs, workboats, cargo vessels, self-propelled barge and other vessels of propelled type. A firm engaged only for construction of Dumb Barge and repair of the vessels are not eligible.
- (ii) The bidder has tie up with experienced design consultant/ Naval Architect for design, preparation of the construction, drawing approval from classification and statutory bodies as well as model testing. The design consultant shall have completed design of atleast three works of inland/sea going propelled vessels of similar or higher size/capacity.
- (iii) The bidder must have the shipbuilding yard and requisite facilities of his own or on lease/rent basis existing on the day of submission of bid.
- (iv) The bidder must have the qualified and experienced technical manpower for design, construction and delivery on schedule.
- (v) The bidder should have a good record of delivering of the vessels on time.

4. Tender must be accompanied with scanned copy of all documentary evidence of credentials viz. similar works done, performance certificate, financial performance and all other documents as specified in the tender document.
5. The Earnest Money as in clause 17 of ITB (Information to bidders) in the form of Demand Draft for **Rs. 13.40 lakh** and **Rs.13.40 lakh** in the form of Bank Guarantee for Schedule A (bigger Ro-Ro vessel) and Demand Draft for **Rs. 11.30 lakh** and **Rs. 11.30lakh** in the form of Bank Guarantee for Schedule B (smaller Ro-Ro vessel) to be deposited along with the bid. The original demand draft for tender fee and EMD must be deposited before closing date and time of submission of bid at IWAI, A-13, Sector-1, NOIDA-201301.
6. The firm should have average annual financial turnover during the last three years ending 31<sup>st</sup> March of the previous financial year of at least **Rs. 1680 lakh** (100% of the estimated cost) for Schedule A and **Rs. 1260 lakh** (100% of the estimated cost) for Schedule B and **Rs. 2940 lakh** (100% of the estimated cost) for firms bidding for both Schedule A & Schedule B.
7. The firm should have experience of having successfully completed similar works during last seven years ending last day of the month previous to the one in which bids are invited, either of the following:

**For Schedule A (bigger Ro-Ro Vessel)**

- a) Three similar completed works costing not less than **Rs. 672 lakh** (40% of estimated cost)
- b) Two similar completed works costing not less than **Rs. 1008 lakh** (60% of estimated cost)
- c) One similar completed work costing not less than **Rs. 1344 lakh** (80% of estimated cost)

**For Schedule B (smaller Ro-Ro Vessel)**

- a) Three similar completed works costing not less than **Rs. 504 lakh** (40% of estimated cost)
- b) Two similar completed works costing not less than **Rs.756 lakh** (60% of estimated cost)
- c) One similar completed work costing not less than **Rs. 1008 lakh** (80% of estimated cost)

**For both Schedule A (bigger Ro-Ro Vessel) & Schedule B (smaller Ro-Ro Vessel)**

- a) Three similar completed works costing not less than **Rs. 1176 lakh** (40% of estimated cost)
- b) Two similar completed works costing not less than **Rs. 1764 lakh** (60% of estimated cost)
- c) One similar completed work costing not less than **Rs.2352 lakh** (80% of estimated cost)

Similar works are as defined in para 3(i)

- 8. The pre bid meeting will be held on 17.07.2015 at 14.30 hrs. in IWAI Office at Noida.
- 9. The complete bid as per the tender documents should be placed online at <https://eprocure.gov.in/eprocure/app> by 1500 hours on 10.08.2015. The technical bids would be online opened on the same day at 15.30 hours in the presence of the representatives of the bidders, if any.
- 10. The proposal, or any query or clarification on the bid document shall be submitted to the following address:

Chief Engineer (P&M)  
Inland Waterways Authority of India,  
A-13, Sector-I,  
Noida – 201 301

Tel (0120) 2543931, Fax (0120) 2544041/ 2522969

Website : [www.iwai.nic.in](http://www.iwai.nic.in). Mobile 9717622733/ 991053

E-mail: [cepm.iwai@nic.in](mailto:cepm.iwai@nic.in) / [suvadandapat@gmail.com](mailto:suvadandapat@gmail.com)/ [vc dialani.iwai@nic.in](mailto:vc dialani.iwai@nic.in)

- 11. IWAI reserves the right to accept or reject any or all tenders without assigning any reason and no correspondence shall be entertained in this regard.

**Chief Engineer (P&M)**  
**IWAI**



## **(SECTION-II)**

**INSTRUCTION TO BIDDERS (ITB) including  
Instruction to the Contractors / Bidders for the e-  
submission of the bids online through the Central  
Public Procurement Portal for E-procurement and  
APPENDIX TO BID**

**Section II:**  
**Instructions to the Bidders (ITB)**

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## Section II

### **Instructions to Bidders (ITB)**

**Instructions to the Contractors/Bidders for the e-submission of the bids online through the Central Public Procurement Portal for eProcurement**<https://eprocure.gov.in/eprocure/app>

- 1) Possession of valid Digital Signature Certificate (DSC) and enrolment/registration of the contractors/bidders on the e-procurement/e-tender portal is a prerequisite for e-tendering.
- 2) Bidder should do the enrolment in the e-Procurement site using the <https://eprocure.gov.in/eprocure/app> option available on the home page. Portal enrolment is generally free of charge. During enrolment/registration, the bidders should provide the correct/true information including valid email\_id. All the correspondence shall be made directly with the contractors/bidders through email\_id provided.
- 3) Bidder need to login to the site through their user ID/ password chosen during enrolment/registration.
- 4) Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY/TCS/nCode/e-Mudra or any Certifying Authority recognized by CCA India on eToken/SmartCard, should be registered.
- 5) The DSC that is registered only, should be used by the bidder and should ensure safety of the same.
- 6) Contractor/Bidder may go through the tenders published on the site and download the required tender documents/schedules for the tenders he/she is interested.
- 7) After downloading / getting the tender document/schedules, the Bidder should go thorough them carefully and then submit the documents as asked.
- 8) If there are any clarifications, this may be obtained online thro' the tender site, or thro' the contact details. Bidder should take into account of the corrigendum published before submitting the bids online.
- 9) Bidder then logs in to the site through the secured log in by giving the user id/ password chosen during enrolment/registration and then by giving the password of the eToken/SmartCard to access DSC.
- 10) Bidder selects the tender which he/she is interested in by using the search option & then moves it to the 'my favourites' folder.
- 11) From the my favourites folder, he selects the tender to view all the details indicated.
- 12) It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender schedules carefully and upload the documents as asked, otherwise, the bid will be rejected.

- 13) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/schedule and generally, they can be in PDF/xls/rar/jpg/
- 14) formats. If there is more than one document, they can be clubbed together and can be provided in the requested format. Each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same can be uploaded, if permitted.
- 15) If there are any clarifications, this may be obtained through the site, or during the pre-bid meeting if any. Bidder should take into account the corrigendum published from time to time before submitting the online bids.
- 16) The Bidders can update well in advance, the documents such as certificates, annual report details etc., under My Space option and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.
- 17) Bidder should submit the Tender Fee/ EMD as specified in the tender. Earnest money shall be accepted in the form of Banker's Cheque or Demand Draft of a Scheduled Bank. A part of earnest money is acceptable in the form of Bank Guarantee also. In such cases 50% of Earnest Money or Rs. 20 lakh whichever is less, will have to be deposited in the shape of Demand Draft/Banker's Cheque and balanced can be accepted in the form of Bank Guarantee issued by a Scheduled Bank. The original payment instruments should be posted/couriered/given in person to the Tender Inviting Authority within the due date as mentioned in this tender document. Scanned copy of the instrument should be uploaded as part of the offer, if asked for.
- 18) While submitting the bids online, the bidder reads the terms & conditions and accepts the same to proceed further to submit the bid packets.
- 19) The bidder has to select the payment option as offline to pay the Tender FEE/ EMD as applicable and enter details of the instruments.
- 20) The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise submitted bid will not be acceptable.
- 21) The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.
- 22) The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid will be rejected.
- 23) If the price bid format is provided in a spread sheet file like BoQ\_xxxx.xls, the rates offered should be entered in the allotted space only and uploaded after filling the

relevant columns . The Price Bid/BOQ template must not be modified/replaced by the bidder, else the bid submitted is liable to be rejected for this tender.

- 24)The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.
- 25)After the bid submission, the acknowledgement number, given by the e-tendering system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and will also act as an entry pass to participate in the bid opening date.
- 26)The bidder should ensure/see that the bid documents submitted should be free from virus and if the documents could not be opened, due to virus, during tender opening, the bid is likely/liable to be rejected.
- 27) The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.
- 28) All the data being entered by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered will not viewable by unauthorized persons during bid submission & not be viewable by any one until the time of bid opening.
- 29)Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 30) The confidentiality of the bids is maintained since the secured Socket Layer 128 bit encryption technology is used. Data storage encryption of sensitive fields is done.
- 31)The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.
- 32)For any queries regarding e-tendering process, the bidders are requested to contact through the modes given below:

Chief Engineer (P&M)  
Inland Waterways Authority of India,  
A-13, Sector-1,  
Noida – 201 301  
Tel (0120) 2543931, Fax (0120) 2544041/ 2522969  
Website : [www.iwai.nic.in](http://www.iwai.nic.in)  
E-mail: [cepm.iwai@nic.in](mailto:cepm.iwai@nic.in) / [suvadandapat@gmail.com](mailto:suvadandapat@gmail.com)

## **A. General**

### **1. Scope of Bid**

**1.1** The Owner (as defined in the Appendix to ITB) invites online bids for “**Design, Construction and supply of two nos. Ro-Ro Vessels for NW-2**” to be delivered at Dhubri as described in these documents and referred to as “the works”. The name of the work is provided in the Appendix to ITB. The bidder at their own option may bid for Schedule A (bigger RO-RO ferry ) or Schedule B (smaller RO-RO Ferry) or both Schedule A and Schedule B.

**1.2** The successful bidder will be expected to complete the works by the delivery schedule as follows:

#### **Schedule A**

Delivery of one no. Ro-Ro vessel to carry 12 trucks of 25,000 kg each - within 15 (fifteen) months.

#### **Schedule B**

Delivery of one no. Ro-Ro vessel to carry 6 trucks of 25,000 kg each - within 12 (twelve) months.

from the date of issuance of work order/letter of acceptance.

**1.3** Throughout these bidding documents, the terms “bid” and “tender” and their derivatives (bidder/tenderer, bid/tender, bidding/tendering, etc.) are synonymous.

### **2. Source of Funds**

**2.1** The expenditure on this project will be met by Inland Waterways Authority of India (IWAI).

### **3. Eligible Bidders**

**3.1** This Invitation for online Bids is open to all bidders engaged in Shipbuilding and has constructed vessels of similar type or vessels with similar or higher size/ capacity as already described in NIT

**3.2** Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices by the Central Government, the State Government or any public undertaking, autonomous body, authority by whatever name called under the Central or the State Government.

### **4. Qualification of the Bidder**

**4.1** This invitation for online bids is open to all manufacturers and their dealers registered with the applicable authorities under the appropriate laws for the time being in force in India.

**4.2** All bidders shall include the scanned copy of following information and documents with their bids online.

- (a) Copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder.
- (b) Total monetary value of similar works performed for each of the last seven years.
- (c) Experience certificate in works of a similar nature and size for each of the last seven years with satisfactory performance certificates from clients.
- (d) Evidence of availability (either owned or leased or rented) of shipyard where the vessels are proposed to be built. The bidder to submit the details of the yard owned by them, in case the yard is on lease or rented, a copy of the lease or rent agreement to be enclosed as evidence. No change of yard or place of construction will be allowed.
- (e) Qualification and experience of key site management and technical personnel proposed for the contract.
- (f) Reports on the financial standing of the Bidder, and a certificate from Chartered Accountant as a proof of turnover for the past five years.
- (g) Evidence of adequacy of working capital for this contract [access to line(s) of credit and availability of other financial resources].
- (h) Proposals for subcontracting components of the works amounting to more than 10% of the contract price.
- (i) Information regarding any litigation or arbitration during the last five years in which the Bidder is involved, the parties concerned, the disputed amount, and the matter;
- (j) Details of the contracts if any having delay in completing the work more than one year over and above contractual delivery period. In the event of no case, similar statement is to be submitted.
- (k) Firm should have financial solvency of not less than **Rs. 672 lakh** for bidding for Schedule A (bigger Ro-Ro vessel) and **Rs. 504 lakh** for bidding for Schedule B (smaller Ro-Ro vessel) and **Rs. 1176 lakh** for bidding for both Schedule A and Schedule B.
- (l) Valid income tax clearance certificate from India builder/supplier.

### **4.3 Bid by Joint Venture / Consortium**

**4.3.1** In case the bid is submitted by a J.V. /Consortium, the J.V. /Consortium may have two or more partners. The Lead Partner should have maximum equity participation. Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements:

- (i) The bid shall include all the information required for qualification criteria
- (ii) The bid security and the bid shall be signed so as to be legally binding on all partners.

- (iii) A Joint Venture Agreement entered into by all partners shall be submitted with the bid. One of the partners shall be nominated as being lead partner. This authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners. The lead partner has to be an Indian Company.
- (iv) The Lead Partner shall be authorized (this authorization shall be evidenced by submitting a power of attorney, duly notarized, signed by the legally authorized signatories of all the partners and a copy of the said authorization shall be furnished in this Bid) to incur liabilities and receive instructions and furnish clarifications and participate in negotiations for and on behalf of any and all partners of the joint venture during the Bid process till finalization of bid in favour of any bidder or till a final decision is taken on the bids.
- v) There shall be a Joint Venture Agreement specific for the contract between the constituent firms, indicating clearly, amongst other things, the proposed distribution of responsibilities both financial as well as technical for execution of the work amongst them. For the purpose of this clause, the most experienced lead partner will be the one defined. A copy of the Joint Venture agreement in accordance with requirements mentioned in submitted along with the bid. The proposal should contain the information required for each member of the Consortium.
- (v) An undertaking signed by all partners stating that JV will, if selected for award of project, incorporate itself as a company under the companies Act 1956 prior to execution of Contract Agreement, is to be enclosed with the bid. The contract agreement shall be signed with the company so incorporated.
- (vi) By submitting the Bid, the Bidder shall be deemed to have acknowledged that it was short-listed on the basis of Technical Capacity and Financial Capacity of Joint Venture Members who will own at least 26% each of the equity of the Company to be incorporated in case the JV is selected for award of work. The Bidder further acknowledges and undertakes that each of such Joint Venture Members shall hold at least 26% of the equity of the Contractor until the completion of the Project is achieved under and in accordance with the provisions of the Contract. The Bidder further acknowledges and agrees that the aforesaid obligation shall be the minimum, and shall be in addition to such other obligations as may be contained in the Contract, and a breach thereof shall, notwithstanding anything to the contrary contained in the Contract, be deemed to be a breach of the Contract and dealt with as such there under and;
- (vii) By submitting the Bid, the Bidder shall also be deemed to have acknowledged and agreed that in the event of a change in control of a Joint Venture Member or an Associate whose Technical Capacity and/ or Financial Capacity was taken into consideration for the purposes of short-listing and qualification under the Bid process, the Bidder shall inform the Chief Engineer (P&M) forthwith along with all relevant particulars about the same and the Chief Engineer (P&M) may, in his sole discretion, disqualify



the Bidder or withdraw the Letter of Acceptance from the Selected Bidder, as the case may be. In the event such change in control occurs after signing of the Agreement, it would, notwithstanding anything to the contrary contained in the Agreement, be deemed to be a breach thereof, and the Agreement shall be liable to be terminated at the sole discretion of the Employer without the Employer being liable in any manner whatsoever to the Contractor. In such an event, notwithstanding anything to the contrary contained in the Agreement, the Chief Engineer (P&M) or Employer shall forfeit and appropriate the Bid Security or Performance Security, as the case may be, as mutually agreed genuine pre-estimated compensation and damages payable to the Employer for, inter alia, time, cost and effort of the Employer, without prejudice to any other right or remedy that may be available hereunder or otherwise.

- (ix) The bid, and in the case of the successful bidder, the Form of Agreement, etc., shall be signed and/ or executed in such a manner as may be required for making it legally binding on all partners (including operative parts of the ensuing Contract in respect of Agreement of Arbitration, etc.). On award of work, the Form of Agreement and Contract Documents shall be signed by all partners of the Joint Venture to conclude Contract Agreement.
- (x) All partners of the Joint Venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under sub clause (iv) above as well as in the Form of Bid and the Form of Agreement (in case of a successful bidder).
- xi) In the event of default by any partner, in the execution of his part of (the Contract, the Employer shall be so notified within 30 days by the partner-in-charge, or in the case of the partner-in-charge being the defaulter, by the partner nominated as partner-in-charge of the remaining Joint Venture. The partner-in-charge shall, within 60 days of the said notice, assign the work of the defaulting partner to any other equally competent party acceptable to the Employer to ensure the execution of that part of the Contract, as envisaged at the time of bid. Failure to comply with the above provisions will make the Contractor liable for action by the Employer under the Conditions of Contract.

#### **4.3.2 Change in composition of the J.V:**

- (a) Change in composition of the J.V may be permitted by the Chief Engineer (P&M) during the bid stage, only where:
  - (i) The Lead Member continues to be the Lead Member of the J.V.
  - (ii) The substitute is at least equal, in terms of Technical Capacity and Financial Capacity, to the J.V. Member who is sought to be submitted and the modified J.V shall continue to meet the pre-qualification and short-listing criteria for Applicants; and

(iii) The new Member(s) expressly adopt(s) the Application already made on behalf of the J.V as if it were a party to it originally, and is not an applicant/Member of any other J.V bidding for this Project.

b) Approval for change in the composition of a J.V shall be at the sole discretion of the Chief Engineer (P&M) and must be approved by him in writing.

(c) The modified/reconstituted J.V shall be required to submit a revised Jt. Bidding Agreement at least five working days before the Financial Bid opening Due Date.

**4.3.3** The Lead Member of the J.V. to be a registered firm / company having ship building experience of at least three years and has adequate financial capacity to the tune of at least 50% of the financial criteria

**4.3.4** In case the Bidder is a Consortium, it shall comply with the following additional requirements:

- (i) Number of members in a consortium shall not exceed 3 (three);
- (ii) The proposal should contain the information required for each member of the Consortium;
- (iii) Members of the Consortium shall nominate one member as the lead member (the "Lead Member"), who shall have an equity share holding of **at least 51% (fifty one per cent)** of the paid up and subscribed equity of the Contractor during the execution period. The nomination(s) shall be supported by a Power of Attorney, signed by all the other members of the Consortium;
- (iv) The Proposal should include a brief description of the roles and responsibilities of individual members, particularly with reference to financial and technical obligations;
- (v) The members of a Consortium shall incorporate an appropriate a special purpose vehicle as Contractor under the provisions of Companies Act, 1956, (as their wholly owned subsidiary) to execute the Project, if awarded to the Consortium;

Members of the Consortium shall enter into a binding Joint Bidding Agreement, for the purpose of making the Proposal. The Jt. Bidding Agreement, to be submitted along with the Proposal, shall, inter alia

- (a) Convey the intent to form with shareholding/ ownership equity commitment(s) in accordance with this TENDER, which would enter into the Contract and subsequently perform all the obligations of the bidder in terms of the Contract,
- (b) Commit that in case such consortium of entities is the Preferred Bidder, the Preferred Bidder shall incorporate a wholly owned special purpose company under the provisions of Indian Companies Act, 1956, as the Contractor; in whose subscribed and paid up capital,

the Preferred Bidder shall collectively hold 100% equity during the execution period.

- (c) The Lead Member of such Preferred Bidder consortium shall at all time during the License Period hold equity equivalent to at least 51% of the subscribed and paid up capital of the Contractor. Further, other consortium members whose technical/financial eligibility shall have been used for the purpose of qualification under this TENDER shall hold at least 26% equity in the subscribed and paid up capital of Contractor during the execution period; Provided however that Authority may in its sole and absolute discretion permit a consortium member to divest [in full/partially] its equity shareholding in the subscribed and paid up capital of the Contractor.
- (d) Include a statement to the effect that all members of the Consortium shall be liable jointly and severally for all obligations of the Bidder consortium in relation to the Project until the expiry of the contract.

Except as provided under this TENDER and the Bidding Documents, there shall not be any amendment to the Jt. Bidding Agreement without the prior written consent of the Authority.

No change in the composition of a Consortium will be permitted by the Authority during the Bidding process

- 4.3.5 In computing the Technical Capacity and Financial Capacity of the Bidder/ Consortium Members, the Technical Capacity and Financial Capacity of their respective Associates would also be eligible as per the terms hereunder.

If the Bidder is a public listed company, it shall submit a copy of its Annual Financial statements for the last 3 (three) financial years preceding the Proposal Due Date clearly setting out the relationship of Associates with the entity whose technical/financial capacity is relied upon. In case a bidder [other than a public listed company], relies on the eligibility capacity of its Associates, they shall be required to submit a Certificate from their respective statutory auditors stating that the entity whose Technical/Financial Capacity is considered for the purposes of this TENDER and the Bidder are Associates in terms hereof. In case the experience of Associate is claimed by a Bidder, the Bidder shall ensure that such entity continues to remain its Associate through the term of Contract.

For purposes of this TENDER, Associate means, in relation to the Bidder/ Consortium Member, a person who controls, is controlled by, or is under the common control with such Bidder/ Consortium Member (the "Associate"). As used in this definition, the expression "control" means, with respect to a person which is a company or corporation, the ownership, directly or indirectly, of more than 50% (fifty per cent) of the voting shares of such person, and with respect to a person which is not a company or corporation, the power to direct the management and policies of such person by operation of law.

**4.4 A** To qualify for award of the Contract, each bidder should have

(a) Achieved average annual financial turnover during the last 3 years, ending 31<sup>st</sup> March of the previous financial year (in all cases of ship building works only) volume of ship construction work of following i.e. 100% of the estimated cost of the amount prescribed in Notice Inviting E-Tender for which bid has been invited.

(i) For Schedule A: At least Rs. 1680 lakh;

(ii) For Schedule B: At least Rs. 1260 lakh &

(iii) For both Schedule A and Schedule B: At least Rs. 2940 lakh

(b) Satisfactorily completed (not less than 90% of contract value), as a prime contractor of similar works during last seven years ending last day of month previous to the one in which bids are invited should be either of the following:

**For Schedule A (bigger Ro-Ro Vessel)**

- a) Three similar completed works costing not less than Rs. 672 lakh (40% of estimated cost)
- b) Two similar completed works costing not less than Rs. 1008 lakh (60% of estimated cost)
- c) One similar completed work costing not less than Rs. 1344 lakh (80% of estimated cost)

**For Schedule B (smaller Ro-Ro Vessel)**

- a) Three similar completed works costing not less than Rs. 504 lakh (40% of estimated cost)
- b) Two similar completed works costing not less than Rs. 756 lakh (60% of estimated cost)
- c) One similar completed work costing not less than Rs. 1008 lakh (80% of estimated cost)

**For both Schedule A (bigger Ro-Ro Vessel) & Schedule B (smaller Ro-Ro Vessel)**

- a) Three similar completed works costing not less than Rs. 1176 lakh (40% of estimated cost)
- b) Two similar completed works costing not less than Rs. 1764 lakh (60% of estimated cost)
- c) One similar completed work costing not less than Rs. 2352 lakh (80% of estimated cost)

The similar work constitutes design, construction and supply of inland/sea-going vessels particularly Ro-Ro vessels, tugs, workboats, cargo vessels, self-propelled barge and other vessels of propelled type.

(Escalation factor as specified in the appendix shall be used to bring the value of the such completed works at the level of current financial year i.e. 2015-16)

**4.4 B (a)** Each bidder must produce:

(i) An affidavit on a Stamp Paper, duly attested from the Notary, that the information furnished with the bid documents is correct in all respects; and failure to submit the document as specified shall make the bid non-responsive. Scanned copy to be submitted online.

**(b)** Each bidder must demonstrate:

(i) evidence of availability (either owned or leased or rented) of shipyard where the workboats are proposed to be built. The bidder to submit the details of the yard owned by them, in case the yard is on lease or rented, a copy of the lease or rent agreement to be enclosed as evidence.

(ii) availability of technical, managerial and skilled personnel for this work.

**4.5** Even though the bidders meet the above qualifying criteria, they are subject to be disqualified if they have:

(i) made misleading or false representations in the forms, statements, affidavits and attachments submitted in proof of the qualification requirements; and/or

(ii) record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc. or debarring.

(iii) tampered the bid document in any manner.

**5. One Bid per Bidder**

**5.1** Each Bidder shall submit only one online Bid for the work. A Bidder who submits more than one Bid will cause the proposals with the Bidder's participation to be disqualified (for the purpose of this tender one bid for each Schedule separately quoted for ).

**6. Cost of Bidding**

**6.1** The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the Owner will, in no case, be responsible or liable for those costs regardless of the conduct or out come of the bidding process.

**B. Bidding Documents**

**7. Content of Bidding Documents**

**7.1** The set of bidding documents comprises the documents listed below and addenda issued in accordance with Clause 9:

1. Notice Inviting Tender
2. Instructions to Bidders
3. Forms of bid and Bank Guarantee
4. Conditions of Contract

(Part I General Conditions of Contract, and Contract Data; Part II Special Conditions of Contract)

5. Technical Specifications

**7.2** The bidder is expected to examine carefully all instructions, conditions of contract, contract data, forms, terms, specifications, forms and drawings in the Bid Document. Failure to comply with the requirements of Bid Documents shall be at the bidder's own risk. Pursuant to clause 25 hereof, bids, which are not substantially responsive to the requirements of the Bid Documents, shall be rejected.

## **8. Clarification of Bidding Documents**

**8.1** A prospective Bidder requiring any clarification of the bidding documents may notify the owner in writing or by facsimile at the owner's address indicated in the Notice Inviting Tenders. The Owner will respond to any request for clarification received earlier than 10 days prior to the deadline for submission of bids. Copies of the Owner's response will be forwarded to all purchasers of the bidding documents, including a description of the inquiry, but without identifying its source.

**8.2.1** If a pre-bid meeting is to be held, the bidder or his official representative is invited to attend it. Its date, time and address are given in the Appendix to ITB.

**8.2.2** The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

**8.2.3** The bidder is requested to submit any questions in writing or by fax so as to reach the Owner not later than one week before the meeting.

**8.2.4** Minutes of the meeting, including the text of the questions raised (without identifying the source of the enquiry) and the responses given will be uploaded.

**8.2.5** Non-attendance at the pre-bid meeting will not be a cause for disqualification of a bidder.

## **9. Amendment of Bidding Documents**

**9.1** Before the deadline for online submission of bids, the Owner may modify/amend/make addition in the bidding documents for any reason, whether at its own initiative or in response to clarification requested by a prospective bidder by issuing addenda/corrigendum.

**9.2** Any addendum/corrigendum uploaded on website shall be part of the bidding documents. Corrigendum/Addendum will be available on website. The modification /amendment/additions in the bidding document shall be binding on the prospective bidders.

**9.3** To give prospective bidders reasonable time in which to take an corrigendum/addendum into account in preparing their bids, the Owner shall extend, as necessary, the deadline for submission of bids, in accordance with Clause 19.2.

## **C. Preparation of Bids**

### **10. Language of Bid**

**10.1** All documents relating to the Bid shall be in the language specified in the Appendix to ITB.

### **11. Documents Comprising the Bid**

**11.1** The Bid submitted by the Bidder shall be in two separate parts: (separate bids for separate Schedules)

**Part I** This shall be named Technical Bid and shall comprise scanned copies of:

- I. For bidding documents downloaded from the website <https://eprocure.gov.in/eprocure/app>, the scanned copy of the demand draft for the cost of the bidding documents must be uploaded. The original demand draft is to be deposited in the office before the bid submission closing date.
- II. A scanned copy of the Earnest Money must be uploaded. The original of the Earnest money deposit to be deposited in the office before the bid submission closing date. The Earnest Money for each schedule to be submitted separately.
- III. Qualification information, supporting documents, affidavit and undertaking as specified in Clause 4;
- IV. Undertaking that the bid shall remain valid for the period specified in clause 14.1;
- V. Any other information/documents required to be completed and submitted by bidders, as specified in the Appendix to ITB, and
- VI. A scanned affidavit affirming that information he has furnished in the bidding document is correct to the best of his knowledge and belief must be uploaded. The original affidavit is to be deposited in the office before the bid submission closing date.
- VII. Form of bid.
- VIII. The scanned copy of the Program and Method Statement/Work Plan and the Activity Schedule for the entire work including design, model testing, construction, procurement of major machineries, installation, testing and commissioning works for all the six workboats.

**Part II.** It shall be named Financial Bid and shall comprise of:

- (i) Cost schedule (BOQ) (separate financial bid for each schedule)

**12. Bid Prices**

- 12.1** The Contract shall be for the whole Works, as described in Clause 1. 1, based on the cost schedule submitted by the Bidder.
- 12.2** The bidder shall quote rates and prices for all items of the Works described in the cost schedule.
- 12.3** All duties, taxes, royalties and other levies payable by the Contractor under the Contract, or for any other cause, shall be included in the rates, prices, and total Bid price submitted by the Bidder.
- 12.4** The rates and prices quoted by the Bidder shall be fixed for the duration of the Contract and shall not be subject to adjustment.

**13. Currencies of Bid and Payment**

- 13.1** The prices shall be quoted by the bidder entirely in Indian Rupees. All payments shall be made in Indian Rupees.

**14. Bid Validity**

- 14.1** Bids shall remain valid for a period of 120 days after the deadline date for bid submission specified in Clause 19. The Owner as non-responsive shall reject a bid valid for a shorter period.
- 14.2** In exceptional circumstances, prior to expiry of the original time limit, the Owner may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his bid security for a period of the extension, and in compliance with Clause 15 in all respects.

**15. Earnest Money / Bid Security**

- 15.1** The Bidder shall furnish, as part of the Bid, Earnest Money/Bid security, for the amount as specified in the Appendix to ITB. Earnest Money/ Bid security for each schedule to be submitted separately.
- 15.2** The Earnest Money shall, at the Bidder's option, be in the form of Bank Guarantee/ Demand Draft as specified in the Appendix to ITB. It shall be valid for 90 days beyond the validity of the bid.



- 15.3** Any bid not accompanied by an acceptable Earnest Money, unless exempted in terms given in the Appendix to ITB, shall be rejected by the Owner as non-responsive.
- 15.4** The Earnest Money of unsuccessful bidders will be returned within 28 days of the end of the Bid validity period specified in Sub-Clause 14.1.
- 15.5** The Earnest Money of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security.
- 15.6** The Bid Security / Earnest Money will be forfeited:
- a) if the Bidder withdraws the Bid after its submission during the period of Bid validity;
  - b) in the case of a successful Bidder, if the Bidder fails within the specified time limit to
    - i. sign the Agreement; and/or
    - ii. furnish the required Performance Security.

**16. Alternative Proposals by Bidders**

- 16.1** Bidder shall submit offers that fully comply with the requirement of the bidding document including conditions of contract. Conditional offer or alternate offer will not be considered further in the process of tender evaluation.

**17. Format and Signing of Bid**

- 17.1** The Bidder shall submit online bid comprising of the documents as described in Clause 11 and other documents as specified in the tender.
- 17.2** The Bid shall be signed by a person or persons duly authorized to sign on behalf of the Bidder. All pages of the Bid shall be signed by the person or persons signing the Bid.
- 17.3** The Bid shall contain no overwriting, alterations or additions, except those to comply with instructions issued by the Owner, or as necessary to correct errors made by the Bidder, in which case such corrections shall be made by scoring out the cancelled portion, writing the correction and signing and dating it along with the stamp by the person or persons signing the Bid.

**D. Submission of Bids**

**18. Online submission of Bids**

- 18.1** The Bidder shall submit online bids.

**19. Deadline for Submission of Bids**

- 19.1** Complete online Bids (including Technical and Financial) must be received by the bid submission closing date and time.

- 19.2** The Owner may extend the deadline for submission of bids by issuing an amendment in accordance with Clause 9, in which case all rights and obligations of the Owner and the bidders previously subject to the original deadline will then be subject to the new deadline.

## **20. Modification and Withdrawal of Bids**

- 20.1** Bidders may modify or withdraw their bids online before the deadline prescribed in Clause 19.
- 20.2** Withdrawal or modification of a Bid between the deadline for submission of bids and the expiration of the original period of bid validity specified in Clause 14.1 above or as extended pursuant to Clause 14.2 shall result in the forfeiture of the Bid security pursuant to Clause 15.

## **E. Bid Opening and Evaluation**

### **21. Bid Opening**

Online Bid opening shall be carried out in two stages. Firstly, 'Technical Bid' of all the online bids received shall be opened on the date and time mentioned in the Appendix to ITB. 'Financial Bid' of those bidders whose technical bid has been determined to be responsive and on evaluation fulfils the criteria laid down in Clause 25.2 shall be opened on a subsequent date, which will be notified to such bidders.

- 21.1** The Owner will open the online "Technical Bid" of all the bids received , including modifications of Technical Bid made pursuant to Clause 20 in the presence of the bidders/bidders' representatives who choose to attend at the time, date and place specified in the Appendix to ITB. In the event of the specified date for the submission of bids being declared a holiday for the Owner, the Bids will be opened at the appointed time and location on the next working day.
- 21.1.1** Bidder's names, the presence of bid security and such other details, as the Owner may consider appropriate will be announced by the Owner after the opening.
- 21.2** In all other cases, the amount of Earnest Money, forms and validity shall be announced. Thereafter, the Owner at the opening as the Owner may consider appropriate, will announce the bidders' names and such other details.
- 21.3** After the opening of the technical bids their evaluation will be taken up with respect to bid security, qualification information and other information furnished in Part I of the bid in pursuant to clause 11.1, thereafter on fulfilling the criteria laid down in Clause 25.2, a list will be drawn up of the responsive bids whose financial bids are eligible for consideration.

**21.4** The Owner shall inform the bidders, whose technical bids are found responsive, of the date, time and place of opening of the financial bids. The bidders so informed, or their representative, may attend the meeting of online opening of financial bids.

**21.5** At the time of the online opening of the 'Financial Bid', the names of the bidders whose bids were found responsive in accordance with clause 21.4 and the Bid prices, the total amount of each bid, and such other details as the Owner may consider appropriate will be announced by the Owner at the time of bid opening.

## **22. Process to be Confidential**

**22.1** Information relating to the examination, clarification, evaluation, and comparison of bids and recommendations for the award of a contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful Bidder has been announced. Any attempt by a Bidder to influence the Owner's processing of bids or award decisions may result in the rejection of his Bid

## **23. Clarification of Bids and Contacting the Owner**

**23.1** During the evaluation of the bids, the owner may, at its discretion, ask the bidder to provide any additional information/clarification in relation to its bids as may be deemed fit by the owner. The bidder shall in all cases where such request has been made by the owner, submit within such period and in such manner as may be specified by the owner in the request so made. Failure of the bidder to furnish such additional information as may be requested by the owner, the owner may in its sole discretion deem such bid as non-responsive. The bidder shall not have any right to challenge the same or any claims arising from such bid being deemed non-responsive by the owner.

**23.2** No bidder shall contract the owner on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. Any attempt by the bidder to influence the Owner's bid evaluation, bid comparison or contract award decision may result in the rejection of his bid.

## **24. Examination of Bids and Determination of Responsiveness**

During the detailed evaluation of "Technical Bids", the Owner will first determine whether each Bid (a) meets the eligibility criteria defined in Clauses 3 and 4; (b) has been properly signed; (c) is accompanied by the required securities; and (d) is responsive to the requirements of the bidding documents.

After the above process is completed the technical specification/offer of the responsive bidders will be examined with respect to technical specifications provided in the tender document, clarifications, if any, at this stage in respect of the technical parameters offered by the bidder will be sought from the bidders. Thereafter, the bids, which conform, to the terms, conditions, and specifications

of the bidding documents, without material deviation or reservation will be considered as responsive for evaluation.

## **25. Evaluation of Bids**

**25.1** Selection of the bidder for design, construction and supply of vessels will be based on technical and financial evaluation.

**25.2** Technical evaluation shall be based on the offer satisfying the 4 criteria.

(i) Availability of vessel building facility along with infrastructure/machineries to justify the capability of the yard to construct and deliver the vessel to be furnished in the format given at **Appendix-1**.

(ii) Out put of the shipyard in terms of number and cost of vessels during the preceding seven years from the date of receipt of the bid as specified in Notice inviting E-tender to be furnished in format given at **Appendix-2**.

(iii) Contract non-performance (during preceding 7 years)- to be furnished in format given at **Appendix-3**

(iv) Financial details

(a) Financial performance during preceding 7 years - to be furnished in format given at **Appendix-4**

(b) Annual construction turn over during preceding 7 years as specified in Notice inviting E-tender - to be furnished in format given at **Appendix- 5**

**All the above Appendices should contain full information of last seven years. Non submission of complete information will lead to rejection of bids.**

**25.3** Verification of the facts furnished by the bidders may be made by the owner by visiting the establishment/yard of the bidders prior to finalizing the technical evaluation

**25.4** If the bidder does not fulfill the above criteria his bid shall be technically disqualified and his financial bid shall not be opened.

**25.5** The evaluation of the financial bid will be based on the lowest financial offer received for the work.

## **F. Award of Contract**

### **26. Award Criteria**

**26.1** Subject to Clause 28, the Owner will award the Contract to the Bidder after evaluation as per Clause 25.

**27. Owner's Right to Accept any Bid and to Reject any or all Bids and Split the work or Increase and Decrease work.**

**27.1** Notwithstanding Clause 26, the Owner reserves the right to accept or reject any Bid, and to cancel the bidding process and reject all bids, at any time prior to the award of Contract, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Owner's action. Owner also the reserve the right to split the work to one or more parties depending on capability of the yard and increase/decrease the work requirement.

**28. Notification of Award and Signing of Agreement.**

**28.1** The bidder whose Bid has been accepted will be notified of the award by the Owner prior to expiration of the Bid validity period by confirmed by registered letter. This letter (hereinafter and in the Part I *General Conditions of Contract* called the "Letter of Acceptance") will state the sum that the Owner will pay to the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price").

**28.2.** The notification of award will constitute the formation of the Contract, subject only to the furnishing of a performance security in accordance with the provisions of Clause 30.

**28.3.** The Agreement will incorporate all agreements between the Owner and the successful Bidder. It will be signed by the Owner and the successful Bidder after the performance security is furnished and within 15 days of issuance of Letter of Acceptance.

**28.4** Upon the furnishing by the successful Bidder of the Performance Security, the other Bidders will be informed that their Bids have been unsuccessful.

**29. Factors Affecting the Award of the contract.**

**29.1** The bidder should have its own contract support facilities. The support facilities should be fully owned and managed by the bidder.

**29.2** Conformity with the request for bid/tender required and conditions.

**29.3** The assessment of the capability of the bidder to meet the terms and conditions.

**29.4** The bidder must have executed similar orders, for which the bidder is quoting as indicated in clause 1 of ITB for Government/ semi Government/Autonomous Organisations/reputed Private organisations.

**30. Performance Security**

**30.1** Within 10 (ten) days after receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Owner a Performance Security of Ten percent of the

Contract Price, for the period of 28 days after the expiry of defect liability period of 12 months.

**30.2** The performance security shall be either in the form of a Bank Guarantee or Bank Draft, in the name of the Owner, from a Bank as applicable in case of earnest money / bid security defined in Appendix to ITB.

**30.3** Failure of the successful bidder to comply with the requirement of sub-clause 30.1 shall constitute sufficient ground for cancellation of the award and forfeiture of the bid security.

**31. Advances**

On award of work and execution of agreement and if requested a mobilisation advance of 10% of contract price will be given at the simple rate of interest as specified in Appendix to ITB against furnishing of non-revocable bank guarantee. The mobilisation advance will be recovered in four equal installments from the first running bill i.e., when the keel is laid.

**32. Corrupt or Fraudulent Practices**

The Owner will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question and will declare the firm ineligible, either indefinitely or for a stated period of time, to be awarded a contract with Inland Waterways Authority of India and any other agencies, if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for the contractor, or in execution.

The Owner requires the bidders/Contractors to strictly observe the laws against fraud and corruption enforced in India, namely, Prevention of Corruption Act, 1988.

## **Appendix to ITB**

The Owner should fill out this Appendix to ITB before issuing the bidding documents. The insertions should correspond to the information provided in the Invitation for Bids.

Instructions  
to Bidders  
Clause  
Reference

(1.1) The Owner is Chairman, Inland Waterways Authority of India

(1.1) The Works are :  
Schedule A Design, Construction & supply of one no. Ro-Ro vessel to carry 12 trucks of 25,000 kg each with two ramps and 200 passengers (100 seated) for NW-2 and to be delivered at Dhubri.

Schedule B Design, Construction & supply of one no. Ro-Ro vessel to carry 8 trucks of 25,000 kg each with two ramps and 100 passengers (50 seated) for NW-2 and to be delivered at Dhubri.

(4.4 A) (b) The value shall be as mentioned in Bid Notice.  
Escalation factor (for the cost of works completed during the last 7 years )  
may be taken as follows: [CI. 4.4A(b)]

Year Before	Multiplying Factor
One .....	1.07
Two .....	1.15
Three .....	1.23
Four .....	1.31
Five .....	1.40
Six .....	1.50
Seven .....	1.60

(8. 2.1) Place, Time and Date for pre-bid meeting are:

Place: NOIDA (will be intimated later, in case of change, if any)  
Time 14.30 hrs  
Date 17.07.2015

(10.1) Language of the bid is English

(11.1.v) Nil

(15.1) The amount of Earnest Money shall be as mentioned in NIT.

(15.2) A. The EMD/bid security which shall either be in the form of a

Bank Guarantee, in the name of the Owner, from a National or Scheduled bank of India. Any Scheduled commercial bank approved by a RBI having a net worth of not less than Rs. 500 crore as per the latest Annual Report of the Bank.

and

Demand Draft in favour of 'IWAI Fund'  
Payable at Noida/New Delhi.

- (19.1) The Owner's address for the purpose of Bid submission is Inland Waterways Authority of India, A-13, Sector-I, Noida – 201 301.
- (19.1) The deadline for submission of bids shall be:  
Time & Date : As prescribed in Notice inviting E-tender
- (21.1) The date, time and place for opening of the Bids are:  
(A) Technical Bid  
Date, Time & Place : As prescribed in Bid Notice  
(B) Financial Bid (For qualified bidder)  
Date, Time & Place : (Will be intimated later)
- (30.1) The amount and validity period of the performance guarantee is:  
Amount: 10 % of the contract price.  
Validity Period: (i) Performance security shall be valid until a date 28 days after the expiry of Defect Liability Period.
- (31.) Rate of simple interest for mobilisation advance will be 15%.



## **Appendix – 1**

### **Availability of vessel building facility including infrastructural facilities, machineries, etc. which will be utilised for the work under tender**

<b>Name &amp; Address of the Ship Builder</b>	<b>Detailed Particulars</b>
(i) Building Dock/Slipway including fabrication/ construction bays (details including number, dimension, location and layout of shipyard to be given). Whether covered or open.	
(ii) Skids/Mould loft for modular construction (details including number, dimension and location to be given). Whether covered or open.	
(iii) Design and drawing office of own or tie up with experienced Design Consultant/ Naval Architect with brief resume	
(iv) List of manpower, machinery, equipment etc.	
(v) Facilities for doing outfitting job in afloat condition indicating location and area.	

Name & Signature of  
the authorized signatory

## **APPENDIX – 2**

### **OUTPUT OF THE SHIPYARD DURING PRECEDING 7 YEARS**

Sl.No.	Name of the contract	Name and Address of employer	Cost of Work	Date of Award	Date of completion		Type of Vessel and specification
					Schedule	Actual	

Name & Signature of  
the authorized signatory

### **APPENDIX – 3**

#### **CONTRACT NON-PERFORMANCE (DURING PRECEDING 7 YEARS)**

Sl. No.	Name of Contract	Name and Address of employer	Date of award	Date of completion as per contract	Physical status	Reason for non-completion	Any revised date fixed for completion	Whether under Litigation

Name & Signature of  
the authorized signatory

## **APPENDIX – 4**

### **FINANCIAL PERFORMANCE (DURING PRECEDING 7 YEARS)**

Sl. No.	Name of Contract	Name and Address of employer	Date of award	Cost of contract	Date of completion as per contract	Actual date of completion	Any cost overrun allowed indicating reasons	Revised cost if any

Name & Signature of  
the authorized signatory

## **APPENDIX – 5**

### **ANNUAL CONSTRUCTION TURNOVER (DURING PRECEDING 7 YEARS)**

Year	Annual Turnover

Name & Signature of  
the authorized signatory

N.B. -The annual turnover duly certified by the bidders Chartered Accountant on their letter head for last seven years to be submitted as a scanned document in the technical bid and original to be submitted along with EMD and other specified document before the closing date and time i.e. submission of bid.

**(SECTION-III)**  
**INTEGRITY AGREEMENT**

### **SECTION-III**

**To be signed by the bidders' and same signatory competent/  
authorized to sign the relevant contract on behalf of IWAI.**

### **INTEGRITY AGREEMENT**

This Integrity Agreement is made at ..... on this ..... day of ..... 20.....

BETWEEN

Chairperson, Inland Waterways Authority of India represented through Chief Engineer (P&M), Inland Waterways Authority of India, A - 13, Sec. – 1, Noida.

IWAI, (Hereinafter referred as the 'Principal/ Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....  
(Name and Address of the Individual/firm/Company)  
through .....(Hereinafter referred to as the  
(Details of duly authorized signatory)  
"Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No.: IWAI/MD/133/2015-16) (hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for Design, Construction and Supply of two nos. RO-RO vessels for NW-2.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as "Integrity Pact" or "Pact"), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

#### **Article 1: Commitment of the Principal/Owner**

- 1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

- (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  - (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
  - (c) The Principal/Owner shall endeavour to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- 2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

**Article 2: Commitment of the Bidder(s)/Contractor(s)**

1. It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the IWAI all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
2. The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
  - a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the tender process or execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the contract.
  - b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.



- c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
  - d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
  - e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
3. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
  4. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a wilful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.
  5. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

### **Article 3: Consequences of Breach**

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the bidder/contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

1. If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the

Principal/Owner after giving 14 days' notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.

2. Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the tender process prior to the award of the contract or terminated/determined the contract or has accrued the right to terminate/determine the contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
3. Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a bidder or Contractor, or of an employee or a representative or an associate of a bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

#### **Article 4: Previous Transgression**

- 1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
- 2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
- 3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

#### **Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors**

- 1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/ sub-vendors.
- 2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.

- 3) The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

#### **Article 6: Duration of the Pact**

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, IWAI.

#### **Article 7: Other Provisions**

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal/Owner, who has floated the Tender.
- 2) Changes and supplements need to be made in writing. Side agreements have not been made.
- 3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
- 4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

#### **Article 8: LEGAL AND PRIOR RIGHTS**

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

.....  
(For and on behalf of Principal/Owner)

.....  
(For and on behalf of Bidder/Contractor)

WITNESSES:

1. ....  
(signature, name and address)

2. ....  
(signature, name and address)

Place:

Date :

Note – The INTEGRITY AGREEMENT will be signed on behalf of Chairperson, IWAI, Noida by the same authority who will sign the remaining part of the agreement.

**(SECTION-IV)**  
**SCHEDULES**

## **SECTION-IV**

### **SCHEDULES**

#### **SCHEDULE 'A' : Salient Features of the work.**

**Name of Work :** Design, Construction and Supply of two nos. RO-RO vessels for NW-2

Schedule A Design, Construction and Supply of RO-RO Vessel carrying 12 trucks and 200 passengers (100 seated).

Schedule B Design, Construction and Supply of RO-RO Vessel carrying 8 trucks and 100 passengers (50 seated)

**Estimated cost of work:** The work is estimated to cost for Schedule A (bigger RO-RO Ferry )Rs 1680 lakh and for Schedule B (smaller RO-RO Ferry) Rs. 1260 lakh

- |                                  |   |   |
|----------------------------------|---|---|
| <b>(a) Earnest Money</b>         | : | Schedule A (bigger RO-RO Ferry )Rs 26.80 lakh and for Schedule B (smaller RO-RO Ferry) Rs. 22.60 lakh |
| <b>(b) Performance Guarantee</b> | : | 10% of tendered value.  |
| <b>(c) Security Deposit</b>      | : | 5% of tendered value.   |

#### **SCHEDULE 'B' : General Rules & Directions with reference to General Conditions of Contract: -**

- (i). **Officer inviting tender: -** Chief Engineer (P&M), IWAI
- (ii). **Tender Accepting Authority:-** Chairman, IWAI
- (iii). (a) **Time allowed for submission of Performance Guarantee as per clause 3.1 of GCC from the date of issue of letter of acceptance:-** 15 days  
(b) **Maximum allowable extension beyond the period provided in (iii) (a) above:-** 7 days
- (iv) **Percentage on Cost of Materials & Labour to cover all overheads and profits:-** included in the estimate
- (v) **Standard Schedule of Rates:-** Not applicable
- (vi) **Specifications to be followed:-** Not applicable
- (vii) **Deviation Limit beyond which clause 16.3, 16.4, 16.5 & 16.6:-** 20%
- (viii) **Competent authority of grant extension of time under clause 34:-**
  - (a) Regional Director (Field), IWAI (if the amount of contract is upto 50 lakhs).
  - (b) Member (Technical), IWAI (if the amount of contract is upto 100 lakhs).

- (c) Vice-Chairman/ Chairperson, IWAI, Noida (if the cost of contract is more than 100 lakhs & up to 500 lakhs).
- (d) Chairman, IWAI, Noida (if the amount of contract is more than 500 lakhs).

**(ix) Competent authority to levy liquidated damages for delay under clause 35:-**

- (a) Regional Director (Field), IWAI (if the amount of contract is upto 50 lakhs).
- (b) Member (Technical), IWAI (if the amount of contract is upto 100 lakhs).
- (c) Vice-Chairman/ Chairperson, IWAI, Noida (if the cost of contract is more than 100 lakhs & up to 500 lakhs).
- (d) Chairman, IWAI, Noida (if the amount of contract is more than 500 lakhs).

**(x) Competent authority to determine the contract as per clause 36:-**

- Engineer-in-Charge with the prior approval of
- (A) Regional Director (Field), IWAI (if the amount of contract is upto 50 lakhs).
  - (B) Regional Director/Engineer-in-Charge with the prior approval of
    - (a) Member Technical), IWAI (if the amount of contract is upto 100 lakhs).
    - (b) Vice-Chairman/Chairperson, IWAI, Noida (if the cost of contract is more than 100 lakhs & up to 500 lakhs).
    - (c) Chairman, IWAI, Noida (if the amount of contract is more than 500 lakhs).

**(xi) Milestones as per table given below:  
(Clause 34.5 & 34.6 shall be applicable only when the amount of the contract is more than 10 crores)**

Sl. No.	Milestone	Time Allowed (from date of start) in months	Amount to be withheld in case of non-achievement of mile stone
1.			
2.			
3.			
4.			
5.			

**(xii) Competent authority to reschedule the milestones as per clause 34.5:-**

Chairman, IWAI, Noida

**(xiii) Competent authority for foreclosure of contract in full or in part due to abandonment or reduction in scope of work as per clause 31:-**

Engineer-in-Charge with the prior approval of

- (A) Regional Director (Field), IWAI (if the amount of contract is upto 50 lakhs).
- (B) Regional Director/Engineer-in-Charge with the prior approval of
  - (a) Member Technical), IWAI (if the amount of contract is upto 100 lakhs).
  - (b) Vice-Chairman/Chairperson, IWAI, Noida (if the cost of contract is more than 100 lakhs & up to 500 lakhs)
  - (c ) Chairman, IWAI, Noida (if the amount of contract is more than 500 lakhs).

**(xiv) Incentive for early completion.**

Not applicable



**(SECTION-V)**

**GENERAL CONDITIONS OF THE  
CONTRACT**

**SECTION –V**  
**GENERAL CONDITIONS OF THE CONTRACT**  
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## GENERAL CONDITIONS OF CONTRACT

### CLAUSE - 1: DEFINITIONS

In the contract, the following words & expressions shall, unless context otherwise requires, have the meaning thereby respectively assigned to them:

- i) **Contract:** means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Chairman, Inland Waterways Authority of India and the contractor, together within the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-charge and all these documents taken together shall be deemed to form one contract and shall be complementary to one another
- ii) **Contract sum;** means the amount arrived at by multiplying the quantities shown in the schedule of quantities and price by the respective item rates as allowed.
- iii) **Contractor:** means the successful tenderer who is awarded the contract to perform the work covered under this tender documents and shall be deemed to include the contractor's successors, executors, representatives or assign approved by the Engineer-in-charge.
- (iv) **Employer** means the Chairman, Inland Waterways Authority of India and his successors.
- (v) **IWAI/ Authority/ Department/ Owner** shall mean the Inland Waterways Authority of India, which invites tenders on behalf of the Chairman, IWAI and includes therein-legal representatives, successors and assigns.
- (vi) **Engineer-In-Charge (EIC)** means the Engineer officer authorised to direct, supervise and be In-charge of the works for the purpose of this contract who shall supervise and be in charge of the work.
- (vii) **Engineer-in-charge representative** shall mean any officer of the Authority nominated by the Engineer-in-charge for day to day supervision, checking, taking measurement, checking bills, ensuring quality control, inspecting works and other related works for completion of the project.
- (viii) **Chairman:** means Chairman of Inland Waterways Authority of India.
- (ix) **Chief Engineer:** means the Chief Engineer of the Authority.
- (x) **Director** means the Director of the Authority, as the case may be.
- (xi) **Deputy Director** means the Deputy Director of the Authority, as the case may be.

- (xii) **Assistant Director** means the Asstt. Director of the Authority, as the case may be.
- (xiii) **Work Order** means a letter from the Authority conveying the acceptance of the tender/offer subject to such reservations as may have been stated therein.
- (xiv) **Day** : means a calendar day beginning and ending at mid-night.
- (xv) **Week** : means seven consecutive calendar days
- (xvi) **Month** : means the one Calendar month.
- (xvii) **Site** means the waterway and / or other places through which the works are to be executed.
- (xviii) **Vessel** : **Vessel** is the **Ro-Ro vessels** to be designed, constructed, equipped and delivered afloat in accordance with the contract and with modification, if any, as mutually agreed upon.
- (xix) **Drawings** : means the drawings referred to in the specifications and / or appended with the tender document, any modifications of such drawing approved in writing by the Engineer-in-Charge and shall also include drawings/ charts issued for actual execution of the work time to time by the Engineer-in-Charge.
- (xx) **Urgent Works**: means any urgent nature which in the opinion of the Engineer-In-Charge become necessary at the time of execution and / or during the progress of work to obviate any risk or accident or failure or to obviate any risk of damage to the vessel structure, or required to accelerate the progress of work or which becomes necessary for security or for any other reason the Engineer-in-Charge may deem expedient.
- (xxi) **Work/ works**: means work / works to be executed in accordance with the contract.
- (xxii) Schedules referred to in these conditions shall mean the relevant schedules annexed to the tender papers.
- (xxiii) Tendered value means the value of the entire work as stipulated in the letter of award.
- (xxiv) A **Defect** is any part of the Works not completed in accordance with the Contract.
- (xxv) **The Defects Liability Certificate** is the certificate issued by Owner, after the Defect Liability Period has ended and upon correction of Defects by the Contractor.

(xxvi) **The Defects Liability Period** is 12 months calculated from the Date of delivery of the *Ro-Ro vessels*.

(xxvii) **Inspection Authority or Inspector** is the Officer of the Owner or any other person from time to time appointed by the Owner to act as an inspecting authority or inspector for the purpose of the contract.

(xxviii) **Government** is the Government of India.

(xxix) **Representative** is the Officer appointed by the owner on behalf of the owner to receive the vessel along with spares and equipment etc. on their behalf upon delivery at the specified destination.

(xxx) **Test** is the test or tests as are prescribed by the specification to be made by the contractor/owner or their nominee, before the vessels are taken over by the owner.

(xxxi) **Specification** means the Specification of the Works included in the Contract.

(xxxii) The **Start Date** is given in the Contract Data. It is the date when the Contractor shall commence execution of the Works.

(xxxiii) A **Variation** includes alterations, amendments, omissions, additions or suspensions of the works.

## **CLAUSE – 2: INTERPRETATIONS**

2.1 Where the contract so requires, words imparting the singular only shall also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.

2.2 Heading and marginal notes in these General Conditions shall not be deemed to form part thereof or be taken into consideration in the interpretation of construction thereof of the contract.

## **CLAUSE-3. (a) PARTIES**

The parties to the contract are the contractor and the owner.

### **(b) AUTHORITY OF PERSONS SIGNING THE CONTRACT ON BEHALF OF THE CONTRACTOR:**

A person signing the tender or any other document in respect of the contract on behalf of the contractor without disclosing his authority to do so shall be deemed to warrant that he has authority to bind the contractor. If it is discovered at any time that the person so signing had no authority to do so, the Chairman on behalf of Authority may, without prejudice to any other right or remedy of the owner, cancel the contract and make or authorize the making of a purchase of the vessels at the risk and cost of such person and hold such person liable to the owner for all costs and damages arising from the cancellation of the contract

including any loss which the owner may sustain on account of such purchase. The provisions of clause 11 apply to every such purchase as far as applicable.

**(c) ADDRESS OF THE CONTRACTOR AND NOTICES AND COMMUNICATIONS ON BEHALF OF THE OWNER**

(i) For all purposes of the contract including arbitration there under, the address of the contractor mentioned in tender shall be the address to which all communication addressed to the contractor shall be sent, unless the contractor has notified a change by a separate letter containing no other communication and sent by registered post due to Chairman, Inland Waterways Authority of India, A-13, Sector-1, NOIDA, Gautam Budh Nagar Distt (U.P.) 201301. The Contractor shall be solely responsible for the consequence of an omission to notify a change of address in the matter aforesaid.

(ii) Any communication or notice on behalf of the owner, in relation to the contract may be issued to the contractor by the owner, and such communications and notices may be served on the contractor either by fax or courier or registered post or under certificate of posting or by ordinary post or by hand delivery at the option of the owner.

**CLAUSE-4. AUTHORITY OF THE CHAIRMAN:**

For all purposes of the contract including arbitration proceeding there under the Chairman on behalf Authority shall be entitled to exercise all the rights and powers of the owner

**CLAUSE – 5: PERFORMANCE SECURITY & SECURITY DEPOSIT:**

- 5.1 The contractor shall be required to deposit an amount equal to 10% of the tendered value of the work as performance guarantee in the form of either demand draft payable at any nationalized/schedule bank **OR** an irrevocable bank guarantee of any scheduled bank or State Bank of India in accordance with the form prescribed within 10 days of the issue of the work order.
- 5.2 The owner shall retain security deposit of five percent of the amount from each payment due to the contractor until completion of the whole of the work. The security deposit @ 5% may be deducted from each payment after adjustment of the Earnest Money Deposit deposited in the form of Demand Draft .
- 5.3 The security deposit /retention money and the performance security aggregating to 15 percent of the contract price will be released to the contractor when the defect liability period is over, and the Engineer-in-charge has certified that the defects, if any, notified by the Engineer-in-charge to the contractor before the end of this period have been corrected.
- 5.4 Performance of contract including warrantee period of 12 months on the guarantee with the respect to workmanship and material etc. shall be initially valid up to the stipulated date of completion plus 28 days beyond that. In case the time for completion gets enlarged, the contractor shall get

the validity of the performance guarantee extended to cover such enlarged time of the work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor without any interest.

- 5.5 In the event of contract being determined under the provision of any of the clauses/conditions of agreement, the performance guarantee shall be forfeited in full or in part and shall be absolutely at the disposal of the authority.

#### **CLAUSE – 6: RELEASE OF PERFORMANCE SECURITY/GUARANTEE & SECURITY DEPOSIT**

(1) The performance security will be released to the contractor when the defect liability period of 12 Months after the delivery of the vessel is over and the Engineer-in-charge has certified that the defects, if any, notified by the Engineer-in-charge to the contractor before the end of this period have been corrected.

(2) No claim shall lie against the owner either in respect of interest or any depreciation in value of any security.

(3) If the contractor fails or neglects to observe or perform any of his obligations under the contract, it shall be lawful for the Chairman or his duly authorized representative to forfeit either in whole or in part, the performance security furnished by the contractor. Save as aforesaid, if the contractor duly performs and completes the contract in all respects and presents in absolute “NO DEMAND CERTIFICATE” in the prescribed form, the Chairman on behalf of the Authority shall refund the performance security to the contractor after deducting all costs and other expenses that the owner may have incurred and all dues and other money including all losses and damages which the owner is entitled to recover from the contractor.

#### **CLAUSE – 7: RESPONSIBILITY OF THE CONTRACTOR FOR EXECUTION OF THE CONTRACT**

##### **i) RISK IN THE CONSTRUCTIONS:**

The contractor shall perform the contract in all respects in accordance with the terms and conditions thereof. The vessel and every constituent part thereof, whether in the possession or control of the contractor, his agents or employees or in the joint possession of the contractor, his agents or employees or purchaser, his agents or employees shall remain in every respect of at the risk of the contractor until its actual delivery to the representatives at the stipulated place or destination or, where so provided in the acceptance of tender, until its delivery to a person specified in the schedule as interim consignee for the purpose of dispatch to the consignee. The contractor shall be responsible for all loss, destruction, damage or deterioration of or to the vessel from any cause whatever while the vessel after approval by the inspector is awaiting delivery or is in the course of transit from the contractor to the consignee or, interim consignee as the case may be.



**(ii) RESPONSIBILITY FOR COMPLETENESS:**

In respective of any inspection and tests made by the inspector, the contractor shall be entirely responsible for the proper execution of the contract notwithstanding any approval, which may have been given by the inspector or the contractor.

Any fittings, accessories which may not be specially mentioned in the specification but which are usual or necessary are to be provided by the contractor without extra charge.

**(iii) SUBLETTING THE CONTRACT:**

The contractor shall not assign, lease or sublet or cede this contract or the benefit hereof or any part thereof or any money payable hereunder or sublet the services to be rendered as aforesaid or any part thereof to any other person or company without the previous permission of the Owner certified in writing under the hands of the Owner and no assignment, lease, cession or subletting although so permitted shall exonerate the contractor from his liability under this contract and the Owner shall not be bound or required to take notice or give effect to any such assignment, lease, cession or subletting unless the same shall have been made with such permission as aforesaid PROVIDED ALWAYS the contractor may procure any necessary materials to be manufactured for the purposes of, this contract by any person, firm or company whose names shall have been submitted to and approved by Chairman on behalf of the Authority before the said materials are ordered but no such approval shall relieve the Contractor from any responsibility or obligations with reference to any such materials.

**(iv) (a) CHANGES IN A FIRM**

(i) Where the contractor is a partnership firm, a new partner shall not be introduced in the firm except with the previous consent in writing of the Chairman on behalf of Authority which may be granted only upon acceptance of a written undertaking by the new partner to perform the contract of accept all liabilities incurred by the Firm under the contract prior to the date of such undertaking.

(ii) On the death or retirement of any partner of the contractor firm before complete performance of the contract the Chairman on behalf of Authority may, at his opinion cancel the contract and in such case the contractor shall have no claim whatsoever to compensation against the owner.

(iii) If the contract is not determined as provided in sub-clause (ii) above notwithstanding the retirement of a partner from the firm he shall continue to be liable under the contract for acts of the firm until a copy of the public notice given by him under section 32 of the partnership Act has been sent by him to the owner by registered post acknowledgement due.

**(b) CONSEQUENCE OF BREACH:**

Should the contractor or a partner in the contractor firm commit breach of either of the conditions (iii) or (ii) (a) (i) of this sub clause it shall be

lawful for the owner to cancel the contract and purchase or authorize the purchase of the vessels at the risk and cost of the contractor and in that event the provisions of clause 48 & 56 of **GENERAL CONDITIONS** shall as far as applicable apply. The decision of the Chairman on behalf of Authority as to any matter or thing concerning or arising out of this sub-clause or any question whether the contractor or any partner of the contract firm has committed a breach of any of the conditions in this sub-clause contained shall be final and binding on the contract.

**(v) ASSISTANCE TO THE CONTRACTOR:**

a) The contractor shall be solely responsible to procure any material or obtain any import or other license or permit required for fulfilment of the contract and the grant by "the owner or any other authority of a quota certificate or permit required under any law for distribution or acquisition of iron and steel or any other commodity or any other form of iron and steel, or any other commodity or any other form of assistance in the procurement of the material aforesaid, shall not be construed as a representation in the part of the purchase that the material covered by such license or permit quota certificate is available or constitute any promise, undertaking or assurance on the part of the owner regarding the procurement of the same or effect any variation in the rights and liabilities of the parties under the contract. But, if by reason of any such assistance as aforesaid, the contractor obtains any materials at less than their market price or the cost of production of the vessel is lowered, the price of the vessels payable under the contract shall be reduced proportionately and the extent of such reduction shall be determined by the owner whose decision shall be final and binding on the contractor.

(b) Every agreement made by Chairman on behalf of the Authority to supply or give assistance in the procurement of materials, whether from the Govt. Stock or by purchase under permit or release order issued by or by any officer empowered in that behalf of Govt. shall be deemed to be subject to the condition that it will be performed with due regard to other demands and only if it is found practicable to do so within the stipulated time and the decision of the Chairman on behalf of Authority whether it was practicable to supply or give assistance as aforesaid or not shall be final and binding on the contractor.

**CLAUSE-8. INABILITY TO PERFORM CONTRACT:**

Should the Contractor's preparation for the commencement of the work, or any portion of it or his subsequent rate of progress may be, from any cause whatever, so slow that in the opinion of the inspector, which shall be conclusive, the contractor will be unable to complete the work or any portion thereof as agreed upon, or should he not have the work ready for delivery in conformity with the contract should he neglect to comply with any directions given to him by the inspector or in any respect fail to perform the contract, the owner shall have power to declare the contract at an end, in which case the contractor shall be liable for any expense, loss or damage which the owner may incur or sustain by reason, of or in connection with contractor's default.

## **CLAUSE – 9: QUOTATION OF RATES BY CONTRACTOR:**

The price quoted by contractor shall be firm with no provision for any deviation as per the cost schedule. The price shall include the cost of the material, equipment, machineries, the import/custom duty, all tax and duties including cost of dry docking, test & trial, transportation/Shipping and delivery at Dhubri, India.

If the Ro-Ro vessel is delivered as dry cargo, the dry docking is not necessary. In case, the same is delivered after sailing in the river/sea, dry docking shall be done at the sole cost of the builder. Accordingly, provision is to be made and rate to be quoted.

## **CLAUSE – 10: DELEGATION OF POWERS**

The Chairman on behalf of Authority may from time to time delegate to any person operations to be named by him such of the powers, authorities and discretion's vested in him by the contract as he may think fit and the contractor shall recognize such person or persons on written notice from the Chairman of him or their appointment and of the powers, authorities and discretion's respectively delegated to him or them as lawfully exercising for the purpose of this contract the powers, authorities and discretion's so delegated provided that the Chairman on behalf of Authority shall not delegate the powers, authorities and discretion's conferred on him by the clause 66 hereof.

## **CLAUSE-11. RISK OF LOSS OR DAMAGE TO AUTHORITY OR OWNER'S PROPERTY**

(1) All the property of the Authority or Owner loaned whether with or without deposit to the contractor in connection with the contract shall remain the property of the authority or the Owner as the case may be. The contractor shall use such property for the purpose of the execution of the contract and for no other purpose whatsoever.

(2) All such property shall be deemed to be in good condition when received by the contractor unless he shall have within seven days of the receipt thereof notified the Chairman to the contrary. If the contractor fails to notify any defect in the condition or equality of such properties he shall be deemed to have lost the right to do so at any subsequent stage.

(3) The contractor shall return all such property in good condition. The contractor shall be able for loss or damage to such property in the possession of or under the control of the contractor, his employees or agents and responsible for the full value thereof to be assessed by the Chairman on behalf of authority whose decision shall be final and binding on the contractor.

(4) Where such property is insured by the contractor against loss or fire at the request of the authority or the Owner such insurance shall be

deemed to be affected by way of additional precaution and shall not prejudice the liability of the contractor as aforesaid.

**CLAUSE-12: CHARGES FOR WORK NECESSARY FOR COMPLETION OF THE CONTRACT:**

The contractor shall pay all charges for handling, stamping, printing, painting, marking and for protecting and preserving patent rights and for all such measures which the inspector or the representative of owner may require the contractor to take for the proper completion of the contract though no special provision in respect thereof may have been made in particular.

**CLAUSE-13: TIME AND DATE OF COMPLETION OF WORK**

The time and the date stipulated in the tender for the completion of the work shall be deemed to be the essence of the contract. In case of delay the contractor shall in addition to other liabilities mentioned in to special conditions of contract be liable for all cost of inspection, which may be incurred after the date on which the work ought to have been completed. But if the delay shall have arisen from any cause such as strikes, locations, fire, accident, riot, etc. which the owner may admit as reasonable ground for further time, the owner will allow such additional time as he may consider to have been required by the circumstances of the case.

**CLAUSE-14: PROGRESS REPORT**

- (1) The contractor shall from time to time tender reports concerning the progress of the contract in such form as may be required by the Chairman on behalf of Authority.
- (2) The submission, receipts and acceptance of such reports shall not prejudice the rights of the owner under the contract, nor shall operate as a stopple against the owner merely by the reason of the fact that he has not taken notice of or objected to any information contained in such report.

**CLAUSE –15: CERTIFICATE AND FEES**

All test certificates and other certificates are to be handed over to the owner or his representative on completion of the vessel(s) by the contractor with the report that the vessel is ready for delivery. The contractor shall pay all the fees in connection with the certificates and all royalties or incur other fees during the construction of the vessel(s).

**CLAUSE – 16: CONTRACT PRICE**

**(a) CONTRACT PRICE:**

Subject to any deduction and addition authorized by and to the other provisions of this contract, Owner shall pay to the contractor for the

building, equipment, testing and delivery at specified destination, for the vessel(s) including Dry Docking (import and customs Duty if applicable) and for all other works, matters, things and obligations to be executed, done, supplied and performed by the contractor under this contract including the provision of the hull inventory as specified (which said amount is herein called the contract price) by the time and in the manner following viz.

- i) 15% when keel is laid against irrevocable Bank Guarantee. The Bank Guarantee will be returned after delivery of the vessel(s).
- ii) 15% when 50% Hull Fabrication and erection is completed.
- iii) 20% when 100% Hull fabrication and erection is completed.
- iv) 20% on arrival of major machineries i.e. main engines, auxiliary engines, propulsion shafts, steering gear and stern gear of the vessel(s).
- v) 15% on launching of the vessel(s).
- vi) 15% on successful tests and trials and delivery of the vessel(s).

#### **(b) MOBILISATION ADVANCE**

On award of work and execution of agreement a mobilisation advance of 10% of contract price will be given at a simple rate of interest of 15% per annum or the rate as prevailing against furnishing of Non-revocable Bank Guarantee. The mobilisation advance will be recovered in four equal installments from the first running bill i.e. when the keel is laid.

For the mobilisation advance the firm shall have to furnish non-revocable Bank Guarantee and for the first installment of 15% when the keel is laid the firm shall have to furnish Bank Guarantee for the sums being claimed in the forms enclosed, from a nationalised bank or a scheduled bank located in India.

These documents shall be kept valid till full recovery of mobilization advance. There shall not be any additional payment to the contractor for obtaining bank guarantee.

#### **(c) SYSTEM OF PAYMENT:**

Unless otherwise agreed in writing between Chairman on behalf of Authority and the Contractor payment for the works shall be made by Chairman on behalf of Authority as in clause 16 (a) upon production of the certificate of the representative of owner after the inspection of the construction of the vessel(s) against the installment due. The contractor must submit the bills and necessary documents allowing 30 days from the date of submission for the payment of installment subject to the condition that the amount of an installment payment shall in no case exceed the value of the work done.

#### **CLAUSE – 17: WITHHOLDING AND LIEN IN RESPECT OF SUM CLAIMED**

Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the contractor, the owner shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, deposited by the contractor and for the purpose aforesaid the owner shall be entitled to withhold the said security deposit furnished and also have a lien over the same pending finalization or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the owner shall be entitled of the such claimed amount or amounts referred to supra, from any sum or sums found payable or which at any time thereafter may become payable to the contractor under the same contract or any other contract with the owner or the government or any person contracting through the owner pending finalization or adjudication of any such money so withheld or retained under the lien referred to above, by the owner will claim arising out of or under the contract is determined by the arbitrator.

#### **CLAUSE – 18: INDEMNITY**

(1) The contractor shall at all-time indemnify the owner against all claims which may be made in respect of the vessel(s) for infringement of any right protected by patent, registration of designs or trade mark. Provided always that in the event of any claim in respect of alleged breach of patent, registered designs or trade mark being made against the owner, the owner shall notify the contractor of the same and the contractor shall at his own expense either settle any such dispute or conduct and litigation's that may arise there from.

(2) The contractor shall not be liable for payment of any royalty, license fee or other expenses in respect of for making use of patents or designs with respect to which he is according to the terms of the contract, to be treated as an agent of the Government for the purpose of making use of the patent of trade mark for fulfillment of the contract.

#### **CLAUSE – 19:TESTS**

19.1 The contractor shall be solely responsible for :

- i) Carrying out the mandatory tests prescribed as per ship building practice and
- ii) For the correctness of the test results, whether preformed in his laboratory or elsewhere.

19.2 If the Owner instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples.

## **CLAUSE – 20: CURRENCIES**

All payments will be made in Indian Rupees for the supply of two nos. Ro-Ro vessels.

## **CLAUSE – 21: SUFFICIENCY OF TENDER**

The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates quoted in the schedule of Quantities and Prices which shall (except as otherwise provided in the contract) cover all his obligations under the contract and all matters and things necessary for the proper execution and completion of the works in accordance with the provisions of the contract and its operation during execution of work.

## **CLAUSE – 22: CONTRACT DOCUMENTS**

- 22.1 The language in which the contract documents shall be drawn up shall be English and if the said documents are written in more than one languages, the language according to which the contract is to be constructed and interpreted shall be English.
- 22.2 The Contractor shall be furnished free of charge certified true copy of the contract document.
- 22.3 A copy of the Contract Documents furnished to the Contractor as aforesaid shall be kept by the Contractor on the Site in good condition and the same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge, his representatives or by other Inspecting officers of the Authority.
- 22.4 None of these Documents shall be used by the Contractor for any purpose other than that of this contract.

## **CLAUSE – 23: DISCREPANCIES AND ADJUSTMENT OF ERRORS**

- 23.1 Detailed drawings shall be followed in preference to small-scale drawings and figured dimensions in preference to scaled dimensions. The case of discrepancy between the Schedule of Quantities and prices, the Specifications and/ or the drawings, the following order of precedence shall be observed : -
  - (a) Description in the Schedule of Quantities and Prices.
  - (b) Relevant Specifications and Special Conditions, if any.
  - (c) Drawings.
  - (d) Indian Standards Specifications of BIS.
- 23.2 The contractor shall study and compare the drawings, specifications and other relevant information given to him by the Engineer-in-Charge and shall report in writing to the Engineer-in-Charge any discrepancy and inconsistency which he notes. The decision of the Engineer-in-Charge

regarding the correct intent and meaning of the drawings and specifications shall be final and binding.

- 23.3 Any error in description, quantity or price in Schedule of Quantities and Prices or any omission there from shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the work(s) comprised therein according to drawings and specifications or from any of his obligations under the contract.
- 23.4 If on check there is difference in the amount worked out by contractor in the schedule of quantities and prices and General summary the same shall be adjusted in accordance with the following rules:
- (a) In the event of error/discrepancy occurring in the rates written in figures and words, then the rate which corresponds with the amount worked out by the contractor shall, unless otherwise proved, be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rate written either in figures or in words, then the rate quoted by the contractor in words shall be taken as correct. When the rate quoted by the contractor in figures and words tally, but the amount is not worked out correctly, the rate quoted by the contractor will, unless or otherwise proved, be taken as correct.
  - (b) All errors in totaling in the amount column and in carrying forward totals shall be corrected.
  - (c) The totals of various sections of schedule of quantities and price amended shall be carried over to the General Summary and the tendered sum amended accordingly. The tendered sum so altered shall, for the purpose of tender, be substituted for the sum originally tendered and considered for acceptance instead of the original sum quoted by the tenderer. Any rounding off of quantities or in sections of schedule of quantities and prices or in General summary by the tenderer shall be ignored.

#### **CLAUSE-24: DUTIES AND POWERS OF THE ENGINEER-IN-CHARGE REPRESENTATIVE**

- 24.1 The duties of the representative of the Engineer-in-Charge are to watch and supervise the works and to test and examine any materials/ parts to be used or workmanship achieved in connection with the works.
- 24.2 The Engineer-in-Charge may, from time to time in writing, delegate to his representative any of the powers and authorities, vested in the Engineer-in- Charge and shall furnish to the contractor a copy of all such written delegation of powers and authorities. Any written instruction or written approval given by the representative of the Engineer-in-Charge to the contractor within the terms of such delegation shall bind the contractor and the Authority as though it has been given by the Engineer-in-Charge.



- 24.3 Failure of the representative of the Engineer-in-Charge to disapprove any work or materials shall be without prejudice to the power of the Engineer-in-Charge thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof. The contractor shall, at his own expense, again carry out such works as directed by the Engineer-in-Charge.
- 24.4 If the Contractor is dissatisfied with any decision of the representative of the Engineer-in-Charge, he will be entitled to refer the matter to the Engineer-in-Charge who shall thereupon confirm, reverse or vary such decision and the decision of the Engineer-in-Charge in this regard shall be final and binding on the contractor.

#### **CLAUSE – 25: ASSIGNMENT AND SUB-LETTING**

The Contractor shall not sub-let, transfer or assign the whole or any part of the work under the contract. Provided that the Engineer-in-Charge may at his discretion, approve and authorize the Contractor to sub-let any part of the work, which in his opinion, is not substantial, after the contractor submits to him in writing the details of the part of the work(s) or trade proposed to be sublet, the name of the sub-contractor thereof together with his past experience in the said work/trade and the form of the proposed sub-contract. Nevertheless any such approval or authorization by the Engineer-in-Charge shall not relieve the contractor from his any or all liabilities, obligations, duties and responsibilities under the contract. The contractor shall also be fully responsible to the Authority for all the acts and omissions of the sub-contractor, his employees and agents or persons directly employed by the contractor. However, the employment of piece rate works shall not be construed as sub-letting.

#### **CLAUSE – 26: CHANGE IN THE CONSTITUTION OF THE FIRM TO BE INTIMATED**

Where the contractor is a partnership firm, prior approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu Undivided Family business concern, such approval, as aforesaid, shall like-wise be obtained before the contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If prior approval as aforesaid is not obtained the contractor shall be deemed to have been assigned in contravention to Clause 57 hereof and the same action will be taken and the same consequences shall ensure as provided for in the said clause-57.

#### **CLAUSE – 27: COMMENCEMENT OF WORK**

The contractor shall commence the work at the respective sites within 15 days of the issue of Letter of Award. If the contractor commits default in mobilization of resources, and equipment as aforesaid, the Engineer-in-Charge shall without prejudice to any other right or remedy be at liberty to cancel the contract and forfeit the earnest money/security deposit.

## **CLAUSE – 28: WORKS TO BE CARRIED OUT IN ACCORDANCE WITH SPECIFICATION DRAWINGS AND ORDERS ETC.**

- 28.1 The contractor shall execute the whole and every part of the work in the most substantial and workman like manner in strict conformity with the specifications laid down in the contract document or as may be laid down by the Engineer-in-Charge under the terms of the contract. The contractor shall also conform exactly, fully and faithfully to the designs, drawings specifications and instructions in writing in respect of the work, duly signed by the Engineer-in-Charge as may be issued from time to time.
- 28.2 The contractor shall be entitled to receive, on demand, in addition to the contract documents, in accordance with the provisions of contract, the documents set forth herein in respect of the work on commencement or during the performance of the contract:
- (a) Specifications or revisions thereof other than standard printed specifications and charts/drawings issued to the contractor from time to time
  - (b) Explanations, instructions etc.

Such further drawings, explanation, modifications and instruction, as the Engineer-in-Charge may issue to the contractor from time to time in respect of the work shall be deemed to form integral part of the contract and the contractor shall be bound to carry out the work accordingly.

- 28.3 All instructions and orders in respect of the work shall be given by the Engineer-in-Charge in writing. However, any verbal instructions or order shall be confirmed by the Engineer-in-Charge as soon as practicable without loss of time and only such written instruction shall be deemed to be valid.

## **CLAUSE – 29: SETTING OUT THE WORKS**

The contractor shall provide all assistance and adhere to the instruction of E.I.C during the course of surveying, inspection, etc.

## **CLAUSE - 30: CONTRACTOR'S SUPERVISION**

- 30.1 The contractor shall either himself supervise the execution of the works or shall appoint at his own expense, a qualified and experienced Engineer as his accredited agent approved by the Engineer-in-Charge, if contractor has himself not sufficient knowledge or experience to be capable of receiving instruction or cannot give his full attention to the works. The contractor or his agent shall be present at the site(s) and shall supervise the execution of the works with such additional assistance in each trade, as the work involved shall require and considered essential by the Engineer-in-Charge. Further the directions/instructions given by the Engineer-in-Charge to the contractor's agent shall be considered to have the same force as if these had been given to the contractor himself.
- 30.2 If the contractor fails to appoint a suitable agent as directed by the Engineer-in-Charge, the Engineer-in- Charge shall have full powers to

suspend the execution of the works until such date as a suitable agent is appointed by the contractor and takes over the charge of supervision of the work. For any such suspension, the contractor shall be held responsible for delay so caused to the work.

#### **CLAUSE - 31: INSTRUCTIONS AND NOTICE**

- 31.1 Except as otherwise provided in this contract, all notices to be given on behalf of the Authority and all other actions to be taken on its behalf may be given or taken by the Engineer-in-Charge or any officer for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge.
- 31.2 All instructions, notices and communications etc. under the contract shall be given in writing and any such oral orders / instructions given shall be confirmed in writing and no such communication which is not given or confirmed in writing shall be valid.
- 31.3 All instructions, notices and communications shall be deemed to have been duly given or sent to the contractor, if delivered to the contractor, his authorized agent, or left at, or posted to the address given by the contractor or his authorized agent or to the last known place of abode or business of the contractor or his agent of services by post shall be deemed to have been served on the date when in the ordinary course of post these would have been delivered to him and in other cases on the day on which the same were so delivered or left.
- 31.4 The Engineer-in-Charge shall communicate or confirm the instructions to the contractor in respect of the execution of work through a "Site Order Book" maintained in the office of the Engineer-in-Charge and the contractor or his authorized representative shall confirm receipt of such instructions by signing the relevant entries in this book. If required by the Contractor, he shall be furnished a certified true copy of such instruction(s).
- 31.5 The "Hindrance Register" shall be maintained at the site of work, where any hindrance which comes to the notice of the representative of the Engineer-in-Charge shall be recorded and immediately a report will be made to the Engineer-in-Charge within a week. The Engineer-in-Charge shall review the Hindrance Register at least once in a month.

#### **CLAUSE – 32: PATENT RIGHTS**

The contractor shall indemnify the Authority, its representatives or its employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the contract. In the event of any claim being made or action being brought against the Authority or any agent, servant or employee of the Authority in respect of any such materials as aforesaid the contractor shall immediately be

notified thereof. Provided that such indemnification shall not apply when such infringement has taken place in complying with the specific directions issued by the Authority but the contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursement to the contractor only if the use was the result of any drawings and or specifications issued after submission of the tender.

### **CLAUSE – 33: MATERIALS**

- 33.1 The contractor shall at his own expenses provide / arrange all materials required for the bona-fide use on work under the contract.
- 33.2 All materials/parts to be provided by the contractor shall be in conformity with the specifications laid down in the contract and the contractor shall furnish from time to time proof and samples, at his own cost, the materials/parts as may be specified by the Engineer-in-Charge. Further the Engineer-in-Charge shall also have powers to have such tests, in addition to those specified in the contract, as may be required and the contractor shall provide all facilities to carry out the same. The cost of materials/parts consumed in such tests and also the expenses incurred thereon including the cost of the testing charges, shall be borne by the contractor in all cases and also where such tests which are in addition to those provided in the contract disclose that the materials are in conformity with the provisions of the contract.
- 33.3 The Engineer-in-Charge or his representative shall be entitled at any time to inspect and examine any materials/parts intended to be used in the works, either on the site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or any place where these are lying or from where these are being obtained. For this, purpose, the contractor shall afford such facilities as may be required for such inspection and examination.

### **CLAUSE - 34: LAWS GOVERNING THE CONTRACT**

The Courts at Delhi only shall have the jurisdiction for filing the award of the arbitration and for any other judicial proceedings.

### **CLAUSE - 35: LABOUR**

- 35.1 (a) The contractor shall employ labour in sufficient numbers to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the works any person who has not completed eighteen years of age the minimum age specified in Indian Labour Law.
- (b) If any foreigner is employed by the contractor on the work within the site the later shall ensure that such foreigner possesses the necessary special permit issued by the Civil Authorities in writing and also comply with the instructions issued there-from from time to

time. In the event of any lapse in this regard on the part of such foreigner the contractor shall be personally held responsible for the lapse & Authority shall not be liable in any event.

- (c) The Contract is liable for cancellation if either the contractor himself or any of his employee is found to be a person who has held Class-I post under the Authority immediately before retirement and has within two years of such retirement accepted without obtaining the previous permission of the Authority or of the Chairman as the case may be and employment as contractor for, or in connection with the execution of the public works, or as an employee of such contractor. If the contract is terminated on account of the failure of the contractor to comply with the above clause, the Authority shall be entitled to recover from him such damages as may be determined by the Engineer-in-Charge with due regard to the inconvenience caused to the Authority on account of such termination without prejudice to the Authority's right to proceed against such officer.

35.2 The contractor shall furnish and deliver fortnightly to the Engineer-in-Charge, a distribution return of the number and description by trades of the works of people employed on the works. The contractor shall also submit on the 4th and 19th of every month for the period of second half of the preceding month and first half of the current month respectively to the Engineer-in-Charge, a true statement in respect of the following.

- i) Any accident if occurred during the said fortnight showing the circumstances under which it happened and the extent of damage and injury caused by it and.
- ii) The number of female workers who have been allowed maternity benefit as provided in the Maternity Benefit Act 1961 or Rules made there under and the amount paid to them.

35.3 The Contractor shall pay to labourer employed by him either directly or through sub-contractors wages not less than wages as defined in Minimum Wages Act 1948 and Contract Labour (Regulation and Abolition) Act 1970 amended from time to time and rules framed there-under and other labour laws affecting contract labour that may be brought in force from time to time.

35.4 The Contractor shall also comply with the provisions of all Acts, Laws, any Regulation or Bye Laws of any Local or other Statutory Authority applicable in relation to the execution of works such as:

- i) Payment of Wages Act, 1936 (Amended)
- ii) Minimum Wages Act, 1948 (Amended).
- iii) The Contract Labour (Regulation & Abolition) Act, 1970 with Rules framed there under as amended.

- iv) Workmen Compensation Act, 1923 as amended by Amendment Act no.65 of 1976.
- v) Employer's Liability Act 1938 (Amended)
- vi) Maternity Benefit Act. 1961 (Amended)
- vii) The Industrial Employment (Standing orders) Act 1946 (Amended).
- viii) The Industrial Disputes Act. 1947 (Amended)
- ix) Payment of Bonus Act.1965 and Amended Act No. 43 of 1977 and No. 48 of 1978 and any amended thereof:
- ix) The Personal Injuries (Compensation Insurance) Act 1963 and any modifications thereof and rules made thereunder from time to time. The Contractor shall take into account all the above and financial liabilities in his quoted rates and nothing extra, whatsoever, shall be payable to him on this account.

The list is indicative only, otherwise the contractor should be aware of all the Acts/Labour Laws and should follow diligently on the work. The contractor shall be fully and personally responsible for the violation of any Act/Labour Law

- 35.5 The Contractor shall be liable to pay his contribution and the employees contribution to the State Insurance Scheme in respect of all labour employed by him for the execution of the contract, in accordance with the provision of "the Employees State insurance Act 1948" as amended from time to time. In case the Contractor fails to submit full details of his account of labour employed and the contribution payable, the Engineer-in-Charge shall recover from the running bills the contribution amount as assessed by him. The amount so recovered shall be adjusted against the actual contribution payable for Employees State Insurance.
- 35.6 The Engineer-in-Charge shall on a report having been made by an inspecting officer as defined in the Contract Labour (Regulation and Abolition) Act and Rules or on his own in his capacity as Principal Employer, have the power to deduct from the amount due to the contractor any sum required for making good the loss suffered by worker(s) by reason of non-fulfillment of the conditions of the Contract for the benefit of Workers, nonpayment of wages or on account of deduction made from the wages of the workers which are not justified by the terms of the contract or non- observance of the said Act and Rules framed there under with amendments made from time to time.
- 35.7 The Contractor shall indemnify the Authority against any payments to be made under and for observance of the Regulation Laws, Rules as stipulated in Clause-35.4 above without prejudice to his right to claim indemnity from his sub-contractors. In the event of the contractor's failure to comply with the provisions of all the Acts/Laws stipulated in Clause-35.4 or in the event of decree or award or order against the contractor having been received from the competent authority on account of any default or breach or in connection with any of the provisions of the Acts/Laws/Rules

mentioned in Sub-Clause 35.4 above, the Engineer-in-Charge without prejudice to any other right or remedy under the contract shall be empowered to deduct such sum or sums from the Bill of the contractor or from his security deposit or from other payment due under this contract or any other contract to satisfy within a reasonable time the provisions of the various Acts/Laws/Rules/Codes as mentioned under Sub-Clause 35.4 above, on the part of the contractor under the contract on behalf of and at the expenses of the contractor and make payment and /or provide amenities/ facilities/services accordingly. In this regard, the decision of the Engineer-in-Charge shall be conclusive and binding on the contractor.

- 35.8 In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid Contract's Labour (Regulation and Abolition) Act and Rules as amended from time to time or furnishing any information or submitting or filling any form/Register/Slip under the provisions of these Regulations which is materially incorrect then on the report of the Inspecting officer as defined in the relevant Acts and Rules as referred in Clause 35.4 above, the Contractor shall without prejudice to any other liability pay to the Authority a sum not exceeding Rs.50/- (Rs. Fifty only) as liquidated damages for every default, breach or furnishing, making, submitting, filling materially incorrect statement as may be fixed by the Engineer-in-Charge. The decision of the Engineer-in-Charge in this respect shall be final & binding.
- 35.9 The Contractor shall at his own expenses comply with or cause to be complied with the Provisions/ Rules provided for welfare and health of Contract Labour in the Contract Labour (Regulation and Abolition) Act and other relevant Acts and Rules framed there under or any other instructions issued by the Authority in this regard for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the contractor fails to make arrangements as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the contractor.
- 35.10 The Contractor shall at his own expense arrange for the safety or as required by the Engineer-in-Charge, in respect of all labour directly or indirectly employed for performance of the Works and shall provide all facilities in connection therewith. In case the contractor fails to make arrangements and provide necessary facilities as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor. But this will not absolve the contractor of his responsibility or otherwise thereof.
- 35.11 Failure to comply with "Provisions/Rules made for Welfare and Health of Contract Labour" Safety Manual, or the provisions relating to report on accidents and grant of maternity benefits to female workers and the relevant Acts/Rules referred in clause 35.4 above shall make the contractor liable to pay to the Authority as liquidated damages an amount not exceeding Rs. 50/- for each default or materially incorrect statement. The decision of the Engineer-in-Charge in such matters based on reports from the inspecting Officers as defined in the relevant Acts and Rules as referred in clause 35.4 above shall be final and binding and deductions for recovery of such liquidated damages may be made from any amount

payable to the contractor. In the event of any injury, disability or death of any workmen in or about the work employed by the contractor either directly or through his sub-contractor, contractor shall at all time indemnify and save harmless the Authority against all claims, damages and compensation under the Workmen Compensation Act. 1923 as amended from time to time or in other Law for the time being in force and Rules there-under from time to time and also against all costs, charges and expenses of any smooth action by proceedings arising out of such accidents or injury, disability or death of a workmen and against all sum or sums which may with the consent of the contractor be paid to compromise or compound any claim in this regard. If any award, decree or order is passed against the contractor for recovery of any compensation under the Workmen Compensation Act, 1923, for any injury, disability or death of a workman by any competent court, the said sum or sums shall be deducted by the Engineer-in-Charge from any sum then due or that may become due to the contractor or from his security deposit or sale thereof in full or part under the contract or any other contract with the Authority towards fulfillment of the said decree, award or orders.

- 35.12 Provided always that the contractor shall have no right to claim payments/claims whatsoever on account of his compliance with his obligations under this clause and Labour Regulations.
- 35.13 The contractor shall not otherwise than in accordance with the statutes ordinance and Government Regulations or orders for the time being in force import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs to permit or suffer any such import, sale, gift, barter or disposal by his sub-contractor, agent or employees.
- 35.14 The contractor shall not give, barter or otherwise dispose of to any person or persons any arms or ammunition of any kind or permit to suffer the same as aforesaid.
- 35.15 The Contractor shall employ for the execution of the works only such persons as are skilled and experienced in their respective trades and Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any persons employed by the Contractor for the execution of the works who, in the opinion of the Engineer-in-Charge, misconduct himself or is incompetent or negligent in the proper performance of his duties. The contractor shall forthwith comply with such requisition and such person shall not be again employed upon the works without permission of the Engineer-in-Charge.

#### **CLAUSE – 36: FORCE MAJEURE**

- 36.1 The term Force Majeure shall herein mean Riots (other than among the contractor's employees), Civil Commotion (to the extent no insurable), war (whether declared or not), invasion, act of foreign enemies, hostilation, civil war, rebellion, revolution, insurrection, military or usurped power, damage from aircraft, nuclear fission, acts of God, such as earthquake (above 7 magnitude on Richter Scale), lightning, unprecedented floods, fires not



caused by contractor's negligence and other such causes over which the contractor has no control and are accepted as such by the Engineer-in-Charge, whose decision shall be final and binding. In the event of either party being rendered unable by Force Majeure to perform any obligation required to be performed by them under this contract, the relative obligation of the party affected by such Force Majeure shall be treated as suspended for the period during which such Force Majeure cause lasts, provided the party allowing that it has been rendered unable as aforesaid, thereby shall notify within 15 days of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of such cause.

- 36.2 For delays arising out of Force Majeure, the bidder shall not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither the Authority nor the bidder shall be liable to pay extra costs provided it is mutually established that Force Majeure conditions did actually exist.
- 36.3 If any of the Force Majeure conditions exists in the places of operation of the bidder even at the time of submission bid, he shall categorically specify in his bid and state whether they have been taken into consideration in their quotations.

**CLAUSE - 37: LIABILITY FOR DAMAGE, DEFECTS OR IMPERFECTIONS AND RECTIFICATION THEREOF**

- 37.1 If the contractor or his labour or his sub-contractor, injure, destroy or damage, battery, solar panel, lighting system, road, fence, enclosures, water pipe, cables, buildings, drains, electricity or telephone posts, wires, trees, grass line, cultivated land in the area in which they may be working or in the area contiguous to the premises on which the work or any part of it is being executed or if any damage is caused to any item belonging to IWAI or to any person during the progress of work, the Contractor shall upon receipt of a notice in writing in that behalf from the Engineer-in-Charge, make good the same at his cost.
- 37.2 If it appears to the Engineer-in-Charge or his representative at any time during the progress of work or prior to the expiration of the Defects Liability period that any work has been executed with unsound, imperfect or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the work are unsound or of a quality inferior to that contracted for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other faults found in the work arising out of defective design or defective/ improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer-in-Charge forthwith rectify or remove and reconstruct the work so specified in whole or in part, as the case may be, and/or remove the materials/articles so specified and provide other proper and suitable materials at his expense.
- 37.3 All damages caused by accidents or carelessness of the contractor or any of his employees or any property belonging to the Authority is wasted or is

misused by the contractor or any of his employees shall be to the account of the contractor, who shall make good the loss.

#### **CLAUSE – 38: CONTRACTOR'S LIABILITY AND INSURANCE**

38.1 From commencement to completion of the work(s) as a whole, the Contractor shall take full responsibility for the care thereof and for taking precautions to prevent loss or damage. He shall be liable for any damage or loss that may happen to the works or any part thereof and to the Authority's Plant, Equipment and Material (hired or issued to the Contractor) shall be in good order and condition and in conformity in every respect with the requirements of the Contract and instructions of the Engineer-in-Charge.

- 38.2 i) Neither party to the contract shall be liable to the other in respect of any loss or damage which may occur or arise out of "Force Majeure" to the works or any part thereof on to any material or article at site but not incorporated in the works or to any person or anything or material whatsoever or either party provided such a loss or damage could not have been foreseen or avoided by a prudent person and the either party shall bear losses and damages in respect of their respective men and materials. As such liability of either party shall include claims/ compensations of the third party also.
- ii) Provided, however, in an eventuality as mentioned in sub-clause – 38.2 (i) above, the following provisions shall also have effect:
- (a) The Contractor shall, as may be directed in writing by the Engineer-in-Charge proceed with the completion of the works under and in accordance with the provisions and conditions of the contract, and
  - (b) The Contractor shall, as may be directed in writing by the Engineer-in-charge, re-execute the works lost or damaged, remove from the site any debris and so much of the works as shall have been damaged and carry the Authority's T & P, Plant and Equipment, Material etc. to the Authority's store. The cost of such re-execution of the works, removal of damaged works and carrying of Authority's store shall be ascertained in the same manner as for deviations and this shall be added to the contract sum. Provided always that the Contractor shall, at his own cost, repair and make good so much of the loss or damage as has been occasioned by any failure on his part to perform his obligations under the contract or not taking precautions to prevent loss or damage or minimize the amount of such loss or damage, Final assessment of loss or damage shall be decided by the Engineer-in-Charge and his decision shall be final and binding.

- 38.3 The contractor shall take special precautions to see that public places and roads adjacent to contractor's yard are not blocked at any time either by his material or by his workmen. The roads are to be kept always clear and no equipment/materials shall be stacked.
- 38.4 The navigable waterways shall not be blocked by Contractor's vessels. The anchors dropped in the waterways shall be properly marked and removed after done with.
- 38.5 The contractor shall indemnify and keep indemnified the Authority against all losses and claims for death, injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance, of works during the contract period and also against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto, and such liabilities shall include claims/compensations of the third party.
- 38.6 (a) Before commencing execution of the work, the Contractor shall without in any way limiting his obligations and responsibilities under this condition, insure against any damage, loss or injury which may occur to any property (excluding that of the Authority but including the Authority building rented to the contractor wholly or in part and any part of which is used in part and any part of which is used by him for storing combustible materials) public liability by arising out of the carrying out of the contract. For this purpose the contractor shall take out, pay all costs and maintain throughout the period of his contract public liability with the following coverage.
- i) Public liability limits for bodily injury or death not less than Rs. 1,00,000 for one person and Rs. 2,00,000 for each accident.
  - ii) Property liability limits for each accident not less than Rs. 1,00,000 ;
  - iii) The Contractor shall prove to the Engineer-in Charge from time to time that he has taken out all the insurance policies referred to above and has paid the necessary premiums for keeping the policies alive till expiry of the Defects Liability Period.
- (b) The Contractor shall ensure that similar insurance policies are taken out by his sub-contractor (if any) and shall be responsible for any claims or losses to the Authority resulting from their failure to obtain adequate insurance protection in connection thereof. The Contractor shall produce or cause to be produced by his sub-contractors (if any) as the case may be, relevant, policy or policies and premium receipt as and when required by the Engineer-in-Charge.
- (c) If the contractor and/or his sub- contractor (if any) shall fail to effect and keep in force the insurance referred to above or any other insurance which he/they may be required to effect under the term of the Contract then and in any such case the Authority may, without being bound to effect and keep in force any such insurance and pay

such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Authority from any moneys due or which may become due to the contractor or recover the same as a debt due from the contractor.

- (d) The contractor shall at his own expense arrange for the safety provisions as required in respect of the works covered under this contract as per the instruction of Engineer-in-charge. In case, the contractor fails to comply with the provisions of the safety the Engineer- in-Charge shall be entitled to and make the necessary arrangements at the risk and cost of the contractor. This will, however, not absolve the Contractor of his overall responsibility to execute the works under the contract.

### **CLAUSE – 39: SUSPENSION OF WORKS**

39.1 The contractor shall on the receipt of order of the Engineer-in-Charge (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer-in-Charge may consider necessary.

39.2 The suspension of the work can be done by Engineer-in-Charge for any of the following reasons:

- (a) On account of any default on the part of the contractor or
- (b) for proper execution of the works or part thereof for the reasons other than the default of the contractor or
- (c) For the safety of the works or part thereof.

39.3 The contractor shall during the suspension period, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

39.4 If the suspension is ordered for the reasons under the Clause 39.2(b) and (c) above, the contractor shall be entitled to the extension of time equal to the period of every such suspension Plus 25% for the completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which suspended work forms a part

### **CLAUSE – 40: FORECLOSURE OF CONTRACT IN FULL OR IN PART DUE TO ABANDONMENT OR REDUCTION IN SCOPE OF WORK**

If at any time after acceptance of the tender the Authority decides to abandon or reduce the scope of the works for reason whatsoever and hence does not require the whole or any part of the works to be carried out, the Engineer-in-Charge (with the prior approval of competent authority shall give notice in writing to that effect to the contractor and the Contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he could not

derive in consequence of the fore closure of the whole or part of the works.

#### **CLAUSE – 41: TERMINATION OF CONTRACT ON DEATH**

If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies, or if the Contractor is a partnership concern and one of the partners dies, then, unless the Engineer-in-Charge is satisfied that the legal representatives of the individual contractor or of the proprietor of the proprietary concern and in the case of partnership, the surviving partners are capable of carrying out and completing the contract, the Engineer-in-Charge shall be entitled to terminate the Contract as to its incomplete part without the Authority being in anyway liable to payment of any compensation whatsoever on any account to the estate of the deceased Contractor and/or to the surviving partners of the Contractor's firm on account of termination of the Contract. The decision of the Engineer-in-Charge that the legal representatives of the deceased contractor or the surviving partners of the Contractor's firm cannot carry out and complete the works under the contract shall be final and binding on the parties. In the event of such termination, the Authority shall not hold the estate of the deceased Contractor and/or the surviving partners of the Contractor's firm liable for damages for not completing the contract. Provided that the power of the Engineer-in-Charge of such termination of contract shall be without prejudice to any other right or remedy which shall have accrued or shall accrue to him under the contract.

#### **CLAUSE -42: INSOLVENCY AND BREACH OF CONTRACT:**

The Chairman on behalf of Authority may at any time, by notice in writing, summarily determine the contract without compensation to the contractor in any of the following events, that is to say:

- (i) If the contractor being an individual or if a firm, any partner thereof, shall at any time, be adjudged insolvent or shall have a receiving order or other for administration of his estate made against him or shall take any proceeding for composition under any insolvency act for the time being in force or make any conveyance or assignment of his effects or enter into any arrangement or composition with his creditors or suspend payment or if the firm be dissolved under the partnership act, or
- (ii) If the contractor being a company is wound up voluntarily or by the order of a court or a Receiver, Liquidator or Manager on behalf of the debenture holders is appointed or circumstances shall have arisen which entitled the court or debenture- holders to appoint a Receiver, Liquidator or Manager, or
- (iii) If the contractor commits any breach of the contract not herein specifically provided for: provided always that such determination shall not prejudice any right of action or remedy which shall have accrued or shall accrue thereafter to the owner and provided also the contractor shall be liable to pay to the owner for any extra expenditure is thereby

put to and the contractor shall under no circumstances be entitled to any gain on re-purchase.

**CLAUSE– 43: CARRYING OUT PART OF WORK AT THE RISK AND COST OF THE CONTRACTOR**

**43.1 If the contractor**

- (i) At any time makes default during the currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; **or**
- (ii) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; **or**
- (iii) Fails to complete the work (s) or items of work with individual dates of completion, on or before the date (s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.

The Engineer-in-Charge without invoking action under clause 36 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to IWAI, by a notice in writing to take the part work/ part incomplete work of any item (s) out of his hands and shall have powers to:

- (a) Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/ or
- (b) Carry out the part work/ part incomplete work of any items (s) by any means at the risk and cost of the contractor.

**43.2** The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item (s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by IWAI because of action under this clause shall not exceed 10% of the tendered value of the work.

**43.3** In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same number and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the IWAI are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

- 43.4 Any excess expenditure incurred or to be incurred by IWAI in completing the part work/ part incomplete work of any item (s) or the excess loss of damages suffered or may be suffered by IWAI as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to IWAI in law or as per agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.
- 43.5 If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.
- 43.6 In the event of the above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

**CLAUSE-44: POWERS OF THE OWNER TO TAKE POSSESSION OF VESSELS AND MATERIALS IN CERTAIN CASES AND COMPLETE WORKS:**

Subject to the terms of the contract, in the event of the contractor making default in the prosecution of construction of the vessel(s) and machineries or in the event of contractor becoming insolvent or from any cause going or taking steps to go into liquidation (except a voluntary liquidation undertaken with the object of amalgamation or reorganization by separation of departments of the contract into separate companies or taking any steps for compounding with his creditors it shall be competent for (but not incumbent upon) the Owner after due notice to the contractor in writing, to take possession of the vessel(s) in her then state and all other materials and machineries and all intended for here, as before mentioned and to complete the vessel(s) and machineries and for this purpose with power to enter into any contract with other contractors or manufacturers, and to use the yard or yards, workshops, machineries and tools of the Contractor or such other contractors or manufacturers with whom the contractor may have entered into sub-contracts and the reasonable cost incurred by the exercise of any of the power of this clause shall be deducted from the purchase money then unpaid, if sufficient, and if not sufficient, shall be made good by the Contractor.

**CLAUSE-45: APPEAL**

If the contractor desires to appeal against the decision of the Inspector against the rejection of any work as not being in accordance with the contract, he shall appeal to the Chairman within fourteen days after the

Inspector's decision and if an appeal is so preferred, the decision of the Chairman on behalf of Authority shall be final and conclusive.

**CLAUSE-46: CHAIRMAN'S CERTIFICATE TO BE FINAL:**

Wherever in this contract provision is made for any question, arrangement, amount matter or things being settled, decided, certified or determined by the Chairman or by the Inspecting authority or officer or by the representative or resting upon or being governed or controlled by or submitted to the judgment or opinion of them/him or any of them/their/his assessment, decision, certificate, determination judgment or opinion shall unless otherwise stated therein be final and conclusive for all purposes and shall be binding on the Authority and the contractor notwithstanding anything contained in this contract.

**CLAUSE-47: AUTHORITY AND THEIR STAFF NOT TO BE PERSONALLY LIABLE**

Nothing in these presents shall be deemed to or shall impose any personal liability of the Authority or their staff.

**CLAUSE-48: STANDARD BREAK CLAUSE**

The owner shall in addition to his power under other clauses to determine this contract have power to terminate his liability there under at any time by giving three months (or such shorter period as may be mutually agreed) notice in writing to the contractor of the owner's desire to do so and upon the expiration of the notice the contract shall be determined without prejudice to the rights of the parties accrued to the date of determination but subject to the operation of the following provisions of this clause.

2. In the event of this, notice being given the Owner shall be entitled to exercise as soon as may be reasonably practicable within that period the following powers or any of them: -

a) To direct the Contractor to complete in accordance with the contract all or any articles, parts of such articles or components in course of manufacture at the expiration of the notice and to deliver the same at such rate of delivery which may be mutually agreed or in detail of agreement at the contract rate. All articles delivered by the contractor in accordance with such directions and accepted shall be paid at a fair and reasonable price assessed on the basis of the contract price when it exists.

b) To require the contractor on receipt of the notice of termination.

i) immediately to take such steps as will ensure that the production rate of the articles specified in the schedule and parts thereof is reduced as rapidly as possible.

ii) as far as possible consistent with (i) above to concentrate work on the completion of parts already in partly manufactured state; and

iii) to terminate on the best possible terms such orders for materials and parts bought out in a partly manufactured or wholly manufactured



state as have not been completed, observing in this connection any directions given under this paragraphs (a) and (b) (i) and (ii) above as far as this may be possible.

**3.** In the event on such notice being given provided the contractor has reasonably performed all the provisions of the contract binding upon him down to the date of this notice.

**a)** The Owner shall take over from the contractor at a fair and reasonable price (assessed on the basis of the contract price of the completed articles), all unused, undamaged and acceptable materials, bought out components and articles in the course of manufacture in possession of the Contractor at the expiration of the notice and properly provided by or supplied to the contractor for the performance of this contract except such materials, bought out components are supplied to the contractor through the intervention of the owner or on his behalf:-

(i) the said fair and reasonable price shall be assessed on the basis of the cost price of such materials and/or components, and

(ii) If the contractor elects to retain any materials, bought-out components and articles as in this clause provided, he shall settle all claims of supplier in respect of the materials and/or components supplied to him as aforesaid including any claims to any extra charge (if the original stipulated terms and been concessional) and shall keep the owner indemnified against the same:

(b) The Contractor shall deliver in accordance with the direction of the Owner all such unused, undamaged and acceptable materials, bought out components and articles in course of the manufacture (except as aforesaid) taken over by or previously belonging to the Owner and the Owner shall pay to the Contractor fair and reasonable handling and delivery charges therefore,

(c) The Owner shall indemnify the contractor against the commitments, liabilities or expenditure which in the opinion of the Owner are reasonable and properly chargeable by the contractor in connection with the contract to the extent to which the Owner is satisfied that such commitments, liabilities or expenditure would otherwise represent and unavoidable loss by the contractor by reason of the termination of the contract. Provided that in the event of the contractor not having observed any direction given to him under the sub clause (2) hereof the Owner shall not be liable under the sub clause to pay any sums in excess of those for which the Owner would have been able had the contractor observed that direction.

**4.** If in any particular case exceptional hardship to the contractor should arise from the operation of this clause it shall be open to the Contractor to refer the circumstances to the Chairman who on being satisfied that such hardship exists shall make such allowance if any as in his opinion is reasonable.

5. The Owner shall not in any case be liable to pay under the provisions of this clause any such sum which when taken together with any sums paid or due to becoming due to the contractor under this contract shall exceed the total price of the article specified in the schedule payable under this Contract.

6. The Contractor shall in any substantial order or sub-contract planned or made by him in connection with or for the purpose of this contract take power wherever possible by securing the acceptance of the sub-contractor to terminate such order or sub-contract in the event of the termination of this contract by the Owner of this clause and save only that: -

(a) The name of the contractor shall be substituted for the owner throughout except in sub-clause 3 (c) where it occurs for the second and third times;

(b) The period of the notice of termination shall be two months or such shorter period as may be mutually agreed upon). Substantial order or sublet contracts of or over Rs. 1,00,000 (Rupees One lakh) in value.

#### **CLAUSE-49: Program and Method Statement/Work Plan**

**49.1** The Contractor shall submit to the Owner for approval a programme showing the general methods, arrangements, order, and timing for all the activities in the Works, along with cash flow forecasts. The program and method statement/work plan are to be submitted in the Technical Bid. The Method Statement/Work Plan to indicate the activities in detail vessel wise proposed to be carried out for the execution of the works. This is also to include the selection of equipment, approval of the Owners for the selected equipment and thereafter ordering and receipt of the same. All activities to be listed in the Method Statement/Work Plan including the completion of the stages as per the stage payments.

**49.2** An update of the Programme shall be a programmed showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining Works, including any changes to the sequence of the activities. This update is to be sent at monthly intervals.

**49.3** The Owner's approval of the Programme shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Owner again at any time. A revised Programme shall show the effect of Variations.

#### **CLAUSE-50: MANAGEMENT MEETINGS**

**50.1** The Owner may require the Contractor to attend a management meeting. The business of a management meeting shall be to review the plans for the Works.

**50.2** The Owner shall record the business of management meetings and provide copies of the record to those attending the meeting. The responsibility of the parties for actions to be taken shall be decided by the Owner either at the management meeting or after the management meeting and stated in writing to all those who attended the meeting.

#### **CLAUSE-51: IDENTIFYING DEFECTS**

The Owner or the inspector shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Owner or the inspector may instruct the Contractor to search for a Defect and to uncover and test any work that the Owner considers may have a Defect.

#### **CLAUSE-52: CORRECTION OF DEFECTS NOTICED DURING THE DEFECT LIABILITY PERIOD.**

**52.1** If any defects including workmanship of hull, structure, performance of engines, machineries, stern gear or any other part appear within twelve months of "Taking over" certificate, the Owner shall give notice to the Contractor of any defects before the end of the Defects Liability Period, which begins at Completion, and is for twelve months thereafter. The Defects Liability shall be extended for as long as defects remain to be corrected.

**52.2** Every time notice of a defect is given, the Contractor shall correct the notified defect at his own cost within the length of time specified by the Owner's notice. If the contractor is in default the Owner shall cause the same to be made good by other workmen and deduct the expense from any sums that may be due to the contractor.

#### **CLAUSE-53. UNCORRECTED DEFECTS**

If the Contractor has not corrected a Defect, to the satisfaction of the Owner, within the time specified in the Owner's notice, the Owner will assess the cost of having the Defect corrected, and the Contractor will pay this amount, on correction of the Defect.

#### **CLAUSE-54: ACTIVITY SCHEDULE**

The Activity Schedule shall contain items for the construction, installation, testing, and commissioning works to be done by the Contractor. All variations shall be included in updated programmes and Activity Schedules produced by the contractor. When the Programme or Activity Schedule is updated, the Contractor shall provide the Owner with an updated cash flow forecast. The Activity schedule shall be submitted in the Technical Bid.

## **CLAUSE - 55: COMPLETION TIME AND EXTENSIONS**

- 55.1 If after the award of the work the contractor commits defaults in commencing the execution of work as aforesaid, the authority shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.
- 55.2 As soon as possible after the Contract is concluded, the Contractor shall submit a Time and Progress Chart get it approved by the Department. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work.
- 55.3 However, if the work (s) be delayed by:-
- (i) Force majeure as per clause 36, or
  - (ii) Abnormally bad weather, or
  - (iii) Serious loss or damage by fire, or
  - (iv) Civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
  - (v) Delay on the part of other contractors or tradesman engaged by Engineer-in-Charge in executing work not forming part of the contract, or
  - (vi) Non-availability of stores, which are the responsibility of Government to supply or
  - (vii) Non-availability of breakdown of Tools and Plant to be supplied or supplied by Government or
  - (viii) Any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor's control.

then immediately upon the happening of any such events as aforesaid, the contractor shall inform the Engineer-in-Charge accordingly, but the contractor shall nevertheless use constantly his best endeavors to prevent and/or make good the delay and shall do all that may be required in this regard. The Contractor shall also request, in writing, for extension of time, to which he may consider himself eligible under the contract, within fourteen days of the date of happening of any such events as indicated above.

- 55.4 In case the cost of the work is more than 10 crores then the total scope of work will be divided into milestones. The contractor shall submit a Time & Progress chart for each milestone and get it approved by the competent authority.
- 55.5 Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

- 55.6 In any such case as may have arisen due to any of the events, as aforesaid, and which may have been brought out by the contractor in writing, the Competent Authority may give a fair and reasonable extension of time, after taking into consideration the nature of the work delayed and practicability of its execution during the period of extension.
- 55.7 Such extensions shall be communicated to the contractor by the Engineer-in-Charge in writing. The contractor shall not be entitled to claim any compensation or over run charges whatsoever for any extension granted.

#### **CLAUSE – 56: LIQUIDATED DAMAGES FOR DELAY**

- 56.1 If the contractor fails to maintain the required progress in terms of clause 55 or to complete the work on or before the date of completion as per the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the authority on account of such breach, pay as agreed liquidated damages the amount calculated at the rates stipulated below.

- |     |                    |                                   |
|-----|--------------------|-----------------------------------|
| (i) | Liquidated Damages | - @ 1.5 % per month of delay      |
|     | for delay of work  | - to be computed on per day basis |

Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the Tendered Value of work.

The competent authority (whose decision in writing shall be final & binding) may decide on the amount of tendered value of the work for every completed day/month (as applicable) that the progress remains below that specified in Clause 55 or that the work remains incomplete.

The amount of liquidated damages may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the authority.

- 56.2 In case of contracts having tendered amount more than 10 crores, if the contractor does not achieve a particular milestone, or the re-scheduled milestone(s) in terms of Clause 55.5, the amount shown against that milestone shall be withheld, to be adjusted against the liquidated damages levied at the final decision on Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

- 56.3 In case of contracts having tendered amount less than 10 crores, if the work remains incomplete after the stipulated date of completion, the Engineer-in-charge may withhold 10% of the tendered value of the work from the running payments of the contractor pending final decision of the competent authority on the extension of time case. If the competent authority decides to grant extension of time without levy of liquidated damages or levy part of the total liquidated damages specified above then the balance withheld amount after adjusting the amount of the liquidated damages levied by the competent authority will be refunded to the contractor.

#### **CLAUSE – 57: WHEN THE CONTRACT CAN BE DETERMINED**

- 57.1 Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:
- (i) If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workman like manner shall comply with the requirement of such notice for a period of seven days thereafter.
  - (ii) If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.
  - (iii) If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.
  - (iv) If the contractor persistently neglects to carry out his obligations under the contract and/ or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.
  - (v) If the contractor shall offer or give or agree to give to any person in IWAI service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of contract.

- (vi) If the contractor shall enter into a contract with IWAI in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.
- (vii) If the contractor shall obtain a contract with IWAI as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of integrity pact.
- (viii) If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.
- (ix) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.
- (x) If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.
- (xi) If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer -in-Charge.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the IWAI with the approval of the competent authority shall have powers:

- (a) To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the IWAI.

- (b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

#### **CLAUSE – 58: INSPECTION AND APPROVAL**

- 58.1 All works involving more than one process shall be subject to examination and approval at each stage thereof and the contractor shall give due notice to the Engineer-in-Charge on his authorized representative, when each stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof and the decision of the Engineer-in-Charge in this regard shall be final and binding.
- 58.2 No work shall be put out of view without the approval of the Engineer-in-Charge or his authorized representative and the Contractor shall afford full opportunity for examination. The contractor shall give due notice to the Engineer-in-Charge or his authorized representative whenever any such work is ready for examination and the Engineer-in-Charge or his representative shall, without unreasonable delay, unless he considers it necessary and advise the contractor accordingly, examine and measure such work. In the event of the failure or the contractor to give such notice, he shall if required by the Engineer-in-Charge, uncover such work at the contractor's expenses.
- 58.3 Periodic inspection will be carried out by the EIC or his representative. The contractor can have the inspection schedules finalized with the Engineer-in-charge. Generally all attempts should be made to have joint inspection

#### **CLAUSE – 59: COMPLETION CERTIFICATE AND COMPLETION PLANS**

- 59.1 The work shall be completed to the entire satisfaction of the Engineer-in-Charge and within the specified time limit and under the terms and conditions of the contract. As soon as the work under the contractor is completed as a whole the contractor shall give notice of such completion to the Engineer-in-Charge. The Engineer-in-Charge shall inspect the work and shall satisfy himself that the work(s) has been completed in



accordance with the provisions of the contract and then issue to the Contractor a certificate of completion indicating the date of completion. Should the Engineer- in-Charge notice that there are defects in the works or the works are not considered to be complete, he shall issue a notice in writing to the Contractor to rectify / replace the defective work or any part thereof or complete the work, as the case may be within such time as may be notified and after the contractor has complied with as aforesaid and gives notice of completion the Engineer-in-Charge shall inspect the work and issue the completion certificate in the same manner as aforesaid.

59.2 No certificate of completion shall be issued as stipulated above and no work be considered to be completed unless the contractor shall have removed from the work site and / or premises all his belongings / temporary arrangements brought / made by him for the site and / or premises in all respects and made the whole of the site and / or premises fit for immediate occupation / use to the satisfaction of the Engineer- in-Charge. If the contractor fails to comply with the above mentioned requirements on or before the date of completion of the work, the Engineer-in-Charge, may as he thinks fit and at the risk at cost of the contractor, fulfill such requirements and remove / dispose of the contractor's belongings / temporary arrangements, as aforesaid, and the contractor shall have no claim in this respect except for any sum realized by the sale of Contractor's belongings / temporary arrangements less the cost of fulfilling the said requirements and any other amount that may be due from the contractor. Should the expenditure on the aforesaid account exceed the amount realized by sale of such contractor's belongings / temporary arrangements then the contractor shall on demand pay the amount of such excess expenditure.

59.3 The contractor shall submit the completion plans of the work wherever required within 30 days of the completion of work. In case the contractor fails to submit completion plans as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of Rs. 15000/- (Rupees fifteen thousand only) as may be fixed by Engineer-in-Charge concerned and in this respect the decision of the Engineer-in-Charge shall be final and binding on the contractor.

#### **CLAUSE – 60: TAXES, DUTIES AND LEVIES ETC.**

The prices shall include all the taxes, levies, cess, octroi, royalty, terminal tax, excise, or any other local, State or Central taxes as applicable/ charged by Centre or State Government or Local authorities on all materials that the contractor has to purchase for the performance of the contract and services, shall be payable by the contractor and the Authority will not entertain any claim for compensation whatsoever in this regard. The rates quoted by the contractor shall be deemed to be inclusive of all such taxes, duties, levies, etc.

Service tax, if paid by the contractor to the concerned Authority, shall be reimbursed on production of proof of service tax paid. However the service tax shall not be taken into the consideration for financial evaluation of the bids.

#### **CLAUSE-61: TAX DEDUCTION AT SOURCE**

TDS at the applicable rate as per Income Tax Act/Rules shall be deducted from all the payment/advances made against the contract.

#### **CLAUSE – 62: PAYMENT OF FINAL BILL**

The final bill shall be submitted by the contractor within one month from the date of completion of the work or of the date the certificate of completion furnished by the Engineer-in-Charge. No further claim in this regard unless as specified herein under shall be entertained. Payment of final bill shall be made within three months if the amount of the contract is up to Rs. 15 lakhs and six months if the value of the work exceeds Rs. 15 lakhs. If there shall be any dispute about any item or items of the work then the undisputed item or items only shall be paid within the said period of three months or six months, as the case may be. The contractor shall submit a list of the disputed items within thirty days from the disallowance thereof and if he fails to do so, his claim shall be deemed to have been fully waived and absolutely extinguished.

#### **CLAUSE - 63: OVER PAYMENTS AND UNDER PAYMENTS**

- 63.1 Whenever any claim whatsoever for the payments of a sum of money to the Authority arises out of or under this contract against the contractor, the same may be deducted by the Authority from any sum then due or which at any time thereafter may become due to the contractor under this contract and failing that under any other contract with the Authority or from any other sum whatsoever due to the contractor from the Authority or from his security deposit, or he shall pay the claim on demand.
- 63.2 The Authority reserves the right to carry out post- payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc. The authority further reserves the right to enforce recovery of any over payment when detected notwithstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute before an arbitrator appointed under clause 48 of this contract and notwithstanding the fact that the amount of the final bill figures in the arbitration award.
- 63.3 If as a result of such audit and technical examination any over payment is discovered in respect of any work done by the contractor or alleged to have been done by him under contract, it shall be recovered by the Authority from the contractor by any of all of the methods prescribed above, and if any under payment is discovered, the amount shall be duly paid to the contractor by the Authority.
- 63.4 Provided that the aforesaid right of the Authority to adjust over-payment against amount due to the contractor under any other contract with the Authority shall not extend beyond the period of two years from the date of payment of the final bill or in case the final bill is a MINUS bill, from the date the amount payable by the Contractor under the MINUS final bill is communicated to the contractor.

- 63.5 Any sum of money due and payable to the Contractor (including the security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or Authority against any claim of the Authority or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or Authority or with such other person or persons. The sum of money so withheld or retained under this clause by the Engineer-in-Charge or Authority will be kept withheld or retained as such by the Engineer-in-Charge or Authority or till his claim arising out of in the same contract or any other contract is either mutually settled or determined by the arbitrator, if the contract is governed by the arbitration clause under the clause 48 or by the competent court hereinafter provided, as the case may be, and the contractor shall have no claim for interest or damages whatsoever on this account or any other ground in respect of any sum of money withheld or retained under this clause.

#### **CLAUSE – 64: FINALITY CLAUSE**

It shall be accepted as an inseparable part of the contract that in matters regarding design, materials, workmanship, removal of improper work, interpretation of the contract drawings and contract specifications, mode of procedure and the carry out of the work the decision of the Engineer-in-Charge which shall be given in writing shall be final and binding on the contractor.

#### **CLAUSE – 65: SUM PAYABLE BY WAY OF COMPENSATION TO BE CONSIDERED IS REASONABLE WITHOUT PREFERENCE TO ACTUAL LOSS**

All sum payable by way of compensation to the Authority under any of these conditions shall be considered as reasonable compensation without reference to the actual loss or damage sustained and whether or not damage shall have been sustained.

#### **CLAUSE - 66 SETTLEMENT OF DISPUTES & ARBITRATION.**

- 66.1 Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in-before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, design, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

- (i) If the contractor considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge on any matter in

connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days of the receipt of decision from the Engineer-in-Charge request the Chief Engineer in writing through the Engineer-in-Charge for written instruction or decision. Thereupon, the Chief Engineer shall give his written instructions of the decision within a period of one month from the receipt of the contractor's letter. However, this will not be reason for the stoppage of work.

- (ii) If the Chief Engineer fails to give his instructions or decision in writing within the aforesaid period or if the contractor is dissatisfied with the instruction or decision of the Chief Engineer, the contractor may, within 15 days of the receipt of Chief Engineer's decision, appeal to the Chairman, IWAI who shall afford an opportunity to the contractor to be heard, if the latter so desires, and to offer evidence in support of his appeal. The Chairman, IWAI shall give his decision within 30 days of receipt of contractor's appeal. If the contractor is still dissatisfied with his decision, the contractor shall within a period of 30 days from receipt of the decision, give notice to the Chairman, IWAI for appointment of arbitrator failing which the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

66.2 Except where the decision has become final, binding and conclusive in terms of Sub Para 47.1 above, disputes or differences shall be referred for adjudication through arbitration by a sole arbitrator appointed by Chairman, IWAI.

66.3 Further, within thirty (30) days of receipt of such notice from either party, the Engineer-in-Charge of work at the time of such dispute shall send to the Contractor a panel of three persons preferably but not necessarily from the approved panel of arbitrators being maintained by Indian Council of Arbitration (ICA) and thereafter the Contractor within fifteen (15) days of receipt of such panel communicate to the Engineer-in-charge the name of one of the persons from such panel and such a person shall then be appointed as sole arbitrator by the Chairman, IWAI. However, the arbitrator so appointed shall not be an officer or the employee of Inland Waterways Authority of India.

Provided that if the Contractor fails to communicate the selection of a name out of the panel so forwarded to him by the Engineer-in-charge then after the expiry of the aforesaid stipulated period the Chairman, shall without delay select one person from the aforesaid panel and appoint him as the sole arbitrator.

66.4 The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, then the Chairman IWAI shall appoint another person to act as sole arbitrator, such person shall be entitled to proceed with the reference from the stage at which it was left by the predecessor.

- 66.5 The award of the Arbitrator shall be final and binding. The Arbitrator shall decide in what proportion the Arbitrator's fees, as well as the cost of Arbitration proceeding shall be borne by either party.
- 66.6 The arbitrator with the consent of the parties can enlarge the time, from time to time to make and publish his award.
- 66.7 A notice of the existence in question, dispute or difference in connection with the contract unless served by either party within 30 days of the expiry of the defects liability period, failing which all rights and claim under this contract shall be deemed to have been waived and thus forfeited and absolutely barred.
- 66.8 The Arbitrator shall give reasons for the award if the amount of claim in dispute is Rs. 1,00,000/- and above.
- 66.9 The work under this Contract shall continue during Arbitration proceedings and no payments due from or payment by the Authority shall be withheld on account of such proceedings except to the extent which may be in dispute.
- 66.10 The Arbitration and Conciliation Act 1996 with any statutory modifications or re-enactment thereof and the rules made there under and being in force shall apply to the Arbitration proceedings under this clause.
- 66.11 The parties to the agreement hereby undertake to have recourse only to arbitration proceedings under for Arbitration Act 1996 and the venue of the arbitration proceeding shall be Noida/ New Delhi and the parties will not have recourse to Civil Court to settle any of their disputes arising out of this agreement except through arbitration.

**NOTE:** In case of contract with another Public Sector Undertaking, following Arbitration Clause shall apply: "Except as otherwise provided, in case of a contract with a public Sector Undertaking if at any time any question dispute or difference whatsoever arises between the parties upon or in relation to, or in connection with this agreement, the same shall be settled in terms of the Ministry of Industry, Department of Public Enterprises O.M No. 3/5/93-PMA dt.30.06.93 or any modifications / amendments thereof. "The arbitrator shall have the power to enlarge the term to publish the award with the consent of the parties provided always that the commencement or continuation of the arbitration proceeding shall not result in cessation or suspension of any of other rights and obligations of the parties of any payments due to them hereunder.

#### **CLAUSE 67: INTEREST**

'No interest shall be payable on account due to the contractor against final bills or any other payment due under the contract.

**CLAUSE 68: BANNED OR DELISTED FIRMS:**

The firm shall give a declaration that they have not been banned or de-listed by any Govt. or quasi Govt. agency or Public Sector Undertaking.

If a firm has been banned by any Govt. or quasi Govt. Agency or PSU, this fact must be clearly stated and it may not be a cause of disqualifying the firm. If the declaration is not given, the bids shall be rejected as non-responsive.

## **Contract Data to General Conditions of Contract**

### **Clause Reference**

1. The Owner is IWAI represented by [Cl.1(i)]  
Chairman, IWAI  
Address: A-13, Sector-1, Noida.
2. The Engineer-in-charge is:  
Designation: Chief Engineer (P & M)  
Address: IWAI, A-13, Sector 1, Noida 201301 [Cl.1(i)]
3. The place of delivery is Dhubri.
4. The Start Date shall be from the issuance of Work Order/ Letter of  
Acceptance [Cl.1(i)]
5. (a) The name and identification number of the Contract is :  
**Tender no. IWAI/MD/133/2015-16“Design, Construction and supply  
of two nos. Ro-Ro Vessels for NW-2 to be delivered at Dhubri”.**
6. The standard form of Performance Security acceptable to the Owner  
Shall be an unconditional Bank Guarantee of the type as presented in  
the Bidding Documents. [Cl. 38]

**(SECTION-VI )**

**SPECIAL CONDITIONS OF THE CONTRACT**



## **SECTION – VI**

### **SPECIAL CONDITIONS OF CONTRACT**

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3. Guarantee for the main engines and equipments supplied
4. Mistake in drawings.
5. Variations (i.e. modifications) in design and dimension.
6. Approval of Drawings and Equipment with consent of owner.
7. Contractors to construct, equip, test and deliver the vessel(s).
8. Contractor to include execution and supply of all work, matters & thing required by owner for due performance of contract.
9. Inspection
  - (a) Obligation to carryout Inspector's instructions.
  - (b) Inspection and testing during progress of work.
  - (c) Intimation for inspection & cost involved.
10. Replacement of defective work, material and fittings.
11. Trials.
12. Delivery
  - (a) Preparation for voyage and delivery
  - (b) Spare parts
  - (c) Provisions as to trials.
  - (d) Vessels to be at Contractors risk until the issue of certificate of delivery.
  - (e) As to acceptance of delivery.
  - (f) Power for representative to dismantle and re-equip the vessel in default of Contractor.
  - (g) Penalty for deficiency in speed of the vessel.

- (h) Penalty for deficiency in draft of the vessel.
- 13. Number of workmen and rate of progress to be increased on requisition of the owner.
- 14. Liquidated damages for delay in delivery and force majeure
- 15. Defect liability period
- 16. Registration of the vessel
- 17. Insurance

## **SECTION – VI**

### **SPECIAL CONDITIONS OF CONTRACT**

(Two nos. Ro-Ro Vessels for NW-2)

#### **1. PERFORMANCE OF THE WORK:**

The work shall be performed at the place or places named in the tender or at such other place or places as may be approved by the Owner.

#### **2. SPECIFICATION:**

In particular and without prejudice to the foregoing condition, when tenders are called for in accordance with the particulars, the contractor's tender to supply the vessel in accordance with such particulars shall be deemed to be an admission on his part that he has acquainted himself with the details thereof and no claim shall lie against the owner on the ground that the contractor did not examine or acquaint himself with such particulars.

#### **3. GUARANTEE FOR THE MAIN ENGINES AND EQUIPMENTS SUPPLIED**

The contractor will be required to obtain and furnish a guarantee for the main engines and auxiliaries, machineries fitted on the vessel to the effect that General spares suppliers will be in a position to supply the spare parts of the engines and other machineries and the spares will continue to be available from the stock for a period of at least seven years from the date of the receipt of the machineries and equipments.

#### **4. MISTAKE IN DRAWINGS:**

The contractor will be responsible for and shall pay for any alterations of the work due to any discrepancies, errors or omissions in the drawings or other particulars supplied by him whether such drawings or particulars have been approved by the Owner or not, provided that such discrepancies, error or omission be not due to inaccurate information or particulars furnished to the Contractor on behalf of the Owner. If any dimensions figured upon a drawing or plan differ from those obtained by scaling the drawing or plan, the dimensions as figured upon the drawing or plan shall be taken as correct.

#### **5. VARIATIONS (i.e. MODIFICATIONS) IN DESIGN AND DIMENSION:**

Should any alterations in or additions to the works as specified in the said specifications not involving extra cost to the Contractor be considered necessary or expedient by the Contract or by the owner or the Inspecting Owner or Officer and be mutually agreed on in the writing the Contractor shall execute the same without any charge beyond the Contract Price. But if the owner shall desire any alteration or additions involving extra cost to the contractor before executing the same shall tender to the owner a written offer

stating the nature and cost of such alterations or additions and the extension of time if any required for making them and if the owner shall accept the said offer and allow such extension of time in writing the Contractor shall be bound to execute the work. No extra work shall be executed by the Contractor or if executed shall be paid for to the Contractor except such as may be embraced in such offer and acceptance. The Contractor shall allow the owner the value as shall be mutually agreed in writing or any materials and value as shall be mutually agreed in writing or any material and workmanship dispensed with by any such alterations or additions.

Provided that no such variations shall except with the instructions from the Inspector as to carry out the work which either then or later will in the opinion of the contractor, involve a claim for additional payment, the Contractor shall, as soon as reasonably possible after receipt of instructions aforesaid advice the Inspector to that effect.

#### **6. APPROVAL OF DRAWINGS AND EQUIPMENT WITH CONSENT OF OWNER**

The detailed drawings so prepared from the general arrangement drawing should be got approved from owner or his authorised officer/agency. Approved statutory body/Classification Society will give approval of all construction drawings. However, other drawings such as General Arrangement, Machinery layout, system control drawings and particular of all equipments to be installed shall be forwarded to owner or his authorized Officer for his approval. Copies of all drawings to be sent to the owner, IWAI will be the Owner of such design and drawings of the vessels.

Before ordering any equipment, materials and outfit of any description for the works, the contractor shall submit for the approval of the Owner or his authorised representative/consultant, the names of the makers and suppliers proposed and any other detail required by the Owner or his authorised representative/consultant and seek their approval prior to ordering.

#### **7. CONTRACTOR TO CONSTRUCT, EQUIP, TEST AND DELIVER THE VESSELS.**

Subject to and in accordance with the provisions of the Contract, the Contractor shall in the best and most workman like manner and with material, thing and workmanship respectively of the best kinds build, equip and test to the satisfaction of the Owner and deliver to the representative in the condition provided by this Contract, the vessels of the description dimensions containing the accommodation and supplied with all apparatus, permanent and temporary fittings, outfit and gear and the spare gear mentioned and described in or to be informed from the modifications hereto attached and from the specifications furnished by the Contractor and accepted by him (Owner) for the purposes of this Contract, both of which hereinafter called the said specifications hereto attached and from the plan or plans which have for purposes of identification been signed on behalf of the Owner and by the Contractor and shall supply and deliver as hereinafter mentioned the spare parts as specified in all respects with this contract, the said specifications and the said plans, supplementary drawing, instructions and explanations as shall

from time to time hereinafter be furnished and given by the contractor to and be approved by the Owner the contractor shall also in manner aforesaid when requested by the Owner supply further drawings and execute supply and complete to the satisfaction of the Owner all other works, materials and thing mentioned and described in or to be inferred from the said specifications and the said drawings furnished and given to and approved by the Owner shall provide to the satisfaction of the Owner, labour, superintendence, power, materials and things which shall be requisite for the due performance, execution and completion of all and every work, matters and thing hereby contracted to be executed and done.

**8. Contractor to include execution and supply of all work matters and things required by Owner for due performance of Contract:**

This contract shall be deemed to comprise the design of Ro-Ro Vessel(s), construction, testing, installation of the equipment/machineries and delivery complete in working order in all respects of the vessels together with the equipment and all other things to be supplied in connection therewith and the due performance, execution and completion of all works, matters and thing necessary or proper for such construction, installation of equipment/machineries and delivery at the price hereinafter mentioned and accordingly the Contractor shall execute all works and find and supply all things which the Owner or the inspecting Owner or officer shall consider necessary proper according to the direction of the Owner or inspecting authority or officer and to their satisfaction according to the true intent and meaning of this Contract and notwithstanding that any such work or things respectively may not be expressly mentioned for referred to in the said specification and the said plans and the Contractor shall not be entitled to any payment or allowance whatsoever in respect thereof unless such payment or allowance is, in the opinion of the Owner, occasioned on account of such modifications of the said Contract, as have been agreed to in writing by the Owner.

**9. INSPECTION**

**(a) Obligation to carryout Inspector's instructions**

The Contractor shall satisfy the Inspector that adequate provision has been made, (i) to carry out his instructions fully and with promptitude (ii) to ensure that parts required to be inspected before use are not used before inspection; and (iii) to prevent rejected parts being used in errors. Where parts rejected by the inspector have been rectified or altered, such parts shall be segregated for separate inspection and approved before being used in the work.

**(b) Inspection and testing during progress of work:**

The Contractor shall offer the Owner or the Inspecting authority or Officer all proper and reasonable facilities for examining inspecting and testing the materials, machinery and workmanship used or intended to be used or employed during the progress of the construction and installation of equipment of the vessel and on completion thereof shall also supply free of charge such apparatus, materials, tools or labour as may be required from time to time for

the purpose of such examinations, inspections and testing. The Owner, the Inspecting authority or officer shall have access to the place or places where any part of the machinery or equipment is being constructed or is stored at all reasonable times during the execution of this Contract and in case any part of the work shall have been covered or closed without previous inspection the Contractor shall if required open such part or parts wherever necessary to enable the Owner or Inspecting authority or Officer to inspect the part so opened up at the expense of the Contractor.

**(c) Intimation for Inspection & Cost involved**

The Contractor shall inform the Inspector in writing when any portion of the work is ready for inspection, giving him sufficient notice to enable him to inspect the same without retarding the further progress of the work. No portion of the work shall be considered completed in accordance with the terms of the contract until the Inspector shall have certified in writing that it has been inspected, and approved by him. The expense incurred in the inspection and / or tests at the place agreed upon the contract will be defrayed by the owner, provides that the results are the event of inspection and or tests providing unsatisfactory and resulting in the non-acceptance of the plan/structure or any portion thereof, the cost of such re-inspection and / or tests shall be borne by the contractor.

**10. Replacement of defective work, material and fittings**

All materials, machinery and workmanship used and employed in carrying out this Contract shall be to the entire satisfaction of the Owner or the Inspecting Owner or Officer. Any portion or portions of the material, machinery or any of the works done under this Contract which may be considered by the Owner or the Inspecting Owner or officers to be defective or unsatisfactory or not in accordance with the said specifications and plans and the requirements of the vessel shall be replaced in a manner satisfactory to the Owner or the Inspecting Owner or Officer at the sole expense of the Contractors

If the Inspector shall find any work to be not in accordance with the contract, he shall be entitled to give the Contractor notice thereof and the Contractor shall forthwith make the defective work good or alter the same to make it comply with the requirements of the contract. Should he fail to do so within a reasonable time (as to which the Inspector shall be the judge), the owner may reject and replace at the cost of the contractor the whole or any portion of the work as the case may be, which is defective or fails to fulfil the requirement or the contract. Such replacement shall be carried out by the Owner within a reasonable time to the same specifications and under competitive conditions. The Contractor's full and extreme liability under this clause shall be satisfied by the payment to the owner, of the extra cost, if any, of such replacement delivered and / or constructed as provided for in the original contract, such extra cost being the ascertained difference between the price paid by the Owner, under the provisions above mentioned, for such replacement and the contract price for the work so replaced, and the repayment of any sum paid by the owner to the Contractor in respect of such defective work. Should the Owner not so replace the rejected work within reasonable time, the

Contractor's full and extra liability under this clause shall be satisfied by the repaying of all money paid by the Owner to him in respect of such work.

## **11. TRIALS**

Forthwith after the completion of the vessel in strict conformity with the Technical specifications under this contract the vessel shall undergo, in the presence of the Owner and the Inspecting Owner or Officer or their representative trials near the yards of construction or any other places as mutually agreed upon in accordance with the provisions of the specifications and as directed by the Owner or the Inspecting Owner or Officer.

The said trials shall be at the sole expenses and risk of the Contractor who shall pay and discharge all costs and bear all liabilities whatever arising out of the same. The contractor shall supply all crew and officers, fuel, gear and equipment required for the trials, all at his own expenses and shall also be responsible for all risks to the vessel(s) and other craft or to any person or property during the continuance of such trials and make good any damage which may arise in consequence thereof and indemnify the owner and his Officers / and servants therefrom and from all claims, action, suits and proceedings and all costs, charges and expenses in respect thereof or in any way arising there out or incidental thereto. Provided that all claims in respect of the owner shall meet the employee's representatives of the Owner.

## **12. DELIVERY**

### **(a) Preparing for voyage and delivery**

Immediately after completion of satisfactory trials the Contractor shall proceed to make the Vessels ready for the delivery at specified destination and shall thereupon deliver the vessels or cause the same to be delivered in a proper and seaman like manner at their own risk at the said specified destination and deliver the same in the charge of the representative in such suitable place and position as may be indicated by him complete with all necessary certificates and licences and in a good, complete and satisfactory condition of repair, fair wear and tear, consequent on the voyage accepted and with all stores and equipments in the specification mentioned or herein provided for on board, any damages incurred (other than fair wear and tear) or defects discovered during such navigation being made good by the Contractor at his own expenses prior to such last mentioned delivery. A sufficient crew and all engines and other necessary and usual stores and equipment are to be provided for the delivery by the Contractor and all costs and charges of every description in connection with the delivery are to be borne by the Contractor and all dock, canal and harbour dues and charges are to be paid by him.

The contractor shall comply with all Ministry of Shipping Rules, if any, and must also satisfy the requirements of the insurance broker, underwriters and surveyors and not do anything or leave anything undone where by the cost of insurance premium is increased. Should the cost of insurance be in any way increased by the failure of the contractor to meet such requirements, any such increased cost shall be borne by the contractor.

**(b) Spare Parts**

The spare parts as per manufacturers recommendation for 500 hrs. of operation are to be supplied for major machineries and equipment without extra cost along with the vessels and accordingly the cost is to be including in the bid.

A list of the spare parts of major machineries and equipment to include Main Engines, Auxiliary Engines, dredge pumps, Crane, Anchor Handling Winch etc. as in the technical specification clause no. 18 shall be submitted with price, terms & conditions if any for placement of supply order separately. However, the spare parts are to be supplied along with the vessel. The above cost shall not be considered for the evaluation of the financial bids.

Should it be necessary for the Contractor to send any of the spare parts by the separate means, the contractor shall be responsible for the cost of delivery and also for the proper packing, storage and protection whilst on the board and for their subsequent reception and delivery to the representative.

**(c) Provision as to Trials**

As soon as the vessels shall have been re-equipped and made ready for work to the satisfaction of the representative it shall then undergo such trial as their representative may require to demonstrate that neither the hull, machinery nor any other parts of the vessels have been damaged during the delivery and that all are in good working order and that the vessels is upto the standard required when working under local conditions. Any defect noticed during such trials shall be rectified by the Contractor to the satisfactory of the Owner / Inspector or the representative at the cost of the contractor.

**(d) Vessels to be at Contractor's risk until the issue of certificate of delivery**

The said delivery and re-equipment of the vessels at the specified destination shall be at the expense and risk of the contractor who shall pay and discharge all costs and liabilities thereof and connected therewith and shall continue to be responsible for the safety of the vessels until the Owner or his representative shall have accepted delivery thereof as hereinafter mentioned. If any loss (whether total or otherwise) shall be sustained or incurred by the vessels by any means or from any cause either during the delivery or before acceptance by the Owner then and in any such case the Contractor shall at his own expenses forthwith make good such loss subject in the case of total of constructive total loss to the provision of this contract.

**(e) As to acceptance of delivery**

When and as soon as the vessels shall have been duly re-equipped and made ready for work in accordance with the specifications and shall be in a complete and satisfactory condition with their certificates, licences and outfits and spare gears enumerated in the specifications on board then the vessels shall be delivered to the representative of Owner who shall thereupon give to



the Contractor or to such other persons who may be appointed by the contractor to receive the certificates of such delivery and of the date thereof and the granting of such delivery and of the date thereof and the granting of such certificates shall along be evidence of the acceptance by the owner of the delivery and of the date thereof.

**(f) Power for representative to dismantle and re-equip the vessels in default of Contractor**

If after the arrival of the vessels at the specified destination the contractor shall fail to dismantle any equipment/machineries of the vessels and re-equip and make them ready in all respects for work to the satisfaction of the representative or shall in the opinion of the representative be carrying on such dismantling, re-equipment and making ready for work negligently, improperly or so slowly as to cause or be delayed then in any such case the representative on behalf of the Owner may without vitiating this Contract take the vessels out of the possession of the Contractor and employ any persons or workmen upon such terms as he may think fit to dismantle and re-equip the vessels and make them ready for work in accordance with the specifications and this Contract and to perform any of the other obligations of the contractor under this contract which shall remain to be performed and the contractor shall pay to owner such a sum as shall be certified in writing by the representative to represents to costs and expenses incurred by the owner or the representative by reason or in course of the exercise of any of the powers conferred on the representative under this clause or the owner may at his option deduct such sum from the contract price.

**(g) Penalty for deficiency in speed of the vessels**

The contractor shall give full guarantee in every respect in accordance with the provisions of the specifications for the construction of the fully river worthy vessel constructed out of the best material of international shipbuilding quality and workmanship with good stability as also for faultless execution of work in all its details. The total contract price of the vessel shall have to be affected or changed, by reason of the actual speed, as determined by trial runs, in accordance with the specifications, being less than the guaranteed speed under the terms of the attached specifications, if the actual speed is less than three-tenth (3/10) of knot below the aforementioned guaranteed speed.

However, commencing with and including a decrease of three-tenth(3/10) of a knot in actual speed below the guaranteed speed of the vessel, the total contract price of the vessel shall be reduced for deficiency in speed as follows (but dis-regarding fractions of less than one-tenth(1/10), of knot ):

For three-tenths (0.3) of a knot	1% of the basic cost of the vessel
For four-tenths (0.4) of a knot	3% of the basic cost of the vessel
For five-tenths (0.5) of a knot	10%of the basic cost of the vessel

If the deficiency in actual speed of the vessel upon said trial runs, is more than 0.5 knot below the guaranteed speed as provided herein above, and the builder is not able to rectify even by an extension of the delivery period, then the owner at his option may reject the vessel and rescind this contract or may

accept the vessels at a reduction in the price as may be agreed between the parties.

**(h) Penalty for deficiency in draft of the vessel**

The total contract price of the vessel has to be affected or changed by reason of the actual max. draft with full bunker, water, personnel and stores as determined by actual measurement in accordance with specification being more than that specified in the attached specifications if the actual draft is more than 25mm.

However, commencing with and including an increase of 25mm in actual draft the total contract price of the vessel shall be reduced for deficiency in draft as follows:

Up to 50 mm of draft (1850 mm draft): **5% of the basic cost of the vessel.**

Up to 100mm of draft (1900 mm draft): **10% of the basic cost of the vessel.**

If the actual draft of the vessel is more than 1850 mm and builder is not able to rectify even by an extension of delivery period, then the owner at his option may reject the vessel and rescind the contract or may accept the vessel at a reduction of the price as may be agreed between the parties.

**13. Number of workmen and rate of progress to be increased on requisition of the Owner.**

The contractor shall at all times during the progress of the construction and installation of equipment and machineries of the vessels and subject to the limits of his control in the matter of labour employment and sufficient number of skilled workmen and labourers with necessary overlooks and proceed with the works hereby agreed to be executed (hereinafter referred to as the "workers with such despatch as in the opinion of the Owner or Inspecting Owner or Officer shall be necessary in order to secure the due completion of the vessels within the time limit for that purpose by the contract and shall also at times during the progress of the works upon being required to do so by the Owner or the Inspecting Owner or officers hasten the rate of progress of the vessels and of the work in accordance with any such requisition and to the satisfaction of the Owner or the Inspecting Owner or Officer PROVIDED ALWAYS that nothing herein contained nor anything done or omitted to be done by the Owner or the inspecting Owner or officer on behalf of owner in pursuance hereof shall be deemed to release the Contractor from or diminish or affect obligation to complete the vessels within the limit by this Contract or their liability in respect thereof.

**14. Defect Liability**

In the event of any defect being discovered in any part of the vessels, the machineries or equipments or fittings (which is not attributable to fair wear and tear of the vessels nor to improper management on the part of the official staff of the vessels during a period of 12 calendar months from the date of the

delivery certificate, the Contractor shall supply to Owner or their representative at the specified destination new parts to replace any that may be proved to have been so defective or shall pay to Authority such sum as it would cost the Contractor to supply such parts for replacement from the Contractors works.' The cost of receiving any such defective parts and or fitting such parts in replacement thereof shall be borne by the Contractor or be adjusted as liquidated damages from the security deposits/payment of last instalment of the contract price to such amount as it would in the opinion of the Owner have cost the contractor if the removing and replacing had been done at their works. The contractor shall also be entitled to have any workmanship or material claimed to be defective inspected by a representative to be appointed by them for that purpose or should the Contractor so require, Owner shall be bound to consign to the Contractor at his works in and at the Contractors expenses the parts claimed by the Owner to be defective so that the contractor may have an opportunity of satisfying himself as to the defect complained of and also be in position to operate his relief if any against any sub-contractor in respect of such defective parts.

## **15. Registration of Vessels**

The Contractor shall give all such builders and other certificates and documents and do such other acts and things as may be necessary or proper on his part for the registration of the vessels in the name of the Owner to the representative or other agent of the Owner whom the Owner may appoint for that purpose. Failing this the Contractor must arrange for the vessels to proceed to the specified destination under a "Pass" from the appropriate authorities at any port and all fines payment or penalties which may become payable by the Owner, the representative of the said agent by reason of any defect in such registration or during the delivery of the vessels to the specified destination shall be paid by the Contractor or may be deducted from the money payable to him under this contract and he shall indemnify the Owner, the representative and the said agent respectively there from and from all claims, actions, suits and proceeding and all costs, charges and expenses in respect thereof.

## **16. Insurance**

The Contractor shall at his own cost fully insure and keep insured in the joint names of the Owner and the Contractor the vessels and the machineries, materials and thing used or intended for use in the construction and outfit thereof. Hull insurance and machinery insurance may be done by the Builder but the insurance cover should cover the effected payment as well as the extent of work completed. The contractor is also to keep insured the value of any modifications, additions and spare parts as may be agreed upon from time to time during the construction of the vessels.

The Policy/Policies shall be effected with reputable Insurance Company approved by the Govt. and shall comprise insurance against fire, launching and all other risks, accidents and damages excluding War Risk which for the time being can be covered by insurance during and after the construction of the vessels and while she remains in the harbour or the yard of construction or when engaged on or in connection with any trials made under this Contract as

well as the perils of the river and all other risk of every kind including War Risk so far as they are insurable, or whilst lying therein or on a slipway or in a dry dock or being tried near thereto previous to being accepted by Owner and the Contractor shall from time to time (if from any cause the vessels shall not be delivered to and accepted by the Owner during the term of such policies) renew and said insurance and pay and continue to pay all premium which shall become payable in respect of such insurance and within seven days from the date when such renewed insurance is effected or premium paid shall deliver to the Owner the policy or policies thereof and the receipts for such premium PROVIDED ALWAYS that in case of default by the Contractor to keep up the said insurance or to effect any such renewal insurance as aforesaid then the Owner if they shall think fit shall be at liberty to do so and thereupon the Contractor shall repay the owner the amount of the premium paid by them or the Owner shall be at liberty at his option to deduct the amount thereof from any sums payable to the Contractor under this contract PROVIDED ALSO that nothing wherein contained nor anything done or omitted to be done by the Owner in pursuance hereof shall be deemed to release the Contractor from diminish or affect his obligation to keep the vessels machineries, materials and thing insured to the full amount of the value therefore from time to time in accordance herewith until her acceptance at the place of delivery mentioned in the Contract nor shall diminish or affect the liability of the Contractor in respect thereof. If any event shall happen giving rise to a claim under the insurance policy to be effected under this clause or if the vessels shall become a total or constructive total loss on the delivery to specified destination or after the arrival there and before the acceptance by the representative owing to perils of the river or other risks insurance so far as they are insurable to be effected for the delivery at the specified destination the Owner without prejudice to the rights to have this contract performed within such extended time and at such price as may be mutually agreed and failing agreement determined by the Owner shall give the money which shall become payable under whichever of the said policies the claim shall arise and retain the same paying the contractor the difference between the aggregate of such sums as they may have previously paid the contractor under this contract and such total amount as the Owner may certify would have been payable to the contractor if this contract had been terminated. Provided that if the vessels are covered against War Risks the premium on the account shall be payable by owner.

## **(SECTION-VII)**

### **ANNEXURES**

**AGREEMENT FORMAT**

This agreement made on \_\_\_\_\_ day \_\_\_\_\_ year \_\_\_\_\_ between the Inland Waterways Authority of India (hereinafter called the 'IWAI' which expression shall unless excluded by or repugnant, to the context, be deemed to include heir, successors in office) on one part and M/S \_\_\_\_\_ (hereinafter called the 'CONTRACTOR' which expression, shall unless excluded by repugnant to the context be deemed to include his heirs, executors, Administrators, representatives and assigns of successors in office) on the other part.

WHEREAS THE IWAI desirous of undertaking the works **Design, Construction and Supply of two no. RO-RO Ferry to be delivered at Dhubri (Schedule A-bigger RO-RO Ferry/Schedule B-Smaller RO-RO Ferry)**

WHEREAS the contractor has offered to execute and complete such works and whereas IWAI has accepted the tender of the contractor and WHEREAS the contractor \_\_\_\_\_ has \_\_\_\_\_ furnished

\_\_\_\_\_ as security for the due fulfillment for all the conditions of this contract.

**NOW IN THIS AGREEMENT WITNESSTH AS FOLLOWS**

In this agreement words and expression shall have the same meaning as are respectively as assigned to them in the conditions of contract hereinafter referred to:

The following documents shall be deemed to form and be read and construed as part of this agreement VIZ.

- i) (a) Notice Inviting Tenders
- (b) Tender form
- (c) Warranty
- ii) Information & instruction for Tenders
- iii) (a) Schedule : Bill of Quantity
- (b) Annexure
- iv) General Conditions of Contract
- v) Technical specifications and Special Conditions of Contract

The contract agreement has been compiled by the IWAI from the original tender documents and all the correspondences from the tendering stage till acceptance. In the event of any difference arising from the completion of the contract, the original tender documents, contractor's offer, minutes of meetings and correspondence between the party ended vide letter No. \_\_\_\_\_ may be referred

to by either party. These documents shall take precedence over the compiled documents.

The contractor hereby covenants with the IWAI to complete and maintain the “Works” in conformity in all respect, with the provisions of the agreement.

The IWAI hereby covenants to pay the contractor in consideration of such completion of works, the contract price at the time and in the manner prescribed by the contract.

IN WITNESS WHEREOF the parties hereunto have set their hands and seals on the day year first written.

For and on behalf of  
(*Inland Waterways Authority of India*)

For and on behalf of  
*Contractor*

*Signature* \_\_\_\_\_

*Signature* \_\_\_\_\_

*Name & Designation* \_\_\_\_\_

*Name & Designation* \_\_\_\_\_

*Stamp*

*Stamp*

Witness:

Witness:

1) Signature \_\_\_\_\_

1) Signature \_\_\_\_\_

2) Name & Designation \_\_\_\_\_  
Designation \_\_\_\_\_

2) Name \_\_\_\_\_ &

**BANK GUARANTEE PROFORMA FOR FURNISHING  
PERFORMANCE GUARANTEE**

**To**  
**The Chairman**  
**Inland Waterways Authority of India**  
**A-13, Sector-1**  
**Noida - 201301**

In consideration for the Chairman, Inland Waterways Authority of India hereinafter called ‘the Authority’ having agreed, under the terms and conditions of the Agreement dated ..... made between..... and ...for the due fulfillment of the said Agreement by the Contractor of the terms and conditions contained in the said Agreement, on production of Bank Guarantee for Rs..... (Rupees.....) at the request of..... Contractor(s), We (Bank) do hereby undertake to pay to the Authority an amount not exceeding Rs..... against any loss or damage caused to or suffered, or would be caused to or suffered by the Authority by reason of any breach of the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

2. We..... do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the Authority stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the authority by reason of breach by the said contractor(s) of any of the terms or conditions contained in the said Agreement or by reason of the contractor(s)’s failure to perform the said Agreement,. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.....

3. We undertake to pay the authority any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) / suppliers(s) in any suit or proceeding pending before any court or Tribunal relating thereto liability under this present being absolute and unequivocal.

The payment so made by us under this Bond shall be valid discharge of our liability for payment there under and the contractor(s) / supplier(s) shall have no claim against us for making such payment.

4. We, ..... further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Authority under or by virtue of the said Agreement have been fully and its claim satisfied or discharge or till..... Certify that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contactor(s) and accordingly discharges this Guarantee after..... years from the date of completion of the said contract unless a demand or claim under this Guarantee is served in writing on the bank but before the expiry of the said period of ..... years in which case it shall be enforceable against the bank not withstanding the fact that the same is enforced after the expiry of the said period of ..... years.



5. We,.....further agree with the Authority that the Authority shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Authority against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the Authority or any indulgence by the Authority to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for the provision, have effect of so relieving us.
6. It shall not be necessary for the Authority to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the Authority may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Bank hereunder be outstanding or unrealized.
7. Notwithstanding anything contained herein above our liability under the guarantee is restricted to Rs. .... and shall remain in force until..... Unless a claim or suit under this guarantee is filed with us on or before..... **ALL OUR RIGHTS UNDER THE GUARANTEE SHALL BE FORFEITED** and the bank shall be relieved and discharged from all liabilities therein.
8. This Guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s) / supplier(s).
9. We,..... lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Authority in writing.

Dated the .....date of.....201...  
for.....  
(indicate the name of Bank)  
Signature.....  
Name of the Officer.....  
(in Block Capitals)  
Designation of  
Code No.....  
Name of the Bank and Branch.

**SAMPLE FORM FOR SITE ORDERS BOOK**  
**Reference Clause No. 18.4**

Name of work ..... Date of commencement/ period for  
completion.....

Sl. No.	Date	Remarks of the Inspecting Officer or Contractor	Action taken and by whom	Remarks
1	2	3	4	5

**PROFORMA FOR HINDRANCE REGISTER**  
**Reference Clause No. 18.5**

Sl. No.	Nature of hindrance	Items of work that could not be due executed to this hindrance	Date of start of hindrance	Signature of Representative of EIC	Date of removal of hindrance	Overlapping period, if any	Net hindrance in days	Weightage of this hindrance	Net effective days of hindrance	Remarks of Engineer-in-Charge
1	2	3	4	5	6	7	8	9	10	11

**Notice for appointment of Arbitrator  
[Refer Clause 47]**

To,

The Chairman, IWAI

.....

.....

Dear Sir,

In terms of clause 47 of the agreement, particulars of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputed mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm/Partnership Firm/Ltd. Co.
3. Full address of the applicant
4. Name of the work and contract number in which arbitration sought
5. Name of the Division which entered into contract
6. Contract amount in the work
7. Date of contract
8. Date of imitiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to Chief Engineer for decision
17. Date of receipt of Chief Engineer's decision
18. Date of appeal made to Chairman, IWAI
19. Date of receipt of the decision of Chairman, IWAI

Specimen signatures of the applicant  
(only the person/authority who  
signed the contract should sign)

I/We certify that the information given above is true to the best of my/our knowledge. I/We enclose following documents.

1. Statement of claims with amount of claims
- 2.
- 3.
- 4.

Yours faithfully

(Signatures)

Copy in duplicate to:

1. The Regional Director, IWAI

**TENDER ACCEPTANCE LETTER**

(To be given on Company Letter Head)

Date:

To,  
THE CHIEF ENGINEER (P&M)  
INLAND WATERWAYS AUTHORITY OF INDIA,  
A-13, Sector – 1, Noida - 201 301,  
Distt.- Gautam Budh Nagar; (U.P.)

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: IWAI/MD/133/2015-16

Name of Tender / Work: - **Design, Construction and Supply of two no. RO-RO Ferry to be delivered at Dhubri (Schedule A-bigger RO-RO Ferry/Schedule B-Smaller RO-RO Ferry)**

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely:

—

—

as per your advertisement, given in the above mentioned website(s).

2. I / We hereby certify that I / we have read the entire terms and conditions of the tender documents from Page No. \_\_\_\_\_ to \_\_\_\_\_ (including all documents like Annex(s), schedule(s), etc .), which form part of the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.

3. The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.

4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.

5. In case any provisions of this tender are found violated by us, then your department/ organisation shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.

6. I/ We undertake to complete and Deliver the whole of the works comprised in the Contract within the time as stated in the tender and also in accordance in all respects with the specifications, designs, drawings and instructions as mentioned in the tender documents.

7. I am tendering for the work mentioned in the table below and submitting the EMD in the form of demand draft in favour of IWAI Fund payable at Noida at Nationalised / schedule bank as per the details given therein or as prescribed.

mand draft No. & Date and nk Guarantee details	D )	tails of Bank ame of Bank, Branch and address)

8. I/ We agree to abide by this tender. I/ We agree to keep the tender open for a period of 120 days from the last date of submission of bid or extension thereto as required by the IWAI and not to make any modifications in its term and conditions.

9. I/ We agree, if I/ we fail to keep the validity of the tender open as aforesaid or I/ we make any modifications in the terms and conditions of my/ our tender if I/ We fail to commence the execution of the works as above, I/ We shall become liable for forfeiture of my/ our Earnest money, as aforesaid and IWAI shall without any prejudice to any other right or remedy, be at the liberty to forfeit the said Earnest Money absolutely otherwise the said earnest money shall be retained by IWAI towards part of security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered. Should this tender be accepted, I/ We agree to abide by and fulfill all the terms and conditions and provisions of this tender. No interest is payable on earnest money deposit and/ or security deposit.

10. I/ We have independently considered the amount of Liquidated Damages shown in the tender hereto and agree that it represents a fair estimate of the loss likely to be suffered by IWAI in the event of works not being completed in time.

11. If this tender is accepted, I/ We undertake to enter into execute at my/ our cost when called upon by the employer to do so, a contract agreement in the prescribed form. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereto shall constitute a binding contract.

12. If my/ our tender is accepted, I/We am/are to be jointly and severely responsible for the due performance of the Contract. I/We also declare that the firm has not been banned or blacklisted by any Govt. or its department or any Quasi Govt. agency or Public Sector Undertaking or Multilateral or International Aid Agency/Development Bank.

13. I/ We understand that you are not bound to accept the lowest or any Tender you may receive and may reject all or any tender without assigning any reason.

14. I/ We certify that the tender submitted by me, us is strictly in accordance with the terms, conditions, specifications etc. as contained in the tender document, and it is further certified that it does not contain any deviation to the aforesaid documents.

Yours Faithfully,

Date .....  
Official Seal)

(Signature of the Bidder, with

Name .....

Designation .....

duly authorized to sign & submit tender for an on behalf of  
(Name and address of firm)

M/s .....

Telephone nos.....FAX

No.....

**BANK GUARANTEE PROFORMA FOR FURNISHING  
EARNEST MONEY DEPOSIT**

**To  
The Chairman  
Inland Waterways Authority of India  
A-13, Sector-1, Noida - 201301**

WHEREAS, contractor..... (Name of contractor) (hereinafter called "the contractor") has submitted his tender dated ..... (date) for the work of ..... (name of work) (hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we ..... (name of bank) having our registered office at ..... (hereinafter called "the Bank") are bound unto ..... (Name and division of Executive Engineer) (hereinafter called "the Engineer-in-Charge") in the sum of Rs. .... (Rs. in words ..... ) for which payment well and truly to be made to the said Engineer-in-Charge the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this ..... day of ..... 20... . THE CONDITIONS of this obligation are:

- (1) If after tender opening the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;
- (2) If the contractor having been notified of the acceptance of his tender by the Engineer-in-Charge:
  - (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required; OR
  - (b) fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to contractor, OR
  - (c) fails or refuses to start the work, in accordance with the provisions of the contract and Instructions to contractor, OR
  - (d) fails or refuses to submit fresh Bank Guarantee/Demand draft of an equal amount of this Bank Guarantee, against Security Deposit after award of contract.

We undertake to pay to the Engineer-in-Charge up to the above amount upon receipt of his first written demand, without the Engineer-in-Charge having to substantiate his demand, provided that in his demand the Engineer - in-Charge will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date\* ..... after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the Engineer-in-Charge, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE .....

SIGNATURE OF THE BANK WITNESS .....

SEAL

(SIGNATURE, NAME AND ADDRESS)

\*Date to be worked out on the basis of validity period of 6 months from last date of receipt of tender.

**DETAILS OF BANK ACCOUNT FOR RELEASE OF PAYMENT THOROUGH  
ELECTRONIC FUND TRANSFER SYSTEM.**

**(TO BE FURNISHED BY THE BIDDER ON ITS LETTER HEAD)  
NAME OF THE PROJECT:\_\_\_\_\_**

**THE BANK ACCOUNT DETAILS ARE FURNISHED AS BELOW.**

We \_\_\_\_\_ (Name of the Bidder) hereby request you to give our payments by crediting our bank account directly by E-payment mode as per account details give below. We hereby undertake to intimate IWAI in case of any change in particulars given below and will not hold IWAI responsible for any delay I default due to any technical reasons beyond IWAI's control:-

Bank Account Number : \_\_\_\_\_

RTGS/NEFT/IFSC Code : \_\_\_\_\_

NAME OF THE BANK : \_\_\_\_\_

ADDRESS OF THE BRANCH OF THE BANK : \_\_\_\_\_

BRANCH CODE : \_\_\_\_\_

ACCOUNT TYPE (SAVING/CURRENT/OTHERS): \_\_\_\_\_

**A BLANK CHEQUE (CANCELLED) IS ENCLOSED HERewith.**

I/WE hereby declare that the particulars given above are correct and complete if the transaction is delayed or credit is not affected at all for reasons of incomplete or incorrect information. I/We would not hold IWAI responsible.

Signature of Authorized Signatory

Date:

**BANK CERTIFICATION**

It is certified that above mentioned beneficiary holds a bank account No \_\_\_\_\_ with our branch and the bank particulars mentioned above are correct.

Date

Authorized Signatory

Authorization No. \_\_\_\_\_

Name: \_\_\_\_\_

**Official Seal/Stamp**



## **Annexure-IX**

### **Form of Bank Guarantee – Secure a Lump-Sum Advance**

To

The Chairman,  
Inland Waterways Authority of India,  
A –13, Sector-1,  
NOIDA-201301 (UP).

In consideration of the Chairman, Inland Waterways Authority of India ..... Hereinafter called “the Authority” which expression shall unless repugnant to the subject or context include his successor an assigns) having agreed under the terms and conditions of Contract No. .... dated..... Made between..... and the authority in connection with .....(Hereinafter called “the said Contract”) to make at the request of the Contractor a lump-sum advance of Rs. .... For utilising it for it for the purpose of the contract on his furnishing a guarantee acceptable to the Authority, we the ..... Bank Ltd. (hereinafter referred to as the “the said Bank”) a company under the Companies Act. 1956 and having our registered office at ..... Do hereby guarantee the due recovery by the Authority of the said advance with interest thereon as provided according to the terms and conditions of the contract. We do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the Authority stating that the amount claimed is due to the Authority under the said Agreement. Any such demand made on the ..... Shall be conclusive as regards the amount due and payable by the ..... under this guarantee and the amount so demanded shall be absolute and unconditional notwithstanding any dispute or disputes raised by the contractor and notwithstanding any legal proceeding pending in any court or tribunal relating thereto. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs. ....

2. We, ..... Bank Ltd., further agree that the Authority shall be the sole judge of and as to whether the said contractor has not utilised the said advance or any part therefore for the purpose of the contract and the extent of loss or damage caused to or suffered by the Authority on account of the said advance together suffered by the Authority on account of the said advance together with interest now being recovered in full and the decision of the Authority that the said contractor has not utilised the said advance or any part thereof for the purpose of the contract and as to the amount or amounts of loss or damages caused to or suffered by the Authority shall be final and binding on us.

3. We, the said Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said contract and that would be taken for the performance of the said contract and till the said advance with interest has been fully recovered and its claim satisfied or discharged and till..... Certify that the said advance with interest has been fully recovered from the

said contractor, and accordingly discharges this Guarantee subject, however, that the owner shall have no claims under this Guarantee after ..... Years from the date of completion of the said contract, as the case may be, unless a notice of their claim under this guarantee has been served on the Bank but expiry of the said period of ..... Years in which cash the shall be enforceable against the bank notwithstanding the fact that the same is enforced after the expiry of the said period of ..... years.

4. The Authority shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee or indemnity, from time to time to vary any of the terms and conditions of the said contract or the advance or to the extend time of performance by said contractor or to postpone for any time and from time to time any of the powers exercisable by it against the said contractor and either to enforce or forbear from enforcing any of terms and conditions governing the said contract or the advance of securities available to the Authority and the said Bank shall not be released from its liability under these presents by any exercise by the Authority of the liberty with reference to the matters aforesaid or by reasons of time being given to the said contractor or any other forbearance, act or omission on the part of the Authority or any indulgence by the Authority to the said contractor or of any other matter or thing whatsoever which under the laws relating to sureties would but for this provision have the effect of so releasing the bank from its such liability.

5. It shall not be necessary for the Authority to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the Authority may have obtained or obtain from the contractor shall at the time when proceedings are taken against the Bank hereunder be outstanding or unrealised.

6. We, the said Bank lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Authority in writing and agree that any change in the constitution of the said contractor or the said bank shall not discharge our liability hereunder.

7. The executor to this bank guarantee has resolved that it will not have recourse to any civil court for enforcement / cancellation of this bank guarantee to which, we also agree.

Dated this ..... day of ..... 20 .....

For and on behalf of the Bank

(Name and Designation)

The above guarantee is accepted by the Chairman, Inland Waterways Authority of India.

For and on behalf of the Chairman,

Inland Waterways Authority of India

Dated.....

Note:

For proprietary concerns:

Shri ..... Son of ..... Resident of ..... Carrying on business under the name and style of ..... at .....(Hereinafter called the said contractor, which on possession shall unless the context requires or otherwise include his heirs, executors, administrators and legal representatives).

For partnership concerns:

(1) Shri ..... Son of ..... Resident of .....

(2) Shri ..... Son of ..... Resident of .....

And carrying on business in co-partnership under the name and style of ..... At ..... (Here in after collectively called “the said contractor” which expression shall unless the context requires otherwise includes each on them and their respective heirs, executors, administrators, and legal representatives.

For Companies:

Shri ..... A company under the companies Act, 1956 and having its registered office at ..... In the State of ..... (Hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include its successors and assigns).

**Form of Bank Guarantee (for payment of 1<sup>st</sup> installment)**

(Two no. RO-RO Vessel)

In consideration of Inland Waterways Authority of India, under Ministry of Shipping, Government of India (hereinafter called the owner) having made advance payment to ..... (Hereinafter called the contractor) under the terms and conditions of the contract dated ..... made between the contractor and the owner for the design, construction supply and delivery of **Two no. RO-RO Vessel** (hereinafter called the contract) on production of a bank guarantee for Rs. .... (Rupees ..... only). We ..... further agree that if demand is made to the owner for honouring the bank guarantee, we ..... have no right to decline to cash the same for any reason whatsoever and shall cash the same within a maximum period of 2 days from the date of serving notice to the bank from the date of such demand. The fact that there is dispute of any matter whatsoever between the contractor and the owner is no ground for us ..... to decline to honour the bank guarantee in the manner aforesaid is a sufficient reason for the owner to enforce the bank guarantee unconditionally without any reference to the contractor. We ..... further agree that a mere demand by the owner is sufficient for us ..... to pay the amount covered by the bank guarantee in the manner and within the time aforesaid without reference to the contractor and any protest by the contractor shall not be valid ground for us, ..... to decline or fail or neglect the payment to the buyer in the manner and within the time aforesaid. Any such demand on the Bank shall be conclusive as regards the amount due and payable to the owner by the Bank under this guarantee.

We, ..... Further agree that the bank guarantee herein contained shall remain in full force and effect, till the delivery and acceptance of the vessel to the complete satisfaction of the owner in terms of clause 12 of special condition of the contract dated ..... and that it shall continue to be enforceable till all the dues of the owner under or by virtue of the said contract have been fully paid and its claims satisfied or discharged in full or till the owner certifies that the terms and conditions of the contract have been fully and properly carried out by the contractor and accordingly discharge the guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the ....., we shall be discharged from all liability under this guarantee thereafter.

We, ..... further agree that the owner shall have the fullest liberty, without our consent and without effecting in any manner our

obligations hereunder, to vary any of the terms and conditions of the contract or to extend the time during which the contract is to remain valid and or the time for performance by the contractor of its / their obligations under the contract from time to time or to postpone for any time or from time to time any of the powers exercise by the owner against the contractor and to forbear or enforce any of the terms and conditions relating to the contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the contractor or any indulgence by the owner to the contractor or by any such mater or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us,  
.....

The executor to this bank guarantee has resolved that it will not have recourse to any civil court for enforcement / cancellation of this bank guarantee to which, we also agree.

This Guarantee shall be valid upto ..... Including from the date of issue.

We ..... lastly undertake not to revoke this guarantee during its currency except with previous consent of the owner in writing.

Dated ..... day of ..... Two thousand  
.....

Signature .....

SEAL

## **(SECTION-VIII)**

### **TECHNICAL SPECIFICATIONS OF RO-RO VESSEL CARRYING 12 TRUCKS AND 200 PASSENGERS (100 SEATED) FOR NW-2**

## **Section – VIII**

### **TECHNICAL SPECIFICATIONS OF RO-RO VESSEL CARRYING 12 TRUCKS AND 200 PASSENGERS (100 SEATED) FOR NW-2**

#### **1. GENERAL**

##### **1.1 Intent**

The purpose of this document (hereinafter called the “**Specifications**”) is to outline the technical and functional requirements for the design, construction, supply and delivery of 1 no. **Ro-Ro Vessel** (hereinafter called the “**Vessel**”) for the Inland Waterways Authority of India. The RO-RO vessel shall be operated to introduce safe, scientific, economical and efficient way of transporting the vehicles loaded with, public carriers, two/three wheelers, passenger cars and passengers round the clock during the entire year including flood season. The vessel to carry 12 trucks of 25,000 kg and 100 to 200 passengers (sitting arrangement for 100 passengers to be provided).

The vessel including all its material, equipment, piping, machinery, workmanship, etc., shall be in accordance with these specifications and to the requirements of the classification Society as also regulatory bodies, which are mentioned hereinafter and shall be fully documented as required by these bodies.

All fittings, arrangements, systems and equipment not mentioned in the specifications but required under Classification rules and other statutory requirements shall be provided at no extra cost. Anything not described or left out of this specification, but being considered as normal and necessary for the intended services, shall be supplied and fitted without extra charge.

#### **1.2 Design Conditions and Basic Requirements**

##### **1.2.1 Design Conditions**

The following ambient conditions are to be considered for the selection of equipment and machinery: -

- Maximum outside air temperature of 45°C with 90% relative humidity.
- Air temperature of 50°C with 90% relative humidity in the engine room.
- Maximum river water temperature of 32°C.
- Atmospheric pressure of 760 mm Hg.
- Occasionally occurring sand storms with wind speeds up to 40 m/sec.

##### **1.2.2 Basic Requirements**

The Vessel is intended for operation in all weather conditions in the National Waterway National Waterway no.2 (River Brahmaputra) and primarily between Hathsingimari and Dhubri. The vessel can also operate at any other location in NW-1 and NW-2. The vessel should be suitable for operation in Zone-2 (maximum significant wave height of 1.20 m). The vessel to carry 12 to 14 trucks of 25,000 kg and 100 to 200 passengers (sitting arrangement for 100 passengers to be provided).

The following basic requirements apply to the Ro-Ro Vessel:

- a) The Vessel with its installations, systems and equipment shall be able to fulfill all described tasks, duties and capacities when operating under the design conditions mentioned above.
- b) The Vessel to be constructed and built for inland waters and as such classified by class with IRS (Indian Register of Shipping) and Model Rules for Inland Vessel. The building to be carried out under the survey of this classification society having the class notation for both hull and machinery.
- c) The Vessel shall be able to sail continuously at a speed of 9.0 knots at the loaded draft.
- d) The Vessel shall have a good speed control, directional stability and maneuvering qualities over the full speed range and shall be designed with a twin screw propulsion installation.
- e) The Vessel to be equipped with preferably two foldable ramps on main deck, one each on fwd and aft side. The ramp can have a flap of suitable size.
- f) The Vessel shall have a simple living space to accommodate 8 crew members and a wheelhouse with a good view all around.
- g) The Vessel shall have an own fuel storage capacity of at least 20 m<sup>3</sup> and a freshwater storage of about 5 ton and stores for three days sailing.
- h) All materials, equipment and machinery required for the construction of the Vessel shall be of high quality and suitable for marine use and for the prescribed services. All workmanship entering into construction and finishing of the work shall be of first class standard in accordance with good shipbuilding practice, suitable for the purpose intended and to the satisfaction of the classification society.
- i) Special measures to be taken to protect the equipment and engines against the effects of sand/dust-storms.

### **1.3. Liability and Obligations of Contractor**

The Contractor has to convince himself and confirm at the time of submitting the tender that the Vessel will be designed and built in accordance with this Specification and will be able to fulfill all prescribed requirements, capacities and performances.

The Contractor will take the full responsibility in all respects, without any reserve, for the design, the construction, supplies, and trials, efficient working of all systems on board, transport and delivery of the Vessel.

The following documents shall be submitted along with the tender:

- 1. Preliminary GA
- 2. Initial Intact Stability Calculation according to IS Code 2008 with reduced wind speed for inland vessels
- 3. One compartment Damage Stability
- 4. Powering Calculations
- 5. Deadweight Breakups
- 6. Electrical Load Estimate



The approval of the Class of plans, orders, calculations, drawings or delivered materials and tools does not exempt the Contractor from his responsibility to deliver the Vessel with all installations in agreement with this Specification. If some parts do not work satisfactorily during the trials or during the guarantee period, these parts must be replaced or altered by the Contractor at its own cost, to the satisfaction of the Owner and Class. During the building period, the contractor has to take effective precautions to prevent damage by fire or water. After launching, the vessel is to be effectively and tightly moored in sufficient depth.

#### **1.4. Description of Ro-Ro Ferry**

The Vessel will be provided twin screw propulsion at aft end and will have ramps on each end suitable for the slope of the jetty as shown in **Annexure-2** and operating in protected (Inland) waters, such as the river Ganges & Brahmaputra in India. The hull will be constructed of steel and the vessel will be classified as Ro-Ro Ferry for inland water.

The principal dimensions and characteristics are as follows: -

Length of vessel	About 60.00 m
Breadth molded	About 16.00 m
Depth at side	2.80/3.00 m
Maximum loaded draught	1.80 m
Freshwater tank capacity	5 m <sup>3</sup>
Fuel oil tank capacity	20 m <sup>3</sup>
Waste tanks capacity	About 1 m <sup>3</sup>
Propulsion engines	About 2x520 HP
Trial speed (with empty trucks)	9.0 knots with both propellers working and both engines together delivering 85% of MCR
Passengers	100 seated + 100 standing
Truck Loads	Max. 12 Nos. 25 t trucks
Complement	8 nos.

The hull will be subdivided by watertight transverse and longitudinal bulkheads into several compartments.

The accommodation and the wheelhouse cabin shall be built on deck. Propulsions and steering to be remotely controlled from the wheelhouse. Two nos. ramps to be fitted at fwd and aft end of the vessel preferably at an angle as shown in the GA in **Annexure-1**. Due to orientation of the jetties both ramps needs to be on same side. The most optimal solution could possibly be to align the ramp at 30 degree angle with the vessel centerline. Width of the vessel and ramp orientation and breadth is to be designed considering the turning radius of 1 TEU container carrying trailers.

The orientation and fitting of the ramp shown in GA is for guidance, designer is free to provide alternate solution meeting the required operational criteria. A bow thruster shall be provided in the forward end for better directional stability and to hold the vessel in place while loading and unloading.

### **1.5 Design and Model Test :**

On completion of the basic design, the model testing of the vessel to be constructed shall be carried out in a reputed and recognized model testing towing tank in the presence of Owners representative for confirming the propulsive power, speed, draft etc. at the earliest. Model test will take into account the effects of simultaneous running of both propellers

### **1.6 Classification, Regulations and Certificates**

The Vessel shall be designed and built in accordance with the requirements of the rules and regulations of:

1. The Inland Vessel Act 1917 and as amended in 2007
2. IRS Inland Waterways Rules

The vessels are also to conform to the **MODEL INLAND VESSEL RULES prepared by IWAI**. IRS shall also be authorized to check the compliance of the rules with the model rules of IWAI.

The Vessel shall be built under the inspection of the above mentioned Classification Society and shall have the notation **+IWL Zone 2, +IY, Ro-Ro Ferry**. The Owners and their representatives / consultants shall also inspect the construction of the vessel and carry out the specification survey.

The main diesel units and other machineries and equipment will also be subject to the rules and regulations of the Class and certificates have to be supplied covering these engines and machineries.

Where in the Specification and the material are in excess of those required by the Class, the former will overrule those of the Class.

The builder shall obtain the following certificates/documents and deliver to the owner at the time of the vessel's delivery.

The original certificates with three copies shall be handed over prior to delivery or framed and kept onboard as the case may be.

**a)** Issued by appropriate authorities as applicable for this class of vessel.

- 1) Inclining Experiment Report.
- 2) Trim and Stability booklet.
- 3) Certificate of tonnage (GRT/NRT).
- 4) Certificate of Registry

**b)** To be issued by classification society

- 1) Classification Certificate
- 2) All Certificates of machinery and equipment.

**c)** To be issued by Builders

- 1) Builder's Certificate.
  - 2) Official Deadweight Certificates.
- d)** To be issued by others (mainly the classification society, MMD, Dock Labour Board and other statutory/recognized agency):
- 1) Certificate of anchors, chain cables, shackles, hawsers, mooring ropes and equipment.
- e)** Certificate of nautical/navigation instruments.
- 1) Navigation light, Mast light Certificate.
  - 2) Magnetic compass Certificate.

Other usual certificates including those (when applicable for inland vessels) of compass, anchor, hawser, navigation lights, life saving equipment, freeboard etc. issued by recognized authorities concerned shall also be furnished to the Owner.

The vessel will be registered either at Kolkata with IWT Dte., Govt. of West Bengal or at Guwahati with the IWT Directorate, Assam as per the relevant rules and regulations of Inland Vessel Act, 1917 conforming to Model Inland Vessel Rules prepared by IWAI (available on IWAI website) and the builder will furnish all necessary documents required for the registration of the vessel. Life Saving appliances, Navigational aids, Fire Fighting appliances and the light and sound signals shall conform to the requirements of Model IV rules and any other regulations of IWT Directorate, Govt. of West Bengal or Govt. of Assam as applicable, and framed by the State Government where the vessel is to be registered. IWAI shall authorize IRS to examine the statutory plans on its behalf and ascertain the compliance.

All costs and fees for inspection and approval of Class and Regulation Bodies for the necessary certificates shall be borne by the Contractor.

### **1.7. Stability, Draught and Trim**

The vessel shall have ample stability under all loading conditions and operating conditions. No permanent or fixed ballast shall be used. The stability particulars shall also comply with the load line requirements. The vessel shall never have a forward trim in any loading conditions.

The Builder shall keep stringent record of all weights going onboard, during the construction. On completion of the vessel an inclining test in the presence of the Owner and Statutory authorities, shall be carried out to determine the center of gravity and lightship weight of the vessel. A trim and stability booklet shall be prepared incorporating the result of the inclining test. This booklet shall contain all operating conditions and other necessary information regarding general stability of the vessel.

Directorate IWT, Govt. of West Bengal or Govt. of Assam as applicable shall duly approve this and one set shall be placed on board the vessel.

### **1.8. Standards and Building Methods**

The construction and outfitting of the Vessel shall be carried out in accordance with good marine practice, using materials, outfit, machinery and equipment produced in compliance with recognized marine standards and to the rules and regulations of the Classification Society.

The Contractor's and/or Manufacturers' standard can be applied after approval of the Owners or their consultants/ specification surveyors of those items which are not covered by the requirements of the Classification Society.

All materials, equipment and machineries not covered under Class requirements are to at least conform to the applicable BIS standards and same to be procured after obtaining approval of the Owner/Owner's representatives.

Building methods shall be in agreement with good marine practice and are to be approved by the Classification Society. The workmanship shall be to the satisfaction of the classification society and the Owner.

### **1.9. Supervision and Inspection**

The Vessel, its machinery, outfit and equipment shall be inspected and tested by the various governing bodies concerned in accordance with the requirements of their respective rules. The inspections and tests shall be in accordance with the rules and regulations of the Class.

Any defective or sub-standard work, which was pointed out during inspection, by the surveyors or the owner's representative, shall be rectified by the Builder at no extra cost.

The Builder shall submit a monthly report of the progress of the construction of the vessel to the Owner or their consultants who shall carry out Specification survey and shall inspect the work at any stage during the construction of the vessel.

The reports of inspection and testing shall be submitted to the Classification Society and the Owner or their consultants/specification surveyors. The Classification Society or the Owner's consultants are entitled to reject and refuse work and material which do not comply with the specified requirements. The Contractor will admit the Surveyors to all places where work related to this Contract is being carried out and shall grant free access to any premises where equipment is stored, where work is stored or where work is being sub-contracted. The Contractor shall also give all necessary information and render assistance to enable the Classification Society to carry out their inspections efficiently. Supervision by the Classification Society does not release the Contractor from any of his obligations under the Contract.

The Contractor will put at the disposal of Owner's Consultants /specification surveyors one room of a suitable size with telephone connection. At least two tables and chairs are to be provided along with requisite cupboards for files/documents. Appropriate facilities are also to be provided.

The Contractor shall enforce his own effective inspection and quality control of materials and workmanship including that of his sub-contractors during the execution of the Contract.

#### **1.10. Alterations and Additions**

No alterations will invalidate the Contract or absolve the Contractor from his responsibilities taken under the Contract. Eventual consequences in price and/or time of delivery in respect to any alteration should be settled in accordance with the Contract.

If the Contractor requires any reasonable alterations or additions to the Specifications and/or the plans/drawings approved by the Class, the Contractor may make such alterations or additions to the extent that such alterations or additions shall not involve a substantial change in the principal performance and characteristics of the vessel, provided always that the Contractor shall make a written request to the Owner for approval, and explain fully all consequences of the proposed alteration(s).

#### **1.11. Drawings, Schemes, Calculations and Manuals**

The Builder shall prepare all classification/statutory construction/working drawings and as fitted drawings and submit to Owner for approval.

The charges for the approval of the Classification drawings shall be borne by the Builder.

Before delivery of the vessel the Builder shall submit one set of good quality of transparent films and four prints of all drawings including "As Fitted" drawings.

Three sets of as fitted drawings (for structural, machinery, piping, outfitting and electrical), arrangement of withdrawal and installation of steerable, propulsion system, reports of various tests and inspections made, detailed lists of all standard and extra spare parts, inventory tools and additional tools, maintenance, spare parts and other instruction manuals, schemes, calculations, all test reports, trial reports, final trim and stability booklet, etc., necessary for the operation, maintenance and repair of the vessel shall be submitted to the Owner at the time of delivery.

The following drawings shall be plasticized / laminated, framed and fitted on board:

- General Arrangement Plan
- Life Saving Appliances Plan
- Capacity Plan
- Tank sounding chart
- Safety plan

- Bilge, Ballast and Fire Scheme
- Electrical key diagram
- Docking plan.

Three sets of instruction books, operation and maintenance manuals, spares, catalogues given by the original machinery suppliers for all the machinery and instruments installed shall be handed over to the Owner.

Three copies of the list of supplier of all the fittings and equipment used on board with their addresses and phone/fax numbers shall be supplied to Owner/Owner's representative.

Ship's book, an operating manual for the entire vessel shall be made and supplied.

### **1.12. Planning and Progress of Work**

Within 4 weeks after signing the Contract, a program of the complete design, preparation of drawings, building period, fitting-out and testing of the Vessel, with data of delivery of the principal parts, will be furnished by the Contractor to the Owner. As soon as a delay occurs in the progress according to this program, the Contractor will inform the Owner immediately and will take all necessary measures to correct this delay to the satisfaction of the Owner. A monthly progress report is to be submitted to the Owners.

### **1.13. Spare Parts, Inventories and Tools**

Inventories and tools shall be provided in accordance with the Builder's / manufacturer's standard supply. Manufacturer's recommended spares for 2000 hrs. operation to be supplied for major machineries and equipment without extra cost. Major machineries and equipment is to include Main Engines, Auxiliary Engines, Propellers and Anchor winch. List of spares to be supplied along with manufacturers recommendations to be forwarded on selection of major machineries and equipment to Owners for approval.

The parts shall be administrated, packed and preserved properly. Suitable racks shall be provided on board for storage.

### **1.14. Tests and Trials**

All tests and trials required for the vessel and her equipment shall be performed in compliance with the statutory/classification/Owner's requirements.

The Builder shall prepare and submit a detailed program of the relevant trials to the Owner and classification society for approval.

Any defect/shortfall pointed out by the surveyors/owner during the tests and trials shall be rectified by the builder at no extra cost.

All costs involved in conducting the trials shall be borne by the Builder.

The Contractor shall carry out the following tests and trials:

- a) factory or workshop tests (at manufacturers' premises)
- b) installation trials (shore tests at yard)
- c) technical trials
- d) checking and/or demonstration trials

in the presence of the representatives of the Owner/IRS, the Classification Society and other authorities when applicable. All test data and measurements have to be collected by the Contractor and these reports shall be submitted to the Class & Owner. Final reports is to be delivered in 3-fold.

Well in time before the tests and trials mentioned above are to be carried out, the Contractor shall prepare and submit detailed programs of the relevant trials showing methods, sequences, time schedules, characteristics to be measured, type of measurements, instruments etc. to the Class.

The costs of these tests and trials are for account of the Contractor, including those for additional measuring devices and means.

If under tests or trials any part of the Vessel fails to fulfill adequately the specified requirements, the faulty shall be altered, removed or replaced and the test shall be repeated at the Contractor's expense.

#### **1.14.1 Factory Tests**

All machinery equipment with diesel engines, alternators, gearboxes and winches, pumps, hydraulic components etc. shall be tested by the manufacturer prior to delivery to the shipyard (Contractor). If test conditions deviate from practical conditions, calculations (carried out by the manufacturer or Contractor) are to be added to the test reports, showing that the basic requirements regarding capacities, torque, power, revolutions etc. will be fulfilled. Instruments and measuring equipment are to be tested and calibrated at the manufacturers' workshops.

Reports of tests and calibrations to be submitted to the Classification Society and Owners for approval.

Testing of water tightness of steel constructions is to be carried out in accordance with the requirements of the Classification Society. Testing of welds for steel constructions is to be in accordance with the Class requirements.

#### **1.14.2. Installation trials**

When the Vessel is completely equipped to the satisfaction of both the Owners the Classification Society, the installation trials shall be carried out (at or near to the Contractor's shipyard). The Vessel with all installations, systems, equipment, winches, piping systems, hydraulic installations, electric/electronic installation, ventilation, etc. to be tested by the Contractor to prove their good working, capacities and characteristics, separately as well as simultaneously working with other installations.

These trials to include an inclining test for determination of weight, draught, trim and center of gravity etc.

#### **1.14.3. Technical trials**

Before commencing the technical trials, the Contractor shall prepare and submit a detailed trial program showing the method, sequence and time schedule of the trials to the Owner and Class for approval.

The Contractor shall perform the following tests and trials in accordance with the trial program approved by and in the presence of the Owner and Class with the Vessel at a trial draft of about 1.50 m with a load equivalent to half of the fuel and freshwater stores and with a minimum amount of ballast water in order to reduce the trim to about 0.15 m (by the stern):

- 1) Speed trials- with both propellers operating
- 2) Crash stop astern and crash stop ahead
- 3) Steering and turning tests
- 4) Maneuvering tests at slow speed
- 5) Endurance test of 2 hours sailing on 100% CSR
- 6) Anchoring test

#### **1.14.4. Checking trials**

Shortly before and after the transport/ shipment of the Vessel to the place of delivery the vessel has to be dry-docked in the presence of the Owners and Class for examination of the underwater part of the Vessel, for cleaning, restoring the paint system and when applicable for applying the last coat of paint.

#### **1.14.5 Welding**

The vessel shall be of all welded steel construction.

All openings and holes in the structure shall be made with the consent of the classification society and shall be suitably compensated for strength.

Welding shall be of high quality and shall be performed by skilled and classification society approved personnel. Necessary precautions shall be taken to eliminate deformations. All surfaces shall be cleaned from rust and grease before welding. Approved manual, semi-automatic or automatic welding techniques shall be adopted for the construction using coated electrodes of approved make. A regular x-ray testing as per classification society rules shall be carried out to test the standard of welds. Builder shall submit inspection and testing plan to the owner for approval.

#### **1.14.6 Tank Testing**

All tanks and watertight or oil tight compartments shall be tested in the presence of the Surveyor and Owner's representative and shall comply with the rule requirements. The tests shall be carried out after completion of the



construction and prior to commencement of painting. At the time of testing all welds at boundary surfaces shall be clean and free from primer/paint/oil etc. Immediately after testing these entire weld surfaces, which are cleared of any defects, shall be coated with primer/paint.

#### **1.14.7 Inclining Test**

Before the trials and with the vessel in a condition as complete as possible, an inclining test shall be conducted to ascertain the lightship displacement and center of gravity in the presence of Owner's representative, classification society and IWT surveyor. The inclining test report approved by classification society and IWT surveyor shall be made available to the Owner's representative.

#### **1.15 Delivery**

The vessel shall be delivered and accepted at Dhubri. After the trials and the approval of Owner and Classification Society of these trials with reports etc. the vessel shall be handed over to the Owner in a proper and clean condition with at least 50% of liquid stores on board. The costs of transportation, additional painting, checking trials and handing over and with the stores specified above shall be to the account of the Builder. All relevant documents, certificates, tools, inventories, spare parts etc. shall be on board at the time of handing over.

#### **1.16 Miscellaneous**

##### **1.16.1 Ship's Model**

Two nos. Ship's model of about one meter length painted to the same color scheme as the ship and placed in a glass box shall be supplied along with the vessel at the time of delivery.

##### **1.16.2 Photographs**

The Builder shall take photographs of the vessel at various stages of construction and shall submit them along with the monthly progress report and bills for stage payment to the Owner. On completion of the vessel, additional photographs shall be taken for framing purposes.

## **2. HULL STRUCTURE**

### **2.1. GENERAL**

#### **2.1.1. Introduction**

The scantling of the structural members shall comply with the Rules and Regulations of the Classification Society as far as no higher requirements are stipulated.

Good continuity of structural members in basic hull structure shall be maintained. Care shall be taken to obtain proper alignment of important structural members. Where members are discontinuous, the continuity shall be provided by means of suitable tapers, overlaps and/or brackets.

#### **2.1.2 Materials**

All materials used are to be of excellent quality. The hull will be constructed out of shipbuilding quality steel conforming to the rule requirements of the classification society and BIS (Bureau of Indian Standards). Structural steel of hull construction shall be Classification Society Grade 'B'/equivalent.

All structural steel shall be free from rust, pitting, cracks, laminations and similar defects. In case of any such defects being noticed, the plates etc. shall be renewed for the extent necessary to the approved quality/standards.

Large size steel plates shall be used for the construction of hull as far as practicable.

As required by the Class, samples of materials to be submitted for approval. If any material is used which has defects, or which is not considered suitable for the purpose intended, it must be replaced without loss of time and without compensation of cost for carrying out these replacements.

#### **Rolled steel**

Hull materials and further all rolled steel, to be tested to the rules of the Class, of which certificates have to be submitted. The steel must have good welding qualities and should have a carbon percentage not exceeding 0.2%.

Before the material is employed in the construction, rust and mill scale must be removed by means of steel grit or sand blasting according to class Standard. Immediately after the blasting, one coat of approved shop primer with a thickness of approx. **20** micron is to be applied as a temporary protection.

#### **Cast steel**

Steel castings only of first-class approved foundry and of approved design, properly annealed. Quality and testing in accordance with the rules of the Class. Castings must be free from blowholes or other defects.

All materials including casting and forging shall be of qualities complying with the requirements of the Classification Society.

## Bolts and nuts

All bolts and nuts to be of one approved standard. Metric thread is to be used throughout.

### **2.1.3. Preparation of materials and welding**

When steel plates are deformed during transport, these are to be faired by rolling before use.

Flanging of plates and brackets is generally not allowed. For bolts and rivet holes only drilling is allowed.

Doublings to be avoided as far as possible and where necessary, locally inserted thicker plates with well rounded corners are to be adapted.

Plates and rolled sections to be cleaned and preserved as described in 2.1.2 of the Specification. The blocks and panels shall only be placed on the berth after inspection and approval by the Class.

## Welding

All welding is to be of excellent quality. During the welding operations all necessary precautions are to be taken, so that welds of high standards are obtained. All surfaces are to be well cleaned and free from rust, paint etc. before welding has commenced. Plate edges are to be flame-cut mechanically as much as possible. Where possible, plates and sections to be interconnected by automatic welding methods. Overhead welding to be avoided as far as possible and therefore necessary provisions are to be taken for underhand welding where practical.

Manual, semi-automatic or automatic welding procedures for welding specific parts of respective steps in the process of assembling the structural blocks of the hull shall be selected in concert with the Classification Society.

A complete welding list is to be submitted for approval of the Class. In this list particulars are to be given, such as shape of welded joints, the manner of preliminary treatments, the dimensions of the weld and the type of electrodes to be used.

During the welding the relevant construction shall be dry. The welding to be performed with coated electrodes of approved make. Welders, especially those who are working on the main connections, must be qualified and regularly tested. A regular check of the quality of the steel by "X"-ray or similar methods to be carried out to the satisfaction of the Class. If considered necessary by the Owners representatives or specification surveyors and/or the Class, additional measures are to be taken by the Contractor to improve the quality of the welds.

Faults in welded connections to be repaired if possible or otherwise new constructions to be inserted. A total of at least 25 "X"-ray photographs are expected for an adequate check of the quality of the welds. The tests for welding are to be in accordance with the Class requirements and nondestructive testing (NDT), dye penetration tests and X- ray etc as required are to be carried out to the satisfaction of the Surveyors. Welded decks,

bulkheads, deckhouses and other constructions which are deformed by welding, to be faired in order to obtain fair work complying with high standard. On the berth, the hull and sections to be earthed adequately. Clamps, dogs and other means to bring material and equipment in the right position, to be removed in such a way that no visual marks and/or mechanical damage are left.

## **2.2. HULL**

### **2.2.1. Lay-out**

The hull shall be designed to meet the requirements for carrying trucks and passengers.

The lay-out of the hull shall be:

- aft peak
- steering gear compartment
- engine-room with some tanks
- bow thruster compartment
- store
- fore peak

All compartments shall be bordered by watertight bulkheads. The complete hull shall be built of steel according the longitudinal framing system.

### **2.2.2. Bottom construction**

The vessel shall have single bottom construction. The keel to be of a flat plate-type with a thickness of 2 mm more than the bottom plate. Longitudinal girders shall be fitted in the engine-room in such a way that they form part of the foundations for the main and auxiliary engines, otherwise longitudinal girders to be provided as required by the Class. A sufficient number of drain and air holes to be provided in floors and girders. The bottom construction at aft end shall be raised in such a way that they can accommodate the propellers. Bottom plating, floors, girders and brackets in way of the propellers to be of increased thickness and arranged in such a way that a sturdy construction will be obtained. At centerline at aft end, a double plate skeg to be constructed. Plate thickness in way of sea chest and bilge wells shall be at least 2 mm more than required by rules. Special attention shall be given to stiffeners under engines to minimize vibrations.

### **2.2.3. Shell plating and framing**

The scantlings of the shell plating to be determined as per the rules and requirement of Class.

#### **Stem and stern**

The thickness of the stem and stern plating will be equal to the thickness of the shell plating. Adequate stiffening to be provided. Plating of increased thickness shall be provided in way of ramps.

#### **2.2.4. Deck and beams**

The main deck shall be stiffened according the longitudinal system.

In way of the truck loading area, the stiffening is to be sufficient to withstand **20 feet container carrying truck load.**

There will be no Camber on the deck. However, equal sheer shall be provided at aft and forward of midship to align the ramp with the slope of the jetty as shown in the GA.

Local reinforcements shall be integrated in way of anchor winches, bollards, ramps, fairleads etc. The deck shall be locally strengthened adequately in way of deck fittings or deck machinery.

The construction, materials, arrangement and fittings in the accommodation spaces shall comply with the statutory requirements applicable to this class of vessel.

#### **2.2.5. Pillars and girders**

Girders shall be provided under the deck if required from the view points of the design of the Vessel. Reinforcement pillars shall be fitted in combination with, and at the same positions as the web frames.

Pillars shall be arranged such as to minimize obstruction to passage inside the engine-room.

#### **2.2.6. Bulkheads**

The vessel shall have transverse watertight bulkheads and the scantlings to be determined as per the rules and requirements of the Class. All bulkheads shall be vertically stiffened. Where pipes etc., are carried through the watertight bulkhead they shall be provided with necessary arrangements to the approval of classification surveyors.

#### **2.2.7. Foundations**

In the engine-room strong welded foundations shall be constructed for the diesel engines and for the generator set. These foundations are to be incorporated as much as possible in the bottom construction.

Foundations for deck machinery, winches etc. shall be executed with top plates welded on coamings and supported by a sufficient number of brackets. Where necessary additional supports under deck shall be provided. All auxiliary and deck machinery shall be erected on foundations. Suitable reinforcement shall be provided under the machinery. Thicker plating shall be provided under all heavy machinery on the deck.

#### **2.2.8. Cooling system & River chests**

The main engines to be heat exchanger cooled. The main parts of the cooling water system of the diesel engines shall be closed circuit unit built on the

respective engines. The river water for cooling is to be drawn from the river chests. At least two river chests shall be located at a suitable position in engine room for efficient suction at all loading conditions. It should be positioned in such a way to avoid intake of mud, sand etc., when the vessel is passing through shallow waters. River chests shall be covered with hinged/bolted gratings of stainless steel retained by stainless steel bolts. The clear opening area shall be at least 2 mm more than the shell plating in that region. Zinc or aluminum alloy anodes shall be fitted around river chests.

### **2.2.9. Hull openings**

Hull openings shall be provided for sea-inlets and valves. Where penetrations are made through the bottom or shell plating, such as sea-inlets, hull valves, hawse pipes etc. adequate compensations are to be made by means of inserted plates of increased thickness, corner plates or else, to the satisfaction of the Class.

## **2.3. DECKHOUSE AND WHEELHOUSE**

### **2.3.1. Deckhouse**

A deckhouse shall be arranged (as indicated in GA) in a way as to leave an obstruction free deck for stowage and passage of vehicles. The deckhouse shall be provided with at least two crew cabins for 6 persons and one cabin for Master and Driver, two crew toilets, galley, mess cum recreation room and at least four toilets for passengers. The deckhouse shall provide seating for at least 100 passengers. The scantling of the deckhouse to be in accordance with the rules and requirements of the Class and reinforced with stiffeners.

### **2.3.2. Wheelhouse**

A wheelhouse of adequate elevation shall be provided with clear all round visibility as indicated in the GA. The scantlings of the wheelhouse are to be in accordance with the rules and requirement of the class. The wheelhouse shall be provided with windows all around.

Effective drainage from all decks and top of the wheelhouse shall be arranged.

Doublers shall be fitted on decks in way of open drain discharges. Great care shall be taken to avoid water puddles on exposed decks.

## **2.4 Engine Room structure**

The engine room shall be suitably framed with floors in compliance with class rules. Main engine foundation shall be well integrated with the bottom structure. Main engine foundation shall be in accordance with the Engine Manufacturer recommendation and as per class requirements. Sufficient clearance shall be provided below the engine for easy cleaning and maintenance of sump.

Suitable reinforcement shall be provided under heavy concentrated loads with brackets or carlings.

Necessary chequered plate flooring, platforms and ladders shall be arranged in order to give access to machinery, etc. in all machinery. Workbench, racks for spares etc. shall be arranged at suitable locations in engine room.

Special attention shall be paid to minimize structural discontinuity in the machinery spaces.

## **2.5 Miscellaneous**

### **2.5.1. Tanks**

Where possible all tanks shall be provided with two manholes. All tanks shall be provided with the necessary air, sounding, filling, suction and other pipe connections. One spanner for each size and one spare plug of each size to be delivered. The number of each tank to be welded on the hull next to each drain plug. The extension of the tank to be indicated on the hull by welded marks.

### **2.5.2. Manholes and hatches**

#### **Manholes**

Each compartment shall be provided with as much (but at least two) manhole covers as needed to provide a good accessibility. The covers shall be placed in such a way that with opened covers, a good ventilation will be obtained.

Smaller tanks may be provided with one cover.

The covers shall have dimensions of at least 400 x 600 mm or as per class requirements. Thickness of the cover to be at least 10 mm and fixed on a welded coaming ring with tap bolts and nuts of stainless steel. Two thread holes for press bolts shall be provided in each cover. Vertical covers to be provided with handgrips. All covers shall be provided with oil resistant packing.

The tanks in the engine-room shall be provided with manholes in the vertical bulkheads.

Bilge water, sewage and freshwater bunkers shall be provided with manholes in the vertical bulkheads.

#### **Hatches**

The hatches shall be fitted for steering gear compartment entrance and emergency exit in engine-room. The entrance hatch to the steering gear compartment and the escape hatches to be of the hinged type with two adjustable hinges and a device for open position.

All hatches in watertight execution to be with rubber seal and hinged clamping bolts of stainless steel with brass butterfly nuts if applicable.

The hatch coamings to be with circular shape of sufficient height and with flat bar 75 x 16 on top. Cover plating shall have the same thickness as the main deck plating. Cover to be reinforced with flat bar stiffeners, provided with rubber packing and bolted to the coaming.

### **2.5.3. Ladders, railings and bulwark**

#### **Ladders**

Ladders shall be placed in way of each manhole under the entrance and escape hatches and in the store.

All ladders shall be fitted irremovably. Fixation lugs to be welded with square rungs and a width of 300 mm.

Ladders with double square rungs shall be placed in the engine-room entrance and for access to the wheelhouse. Width of these ladders to be 600 mm and hot galvanized after construction.

#### **Railings**

Railings shall be provided all around the wheelhouse.

Entrance ladder to wheelhouse including platform shall also be provided with railings. Further railings shall be placed where required.

Height of railings in general 1000 mm except in way of bulwark.

Railings shall be constructed of flat bar stanchions with a top rail of pipe diameter and with one intermediate rail of stainless steel wire of 10 mm diameter with stretching screws top rail and stanchions in galvanized execution.

#### **Bulwark**

A bulwark with a suitable height shall be placed on the ends of the ship. Bulwark of 6 mm plating with stanchions every 2000 mm and on top a pipe to be provided. Bulwark may be as shown in GA.

The bulwark at the deck corners (both Port and Starboard side) shall be provided with panama leads.

### **2.5.4. Bollards**

At least six double bollards to be provided on the main deck distributed on the port and starboard as shown in the GA. The bollards placed in heavy foundations with a height of about 200 mm. Total height of the bollards 500 mm. Deck construction in way of bollards shall be reinforced with increased plating thickness and extra stiffeners.

### **2.5.5 Steel doors**

Steel watertight door shall be provided on the passenger seating and crew accommodation entrance as shown in the GA. The door to be with a free



passage of 1800 x 700 mm and a threshold of 300 mm. Two adjustable hinges with grease nipples, six interconnected cleats and soft rubber sealing all around shall be fitted. One fixed light of 200 mm diameter with security glass, hook for open position and padlock eyes shall be provided. Padlock also to be delivered.

#### **2.5.6. Ramp**

Two ramps of suitable size (10.5 m x 6 m approx), one on each end, should be provided. Ramp should be designed so as to withstand the truck wheel loads.

The ramp shall be stowable in near vertical position (at least 75 degrees to Horizontal) and shall be capable of being lowered to the desired angle possibly up to 20 degrees below horizontal. The ramp shall be operated by hydraulic winches controlled by hydraulic power packs driven by electric motors.

Ramp should preferably be foldable type so that it does not impair the visibility. Non foldable alternative too may be proposed, however, it should not hinder with the visibility (having sufficient openings to give the visibility without impairing or endangering a smooth wheel movement on it).

#### **2.5.7. Name and draught marks**

##### **A. Ship's name and Port of Registry**

The ship's name shall be marked forward and aft port and starboard sides and transom.

The port of registry shall also be marked below the ship's name on the transom.

The ship's name in brass letter shall also be fitted on the wheelhouse, port and starboard.

##### **B. Draft marks**

The draft mark shall be marked in meters and decimeters by welded 6 mm thick steel plate figures at forward and aft perpendiculars and amidships on both sides.

#### **2.6. Hull preservation**

##### **2.6.1 General**

Painting specification giving details of painting and method of application shall be submitted to the owner for approval.

The colours of finish coats shall be in accordance with the Owner's colour scheme and those of primer coats shall be in accordance with the manufacturer's recommendations. Alternate coatings shall be of different

colours for easy identification. Pipelines shall be marked with a colour code system approved by the Owner.

Equipment, which the builder shall purchase, shall be painted according to each manufacturer's standard and the damaged part, after installation shall be touched up with one coat of finish paint of compatible kind.

### **2.6.2. Surface Preparation**

Surfaces of all structural steel plates and sections to be used for fabrication shall be sand or grit blasted to Sa 2.5 and immediately primed with inorganic zinc silicate type shop primer according to the Builder's standard.

Dry film thickness of shop primer shall be approximately 20 microns.

The steel surface of fittings such as pipe supports, grating supports, auxiliary machinery seats, etc. shall be sand blasted to Sa2.5 or pickling treated.

Pipes of over 250 mm diameter shall be blasted to Sa2.5 and pipes with 250 mm diameter and below, small pieces of pipes, seats etc. shall be power cleaned with wire brush or disc sander to St 3 or pickling.

Prior to the application of main system, all weld spatters, rust grease and other contaminants shall be removed by wire brushing from the surface.

The surface preparation shall be as per the following table:

<b>No</b>	<b>Location</b>	<b>Standard</b>
1	Bottom and boot top	Sa 2.5
2	Topside	Sa 2.5
3	Fresh water and Water ballast tanks	St 3.0 (Mechanical and power tool cleaning)
4	Weather deck	St 3.0
5	Deck house exterior	St 3.0
6	Cofferdam	St 3.0
7	Fuel oil and Lubricating oil tanks	St 3.0
8	Double bottom spaces and Cofferdams	St 3.0
9	Cargo Vessels	St 3.0
10	Void spaces	St 3.0

Prior to subsequent coats damaged areas due to burning and welding and prolonged exposure during fabrication shall be cleaned by abrasive blasting to Sa 2.5. Other spaces shall be power tool cleaned to St3.0.

### **2.6.3 Execution of Painting**

Painting work shall be executed in accordance with the Builder's painting practice and paint manufacturer's recommendations. Copper alloy, aluminium, aluminum alloy, stainless steel, non-ferrous material and galvanized surfaces shall not be painted unless specifically required. Time intervals between applications of coats shall have different colours for identification. No painting

exposed to weather shall be carried out in adverse weather conditions. Application shall be done with the help of airless spray as far as possible. Where spraying is not practicable, brush or roller shall be employed.

Record of temperature and humidity shall be maintained during the painting work and submitted to owner.

Before launching, the outside hull below the waterline shall be painted with sufficient coats for adequate protection. Non-slip paint shall be applied on the main deck open areas and passage.

Dry film thickness shall be measured by magnetic dry film gauges or equivalent in the presence of owner and paint manufacturer. Thickness shall be measured after completion of anti-corrosive coatings and/or the final coating in accordance with Builder's practice to Owner's approval.

On the edges of small holes such as slots, drain holes, scallops, irregular manual weld beads and corners of flame cut free edges of structures, air holes, etc one additional stripe coat shall be applied before or after the classification society coat.

Builder shall provide three years guarantee for painting work carried out on under water area, ballast and fresh water tanks.

#### **2.6.4 Paint scheme**

Painting scheme in general shall be as given below (painting scheme for parts or spaces, which are not specified, shall be similar to surrounding space or comparable spaces):

<b>Sl. No.</b>	<b>Location</b>	<b>Painting specification</b>	<b>Dry Film Thickness (Microns)</b>	<b>Number of coats</b>
<b>A.</b>	<b>OUTER HULL</b>			
1.	Bottom, Underwater hull upto deep load line, Bilge keel, Sea chest,	Epoxy primer Coal Tar Epoxy Coal Tar Epoxy Chlorinated rubber sealer coat Conventional Anti-fouling Conventional Anti-fouling	25 100 100 30 100 100	1 1 1 1 1 1
2.	Top side area including bulwark outside	Epoxy primer Coal tar epoxy Chlorinated rubber sealer Chlorinated rubber finish	25 100 30 30	1 1 1 2
3.	Bulwark Inside	Zinc rich primer Zinc rich primer	40 40	1 1

		Alkyd deck paint	30	2
4.	Vessel Name, Port of Registry, Hull markings	Alkyd gloss finish	30	2
<b>B.</b>	<b>TANKS</b>			
1.	Fresh water tank	Epoxy primer Pure epoxy	25 100	1 2
2.	Fore peak tanks/Water ballast tanks	Coal tar epoxy Coal tar epoxy Coal tar epoxy	100 100 100	1 1 1
3.	Oil tanks	Red brown epoxy and	One coat of respective oil	
4.	Aft peak and other void spaces	Bituminous solution	80	1
<b>C.</b>	<b>EXPOSED DECKS AND SUPERSTRUCTURE</b>			
1.	Exposed steel decks including wheelhouse top and 150 mm dados around all deck structures and machinery seats on decks.	Zinc chromate primer Zinc chromate primer Non-skid alkyd deck paint	40 40 40	1 1 2
2.	Outside exposed bulkheads, superstructure, handrails, stanchions, stays and ladders.	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish Alkyd Gloss finish	40 40 40 40	1 1 1 1
3.	Port light screen	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish Alkyd Gloss finish	40 40 40 40	1 1 1 1
4.	Standard light screen	Zinc chromate primer Alkyd Gloss finish Alkyd Gloss finish	40 40	1 1
5.	Masts, Davits etc.	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish	40 40 40	1 1 2
6.	Chain lockers, hawse pipe, anchors, chain cables	Bituminous paint	125	1
7.	Deck fittings such as bollards, towing post, fairleads, towing post, fairleads, deck rollers, other mooring fittings	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish	40 40 40	1 1 1
<b>D.</b>	<b>INSIDE ACCOMMODATION</b>			

1.	Internal Steel bulkheads and deck heads (uninsulated), Store spaces	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish (White) Alkyd Gloss finish (White)	40 40 40 40	1 1 1 1
2.	Internal steel bulkheads (Insulated area)	Bituminous paint	80	1
3.	Flooring area	Bituminous paint	80	1
4.	Wet spaces in accommodation area like mess, galley, pantry toilets and showers.	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish (White)	100 40 80	1 1 1
5.	All wood work	Varnish		2
<b>E.</b>	<b>ENGINE ROOM</b>			
1.	Above chequered plate level in engine room, deck and overheads	Zinc Chromate primer Zinc Chromate primer Alkyd paint (White)	40 40 40	1 1 2
2.	Engine room – below chequered plating including floors and girders	Zinc metal spray Epoxy primer Bituminous	100 25 80	1 1 1
3.	Machinery seats, bilges of other spaces	Bituminous	80	1
4.	Main Engine	Zinc Chromate primer  Oil and Heat resistant paint	40  40	2  1
5.	Exhaust pipe, Inside of Funnel	Heat resistant paint	25	2
6.	Fire pump, fire main and hydrants	Epoxy primer  Zinc Chromate primer  Oil and Heat resistant paint	40  40 25	1  1 2

The builder may propose alternate painting scheme and submit for Owner's approval.

Inside of fuel oil tanks, lubricating oil tanks and other tanks for oils shall be treated with the oil carried in them.

### **3 EQUIPMENT AND OUTFIT**

#### **3.1 GENERAL**

This paragraph of the Specification contains the descriptions of equipment and outfit of the vessel, except those concerning machinery installation and electrical installation.

All requirements laid down in other paragraphs are also valid in this paragraph as far as applicable. The requirements regarding painting are also valid for the constructions and equipment.

#### **3.2. ANCHORING AND MOORING EQUIPMENT**

The anchoring and mooring equipment to be in accordance with the requirements of the Class as long as no higher requirements are specified hereafter. Subject to the acceptance by Class, our preference shall be for following type of arrangement.

##### **3.2.1. Anchors, chains and wires**

Two (2) sets of standard stockless bower type anchor shall be provided symmetrically about centre line of the vessel with anchor ring swivel according to the requirements of classification society on each end. Anchor chain cable shall consist of intermediate length, which shall be jointed with Kenter type shackle, and total length of chain shall be 12.5M long and at the other end it will be connected to a wire rope of matching strength and will be wound on the winch drum of each of the 2 Anchor Winches. Total length of the wire shall be based on the maximum depths of the river encountered and subject to class acceptance.

##### **3.2.2 Mooring wires**

Four mooring ropes of synthetic material with length and breaking strength according to the class requirements to be delivered.

##### **3.2.3. Anchor Winch**

On the deck two electrically operated anchor winch to be installed, one for each anchor at both ends. Winch shall also be suitable for manual operation in emergency. The anchor winch to have one Wire Drum and a warping head to stow the wire.

#### **3.3. VENTILATION**

##### **Natural ventilation**

All spaces and compartments which are not connected to a mechanical ventilation system shall be provided with natural supply and exhaust means.

Fuel oil tanks, water ballast tanks, sewage tank, bilge water tank and freshwater tanks shall be provided with ventilators.

Other spaces as specified hereafter:

- for steering gear compartments, the space shall be provided with two 250 mm diameter goosenecks
- for main store, the space shall be provided with two 250 mm diameter goosenecks
- for crew's accommodation two 300 mm diameter mushroom ventilators on top deck

All goosenecks shall be galvanized after welding and provided with non-corrosive wire gauze.

In each space half the number of goosenecks shall be lengthened down to 200 mm above floor level.

Where necessary fire isolating flaps shall be fitted at the openings.

### **Mechanical ventilation**

The crew's accommodation shall be provided with fixed mounted oscillating fan. Fan capacity at least 1600 m<sup>3</sup>/hr, two speeds and oscillating 85 degrees.

Engine room natural exhaust in funnel shall be fitted with balanced fire flaps. Flaps shall be easily operated from outside the machinery space and "open" – "shut" nameplates shall be fitted at all operating handles. Other fire dampers shall be provided as required by the rules. Engine room ventilation system should cater for forced exhaust of spaces when required.

Emergency stop switch for Engine Room fans shall be arranged as required by the classification rules. The ventilation system shall be provided for Engine Room by mechanical supply or exhaust system capable of giving the required rate of air changes per hour to meet rule requirements. Ventilation heads shall be of mushroom or wall mounted louvers depending upon the final design and layout. A vent hood with stainless steel grease filter and exhaust fan shall be fitted over cooking ranges.

## **3.4. DECKHOUSE AND WHEELHOUSE**

### **3.4.1. General**

A deckhouse with accommodation for 100 passengers with seating for 100 passengers with at least 4 toilets, i.e. at least two gents' water closet, three gents' urinals and two ladies toilet shall be provided. Accommodation shall also be provided for 8 crews (1 Master, 1 Driver and 6 crew) in at least two crew cabins with double tier berth and one cabin for Master and Driver, separate toilets for crew and officers (at least one for each), galley and mess cum recreation room shall be provided as shown in the GA. The relevant statutory rules regarding construction, material, space and fireproof partitioning shall be compiled with.

All accommodation spaces shall be designed to have a clear height of 2000 mm.

#### **3.4.2 Crew Accommodation**

Accommodation for the vessel's crew shall be provided in accordance with the Model Rules for Inland Vessels. The furniture and other fittings shall comply with crew accommodation rules. Forced air supply ventilation system is to be provided. The cabins shall be adequately furnished.

#### **3.4.3 Mess and Recreation**

Separate mess cum recreation spaces for crew shall be provided. The mess rooms shall be equipped with sufficient number of chairs, tables and fans. One coloured 32 inch LED Television set and 1 no. 300 L capacity fridge shall be provided. One no. drinking water cooler shall be provided in the galley. The drinking water cooler shall have a capacity of 30-litres.

#### **3.4.4 Galley**

Galley shall be equipped with one complete set of galley equipment, which shall include equipment as listed below. The quantity of cutlery and crockery shall be adequate for the total number of crew with 20% excess as reserve. Drain shall be via galvanized perforated top plate. Forced air supply ventilation system is to be provided.

Cooking range with 2 hot plates	- 1 No.
Water boiler	- 1 No.
Oven	- 1 No.
Stainless steel sink	- 1 No.
Wooden desk	- 1 No.
Wooden cupboard	- 1 No.
Cutting table	- 1 No.
Refrigerator	- 1 No. (300 lit.)
Water cooler	- 1 No. (30 lit)
One RO FW unit	
One complete set of utensils shall be provided for the preparation of food.	

#### **3.4.5 Toilets**

All the toilets shall be furnished in accordance with the rules.

Two toilets, with one Indian WC and one European WC made of china clay and shower, for the ship's crew shall be provided. At least four toilets shall be provided for the passengers.

All the toilet fittings shall be provided as per rules and shall be approved by the Owner. All toilets shall be provided with sleek and rugged storage flush tanks and shall be properly secured. Toilet shall have mirrors fitted over the washbasin with lockable cupboards, cloth rails/hooks and towel rails.



#### **3.4.6 Wheel house**

Wheel house to be positioned preferably at midship with console at the centre of wheelhouse for the ease of operation. The wheelhouse shall be of all welded steel construction and provided with equipment as listed in the equipment list. Clear view shall be provided by means of large windows. At least two wall fans shall be provided. Clear view screens shall be fitted in the forward side. One no. straight-line wipers shall be provided. The windows will be arranged to provide clear view on all sides including front and back. Some of the windows shall be of openable type.

One no. split AC of 1 t or 1.5 t capacity shall be provided in the wheelhouse. The wheelhouse shall be provided with enough space. The wheelhouse console shall be adequate in size to accommodate all controls and display units/ meters. Wheel house shall be provided with sofas and seats to enable seating of at least 8 persons.

Further the following equipment shall be provided in the wheelhouse

- one sets of roller blinds and curtains
- one portable fire extinguisher
- one VHF-set
- one clock
- one double coat hooks
- one window wipers
- one clear view screen
- one manoeuvring desk- one settee
- one helmsman's chair
- one corner cupboard
- one chart rack against ceiling - one binocular box

#### **3.4.7 Flooring & Deck Covering**

The steel deck shall be covered with deck compound of approved type. In the accommodation spaces, wheelhouse, passage ways and the mess rooms, vinyl tiles shall be laid over the deck compound. The Galley, toilets and other wet spaces shall be cemented and tiled with unglazed antiskid tiles on the floor and matching glazed tiles on the walls up to a height of 1 meter. All decks shall have provisions for drainage of water through scupper pipes.

#### **3.4.8 Partition Bulkheads, Lining & Ceiling**

The ceiling, paneling and partitions shall be applied as per rules with marine quality and heat resistant plywood/material.

The accommodation spaces shall be insulated against heat and cold. All accommodation spaces, mess rooms, wheelhouse shall be lined on the sides with panels with removable beading all-round. The colour of the ceilings and paneling shall be of owner's choice.

The accommodation and the walls between the engine casing and the engine room shall be well insulated with fire retardant materials.

#### **3.4.9 Insulation**

The portion of the compartment facing weather shall be insulated in accordance with the statutory rules.

In place where rules for insulation against fire, heat and sound shall be applied at the same time, only the highest insulation thickness need be applied.

#### **3.4.10 Doors, Windows and Scuttles**

All doors shall be of such construction, finish and operation so as to suit their location and purpose.

The sill height of doors shall be in accordance with the requirements of Classification society/statutory rules as applicable and the clear heights of door openings for all cabins and public spaces shall be 1900 mm from the steel deck to top of the opening.

All doors shall be provided with suitable doorstoppers and securing arrangements. Door eyebrow shall be provided over exposed weather doors.

Windows and scuttles shall be provided as per BIS where applicable. Where steel plate is cut to fit the windows/scuttles adequate compensation shall be provided.

The type, size, location and number of doors, windows and scuttles shall be as per approved plans. All wheelhouse windows shall be selected so as to minimize heat transfer.

All door openings exposed to weather shall be provided with additional doors with mosquito nets.

#### **3.4.11 Furniture and hardware**

##### **Furniture**

Furniture shall be of good marine quality veneered plywood or hardwood, with massive framework. In double berth in the crew's accommodation berth of plywood bottoms and drawers under the lower berth shall be provided. Berth to be provided with foam mattresses with dimensions 1900 x 850 mm.

The chairs with steel frame and upholstered with foam rubber and cloth. For the helmsman a swiveling chair with arm rests and adjustable in height shall be delivered.

##### **Hardware**

Hardware shall be of non-corrodible heavy construction. Day and night locks shall be placed on crew's accommodation and wheelhouse doors. Good quality locks to be provided with three keys.

Steel doors and hatches shall be provided with padlock-eyes and brass padlock with hardened steel eye. Doors, hatches, lockers and drawers to be numbered and keys to be labeled with stainless steel label with number and vessel's name. Key locker shall be fitted in the control cabin.

Doors, Doors of lockers, cupboards and other furniture shall be fitted with good quality hinges. Door catchers with rubber stops of robust construction shall be fitted on the doors. Wheelhouse door with hook for open position.

Above all doors, on valves on air, sounding and filling pipes, on air caps etc. name and number plates shall be fitted. Plates of stainless steel or brass. The necessary warning and instruction plates shall be fitted, where required.

#### **3.4.12. Desks and instruments**

At the forward of the wheelhouse the manoeuvring desk shall be placed.

The desk to contain all necessary instruments for control of engines. Also the lighting panel to be incorporated in the desk.

The desk with sloping top plate shall be constructed of durable materials and first class finished.

Switches for searchlight and window wipers shall be placed in the vicinity of the apparatus.

#### **3.4.13 Lights**

Adequate lights to be provided in the accommodation and wheelhouse spaces. The lighting fixtures to be of reputed make.

#### **3.4.14 Miscellaneous**

Sign, symbols and markings shall be provided in the accommodation spaces. All cabins/stores/utility spaces shall be provided with engraved nameplates of approved quality. All open areas shall be suitably lighted.

All beds shall be provided with high density foam mattress of 100 mm thick. Mattress cover shall be of cotton fabric, the samples of which shall be approved by the owner.

### **3.5. STORES**

Stores shall be provided in the hull, at least a general store.

Racks to be placed with a breadth of 900 mm and in two tiers.

#### **Racks**

Further hooks and rods for tackles and ropes shall be fitted.

The general store shall be provided with a 38 mm wooden floor directly mounted on the steel floors.

### **3.6 MAST**

The mast will be of collapsible type and will be suitably located on the wheelhouse top and stiffened adequately. The mast shall be provided with necessary arrangements for installing the navigational lights, and yards for hoisting flags and signals. Lowering of the mast shall be with help of a small hand winch. The mast is to be stayed. The height and location of the light masts shall comply with the relevant rules.

### **3.7. NAVIGATIONAL EQUIPMENT**

The following navigational equipment shall be provided and installed:

- one VHF-set in wheelhouse
- two searchlight on top of wheelhouse
- one electric horn
- one Public Address system for Master in Wheel house

### **3.9. LIFE-SAVING EQUIPMENT**

Life-saving equipment shall be delivered according Class, model rules and statutory authorities sufficient for 200 passengers and 8 persons.

The equipment shall be stored and fitted on convenient places in at least the following numbers:

- 1 inflatable raft for 8 crew.
- 10 inflatable rafts of 20 person capacity
- 200 life jackets stowed in a g. r. p. box placed in concert with the Class
- 1 safety hammer in the wheelhouse
- 8 round shaped life-buoys, two with a floating line of 30 m, fitted on the control cabin and two fitted on aft ship

### **3.10. FIRE-FIGHTING EQUIPMENT**

The fire-fighting equipment to be in compliance with the statutory requirements and at least the following of approved make and type shall be delivered and fitted:

- One Power Driven Fire Pump
- One Hand Operated Fire Pump
- Four portable extinguisher, 9 litre chemical foam
- Six portable extinguisher, 5 kg dry powder
- one spare re-fill for each extinguisher.

## **4 MACHINERY INSTALLATIONS**

### **4.1 General**

All the engine room units shall be of marine grade and the installation shall be in accordance with classification society and other statutory requirements.

Engines shall be provided with control from engine room and wheelhouse. The engine room and other machinery rooms shall be mechanically ventilated.

### **4.2 Propulsion machinery**

#### **4.2.1 Main engine**

Two marine grade, fuel efficient, turbo charged diesel main engines of reputed make as required for achieving the speed stated in this document in the ambient conditions specified in 1.2.1, suitable for continuous operation at rated power shall be provided. The engines are to be compatible to the selected propeller system.

The engine shall be compact and of low weight as possible and shall be generally maintenance free. Necessary spares and after sales service for the engines shall be easily available in India.

The engine shall be complete with standard accessories, alarms and instrumentation meeting class requirements.

In addition, the following shall be provided:

- a) Silencers with spark arrestor.
- b) Closed circuit lubricating oil system with engine driven pump.
- c) Monorail with chain blocks over engines for servicing, adequate for handling heavier engine parts
- d) Fresh water, River water, F.O. and L.O. pumps.
- e) Gauges, thermometer, tachometers, flow meters for fuel oil, hour meter, pyrometers, etc.
- f) Heat exchangers for main engines and gearbox shall be of close circuit engine cooling.

Each engine is also to be equipped with:

- An AC-alternator with voltage regulator for charging batteries.
- Remote start/stop/speed control from engine panel in wheelhouse.
- Manual speed control on engine site.
- Electric transmitters for remote indication of engine speed, lube oil pressure and fresh cooling water temperature.
- Electric indicators for mounting in manoeuvring desk in the wheelhouse.
- Electric transmitters for low lube oil pressure alarm and high cooling water temperature alarm.
- Automatic stopping device at overspeed and low lube oil pressure.

- An electric diesel engine hour counters for mounting in the wheelhouse desk. Speed, clutch and brake control must be possible locally as well as remote from the steering desk.

The shop test of the propulsion diesel engines shall be carried out as per the requirements of the Classification society. The engines shall be tested in the presence of the Surveyor in the following manner:

- 4 hours continuously running at 100% load at rated speed
- 1/2 hour running at 110% load
- 1/2 hour running at 75% and 50% each of the rated speed with a load according to the propeller law
- 1/2 hour running at idling speed.
- Specific fuel consumption to be charted for each of the above running ranges.

Governors tests and safety functions shall also be performed. Shop test data and certificates shall be supplied. While testing the engines at shop floor, all fittings constituting the total supply of the engines shall be actually installed. Subject to satisfactory tests, the engines shall be numbered and stamped.

The propulsion systems shall be free from all vibrations throughout the entire working range.

The following items, common for both engines, shall be provided.

- a) Sets of Standard and Special tools and gauges for servicing, including tools for turbo-chargers, as recommended by manufacturer of engine.
- b) Crankshaft deflection gauge.

#### **4.2.2. Propulsion shafts**

Propeller shafting is to consist of intermediate and tail shaft with rigid type couplings flanges. The diameter of intermediate shaft is shall be increased by 3mm in way of shaft bearing. Tail shaft dia shall be 3% in excess of class requirements. No. of steady bearings are to be provided depending on final length and torsion vibration characteristics; with each bearing having its own lubrication system. Stern tube bearing shall be white metal lines and oil lubricated type.

Stern tube seal forward and aft assemblies shall be of approved type. Seal liners shall be of high chromium steel and housing shall be cast bronze. The aft seal is to have a circulatory type lubrication system.

#### **4.2.3 Propellers**

The vessel shall be equipped with two conventional propellers of reputed make. Strength of the fittings of the propeller system shall be in accordance with the classification society and shall be designed for the maximum vessel speed corresponding to the MCR of the Main Engine.

The propellers shall be suitable of a continuous power on the input shaft of about 20% in excess of the maximum continuous rating of the diesel engines at rated engine speed or as per the recommendation of the manufacturers and class requirements. The propeller shall be directly driven by the main engine.

The propeller units will be provided with an integrated lubrication system with built-in circulating pump and necessary arrangements for maintaining the lube oil pressure.

The conventional propeller is to be provided with a 4-blade propeller.

Necessary controls/ Alarm panels shall be provided in the engine room and the wheelhouse as applicable.

#### **4.2.4 Steering Gear**

One set of electro – hydraulic piston type steering gear shall be installed in steering gear room. The steering gear shall consist of one set of hydraulic power unit, integrated oil pipe, etc. Both the tillers arms shall be connected to the hydraulic ram and each tiller arm shall be operable independently.

All parts of steering gears will be designed and equipped in accordance with the requirements of Rule / Regulations.

The steering gear shall be capable of turning the rudder from 35° on one side to 35° on the other side within 28 seconds with the one (1) power unit with the vessel at its designed draft and running ahead at maximum ahead service speed.

The steering gear shall be capable of turning the rudder from 35° on one side to 35° on the other side.

The hydraulic pump shall be started/ stopped in the wheel house and in the steering gear room. The steering gear will be connected to the control unit in wheel house. Means shall be provided to prevent the rudders going in opposite direction.

#### **4.2.5 Bow thrusters**

One (1) fixed pitch type bow thruster of suitable capacity shall be provided in the forward part of the vessel. The thruster tunnel shall be provided as necessary. Stainless steel lining shall be provided in way of the thruster blades. The bow thruster shall be directly driven by diesel engine of approx. 100 hp capacity. The bow thruster shall be controlled from the wheel house.

#### **4.2.6 Duct for Bow Thruster**

Connection with shell plating shall be well rounded. Sides of opening shall be well faired in to shell plating. Protective grids shall be provided.

### **4.3 Diesel Generator Sets**

One auxiliary engines of reputed make coupled with alternator sets of 65 KVA and 10 kVA capacities each shall be provided. All necessary controls shall be placed at a common control panel for the gensets.

Engines and alternators shall be shop tested as per classification rule requirements.

During shop trials and during load test of generator after installation onboard, governor tests shall be carried out and instantaneous change in speed/frequency shall be noted. The tests shall be done for sudden changes in loads from 0-50%, 50% - 100% and 100%-0. Observations shall also be made regarding the initial and the final speeds of the DG set. Engine and alternator shall be shop tested together for at least two hours at 100% load, followed by a run at 110% load during half an hour.

The engine shall be equipped with standard and special tools and accessories as per manufacturer's recommendations/Class requirements - The standard mounted instrumentation, but at least a tachometer, a running hour counter, a lube oil pressure indicator and a fresh cooling water temperature indicator. Alarms on low lube oil pressure and high fresh cooling water temperature. Automatic stopping device at overspeed and for low lube oil pressure. Freshwater, river water, F.O., L.O pumps and heat exchangers shall be engine mounted.

The auxiliary set to be built together on a rigidly constructed common base-frame and the complete unit to be fitted to ship's foundation via anti-vibration mountings.

### **4.4 Engine Starting**

Main engines and Auxiliary Engines shall be Battery started and for this purpose adequate number of batteries as per manufacturer's recommendations shall be provided in the engine room as per class requirements.

### **4.5 ENGINE ROOM SYSTEMS**

**4.5.1** All piping systems shall be installed such that satisfactory functioning of the installations shall be possible in accordance with the rules of the classification societies, statutory bodies and relevant standards. They shall be installed together with all fittings such as flow control valves, cocks, filters, pressure gauges, thermometers, etc. according to the practice of the yard, and approved by the Owner.

All ship service piping systems shall be installed and tested in accordance with the requirements of the class/ Statutory bodies.



All galvanized pipes shall be hot dipped galvanized after fabrication has been completed. Minor damages during installation shall be touched up by zinc paint. Piping in oil tanks shall not be galvanized.

Steel pipes and pipe ends on the machinery shall be blanked prior to final installation.

After completion of fabrication work all lubricating oil pipelines and fuel oil pipelines from daily service tanks to the consumers shall be pickled, oiled and blanked prior to final installation.

The pipes shall be carefully clamped and where necessary fitted with suitable draining arrangements for locations where the liquid is likely to stagnate. Clean plugs shall be provided in domestic and sanitary pipes, which are likely to be choked.

All piping in machinery spaces shall be marked with a coloured ring, to an approved colour scheme, to denote the nature of fluid or gas passing through it.

Remote controls from wheelhouse for valves/ pumps shall be fitted as necessary.

All valves, pumps, vent/sounding pipes shall be fitted with engraved brass nameplates in respect of their duty. Where required for their duty flexible pipe connections shall be used.

Where necessary piping may pierce girders or any structural members provided that these structures are sufficiently compensated in accordance to classification requirements.

Non pressurized pipes such as sounding, vent, scupper, etc shall be inspected by fill up and / or flow test.

#### **4.5.2 Exhaust System**

All diesel engine exhaust gas pipes shall be made of steel fitted with expansion bellows and shall be rigidly secured with brackets. Mild steel flanges shall be provided. All exhaust gas pipes shall be led to the transom after mixing with cooling header of main engines.

All precautions shall be taken to eliminate heat radiation from exhaust gas pipes to the surrounding areas and exhaust fumes shall be led away from the accommodation. Maximum total resistance in exhaust pipes shall not exceed the requirements of engine manufacturer.

Exhaust gas pipes from all the engines shall be led to atmosphere through the silencers and spark arrestors. Exhaust pipes from all the engines shall be insulated by rock wool with adequate thickness and fastened by galvanized steel wire and finished with galvanized sheet.

#### **4.5.3 Fuel Oil System**

Main propulsion engines, auxiliary engines, and other diesel engines shall use HSD oil.

One no. gear/screw type electric driven fuel oil transfer pumps of about 2 m<sup>3</sup>/hr capacity at 2 bar head with suction and delivery connections shall be provided for transferring fuel oil from bunker tanks to the daily service tanks. The pumps shall also have connections to transfer fuel oil between bunker tanks. A hand pump shall be installed as stand-by.

Day tanks shall be provided with high and low level alarms and shall be equipped with waste tray and drain. Overflow and oil level gauge shall be provided.

All fuel oil pumps shall be capable of being stopped from main deck. The control position shall be such that it will not be likely to be rendered inaccessible by a fire in the engine room. Isolation valves shall be provided as necessary.

Fuel oil/ Lube Oil bunkering lines shall be provided with manifold on main deck port and starboard. Drip tray/ coaming shall be provided to contain spillage

A set of hoses of suitable length to be stored on the main deck. Type and size of couplings according to local standards.

#### **4.5.4 Lubricating Oil System**

Each main engine, gearbox and auxiliary engine shall have its own independent lubricating oil system.

One storage tank of suitable capacity shall be provided in the engine room to cater to the requirements of Main Engine, Auxiliary Engine and Gear Boxes.

Drawing arrangement of lube oil from main engine may be provided through pipeline.

As far as possible all systems should use the same lubricant. The Yard will be required to furnish a list of lubricants to be used on machinery and equipment installed on the Vessel, in accordance with the manufacturers' recommendation

Loose tanks for lube oil storage and dirty oil shall be installed in the engine-room, each having a capacity of approx. 0.2 m<sup>3</sup>, as well as a L.O. service tank provided with a tap-cock and drip tray for filling oil cans and having a capacity of 0.05 m<sup>3</sup>.

Semi-rotary type hand pumps shall be installed for filling the oil sumps of the diesel engines and for emptying the dirty lube oil tank.

All piping to be made with steel tubes.

#### **4.5.5 River Chests**

At least two adequately sized river water inlet chests shall be provided in the engine room, integral with vessel's structure, each sufficient for total required river water capacity. Each inlet chest shall be provided with stainless steel gratings. The inlet chest shall be provided with vent pipes to the prescribed height above the freeboard deck.

#### **4.5.6 Cooling Water System**

The main parts of the cooling water system of the diesel engines shall be closed circuit unit built on the respective engines. The connected piping shall be of seamless steel tubes with diameters such that the flow velocity will be not more than 2.5 m/sec.

#### **4.5.7 Bilge/Ballast/General Service/Fire Fighting System**

Two nos. pumps to be provided for the purpose. The bilge/ ballast/ general service/ fire fighting system are to comply with the rules and requirement of classification society. The pump shall be of the self-priming centrifugal type and will have a capacity of 35 m<sup>3</sup>/hour at a pressure of 3.5 bar. Furthermore three hand driven bilge pumps to be installed, two in the engine-room and one in the store. Bilge system shall be equipped with necessary mud boxes. Ballast tanks shall be ballasted and deballasted by these pumps. An auxiliary bilge system equipped with hand pumps shall be provided for chain lockers, forward stores & steering gear compartment.

The bilge system shall be arranged with a valve manifold in engine room and pipeline of dimensions according to classification requirements.

Fire fighting connections shall be arranged on deck and engine room satisfying classification / statutory regulations.

An emergency fire pump shall be provided in the forward stores in an appropriate location.

#### **4.5.8 Sanitary Water System**

A sanitary water system conforming to class requirements to be provided in the vessel. At least two nos. 500 litre tank for sanitary water system to be provided at suitable locations. Necessary filling arrangements to be provided. River water connection shall be supplied to all toilet flushes, toilets and galley. Supply of river water to the overhead tank shall be through pump.

An electrically driven freshwater supply pump to be installed in the store. A discharge connection on the main deck to be provided including a set of hoses and storage reels. Type of coupling according to local standards.

#### **4.5.9 .Domestic Fresh Water System**

Fresh water storage tanks of total capacity of about 5 tons shall be provided for catering to the requirements of the crew.

One fresh water overhead tank of 250 lts. capacity shall be provided. Fresh water pump of  $2\text{ m}^3/\text{hr}$  @ 2 bar shall be provided for transferring fresh water from storage tank. One semi rotary hand pump shall be provided as stand by.

Fresh water connections to Galley, Mess, Water coolers etc. shall be passed through UV sterilizers.

#### **4.5.10 Sewage System**

All scupper pipes with the inlet opening on or below-waterline level and all waste pipes shall be drained into a sewage collecting tank with a capacity of approx.  $3.5\text{ m}^3$  which is to be constructed at a suitable location.

Inside the tank a spray flushing pipe to be fitted connected to the discharge system of the general service pump.

A sewage discharge pump for emptying the tank to the general collecting tank shall be installed. The pump to be with a capacity of approx.  $2\text{ m}^3/\text{h}$  at a pressure of 2 bar. The pump to be provided with dry running protection.

#### **4.5.11 Scupper and waste pipes**

All piping to be executed conforming to the sizes and materials as per the class requirements. Waste pipes from shower, sink, washbasin etc. to have an inner diameter of not less than 35 mm and waste pipes from the toilet to have an inner diameter of not less than 100 mm and shall be connected to the sewage tank.

An emergency direct to overboard connection to be provided. Scuppers shall be so arranged that good drainage will be ensured at every spot. Scupper inlets on open decks to be provided with a welded steel grid. Horizontal pipes to be fitted with a slope to outboard. Pipes which are draining directly to overboard must have the same wall thickness as the hull at that spot.

All pipes to have sufficient cleaning possibilities fitted on easily accessible spots. All cleaning plugs to be of stainless steel.

#### **4.5.12 Filling, vent and sounding pipes**

All pipes on water tanks and dry compartments to be of galvanized steel. For pipes on oil tanks only the parts above open decks to be of galvanized steel. Upper ends of pipes to be clearly labeled.

Filling connections at least 300 mm above deck, suitable of coupling of standard supply hoses, to be shut off with blind flanges. Filling connections for fuel oil to be arranged together with a drip tray.

All built-in and loose tanks to be provided with a vent pipe, connected to the highest point of the tank.

Vent pipes of fuel tanks with flame-preventing safety gauze meeting the Class requirements. Vent pipes of the sewage tank aft to be drawn up to the top of the funnel.

Where possible, level gauges to be fitted. All built-in tanks to be provided with a sounding pipe. The upper ends shut off with a screwed bronze cap, attached to a chain.

Tanks in the engine room to be provided with a short sounding pipe with-a self-closing sounding valve with test-cock.

Air vents for drinking water tank shall be provided with insect proof net. Sleeve joints shall be used for pipes passing through decks.

Drip trays shall be provided below the valves of all oil tanks and coaming shall be provided at the bunkering points.

All built in tanks shall be provided with a sounding pipe with upper ends shut off with a screwed bronze cap, attached to a chain. Sounding pipes shall be led as vertical as practicable. Inclination of sounding pipes where unavoidable shall be less than 30 degrees from the vertical line. Sounding pipe shall be provided as close as possible to the suction and shall be well supported.

A strike protector of steel plate shall be fitted directly under each sounding pipe. Thickness of the sounding pipe shall meet the requirements of the classification society.

Tank level gauges shall be provided for all ballast tanks, fresh water tanks, peak tanks and oil tanks.

Air and sounding pipes shall be arranged near bulkheads and behind stiffeners wherever possible.

#### **4.5.13 Hydraulic installation**

Two nos. hydraulic power packs of reputed make to be provided. Each ramp shall be hydraulically locally operated, for which a complete individual power pack will be provided, installed in the store. The pump will be electrically driven. Special preventions have to be taken for starting of the pump to avoid an unacceptable generator voltage dip.

The electric motor can be vertical/ horizontal mounted of sufficient power with efficiency of 80% operating at 415 V.

#### **4.5.14 Ventilation System**

Mechanical ventilation shall be provided in the engine room through required number of axial flow fans of adequate capacity. One of the supply fans shall be reversible.

Exhaust fan shall be provided in Galley.

Watertight covers shall be arranged on all ventilation inlets as required by load line regulations. Fire dampers shall be fitted to all ventilators as required by rules.

#### **4.5.15 Miscellaneous**

##### **Piping and Valves**

All piping schematic drawings shall be approved by Owner/Class and Statutory Authorities. Pipes shall have suitable expansion arrangements wherever necessary and pipe material shall be suitable for the fluid that it will carry and shall comply with rule requirements.

All valves shall be of approved type. Valves fitted to the hull shall be of Cast steel body with internals of bronze/Stainless steel.

##### **Insulation**

In general the surface of machinery, equipment, pipes and tanks whose surface temperature is more than 60 degrees C shall be insulated.

Pipes shall be tested and painted (when necessary), before insulation is applied.

The insulation materials shall be fire resistant and shall be arranged in such a way that operation and maintenance are not hindered.

##### **Nameplates**

Engraved Al/Brass nameplates shall be provided on each pump, engine, valve, loose tanks etc., and where necessary for safety and control, the function and the medium used in that respective place shall be indicated on nameplates.

All Vent/Filling/ Sounding pipes shall be provided with nameplates for identification above main deck.

The nameplates fitted on weather decks and on aluminum parts shall be of stainless steel. The lettering on nameplates shall be black, however on safety and emergency valves red coloured lettering shall be adopted.

##### **Instruments**

The scales of instruments for pressures, temperatures etc., shall be such that the working range is not more than 70% to 80% of the full scales. The maximum allowed values shall be marked with a red line on the scale.

The temperature gauges shall be provided with scales marked in degrees centigrade. Gauges for temperatures over 300 degrees C shall be of the pyrometer type.

#### **4.6 LAY-OUT OF MACHINERY SPACES**

##### **4.6.1 Engine-room**

The machinery shall be arranged in such a way that easy operation and maintenance shall be possible.

All machinery and equipment shall have shut-off valves to disconnect them from the connecting pipe systems.

The floor shall be made of steel plates of suitable thickness with raised non-slip pattern fitted on galvanized steel bearers by countersunk non-corrosive screws.

Hinged hatches for easy access to equipment under the floor shall be arranged.

Hoisting eyes or lugs have to be provided on direction of the IRS.

#### **4.7 GENERAL REQUIREMENTS REGARDING MATERIALS AND WORKMANSHIP**

##### **4.7.1. Auxiliary pumps**

In general, pumps to be with flanged pipe connections except for inside diameters of less than 25 mm. Pressure gauges to be provided on inlet- and outlet side.

Pumps to be coupled to the driving motors via flexible couplings. Output of driving motors should be at least suitable for the required shaft power. In general pump speeds shall not exceed 1500 rpm. The Yard must submit QH-curves, and power characteristics of all pumps. The information to be based on the specified liquids.

The pumps to be of BE pumps or equivalent and conforming to the Class requirements.

##### **4.7.2. Valves and accessories**

All valves and accessories to be at least suitable for pressure stage 10 according to the BIS standards or equivalent DIN-standards, where no higher system pressures are described.

In general, the material of valves to be as follows:

Body & Cover -	cast iron
Inner parts -	bronze

In the bilge and fire fighting system, valve inner parts to be of sea-water resistant bronze.

Hull valves to have cast-steel or bronze body and cover.

Fire fighting/deck wash valves with bronze body and cover, rubber lines disc-type valve and provided with coupling.

Butterfly valves to be with rubber lined cast-iron or steel body, bronze disc and stainless steel shaft.

Valves with a diameter of 25 mm or less may be completely of forged steel when fitted in steel pipe systems or bronze in case of non-ferro pipes.

Dimensions of the valves according BIS-standards and with flange connections for a diameter of 32 mm and more and with screwed connections for the smaller diameters.

Safety- and relief valves to be adjusted on the maximum admissible pressure of the system and to be locked in that position. They will be of the direct acting, spring-loaded type and mounted in such a way that no injury/damage occurs when they come into action.

Each pipe system should also include a list of all valves and accessories, stating type, makes, type-numbers, nominal diameter, materials of casing and inner parts, the built-in length, flange dimensions with number and size of the bolt-holes, working pressure, working temperature and test pressure. This list must be submitted to the Owner/ Class for approval prior to the placing of orders.

#### **4.7.3. Piping**

Pipe-sizes according the Class requirements and also strictly in accordance with the system-pressure, but in any case suitable for a working pressure of 5 bar/10 bar. Flange dimensions according to BIS-standards or equivalent. Where pipe diameters are stated without further nomination the inside diameter is meant.

Pipes and flexible joints with a diameter of 25 mm and more to be connected with flanges. Welded-on plate flanges to be used.

Copper or copper alloyed pipes to be connected by means of hard solder bronze rings and loose steel flanges. For pipes and flexible joints with a diameter of less than 32 mm screw coupling of the standard type may be used.

Flexible connections of the flexible steel tube type to be used for machines and apparatus, which are mounted on anti-vibration mountings.

Where galvanized pipes pass through gas, oil or watertight bulkheads or decks, these penetrations will be executed with so-called three-flange type pipe-pieces.

Pipes should be mounted in such a way that expansion or contraction can occur without remarkable increase of stress. Piping to be fixed suitably by means of steel clamps of flat bar. Where steel clamps are used for copper or copper alloyed pipes, they shall be provided with a lead or nylon lining.

Drain cocks to be provided on all lowest points of all pipe systems and venting connections on all highest points. All pipes intended for transfer of fuel, lubricants or such like oils, are to be pickled, neutralized and washed with freshwater after manufacturing is completed. If time lag between cleaning and actual operations is big, then the pipes to be applied with a film of oil and adequately protected against foreign particles during the lay-off period. After



completion of the installations, the pipes to be flushed with the liquid they are destined for.

All pipe-systems to be tested after installation with at least 1.5 times the working pressure. This with a minimum of 6 bar.

Insulated pipes and pipes behind paneling to be tested before insulation and paneling are fitted.

#### **4.7.4. Insulation of piping**

Pipes to be tested and painted (when necessary), before insulation is applied.

Thickness of insulation to be at least in such a way, that the surface temperature will not be more than 25° C above the ambient temperature when the engine room ventilation is working. Where the insulation runs the risk of damage or where hot pipes run within normal reach, they have to be provided with a sufficient protection.

The exhaust gas piping and silencers to be insulated with rock wool blankets on wire gauze finished with a glued layer of glass fiber cloth and the whole to be covered with aluminum sheets. The flanges and expansion joints have to be covered with insulating mattresses filled with glass wool. Cold water lines in accommodation to be finished with 2 cm anti-condense insulation.

The application of asbestos as insulating material is not permitted.

#### **4.7.5 Instruments**

The instruments for pressures, temperatures etc. to be such that the working ranges is not more than 70% to 80% of the full.

#### **4.7.6 Loose Tanks**

Loose tanks to be made of steel, reinforced where required. Large tanks to be provided with a manhole, small tanks with a hand hole and further with connections for a level gauge, filling and vent pipes, a drain valve and the necessary system connections. Drip trays to be provided below oil tanks.

#### **4.7.7. Nameplates**

On each pump, engine, valve, loose tank and where necessary for safety and control, the function and the medium to be indicated on nameplates.

Anyway each valve to be provided with a nameplate on or near the cover in addition to nameplates on the hand wheels.

The nameplates of bronze or brass with engraved letters. On weather decks and where fitted on aluminum the nameplates should be of stainless steel. The lettering to be black, however on safety and emergency valves red colored lettering to be adapted.

## **5 ELECTRICAL SYSTEM**

### **5.1 General**

All installations, materials and constructions must be according to good marine practice, fully adapted to tropical and sailing conditions and suitable for this type of Vessel. The complete electrical installation and workmanship shall be in accordance with the rules and regulations of the classification society and statutory authorities applicable to this type of vessel. All electrical fittings and fixtures to be of relevant BIS Standards and with BIS mark.

The electrical rotating machinery, transformers and other electrical equipment shall work satisfactorily at an ambient temperature of 45<sup>0</sup> C. All the electrical equipment shall be arranged for easy accessibility for repair and replacement.

The equipment installed shall work satisfactorily at voltage and frequency variations as specified by classification society.

Each control panel shall be provided with relevant drawing, wherein the fuse ratings of feeders shall be clearly mentioned.

All the relevant electrical drawings and plans including load chart shall be submitted to the classification society for approval prior to placement of orders for equipment/installations.

### **5.2 Power Supply**

#### **5.2.1 General**

A 415 Volts A.C 3 phase, 50 Hz electrical supply shall be used for feeding the main bus bar, and 220 volts A.C. 50 Hz electrical system shall be used for all domestic and necessary lighting requirement.

Provision for shore supply connection shall be made for powering the 220 volts system while the vessel is at harbour.

#### **5.2.2 Main supply**

The generators shall be continuously rated and shall have class 'F' insulation, suitably tropicalised and shall be designed for a temperature rise, after continuous full load working, not exceeding the temperature limits specified by the classification society.

The vessel shall have a 50 Hz. A.C. supply power generation.

One No. diesel engine driven alternators each of 65kVA (minimum) and 10 kVA capacity shall be installed. The 65 KVA alternator shall be able to take the entire load of the vessel with 30% margin. The 10 KVA one will be able to supply required power when the vessel is at rest. Both alternators shall have

automatic voltage regulators to maintain constant voltage within the permissible limits specified by classification rules, and shall have drip proof enclosures. They shall be fitted with all necessary alarms and protections.

### **5.2.3 Emergency Supply**

- (i) Adequate battery shall be provided for catering to emergency load.
- (ii) Adequate sets of storage batteries with charging panels for Main engines, D.G. Sets, Navigation panels and lights, emergency lights, etc. shall be provided.

### **5.2.4 Shore supply**

A shore supply box complete with a four-core supply cable 50 m long with necessary plug and socket fittings, necessary switch, fuses, voltmeter, frequency meter and phase sequence indicator shall be provided on the main deck. A voltage available indicating lamp shall be provided on the panel. All cable, insulation, etc., shall suit the location and duty requirement shall comply with relevant rules.

## **5.3 Supply and Distribution**

### **5.3.1 Main Switch Board**

One main switch board of metal clad, drip proof, dead front type, mounted on resilient mountings shall be fitted on a raised platform in the engine room. The switchboard shall be completely closed at the rear and is to be serviceable from the front.

The alternator panels shall have meters for the measurement of voltage, frequency, current, power factor, and power and earth leakage. The two alternators shall be protected through, circuit breakers of adequate capacity and shall have necessary protective circuits for under voltage, over current, reverse power and short circuit. All the outgoing feeders and the shore supply shall be protected through suitable circuit breakers.

The switchboard shall be designed and installed with ample space for repairs and maintenance.

The construction and installation of switchboards shall be as per rules and they shall be fitted with all necessary alarms and fuse and switch gear.

Switchboards and all enclosed gear must be accessible for maintenance. All the emergency loads shall be powered from Emergency Switchboard (ESB). During normal operation the emergency switchboard shall be powered from the main switchboard (MSB) through a tiebreaker. In the event of a failure of MSB, the tiebreaker shall trip and ESB bus will cater the emergency requirements.

### **5.3.2 Distribution Boards**

Suitable number of lighting distribution boards and power distribution boards shall be provided. All the panels shall be drip proof type, sheet metal enclosed and shall be provided with suitable schematic drawings.

Whenever electrical equipment is located at a distance from its distribution board, a local control panel shall be provided. The local control panel shall have necessary control switches. In such cases suitable interlock shall be provided to prevent accidental starting during maintenance. Ammeters shall be provided either at group starters or at local control panels.

### **5.3.3 Transformers**

Supply to lighting loads and small power loads shall be 220 V single phase through 415 V/220 V transformers. The system shall consist of three single-phase transformers, two connected in delta-delta and one standby.

### **5.3.4 Motors**

In general squirrel cage induction motors of marine type suitable for 3 phase, shall be used. The motors shall be of drip proof or weather proof as required by the location and shall be of approved type. For specific equipment like fans, etc. motors shall be as supplied by the manufacturer and shall meet the rule requirements of Classification society. All motors shall be protected through fuse, overload relay and breakers of adequate capacity. Unless specified by the maker motors with low starting current shall be of direct on line starting type.

### **5.3.5 Battery**

Adequate number of sets of Sealed Maintenance free accumulators shall be installed for the following purpose:

- (i) Main engine starting
- (ii) Generator engine starting
- (iii) Navigational & communication system
- (iv) Emergency lighting
- (v) Lights and fans in the wheel house, crew and officers accommodation and also at deck and engine room during night in the off hours.

The batteries shall be placed on a raised platform, in a well-ventilated box fitted with non absorbent insulating supports and shall be secured properly to avoid any movement during sailing.

An adequate space shall be provided above the cells for maintenance of the same. Battery space shall be well ventilated.

Battery charger shall be provided with necessary meters for reading the battery charging voltage, charging current and load current. The charger shall have necessary protective circuits for over current and reverse current.

## **5.4 Cables**

### **5.4.1 Type**

All cables shall be flame retardant and comply with rules of classification society.

### **5.4.2 Installation**

All the cable runs shall be straight and accessible as far as practicable. Cables shall be installed on galvanized trays and shall be secured properly. Cables passing above main deck and wherever there is a risk of mechanical damage shall be led through galvanized pipes. Cables passing through decks and bulkheads shall be led through suitable coamings or individual watertight glands. The piercing shall be filled with approved filling material for water tightness. Vinyl bushes shall be used for penetrations through 'B' Class bulkheads. Alternatively Multi Cable Transit Gland of reputed make may be used. Where cables pass through non-watertight bulkhead or structural steel the holes shall be bushed with lead or approved materials. Cables passing close to radio and navigation equipment shall be properly screened. As far as possible cables for automation and instrumentation shall be laid in separate trays or when laid on same channel the distance between them shall be as per the rules.

## **5.5 Lighting and cabin fans**

The lighting installation consists of a network of 220 V A.C. systems.

The network is to be powered from the main 220 V supply. In general all the light fittings shall be of weather proof, drip proof or non-watertight as required by the location and shall be suitable for marine application.

In general 2x20 Watts fluorescent fittings shall be used. All lighting fixtures to be of approved make. However stores, level gauge lighting and weather deck lighting may be incandescent type.

Illumination levels in various areas shall comply with the rules of classification society and relevant statutory authorities as applicable to this class of vessel.

The fittings shall be installed for easy maintenance as far as practicable.

In addition to the above at least one set of lights and a fan in the cabins and one set of lights at all passages, engine room, wheelhouse will have provision for 220 V AC power supply from battery bank through a suitable inverter.

### **Lighting for Accommodation**

All the cabin and passage lights shall be of fluorescent type. Switches and sockets in accommodation shall be of flush type. Watertight fittings shall be used in the toilets and galley. Hinged type chart table lights with incandescent lamp and dimmer shall be provided.

### **Machinery Room Lighting**

Fluorescent light fittings shall be used in the engine room for general illumination. Incandescent type lamps shall be used for tank level gauges. All the switches and sockets used shall be of watertight type.

### **Portable lights**

Six number 40 Watts, 220 V portable hand lamps shall be provided with watertight socket and 8 meters flexible cable. Watertight and cabin type sockets / plug shall be of two pin earth type. For portable lamps and for locations in exposed decks watertight type switch sockets shall be provided.

### **Rechargeable lights**

2 numbers handheld chargeable lights will be provided for emergency use.

### **Cabin fans**

Adequate number of circulating fans shall be provided in cabins, messes and wheelhouse.

## **5.6 SPECIAL INSTALLATIONS**

### **Tank contents indicating**

Fuel oil, freshwater, bilge water and sewage storage-tanks to be provided with a tank contents indicator. Start and stop of the pumps to be installed as well near the pump as near the supply/charge/discharge pipe connection.

### **Fuel flow counting**

For the supply of fuel oil and freshwater to provide a flow meter with counting facility giving the supplied quantity.

## **5.7 Navigation and Communication Equipment**

### **5.7.1 Navigation Equipment**

The equipment to comply with minimum standards as per the class requirements.

#### Echo sounder

A depth echo sounder to be installed with digital display on the wheelhouse desk and provided with adjustable acoustic minimum depth alarm. Power supply 24 V DC.

#### Electrical Horn

To install on top of the wheelhouse an electrical horn with pushbutton control in the wheelhouse desk.

#### Window wiper

The front windows to be provided with parallel type window wipers. Power supply 220 V. One connection to the 220 V network after the inverter and the others connected to the main network 220 V.

### **5.7.2 Communication Equipment**

The equipment to comply with minimum standards as per the class requirements.

#### V.H.F.

To install a VHF communication set with DSC Channel 70, radiotelephony 16, 13 and 6.

### **5.7.3 Navigational Lights**

Two sets of electrical navigational lights shall be provided as per rules.

One set shall be powered by the emergency supply. The other set shall be powered from the regular power supply. Navigational lights shall be controlled from a control panel mounted on bridge console. The panel shall indicate the status of the lamps and shall give an audible alarm in case of fused bulb. Signal light of approved make shall be fitted as per rules. The lights to be mast head light, portside light, starboard side light, stern light, anchor light, NUC light and other lights as per rules.

### **5.7.4 Search Lights**

In addition to normal light fittings two search light (swiveling type) of 1000 Watts with ballast shall be fitted, one on each end of the vessel.

### **5.7.5 Flood Lights**

Open decks and ro-ro space shall be illuminated with sufficient number of floodlights. At least 6 nos. flood lights shall be fitted, 2 on each sides and 2 around midship.

### **5.7.6 Navigational Console**

One Navigational console having aesthetic design shall be erected in the wheelhouse and all necessary equipment/controls, including the following shall be fitted on it.

- operating equipment for follow-up and non follow-up steering and speed adjustment of the propellers. Steering controls and rudder angle indicator. Signal/indication equipment for the propellers. start/stop/control indicators for the main diesel engines. one console;
- echo sounder
- VHF
- Remote alarm panel for engine room alarms
- Navigational, search lights and deck lights controls
- Loud hailer
- Electrical air horn
- Window wiper control
- Main engine control
- Main engine load indicator
- Walkie talkie (2 sets)
- Propeller rpm indicator
- Compass
- switch emergency stop ventilation - switches for deck lighting
- ampere and voltmeters batteries.
- Public Address System

### **5.8 Automation and Instrumentation**

An alarm control panel shall be installed in the engine room. It shall monitor temperature, pressure of main & auxiliary engines and steering gear alarms. The alarm panel shall also monitor certain important tank levels.

An audible and visual alarm shall be given in the event of a fault.

A remote indication with audible alarm for all the monitoring points shall be provided in the wheelhouse.

### **5.9 Earthing**

In general all the electrical motors, control panels and generators, unless specified by the supplier, shall be earthed as per the rules. Suitable size of conductor shall be used for earthing purpose depending upon the current capacity of the appliance. The conductor shall be properly crimped at both the ends and one end shall be connected to the earth bolt provided on the equipment, while the other end to an earth bolt welded to the steel structure. Suitable washers and conductor terminals shall be used so that a reliable contact is made.



## **6 SPARE PARTS, INVENTORIES AND TOOLS**

### **6.1 SPARE PARTS:**

Manufacturers recommended spares for 2000 hrs. operation to be supplied for major machineries and equipment without extra cost. Major machineries and equipment to include Main Engines, Auxiliary Engines, Propellers, and Anchor Winch. List of spares to be supplied along with manufacturers recommendations to be forwarded on selection of major machineries and equipment prior to Owners approval.

### **6.2 TOOLS:**

Maker's Standard tools and special tools necessary for overhaul during the life of the vessel are to be delivered by all the manufacturers of the major machineries with their supply.

### **6.3 INVENTORIES:**

The following inventory to be supplied along with the vessel

#### **Deck:**

1. 2 quartz battery for marine clocks
2. 2 black balls and 2-round/1-diamond shape
3. 3 flash lights (200 % batteries)
4. 1 hand lead line (3 kg, 25m)
5. 2 boat hooks
6. 1 heaving line (30 fathom 3/4")
7. 4 rubber fenders (12" diameter)
8. 1 grease gun for hinges
9. 1 tin with 10 kgs grease
10. 1 marline spike
11. 1 triangular rule (300 mm engine divided for chart type)
12. 1 bucket with line 5m
13. 1 tank sounding tape 5 m with plumb
14. 1 drum pump
15. 5 padlocks
16. 2 sounding rods
17. 1 measuring tape (steel, 6 metres)
18. 1 measuring tape (steel, 2 metres)
19. 1 carpenter hand saw 400 mm long
20. 1 carpenter mallet 500g with handle (road type)

#### **Domestic**

1. 12 dishes flat 10", 9" and 7" (porcelain)
2. 12 plates 6" (porcelain)
3. 2 table knives (stainless steel)
4. 12 soup/dessert spoons (s.s)
5. 2 set pots (coffee & tea) 6 nos. per set (porcelain)
6. 2 sugar basins (porcelain)
7. 12 tea spoons
8. 2 bowls for salad & pudding 6" (porcelain)

9. 2 water jugs (s.s) medium size
10. 2 bread knives (s.s)
11. 2 rice bowls 10" (s.s)
12. 12 cups with saucer for tea & coffee
13. 1 water filter
14. 12 stainless steel thali plates 12"
15. 12 katori
16. 2 flat frying pans 30 cm (aluminium)
17. 2 tawas 30 cm (iron)
18. 2 trays (formica)
19. 2 mixing bowls (available size)
20. 1 bottle opener
21. 1 chakibelna
22. 1 cook's knife 6" blade
23. 2 steel buckets with lead 10 lt., 12 lt. And 15 lt.. each
24. 1 can opener
25. 1 potato peeler knife (s.s)
26. 1 bread toaster
27. 2 dusters
28. 1 chopping board (standard size)
29. 1 teakettles 30 cm (aluminum)
30. 1dekchies with lid 20 cm, 25 cm, 35 cm, 50 cm each (aluminium)
31. 2 coir brooms
32. 2 hair brooms
33. 2 lavatory brushes
34. 2 scrubbing brushes
35. 2 single bed sheets (for each person)
36. 2 pillows (for each person)
37. 1 bath towels (for each person)
38. 1 face towels (for each person)

#### **Machinery installation:**

1. 1 hand lamp with 10m cable and plug
2. 1 set of compressions lugs up to 6 sq. mm with plier
3. 1 hand tachometer
4. 1 axe
5. 1 iron saw with 12 blades
6. 1 set of bearing pliers
7. 3 grease gun
8. 1 oil can
9. 1 tank sounding tape 5m with plumb
10. 1 stainless steel inside calipers
11. 1 thermometer
12. 1 marking 'V' block
13. 1 portable electric grinder
14. 1 portable electric drill and chuck 13 mm
15. 1 set straight shank drills up to 13 mm
16. 1 set taps & round dies with case
17. 1 set spanners (normal size, single ended)
18. 1 set spanners (double ended)

19. 1 set box spanners
20. 1 monkey wrench
21. 1 pipe wrench
22. 1 set of screwdrivers
23. 1 set of screw drivers (cross head type)
24. 1 set of combination pliers
25. 1 set files (shape half round)
26. 1 set files (shape flat)
27. 1 set files (each round/ half, round/ traughter)
28. 3 file handles
29. 2 file brushes
30. 2 hand hammers
31. 1 lead hammer
32. 1 claw hammer
33. 1 centre punch
34. 1 cutting punch
35. 1 chisel (flat crossout)
36. 1 chisel (oil groove cut)
37. 1 pair of scissors for packing
38. 1 pair of scissors for metal (flat & round)
39. 1 hacksaw frame and hacksaw for iron and aluminium
40. 1 hand vice
41. 1 stone with bed
42. 1 set wire rope slings of various SWLs.
43. 1 manila rope slings
44. 1 set shackles
45. 1 rope pulley block
46. 1 chain pulley block ½ ton
47. 1 crow bar
48. 1 set Allen keys
49. 1 oil hopper with filter screen
50. 1 grease pump
51. 1 oil pan with strainer
52. 1 paint can
53. 1 set painting brushes
54. 1 set eye/lifting bolts
55. 2 waste boxes
56. 1 set of different sizes steel washers
57. 1 set of different sizes bolts & nuts
58. 1 set of different sizes studs & nuts
59. 1 set of different sizes split pins
60. Steel and aluminium plates
61. Steel wire
62. emery cloth
63. grinding powder
64. valve grinding paste
65. rubber insertions (joining 800 mm x 800 mm)
66. packing materials
67. inspection mirror
68. gland packing
69. 1 steel square

70. 1 steel scale
71. 1 cloth tape measure (30m)

### **Electrical Installations:**

1. Watch maker's screw drivers
2. Watch maker's screw driver cross head size (2 mm)
3. Magnetic spanners
4. Screw drivers cross head size 0-4
5. Screw driver for hexagon socket heads 1 1/2 – 6 mm
6. nut drivers 4 – 7 mm
7. 1 circlip plier for inside rings
8. bended flatnose plier (long grip)
9. 1 tweezer flat nose
10. 1 tweezer bended nose
11. 1 inspection mirror
12. 1 saw frame (junior) with 12 blades
13. 1 set of needle files
14. 1 pair (b) 200 mm
15. 1 pair wire cutting pliers 150 mm
16. 1 pair flat nose pliers 125 mm
17. 1 pair round nose 125 mm
18. Electrician's screw drivers, for wood/leather
  - 1 (a) 3 mm x 75 mm
  - 1 (b) 6 mm x 100 mm
  - 1 (c) 8 mm x 150 mm
  - 1 (d) 10 mm x 250 mm

## **LIST OF DOCUMENTS TO BE SUPPLIED BY THE BUILDER**

### **BASIC DESIGN DRAWINGS:**

- a) General arrangement plan
- b) Lines plan
- c) Docking plan

### **CALCULATIONS:**

- a) Equipment number calculations
- b) Hydrostatic particulars
- c) Tonnage calculations
- d) Freeboard and minimum bow height
- e) Tank capacity calculations and sounding tables
- f) Trim and Stability Booklet

### **STRUCTURAL DRAWINGS**

- a) Midship / Typical transverse section
- b) Profile, Decks and Bottom plan
- c) Watertight / Oil tight bulkheads
- d) Shell expansion
- e) Deck house / Superstructure

- f) Engine foundation
- g) Hawse pipe details
- h) Welding schedule
- i) Skeg construction, if any
- j) Fore peak and aft peak structure
- k) Engine Room Construction
- l) Hatch opening details
- m) Details of Ramp

### **MACHINERY DRAWINGS**

- a) Engine room layout
- b) Engine room ventilation schematic
- c) Air vent system schematic
- d) River chest details
- e) Fuel oil system schematic
- f) Lubricating oil system schematic
- g) Cooling water system schematic
- h) Main engine / Auxiliary engines exhaust system  
schematic

All class approved drawings and other drawings prepared for the constructions of the vessels are to be supplied.

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# **ANNEXURE-1**

## **GA**



## **ANNEXURE-2 SKETCH OF JETTY**





## **ANNEXURE-3**

# **RECOMMENDED VENDOR DETAILS**

<b>Main Engine</b>	: Caterpillar Greaves Cummins Bauduin Yanmar Volvo Penta Hyundia
<b>Steering Gear</b>	: Lourenco Marine Vetus Rexroth
<b>DG Set</b>	: Cummins/ Greaves KOEL
<b>Bow Thruster</b>	: ZF Marine Schottel Veth Rolls Royce Steerprop Italdraghe Podotti
<b>Hydraulic Power Pack</b>	: Rexroth Vickers Perry Smithson Fluid Power Vetus Suvera

## **(SECTION-IX)**

### **TECHNICAL SPECIFICATIONS OF RO-RO VESSELS CARRYING 8 TRUCKS AND 100 PASSENGERS (50 SEATED) FOR NW-2**

## **Section – V**

### **TECHNICAL SPECIFICATIONS OF RO-RO VESSELS CARRYING 8 TRUCKS AND 100 PASSENGERS (50 SEATED) FOR NW-2**

#### **1. GENERAL**

##### **1.1 Intent**

The purpose of this document (hereinafter called the “**Specifications**”) is to outline the technical and functional requirements for the design, construction, supply and delivery of 1 no. **Ro-Ro Vessel** (hereinafter called the “**Vessel**”) for the Inland Waterways Authority of India. The RO-RO vessel shall be operated to introduce safe, scientific, economical and efficient way of transporting the vehicles loaded with, public carriers, two/three wheelers, passenger cars and passengers round the clock during the entire year including flood season. The vessel to carry 6 to 8 trucks of 25,000 kg and 50 to 100 passengers (sitting arrangement for 50 passengers to be provided).

The vessel including all its material, equipment, piping, machinery, workmanship, etc., shall be in accordance with these specifications and to the requirements of the classification Society as also regulatory bodies, which are mentioned hereinafter and shall be fully documented as required by these bodies.

All fittings, arrangements, systems and equipment not mentioned in the specifications but required under Classification rules and other statutory requirements shall be provided at no extra cost. Anything not described or left out of this specification, but being considered as normal and necessary for the intended services, shall be supplied and fitted without extra charge.

##### **1.2 Design Conditions and Basic Requirements**

###### **1.2.1 Design Conditions**

The following ambient conditions are to be considered for the selection of equipment and machinery:-

- Maximum outside air temperature of 45°C with 90% relative humidity.
- Air temperature of 50°C with 90% relative humidity in the engine room.
- Maximum river water temperature of 32°C.
- Atmospheric pressure of 760 mm Hg.
- Occasionally occurring sand storms with wind speeds up to 40 m/sec.

###### **1.2.2 Basic Requirements**

The Vessel is intended for operation in all weather conditions in the National Waterway National Waterway no.2 (River Brahmaputra) and primarily between Hathsingimari and Dhubri. The vessel can also operate at any other

location in NW-1 and NW-2. The vessel should be suitable for operation in Zone-2 (maximum significant wave height of 1.20 m). The vessel to carry 8 trucks of 25,000 kg and 50 to 100 passengers (sitting arrangement for 50 passengers to be provided).

The following basic requirements apply to the Ro-Ro Vessel:

- a) The Vessel with its installations, systems and equipment shall be able to fulfill all described tasks, duties and capacities when operating under the design conditions mentioned above.
- c) The Vessel to be constructed and built for inland waters and as such classified by class with IRS (Indian Register of Shipping) and Model Rules for Inland Vessels. The building to be carried out under the survey of this classification society having the class notation for both hull and machinery.
- d) The Vessel shall be able to sail continuously at a speed of 9.0 knots at the loaded draft.
- e) The Vessel shall have a good speed control, directional stability and maneuvering qualities over the full speed range and shall be designed with a twin screw propulsion installation.
- f) The Vessel to be equipped with preferably two foldable ramps on main deck, each on fwd and aft side. The ramp can have a flap of suitable size.
- g) The Vessel shall have a simple living space to accommodate 8 crew members and a wheelhouse with a good view all around.
- h) The Vessel shall have an own fuel storage capacity of at least 14m<sup>3</sup> and a freshwater storage of about 5 ton and stores for three days sailing.
- i) All materials, equipment and machinery required for the construction of the Vessel shall be of high quality and suitable for marine use and for the prescribed services. All workmanship entering into construction and finishing of the work shall be of first class standard in accordance with good shipbuilding practice, suitable for the purpose intended and to the satisfaction of the classification society.
- j) Special measures to be taken to protect the equipment and engines against the effects of sand/dust-storms.

### **1.3. Liability and Obligations of Contractor**

The Contractor has to convince himself and confirm at the time of submitting the tender that the Vessel will be designed and built in accordance with this Specification and will be able to fulfill all prescribed requirements, capacities and performances.

The Contractor will take the full responsibility in all respects, without any reserve, for the design, the construction, supplies, and trials, efficient working of all systems on board, transport and delivery of the Vessel.

The following documents shall be submitted along with the tender:

7. Preliminary GA
8. Initial Intact Stability Calculation according to IS Code 2008 with reduced wind speed for inland vessels
9. One compartment Damage Stability
10. Powering Calculations
11. Deadweight Breakups
12. Electrical Load Estimate

The approval of the Class of plans, orders, calculations, drawings or delivered materials and tools does not exempt the Contractor from his responsibility to deliver the Vessel with all installations in agreement with this Specification. If some parts do not work satisfactorily during the trials or during the guarantee period, these parts must be replaced or altered by the Contractor at its own cost, to the satisfaction of the Owner and Class. During the building period, the contractor has to take effective precautions to prevent damage by fire or water. After launching, the vessel is to be effectively and tightly moored in sufficient depth.

#### **1.4. Description of Ro-Ro Ferry**

The Vessel will be provided twin screw propulsion at aft end and will have ramps on each end suitable for the slope of the jetty as shown in Annexure-2 and operating in protected (Inland) waters, such as the river Ganges & Brahmaputra in India. The hull will be constructed of steel and the vessel will be classified as Ro-Ro Ferry for inland water.

The principal dimensions and characteristics are as follows: -

Length of vessel	About 48.50 m
Breadth molded	About 14.00 m
Depth at side	2.80/3.00 m
Maximum loaded draught	1.80 m
Freshwater tank capacity	5 m <sup>3</sup>
Fuel oil tank capacity	14m <sup>3</sup>
Waste tanks capacity	About 1 m <sup>3</sup>
Propulsion engines	About 2x300 HP
Trial speed (with empty trucks)	9.0 knots with both propellers working and both engines together delivering 85% of MCR
Passengers	50 seated + 50 standing
Truck Loads	Max. 8 Nos. 25 t trucks
Complement	8 nos.

The hull shall be subdivided by watertight transverse and longitudinal bulkheads into several compartments.

The accommodation and the wheelhouse cabin shall be built on deck. Propulsions and steering to be remotely controlled from the wheelhouse.

Two nos. ramps to be fitted at fwd and aft end of the vessel preferably at an angle as shown in the GA in Annexure-1. Due to orientation of the jetties both ramps needs to be on same side. The most optimal solution could possibly be to align the ramp at 30 degree angle with the vessel centerline. Width of the vessel and ramp orientation and breadth is to be designed considering the turning radius of 7m x 3m trucks.

The orientation and fitting of the ramp shown in GA is for guidance, designer is free to provide alternate solution meeting the required operational criteria. A bow thruster shall be provided in the forward end for better directional stability and to hold the vessel in place while loading and unloading.

### **1.5 Design and Model Test :**

On completion of the basic design, the model testing of the vessel to be constructed shall be carried out in a reputed and recognized model testing towing tank in the presence of Owners representative for confirming the propulsive power, speed, draft etc. at the earliest. Model test will take into account the effects of simultaneous running of both propellers

#### **1.5.1 Classification, Regulations and Certificates**

The Vessel shall be designed and built in accordance with the requirements of the rules and regulations of:

1. The Inland Vessel Act 1917 and as amended in 2007
2. IRS Inland Waterways Rules

The vessels are also to conform to the **MODEL INLAND VESSEL RULES prepared by IWAI**. IRS shall also be authorized to check the compliance of the rules with the model rules of IWAI.

The Vessel shall be built under the inspection of the above mentioned Classification Society and shall have the notation **+IWL Zone 2, +IY, Ro-Ro Ferry**. The Owners and their representatives / consultants shall also inspect the construction of the vessel and carry out the specification survey.

The main diesel units and other machineries and equipment will also be subject to the rules and regulations of the Class and certificates have to be supplied covering these engines and machineries.

Where in the Specification and the material are in excess of those required by the Class, the former will overrule those of the Class.

The builder shall obtain the following certificates/documents and deliver to the owner at the time of the vessel's delivery.



The original certificates with three copies shall be handed over prior to delivery or framed and kept onboard as the case may be.

- a)** Issued by appropriate authorities as applicable for this class of vessel.
  - 5) Inclining Experiment Report.
  - 6) Trim and Stability booklet.
  - 7) Certificate of tonnage (GRT/NRT).
  - 8) Certificate of Registry
- b)** To be issued by classification society
  - 3) Classification Certificate
  - 4) All Certificates of machinery and equipment.
- c)** To be issued by Builders
  - 3) Builder's Certificate.
  - 4) Official Deadweight Certificates.
- d)** To be issued by others (mainly the classification society, MMD, Dock Labour Board and other statutory/recognized agency):
  - 2) Certificate of anchors, chain cables, shackles, hawsers, mooring ropes and equipment.
- e)** Certificate of nautical/navigation instruments.
  - 3) Navigation light, Mast light Certificate.
  - 4) Magnetic compass Certificate.

Other usual certificates including those (when applicable for inland vessels) of compass, anchor, hawser, navigation lights, life saving equipment, freeboard etc. issued by recognized authorities concerned shall also be furnished to the Owner.

The vessel will be registered either at Kolkata with IWT Dte., Govt. of West Bengal or at Guwahati with the IWT Directorate, Assam as per the relevant rules and regulations of Inland Vessel Act, 1917 conforming to Model Inland Vessel Rules prepared by IWAI (available on IWAI website) and the builder will furnish all necessary documents required for the registration of the vessel. Life Saving appliances, Navigational aids, Fire Fighting appliances and the light and sound signals shall conform to the requirements of Model IV rules and any other regulations of IWT Directorate, Govt. of West Bengal or Govt. of Assam as applicable, as framed by the State Government where the vessel is to be registered. IWAI shall authorize IRS to examine the statutory plans on its behalf and ascertain the compliance.

All costs and fees for inspection and approval of Class and Regulation Bodies for the necessary certificates shall be borne by the Contractor.

### **1.6. Stability, Draught and Trim**

The vessel shall have ample stability under all loading conditions and operating conditions. No permanent or fixed ballast shall be used. The stability particulars shall also comply with the load line requirements. The vessel shall never have a forward trim in any loading conditions.

The Builder shall keep stringent record of all weights going onboard, during the construction. On completion of the vessel an inclining test in the presence of the Owner and Statutory authorities, shall be carried out to determine the center of gravity and lightship weight of the vessel. A trim and stability booklet shall be prepared incorporating the result of the inclining test. This booklet shall contain all operating conditions and other necessary information regarding general stability of the vessel.

Directorate IWT, Govt. of West Bengal or Govt. of Assam as applicable shall duly approve this and one set shall be placed on board the vessel.

### **1.7. Standards and Building Methods**

The construction and outfitting of the Vessel shall be carried out in accordance with good marine practice, using materials, outfit, machinery and equipment produced in compliance with recognized marine standards and to the rules and regulations of the Classification Society.

The Contractor's and/or Manufacturers' standard can be applied after approval of the Owners or their consultants/ specification surveyors of those items which are not covered by the requirements of the Classification Society.

All materials, equipment and machineries not covered under Class requirements are to at least conform to the applicable BIS standards and same to be procured after obtaining approval of the Owner/Owner's representatives.

Building methods shall be in agreement with good marine practice and are to be approved by the Classification Society. The workmanship shall be to the satisfaction of the classification society and the Owner.

### **1.8. Supervision and Inspection**

The Vessel, its machinery, outfit and equipment shall be inspected and tested by the various governing bodies concerned in accordance with the requirements of their respective rules. The inspections and tests shall be in accordance with the rules and regulations of the Class.

Any defective or sub-standard work, which was pointed out during inspection, by the surveyors or the owner's representative, shall be rectified by the Builder at no extra cost.

The Builder shall submit a monthly report of the progress of the construction of the vessel to the Owner or their consultants who shall carry out Specification survey and shall inspect the work at any stage during the construction of the vessel.

The reports of inspection and testing shall be submitted to the Classification Society and the Owner or their consultants/specification surveyors. The Classification Society or the Owner's consultants are entitled to reject and refuse work and material which do not comply with the specified requirements. The Contractor will admit the Surveyors to all places where work related to this Contract is being carried out and shall grant free access to any premises where equipment is stored, where work is stored or where work is being sub-contracted. The Contractor shall also give all necessary information and render assistance to enable the Classification Society to carry out their inspections efficiently. Supervision by the Classification Society does not release the Contractor from any of his obligations under the Contract.

The Contractor will put at the disposal of Owner's Consultants /specification surveyors one room of a suitable size with telephone connection. At least two tables and chairs are to be provided along with requisite cupboards for files/documents. Appropriate facilities are also to be provided.

The Contractor shall enforce his own effective inspection and quality control of materials and workmanship including that of his sub-contractors during the execution of the Contract.

### **1.9. Alterations and Additions**

No alterations will invalidate the Contract or absolve the Contractor from his responsibilities taken under the Contract. Eventual consequences in price and/or time of delivery in respect to any alteration should be settled in accordance with the Contract.

If the Contractor requires any reasonable alterations or additions to the Specifications and/or the plans/drawings approved by the Class, the Contractor may make such alterations or additions to the extent that such alterations or additions shall not involve a substantial change in the principal performance and characteristics of the vessel, provided always that the Contractor shall make a written request to the Owner for approval, and explain fully all consequences of the proposed alteration(s).

### **1.10. Drawings, Schemes, Calculations and Manuals**

The Builder shall prepare all classification/statutory construction/working drawings and as fitted drawings and submit to Owner for approval.

The charges for the approval of the Classification drawings shall be borne by the Builder.

Before delivery of the vessel the Builder shall submit one set of good quality of transparent films and four prints of all drawings including "As Fitted" drawings.

Three sets of as fitted drawings (for structural, machinery, piping, outfitting and electrical), arrangement of withdrawal and installation of steerable, propulsion system, reports of various tests and inspections made, detailed lists of all standard and extra spare parts, inventory tools and additional tools, maintenance, spare parts and other instruction manuals, schemes, calculations, all test reports, trial reports, final trim and stability booklet, etc., necessary for the operation, maintenance and repair of the vessel shall be submitted to the Owner at the time of delivery.

The following drawings shall be plasticized / laminated, framed and fitted on board:

- General Arrangement Plan
- Life Saving Appliances Plan
- Capacity Plan
- Tank sounding chart
- Safety plan
- Bilge, Ballast and Fire Scheme
- Electrical key diagram
- Docking plan.

Three sets of instruction books, operation and maintenance manuals, spares, catalogues given by the original machinery suppliers for all the machinery and instruments installed shall be handed over to the Owner.

Three copies of the list of supplier of all the fittings and equipment used on board with their addresses and phone/fax numbers shall be supplied to Owner/Owner's representative.

Ship's book, an operating manual for the entire vessel shall be made and supplied.

#### **1.11. Planning and Progress of Work**

Within 4 weeks after signing the Contract, a program of the complete design, preparation of drawings, building period, fitting-out and testing of the Vessel, with data of delivery of the principal parts, will be furnished by the Contractor to the Owner. As soon as a delay occurs in the progress according to this program, the Contractor will inform the Owner immediately and will take all necessary measures to correct this delay to the satisfaction of the Owner. A monthly progress report is to be submitted to the Owners.

#### **1.12. Spare Parts, Inventories and Tools**

Inventories and tools shall be provided in accordance with the Builder's / manufacturer's standard supply. Manufacturer's recommended spares for 2000 hrs. operation to be supplied for major machineries and equipment without extra cost. Major machineries and equipment is to include Main Engines, Auxiliary Engines, Propellers and Anchor Winch. List of spares to be supplied along with manufacturers recommendations to be forwarded on selection of major machineries and equipment to Owners for approval.

The parts shall be administrated, packed and preserved properly. Suitable racks shall be provided on board for storage.

### **1.13. Tests and Trials**

All tests and trials required for the vessel and her equipment shall be performed in compliance with the statutory/classification/Owner's requirements.

The Builder shall prepare and submit a detailed program of the relevant trials to the Owner and classification society for approval.

Any defect/shortfall pointed out by the surveyors/owner during the tests and trials shall be rectified by the builder at no extra cost.

All costs involved in conducting the trials shall be borne by the Builder.

The Contractor shall carry out the following tests and trials:

- a) factory or workshop tests (at manufacturers' premises)
- b) installation trials (shore tests at yard)
- c) technical trials
- d) checking and/or demonstration trials

in the presence of the representatives of the Owner/IRS, the Classification Society and other authorities when applicable. All test data and measurements have to be collected by the Contractor and these reports shall be submitted to the Class & Owner. Final reports is to be delivered in 3-fold.

Well in time before the tests and trials mentioned above are to be carried out, the Contractor shall prepare and submit detailed programs of the relevant trials showing methods, sequences, time schedules, characteristics to be measured, type of measurements, instruments etc. to the Class.

The costs of these tests and trials are for account of the Contractor, including those for additional measuring devices and means.

If under tests or trials any part of the Vessel fails to fulfill adequately the specified requirements, the faulty shall be altered, removed or replaced and the test shall be repeated at the Contractor's expense.

#### **1.13.1 Factory Tests**

All machinery equipment with diesel engines, alternators, gearboxes and winches, pumps, hydraulic components etc. shall be tested by the manufacturer prior to delivery to the shipyard (Contractor). If test conditions deviate from practical conditions, calculations (carried out by the manufacturer or Contractor) are to be added to the test reports, showing that the basic requirements regarding capacities, torque, power, revolutions etc. will be fulfilled. Instruments and measuring equipment are to be tested and calibrated at the manufacturers' workshops.

Reports of tests and calibrations to be submitted to the Classification Society and Owners for approval.

Testing of water tightness of steel constructions is to be carried out in accordance with the requirements of the Classification Society. Testing of welds for steel constructions is to be in accordance with the Class requirements.

#### **1.13.2. Installation trials**

When the Vessel is completely equipped to the satisfaction of both the Owners the Classification Society, the installation trials shall be carried out (at or near to the Contractor's shipyard). The Vessel with all installations, systems, equipment, winches, piping systems, hydraulic installations, electric/electronic installation, ventilation, etc. to be tested by the Contractor to prove their good working, capacities and characteristics, separately as well as simultaneously working with other installations.

These trials to include an inclining test for determination of weight, draught, trim and center of gravity etc.

#### **1.13.3. Technical trials**

Before commencing the technical trials, the Contractor shall prepare and submit a detailed trial program showing the method, sequence and time schedule of the trials to the Owner and Class for approval.

The Contractor shall perform the following tests and trials in accordance with the trial program approved by and in the presence of the Owner and Class with the Vessel at a trial draft of about 1.50 m with a load equivalent to half of the fuel and freshwater stores and with a minimum amount of ballast water in order to reduce the trim to about 0.15 m (by the stern):

- 1) Speed trials- with both propellers operating
- 2) Crash stop astern and crash stop ahead
- 3) Steering and turning tests
- 4) Maneuvering tests at slow speed
- 5) Endurance test of 2 hours sailing on 100% CSR
- 6) Anchoring test

#### **1.13.4. Checking trials**

Shortly before and after the transport/ shipment of the Vessel to the place of delivery the vessel has to be dry-docked in the presence of the Owners and Class for examination of the underwater part of the Vessel, for cleaning, restoring the paint system and when applicable for applying the last coat of paint.

#### **1.13.5 Welding**

The vessel shall be of all welded steel construction.

All openings and holes in the structure shall be made with the consent of the classification society and shall be suitably compensated for strength.

Welding shall be of high quality and shall be performed by skilled and classification society approved personnel. Necessary precautions shall be taken to eliminate deformations. All surfaces shall be cleaned from rust and grease before welding. Approved manual, semi-automatic or automatic welding techniques shall be adopted for the construction using coated electrodes of approved make. A regular x-ray testing as per classification society rules shall be carried out to test the standard of welds. Builder shall submit inspection and testing plan to the owner for approval.

#### **1.13.6 Tank Testing**

All tanks and watertight or oil tight compartments shall be tested in the presence of the Surveyor and Owner's representative and shall comply with the rule requirements. The tests shall be carried out after completion of the construction and prior to commencement of painting. At the time of testing all welds at boundary surfaces shall be clean and free from primer/paint/oil etc. Immediately after testing these entire weld surfaces, which are cleared of any defects, shall be coated with primer/paint.

#### **1.13.7 Inclining Test**

Before the trials and with the vessel in a condition as complete as possible, an inclining test shall be conducted to ascertain the lightship displacement and center of gravity in the presence of Owner's representative, classification society and IWT surveyor. The inclining test report approved by classification society and IWT surveyor shall be made available to the Owner's representative.

#### **1.14 Delivery**

The vessel shall be delivered and accepted at Dhubri. After the trials and the approval of Owner and Classification Society of these trials with reports etc. the vessel shall be handed over to the Owner in a proper and clean condition with at least 50% of liquid stores on board. The costs of transportation, additional painting, checking trials and handing over and with the stores specified above shall be to the account of the Builder. All relevant documents, certificates, tools, inventories, spare parts etc. shall be on board at the time of handing over.

#### **1.15 Miscellaneous**

##### **1.15.1 Ship's Model**

Two nos. Ship's model of about one meter length painted to the same color scheme as the ship and placed in a glass box shall be supplied along with the vessel at the time of delivery.

##### **1.15.2 Photographs**

The Builder shall take photographs of the vessel at various stages of construction and shall submit them along with the monthly progress report and bills for stage payment to the Owner. On completion of the vessel, additional photographs shall be taken for framing purposes.

## **2. HULL STRUCTURE**

### **2.1. GENERAL**

#### **2.1.1. Introduction**

The scantling of the structural members shall comply with the Rules and Regulations of the Classification Society as far as no higher requirements are stipulated.

Good continuity of structural members in basic hull structure shall be maintained. Care shall be taken to obtain proper alignment of important structural members. Where members are discontinuous, the continuity shall be provided by means of suitable tapers, overlaps and/or brackets.

#### **2.1.2 Materials**

All materials used are to be of excellent quality. The hull will be constructed out of shipbuilding quality steel conforming to the rule requirements of the classification society and BIS (Bureau of Indian Standards). Structural steel of hull construction shall be Classification Society Grade 'B'/equivalent.

All structural steel shall be free from rust, pitting, cracks, laminations and similar defects. In case of any such defects being noticed, the plates etc. shall be renewed for the extent necessary to the approved quality/standards.

Large size steel plates shall be used for the construction of hull as far as practicable.

As required by the Class, samples of materials to be submitted for approval. If any material is used which has defects, or which is not considered suitable for the purpose intended, it must be replaced without loss of time and without compensation of cost for carrying out these replacements.

#### **Rolled steel**

Hull materials and further all rolled steel, to be tested to the rules of the Class, of which certificates have to be submitted. The steel must have good welding qualities and should have a carbon percentage not exceeding 0.2%.

Before the material is employed in the construction, rust and mill scale must be removed by means of steel grit or sand blasting according to class Standard. Immediately after the blasting, one coat of approved shop primer with a thickness of approx. **20** micron is to be applied as a temporary protection.

#### **Cast steel**

Steel castings only of first-class approved foundry and of approved design, properly annealed. Quality and testing in accordance with the rules of the Class. Castings must be free from blowholes or other defects.

All materials including casting and forging shall be of qualities complying with the requirements of the Classification Society.



### Bolts and nuts

All bolts and nuts to be of one approved standard. Metric thread is to be used throughout.

#### **2.1.3. Preparation of materials and welding**

When steel plates are deformed during transport, these are to be faired by rolling before use.

Flanging of plates and brackets is generally not allowed. For bolts and rivet holes only drilling is allowed.

Doublings to be avoided as far as possible and where necessary, locally inserted thicker plates with well rounded corners are to be adapted.

Plates and rolled sections to be cleaned and preserved as described in 2.1.2 of the Specification.

The blocks and panels shall only be placed on the berth after inspection and approval by the Class.

### Welding

All welding is to be of excellent quality. During the welding operations all necessary precautions are to be taken, so that welds of high standards are obtained. All surfaces are to be well cleaned and free from rust, paint etc. before welding has commenced. Plate edges are to be flame-cut mechanically as much as possible. Where possible, plates and sections to be interconnected by automatic welding methods. Overhead welding to be avoided as far as possible and therefore necessary provisions are to be taken for underhand welding where practical.

Manual, semi-automatic or automatic welding procedures for welding specific parts of respective steps in the process of assembling the structural blocks of the hull shall be selected in concert with the Classification Society.

A complete welding list is to be submitted for approval of the Class. In this list particulars are to be given, such as shape of welded joints, the manner of preliminary treatments, the dimensions of the weld and the type of electrodes to be used.

During the welding the relevant construction shall be dry. The welding to be performed with coated electrodes of approved make. Welders, especially those who are working on the main connections, must be qualified and regularly tested. A regular check of the quality of the steel by "X"-ray or similar methods to be carried out to the satisfaction of the Class. If considered necessary by the Owners representatives or specification surveyors and/or the Class, additional measures are to be taken by the Contractor to improve the quality of the welds.

Faults in welded connections to be repaired if possible or otherwise new constructions to be inserted. A total of at least 25 "X"-ray photographs are

expected for an adequate check of the quality of the welds. The tests for welding are to be in accordance with the Class requirements and nondestructive testing (NDT), dye penetration tests and X- ray etc as required are to be carried out to the satisfaction of the Surveyors. Welded decks, bulkheads, deckhouses and other constructions which are deformed by welding, to be faired in order to obtain fair work complying with high standard. On the berth, the hull and sections to be earthed adequately. Clamps, dogs and other means to bring material and equipment in the right position, to be removed in such a way that no visual marks and/or mechanical damage are left.

## **2.2. HULL**

### **2.2.1. Lay-out**

The hull shall be designed to meet the requirements for carrying trucks and passengers.

The lay-out of the hull shall be:

- aft peak
- steering gear compartment
- engine-room with some tanks
- bow thruster compartment
- store
- fore peak

All compartments shall be bordered by watertight bulkheads. The complete hull shall be built of steel according the longitudinal framing system.

### **2.2.2. Bottom construction**

The vessel shall have single bottom construction. The keel to be of a flat plate-type with a thickness of 2 mm more than the bottom plate. Longitudinal girders shall be fitted in the engine-room in such a way that they form part of the foundations for the main and auxiliary engines, otherwise longitudinal girders to be provided as required by the Class. A sufficient number of drain and air holes to be provided in floors and girders. The bottom construction at aft end shall be raised in such a way that they can accommodate the propellers. Bottom plating, floors, girders and brackets in way of the propellers to be of increased thickness and arranged in such a way that a sturdy construction will be obtained. At centerline at aft end, a double plate skeg to be constructed. Plate thickness in way of sea chest and bilge wells shall be at least 2 mm more than required by rules. Special attention shall be given to stiffeners under engines to minimize vibrations.

### **2.2.3. Shell plating and framing**

The scantlings of the shell plating to be determined as per the rules and requirement of Class.

Stem and stern

The thickness of the stem and stern plating will be equal to the thickness of the shell plating. Adequate stiffening to be provided. Plating of increased thickness shall be provided in way of ramps.

#### **2.2.4. Deck and beams**

The main deck shall be stiffened according the longitudinal system.

In way of the truck loading area, the stiffening is to be sufficient to withstand **25t truck load**.

There will be no Camber on the deck. However, equal sheer shall be provided at aft and forward of midship to align the ramp with the slope of the jetty as shown in the GA.

Local reinforcements shall be integrated in way of anchor winches, bollards, ramps, fairleads etc. The deck shall be locally strengthened adequately in way of deck fittings or deck machinery.

The construction, materials, arrangement and fittings in the accommodation spaces shall comply with the statutory requirements applicable to this class of vessel.

#### **2.2.5. Pillars and girders**

Girders shall be provided under the deck if required from the view points of the design of the Vessel. Reinforcement pillars shall be fitted in combination with, and at the same positions as the web frames.

Pillars shall be arranged such as to minimize obstruction to passage inside the engine-room.

#### **2.2.6. Bulkheads**

The vessel shall have transverse watertight bulkheads and the scantlings to be determined as per the rules and requirements of the Class. All bulkheads shall be vertically stiffened. Where pipes etc., are carried through the watertight bulkhead they shall be provided with necessary arrangements to the approval of classification surveyors.

#### **2.2.7. Foundations**

In the engine-room strong welded foundations shall be constructed for the diesel engines and for the generator set. These foundations are to be incorporated as much as possible in the bottom construction.

Foundations for deck machinery, winches etc. shall be executed with top plates welded on coamings and supported by a sufficient number of brackets. Where necessary additional supports under deck shall be provided. All auxiliary and deck machinery shall be erected on foundations. Suitable reinforcement shall be provided under the machinery. Thicker plating shall be provided under all heavy machinery on the deck.

### **2.2.8. Cooling system & River chests**

The main engines to be heat exchanger cooled. The main parts of the cooling water system of the diesel engines shall be closed circuit unit built on the respective engines. The river water for cooling is to be drawn from the river chests. At least two river chests shall be located at a suitable position in engine room for efficient suction at all loading conditions. It should be positioned in such a way to avoid intake of mud, sand etc., when the vessel is passing through shallow waters. River chests shall be covered with hinged/bolted gratings of stainless steel retained by stainless steel bolts. The clear opening area shall be at least 2 mm more than the shell plating in that region. Zinc or aluminum alloy anodes shall be fitted around river chests.

### **2.2.9. Hull openings**

Hull openings shall be provided for sea-inlets and valves. Where penetrations are made through the bottom or shell plating, such as sea-inlets, hull valves, hawse pipes etc. adequate compensations are to be made by means of inserted plates of increased thickness, corner plates or else, to the satisfaction of the Class.

## **2.3. DECKHOUSE AND WHEELHOUSE**

### **2.3.1. Deckhouse**

A deckhouse shall be arranged (as indicated in GA) in a way as to leave an obstruction free deck for stowage and passage of vehicles. The deckhouse shall be provided with at least two crew cabins for 6 persons and one cabin for Master and Driver, two crew toilets, galley, mess cum recreation room and at least three toilets for passengers. The deckhouse shall provide seating for at least 50 passengers. The scantling of the deckhouse to be in accordance with the rules and requirements of the Class and reinforced with stiffeners.

### **2.3.2. Wheelhouse**

A wheelhouse of adequate elevation shall be provided with clear all round visibility as indicated in the GA. The scantlings of the wheelhouse are to be in accordance with the rules and requirement of the class. The wheelhouse shall be provided with windows all around.

Effective drainage from all decks and top of the wheelhouse shall be arranged.

Doublers shall be fitted on decks in way of open drain discharges. Great care shall be taken to avoid water puddles on exposed decks.

## **2.4 Engine Room structure**

The engine room shall be suitably framed with floors in compliance with class rules. Main engine foundation shall be well integrated with the bottom structure. Main engine foundation shall be in accordance with the Engine Manufacturer recommendation and as per class requirements. Sufficient clearance shall be provided below the engine for easy cleaning and maintenance of sump.

Suitable reinforcement shall be provided under heavy concentrated loads with brackets or carlings.

Necessary chequered plate flooring, platforms and ladders shall be arranged in order to give access to machinery, etc. in all machinery. Workbench, racks for spares etc. shall be arranged at suitable locations in engine room.

Special attention shall be paid to minimize structural discontinuity in the machinery spaces.

## **2.5 Miscellaneous**

### **2.5.1. Tanks**

Where possible all tanks shall be provided with two manholes. All tanks shall be provided with the necessary air, sounding, filling, suction and other pipe connections. One spanner for each size and one spare plug of each size to be delivered. The number of each tank to be welded on the hull next to each drain plug. The extension of the tank to be indicated on the hull by welded marks.

### **2.5.2. Manholes and hatches**

#### **Manholes**

Each compartment shall be provided with as much (but at least two) manhole covers as needed to provide a good accessibility. The covers shall be placed in such a way that with opened covers, good ventilation will be obtained.

Smaller tanks may be provided with one cover.

The covers shall have dimensions of at least 400 x 600 mm or as per class requirements. Thickness of the cover to be at least 10 mm and fixed on a welded coaming ring with tap bolts and nuts of stainless steel. Two thread holes for press bolts shall be provided in each cover. Vertical covers to be provided with handgrips. All covers shall be provided with oil resistant packing.

The tanks in the engine-room shall be provided with manholes in the vertical bulkheads.

Bilge water, sewage and freshwater bunkers shall be provided with manholes in the vertical bulkheads.

#### **Hatches**

The hatches shall be fitted for steering gear compartment entrance and emergency exit in engine-room. The entrance hatch to the steering gear compartment and the escape hatches to be of the hinged type with two adjustable hinges and a device for open position.

All hatches in watertight execution to be with rubber seal and hinged clamping bolts of stainless steel with brass butterfly nuts if applicable.

The hatch coamings to be with circular shape of sufficient height and with flat bar 75 x 16 on top. Cover plating shall have the same thickness as the main deck plating. Cover to be reinforced with flat bar stiffeners, provided with rubber packing and bolted to the coaming.

### **2.5.3. Ladders, railings and bulwark**

#### **Ladders**

Ladders shall be placed in way of each manhole under the entrance and escape hatches and in the store.

All ladders shall be fitted irremovably. Fixation lugs to be welded with square rungs and a width of 300 mm.

Ladders with double square rungs shall be placed in the engine-room entrance and for access to the wheelhouse. Width of these ladders to be 600 mm and hot galvanized after construction.

#### **Railings**

Railings shall be provided all around the wheelhouse.

Entrance ladder to wheelhouse including platform shall also be provided with railings. Further railings shall be placed where required.

Height of railings in general 1000 mm except in way of bulwark.

Railings shall be constructed of flat bar stanchions with a top rail of pipe diameter and with one intermediate rail of stainless steel wire of 10 mm diameter with stretching screws top rail and stanchions in galvanized execution.

#### **Bulwark**

A bulwark with a suitable height shall be placed on the ends of the ship. Bulwark of 6 mm plating with stanchions every 2000 mm and on top a pipe to be provided. Bulwark may be as shown in GA

The bulwark at the deck corners (both Port and Starboard side) shall be provided with panama leads.

### **2.5.4. Bollards**

At least six double bollards to be provided on the main deck distributed on the port and starboard as shown in the GA. The bollards placed in heavy foundations with a height of about 200 mm. Total height of the bollards 500 mm. Deck construction in way of bollards shall be reinforced with increased plating thickness and extra stiffeners.

### **2.5.5 Steel doors**

Steel watertight door shall be provided on the passenger seating and crew accommodation entrance as shown in the GA. The door to be with a free

passage of 1800 x 700 mm and a threshold of 300 mm. Two adjustable hinges with grease nipples, six interconnected cleats and soft rubber sealing all around shall be fitted. One fixed light of 200 mm diameter with security glass, hook for open position and padlock eyes shall be provided. Padlock also to be delivered.

#### **2.5.6. Ramp**

Two ramps of suitable size (10.5 m x 4.5 m approx), one on each end, should be provided. Ramp should be designed so as to withstand the truck wheel loads.

The ramp shall be stowable in near vertical position (at least 75 degrees to Horizontal) and shall be capable of being lowered to the desired angle possibly up to 20 degrees below horizontal. The ramp shall be operated by hydraulic winches controlled by hydraulic power packs driven by electric motors.

Ramp should preferably be foldable type so that it does not impair the visibility. Non foldable alternative too may be proposed, however, it should not hinder with the visibility (having sufficient openings to give the visibility without impairing or endangering a smooth wheel movement on it).

#### **2.5.7. Name and draught marks**

##### **A. Ship's name and Port of Registry**

The ship's name shall be marked forward and aft port and starboard sides and transom.

The port of registry shall also be marked below the ship's name on the transom.

The ship's name in brass letter shall also be fitted on the wheelhouse, port and starboard.

##### **B. Draft marks**

The draft mark shall be marked in meters and decimeters by welded 6 mm thick steel plate figures at forward and aft perpendiculars and amidships on both sides.

#### **2.6. Hull preservation**

##### **2.6.1 General**

Painting specification giving details of painting and method of application shall be submitted to the owner for approval.

The colours of finish coats shall be in accordance with the Owner's colour scheme and those of primer coats shall be in accordance with the manufacturer's recommendations. Alternate coatings shall be of different

colours for easy identification. Pipelines shall be marked with a colour code system approved by the Owner.

Equipment, which the builder shall purchase, shall be painted according to each manufacturer's standard and the damaged part, after installation shall be touched up with one coat of finish paint of compatible kind.

### **2.6.2. Surface Preparation**

Surfaces of all structural steel plates and sections to be used for fabrication shall be sand or grit blasted to Sa 2.5 and immediately primed with inorganic zinc silicate type shop primer according to the Builder's standard.

Dry film thickness of shop primer shall be approximately 20 microns.

The steel surface of fittings such as pipe supports, grating supports, auxiliary machinery seats, etc. shall be sand blasted to Sa2.5 or pickling treated.

Pipes of over 250 mm diameter shall be blasted to Sa2.5 and pipes with 250 mm diameter and below, small pieces of pipes, seats etc. shall be power cleaned with wire brush or disc sander to St 3 or pickling.

Prior to the application of main system, all weld spatters, rust grease and other contaminants shall be removed by wire brushing from the surface.

The surface preparation shall be as per the following table:

<b>No</b>	<b>Location</b>	<b>Standard</b>
1	Bottom and boot top	Sa 2.5
2	Topside	Sa 2.5
3	Fresh water and Water ballast tanks	St 3.0 (Mechanical and power tool cleaning)
4	Weather deck	St 3.0
5	Deck house exterior	St 3.0
6	Cofferdam	St 3.0
7	Fuel oil and Lubricating oil tanks	St 3.0
8	Double bottom spaces and Cofferdams	St 3.0
9	Cargo Vessels	St 3.0
10	Void spaces	St 3.0

Prior to subsequent coats damaged areas due to burning and welding and prolonged exposure during fabrication shall be cleaned by abrasive blasting to Sa 2.5. Other spaces shall be power tool cleaned to St3.0.

### **2.6.3 Execution of Painting**

Painting work shall be executed in accordance with the Builder's painting practice and paint manufacturer's recommendations. Copper alloy, aluminium, aluminum alloy, stainless steel, non-ferrous material and galvanized surfaces shall not be painted unless specifically required. Time intervals between applications of coats shall have different colours for identification. No painting



exposed to weather shall be carried out in adverse weather conditions. Application shall be done with the help of airless spray as far as possible. Where spraying is not practicable, brush or roller shall be employed.

Record of temperature and humidity shall be maintained during the painting work and submitted to owner.

Before launching, the outside hull below the waterline shall be painted with sufficient coats for adequate protection. Non-slip paint shall be applied on the main deck open areas and passage.

Dry film thickness shall be measured by magnetic dry film gauges or equivalent in the presence of owner and paint manufacturer. Thickness shall be measured after completion of anti-corrosive coatings and/or the final coating in accordance with Builder's practice to Owner's approval.

On the edges of small holes such as slots, drain holes, scallops, irregular manual weld beads and corners of flame cut free edges of structures, air holes, etc one additional stripe coat shall be applied before or after the classification society coat.

Builder shall provide three years guarantee for painting work carried out on under water area, ballast and fresh water tanks.

#### **2.6.4 Paint scheme**

Painting scheme in general shall be as given below (painting scheme for parts or spaces, which are not specified, shall be similar to surrounding space or comparable spaces):

Sl. No.	Location	Painting specification	Dry Film Thickness (Microns)	Number of coats
A.	<b>OUTER HULL</b>			
1.	Bottom, Underwater hull upto deep load line, Bilge keel, Sea chest,	Epoxy primer Coal Tar Epoxy Coal Tar Epoxy Chlorinated rubber sealer coat Conventional Anti-fouling Conventional Anti-fouling	25 100 100 30 100 100	1 1 1 1 1 1
2.	Top side area including bulwark outside	Epoxy primer Coal tar epoxy Chlorinated rubber sealer Chlorinated rubber finish	25 100 30 30	1 1 1 2
3.	Bulwark Inside	Zinc rich primer Zinc rich primer	40 40	1 1

		Alkyd deck paint	30	2
4.	Vessel Name, Port of Registry, Hull markings	Alkyd gloss finish	30	2
<b>B.</b>	<b>TANKS</b>			
1.	Fresh water tank	Epoxy primer Pure epoxy	25 100	1 2
2.	Fore peak tanks/Water ballast tanks	Coal tar epoxy Coal tar epoxy Coal tar epoxy	100 100 100	1 1 1
3.	Oil tanks	Red brown epoxy and	One coat of respective oil	
4.	Aft peak and other void spaces	Bituminous solution	80	1
<b>C.</b>	<b>EXPOSED DECKS AND SUPERSTRUCTURE</b>			
1.	Exposed steel decks including wheelhouse top and 150 mm dados around all deck structures and machinery seats on decks.	Zinc chromate primer Zinc chromate primer Non-skid alkyd deck paint	40 40 40	1 1 2
2.	Outside exposed bulkheads, superstructure, handrails, stanchions, stays and ladders.	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish Alkyd Gloss finish	40 40 40 40	1 1 1 1
3.	Port light screen	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish Alkyd Gloss finish	40 40 40 40	1 1 1 1
4.	Standard light screen	Zinc chromate primer Alkyd Gloss finish Alkyd Gloss finish	40 40	1 1
5.	Masts, Davits etc.	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish	40 40 40	1 1 2
6.	Chain lockers, hawse pipe, anchors, chain cables	Bituminous paint	125	1
7.	Deck fittings such as bollards, towing post, fairleads, towing post, fairleads, deck rollers, other mooring fittings	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish	40 40 40	1 1 1
<b>D.</b>	<b>INSIDE ACCOMMODATION</b>			

1.	Internal Steel bulkheads and deck heads (uninsulated), Store spaces	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish (White) Alkyd Gloss finish (White)	40 40 40 40	1 1 1 1
2.	Internal steel bulkheads (Insulated area)	Bituminous paint	80	1
3.	Flooring area	Bituminous paint	80	1
4.	Wet spaces in accommodation area like mess, galley, pantry toilets and showers.	Zinc chromate primer Zinc chromate primer Alkyd Gloss finish (White)	100 40 80	1 1 1
5.	All wood work	Varnish		2
<b>E.</b>	<b>ENGINE ROOM</b>			
1.	Above chequered plate level in engine room, deck and overheads	Zinc Chromate primer Zinc Chromate primer Alkyd paint (White)	40 40 40	1 1 2
2.	Engine room – below chequered plating including floors and girders	Zinc metal spray Epoxy primer Bituminous	100 25 80	1 1 1
3.	Machinery seats, bilges of other spaces	Bituminous	80	1
4.	Main Engine	Zinc Chromate primer  Oil and Heat resistant paint	40  40	2  1
5.	Exhaust pipe, Inside of Funnel	Heat resistant paint	25	2
6.	Fire pump, fire main and hydrants	Epoxy primer  Zinc Chromate primer  Oil and Heat resistant paint	40  40 25	1  1 2

The builder may propose alternate painting scheme and submit for Owner's approval.

Inside of fuel oil tanks, lubricating oil tanks and other tanks for oils shall be treated with the oil carried in them.

### **3 EQUIPMENT AND OUTFIT**

#### **3.1 GENERAL**

This paragraph of the Specification contains the descriptions of equipment and outfit of the vessel, except those concerning machinery installation and electrical installation.

All requirements laid down in other paragraphs are also valid in this paragraph as far as applicable. The requirements regarding painting are also valid for the constructions and equipment.

#### **3.2. ANCHORING AND MOORING EQUIPMENT**

The anchoring and mooring equipment to be in accordance with the requirements of the Class as long as no higher requirements are specified hereafter. Subject to the acceptance by Class, our preference shall be for following type of arrangement.

##### **3.2.1. Anchors, chains and wires**

Two (2) sets of standard stockless bower type anchor shall be provided symmetrically about centre line of the vessel with anchor ring swivel according to the requirements of classification society on each end. Anchor chain cable shall consist of intermediate length, which shall be jointed with Kenter type shackle, and total length of chain shall be 12.5m long and at the other end it will be connected to a wire rope of matching strength and will be wound on the winch drum of each of the 2 Anchor Winches. Total length of the wire shall be based on the maximum depths of the river encountered and subject to class acceptance.

##### **3.2.2 Mooring wires**

Four mooring ropes of synthetic material with length and breaking strength according to the class requirements to be delivered.

##### **3.2.3. Anchor Winch**

On the deck two electrically operated anchor winch to be installed, one for each anchor at both ends. Winch shall also be suitable for manual operation in emergency. The anchor winch to have one Wire Drum and a warping head to stow the wire.

### **3.3. VENTILATION**

#### **Natural ventilation**

All spaces and compartments which are not connected to a mechanical ventilation system shall be provided with natural supply and exhaust means.

Fuel oil tanks, water ballast tanks, sewage tank, bilge water tank and freshwater tanks shall be provided with ventilators.

Other spaces as specified hereafter:

- for steering gear compartments, the space shall be provided with two 250 mm diameter goosenecks
- for main store, the space shall be provided with two 250 mm diameter goosenecks
- for crew's accommodation two 300 mm diameter mushroom ventilators on top deck

All goosenecks shall be galvanized after welding and provided with non-corrosive wire gauze.

In each space half the number of goosenecks shall be lengthened down to 200 mm above floor level.

Where necessary fire isolating flaps shall be fitted at the openings.

### **Mechanical ventilation**

The crew's accommodation shall be provided with fixed mounted oscillating fan. Fan capacity at least 1600 m<sup>3</sup>/hr, two speeds and oscillating 85 degrees.

Engine room natural exhaust in funnel shall be fitted with balanced fire flaps. Flaps shall be easily operated from outside the machinery space and “open” – “shut” nameplates shall be fitted at all operating handles. Other fire dampers shall be provided as required by the rules. Engine room ventilation system should cater for forced exhaust of spaces when required.

Emergency stop switch for Engine Room fans shall be arranged as required by the classification rules. The ventilation system shall be provided for Engine Room by mechanical supply or exhaust system capable of giving the required rate of air changes per hour to meet rule requirements. Ventilation heads shall be of mushroom or wall mounted louvers depending upon the final design and layout. A vent hood with stainless steel grease filter and exhaust fan shall be fitted over cooking ranges.

## **3.4. DECKHOUSE AND WHEELHOUSE**

### **3.4.1. General**

A deckhouse with accommodation for 100 passengers with seating for 50 passengers with at least 3 toilets, i.e. at least one gents' water closet, two gents' urinals and one ladies toilet shall be provided. Accommodation shall also be provided for 8 crews (1 Master, 1 Driver and 6 crew) in at least two crew cabins with double tier berth and one cabin for Master and Driver, separate toilets for crew and officers (at least one for each), galley and mess cum recreation room shall be provided as shown in the GA. The relevant statutory rules regarding construction, material, space and fireproof partitioning shall be compiled with.

All accommodation spaces shall be designed to have a clear height of 2000 mm.

### **3.4.2 Crew Accommodation**

Accommodation for the vessel's crew shall be provided in accordance with the Model Rules for Inland Vessels. The furniture and other fittings shall comply with crew accommodation rules. Forced air supply ventilation system is to be provided. The cabins shall be adequately furnished.

### **3.4.3 Mess and Recreation**

Separate mess cum recreation spaces for crew shall be provided. The mess rooms shall be equipped with sufficient number of chairs, tables and fans. One coloured 32 inch LED Television set and 1 no. 300 L capacity fridge shall be provided. One no. drinking water cooler shall be provided in the galley. The drinking water cooler shall have a capacity of 30-litres.

### **3.4.4 Galley**

Galley shall be equipped with one complete set of galley equipment, which shall include equipment as listed below. The quantity of cutlery and crockery shall be adequate for the total number of crew with 20% excess as reserve. Drain shall be via galvanized perforated top plate. Forced air supply ventilation system is to be provided.

Cooking range with 2 hot plates	- 1 No.
Water boiler	- 1 No.
Oven	- 1 No.
Stainless steel sink	- 1 No.
Wooden desk	- 1 No.
Wooden cupboard	- 1 No.
Cutting table	- 1 No.
Refrigerator	- 1 No. (300 lit.)
Water cooler	- 1 No. (30 lit)
One RO FW unit	
One complete set of utensils shall be provided for the preparation of food.	

### **3.4.5 Toilets**

All the toilets shall be furnished in accordance with the rules.

Two toilets, with one Indian WC and one European WC made of china clay and shower, for the ship's crew shall be provided. At least 3 toilets shall be provided for the passengers, at least two gents' urinals and one ladies toilet.

All the toilet fittings shall be provided as per rules and shall be approved by the Owner. All toilets shall be provided with sleek and rugged storage flush tanks and shall be properly secured. Toilet shall have mirrors fitted over the washbasin with lockable cupboards, cloth rails/hooks and towel rails.

### **3.4.6 Wheel house**

Wheel house to be positioned preferably at midship with console at the centre of wheelhouse for the ease of operation. The wheelhouse shall be of all welded steel construction and provided with equipment as listed in the equipment list. Clear view shall be provided by means of large windows. At

least two wall fans shall be provided. Clear view screens shall be fitted in the forward side. One no. straight-line wipers shall be provided. The windows will be arranged to provide clear view on all sides including front and back. Some of the windows shall be of openable type.

One no. split AC of 1 t or 1.5 t capacity shall be provided in the wheelhouse. The wheelhouse shall be provided with enough space. The wheelhouse console shall be adequate in size to accommodate all controls and display units/ meters. Wheel house shall be provided with sofas and seats to enable seating of at least 8 persons.

Further the following equipment shall be provided in the wheelhouse

- one sets of roller blinds and curtains
- one portable fire extinguisher
- one VHF-set
- one clock
- one double coat hooks
- one window wipers
- one clear view screen
- one manoeuvring desk- one settee
- one helmsman's chair
- one corner cupboard
- one chart rack against ceiling - one binocular box

#### **3.4.7 Flooring & Deck Covering**

The steel deck shall be covered with deck compound of approved type. In the accommodation spaces, wheelhouse, passage ways and the mess rooms, vinyl tiles shall be laid over the deck compound. The Galley, toilets and other wet spaces shall be cemented and tiled with unglazed antiskid tiles on the floor and matching glazed tiles on the walls up to a height of 1 meter. All decks shall have provisions for drainage of water through scupper pipes.

#### **3.4.8 Partition Bulkheads, Lining & Ceiling**

The ceiling, paneling and partitions shall be applied as per rules with marine quality and heat resistant plywood/material.

The accommodation spaces shall be insulated against heat and cold. All accommodation spaces, mess rooms, wheelhouse shall be lined on the sides with panels with removable beading all-round. The colour of the ceilings and paneling shall be of owner's choice.

The accommodation and the walls between the engine casing and the engine room shall be well insulated with fire retardant materials.

#### **3.4.9 Insulation**

The portion of the compartment facing weather shall be insulated in accordance with the statutory rules.

In place where rules for insulation against fire, heat and sound shall be applied at the same time, only the highest insulation thickness need be applied.

#### **3.4.10 Doors, Windows and Scuttles**

All doors shall be of such construction, finish and operation so as to suit their location and purpose.

The sill height of doors shall be in accordance with the requirements of Classification society/statutory rules as applicable and the clear heights of door openings for all cabins and public spaces shall be 1900 mm from the steel deck to top of the opening.

All doors shall be provided with suitable doorstoppers and securing arrangements. Door eyebrow shall be provided over exposed weather doors.

Windows and scuttles shall be provided as per BIS where applicable. Where steel plate is cut to fit the windows/scuttles adequate compensation shall be provided.

The type, size, location and number of doors, windows and scuttles shall be as per approved plans. All wheelhouse windows shall be selected so as to minimize heat transfer.

All door openings exposed to weather shall be provided with additional doors with mosquito nets.

#### **3.4.11 Furniture and hardware**

##### **Furniture**

Furniture shall be of good marine quality veneered plywood or hardwood, with massive framework. In double berth in the crew's accommodation berth of plywood bottoms and drawers under the lower berth shall be provided. Berth to be provided with foam mattresses with dimensions 1900 x 850 mm.

The chairs with steel frame and upholstered with foam rubber and cloth. For the helmsman a swiveling chair with arm rests and adjustable in height shall be delivered.

##### **Hardware**

Hardware shall be of non-corrodible heavy construction. Day and night locks shall be placed on crew's accommodation and wheelhouse doors. Good quality locks to be provided with three keys.

Steel doors and hatches shall be provided with padlock-eyes and brass padlock with hardened steel eye. Doors, hatches, lockers and drawers to be numbered and keys to be labeled with stainless steel label with number and vessel's name. Key locker shall be fitted in the control cabin.



Doors, Doors of lockers, cupboards and other furniture shall be fitted with good quality hinges. Door catchers with rubber stops of robust construction shall be fitted on the doors. Wheelhouse door with hook for open position.

Above all doors, on valves on air, sounding and filling pipes, on air caps etc. name and number plates shall be fitted. Plates of stainless steel or brass. The necessary warning and instruction plates shall be fitted, where required.

#### **3.4.12. Desks and instruments**

At the forward of the wheelhouse the manoeuvring desk shall be placed.

The desk to contain all necessary instruments for control of engines. Also the lighting panel to be incorporated in the desk.

The desk with sloping top plate shall be constructed of durable materials and first class finished.

Switches for searchlight and window wipers shall be placed in the vicinity of the apparatus.

#### **3.4.13 Lights**

Adequate lights to be provided in the accommodation and wheelhouse spaces. The lighting fixtures to be of reputed make.

#### **3.4.14 Miscellaneous**

Sign, symbols and markings shall be provided in the accommodation spaces. All cabins/stores/utility spaces shall be provided with engraved nameplates of approved quality. All open areas shall be suitably lighted.

All beds shall be provided with high density foam mattress of 100 mm thick. Mattress cover shall be of cotton fabric, the samples of which shall be approved by the owner.

### **3.5. STORES**

Stores shall be provided in the hull, at least a general store.

Racks to be placed with a breadth of 900 mm and in two tiers.

#### **Racks**

Further hooks and rods for tackles and ropes shall be fitted.

The general store shall be provided with a 38 mm wooden floor directly mounted on the steel floors.

### **3.6 MAST**

The mast will be of collapsible type and will be suitably located on the wheelhouse top and stiffened adequately. The mast shall be provided with necessary arrangements for installing the navigational lights, and yards for

hoisting flags and signals. Lowering of the mast shall be with help of a small hand winch. The mast is to be stayed. The height and location of the light masts shall comply with the relevant rules.

### **3.7. NAVIGATIONAL EQUIPMENT**

The following navigational equipment shall be provided and installed:

- one VHF-set in wheelhouse
- two searchlight on top of wheelhouse
- one electric horn
- One Public Address system for Master in wheel house

### **3.8. LIFE-SAVING EQUIPMENT**

Life-saving equipment shall be delivered according Class, model rules and statutory authorities sufficient for 100 passengers and 8 persons.

The equipment shall be stored and fitted on convenient places in at least the following numbers:

- 1 inflatable raft for 8 crew.
- 6 inflatable rafts of 20 person capacity
- 100 life jackets stowed in a g. r. p. box placed in concert with the Class
- 1 safety hammer in the wheelhouse
- 8 round shaped life-buoys, two with a floating line of 30 m, fitted on the control cabin and two fitted on aft ship

### **3.9. FIRE-FIGHTING EQUIPMENT**

The fire-fighting equipment to be in compliance with the statutory requirements and at least the following of approved make and type shall be delivered and fitted:

- One Power Driven Fire Pump
- One Hand Operated Fire Pump
- Four portable extinguisher, 9 litre chemical foam
- Six portable extinguisher, 5 kg dry powder
- one spare re-fill for each extinguisher.

## **4     MACHINERY INSTALLATIONS**

### **4.1 General**

All the engine room units shall be of marine grade and the installation shall be in accordance with classification society and other statutory requirements.

Engines shall be provided with control from engine room and wheelhouse. The engine room and other machinery rooms shall be mechanically ventilated.

### **4.2 Propulsion machinery**

#### **4.2.1 Main engine**

Two marine grade, fuel efficient, turbo charged diesel main engines of reputed make as required for achieving the speed stated in this document in the ambient conditions specified in 1.2.1, suitable for continuous operation at rated power shall be provided. The engines are to be compatible to the selected propeller system.

The engine shall be compact and of low weight as possible and shall be generally maintenance free. Necessary spares and after sales service for the engines shall be easily available in India.

The engine shall be complete with standard accessories, alarms and instrumentation meeting class requirements.

In addition, the following shall be provided:

- a) Silencers with spark arrestor.
- b) Closed circuit lubricating oil system with engine driven pump.
- c) Monorail with chain blocks over engines for servicing, adequate for handling heavier engine parts
- d) Fresh water, River water, F.O. and L.O. pumps.
- e) Gauges, thermometer, tachometers, flow meters for fuel oil, hour meter, pyrometers, etc.
- f) Heat exchangers for main engines and gearbox shall be of close circuit engine cooling.

Each engine is also to be equipped with:

- An AC-alternator with voltage regulator for charging batteries.
- Remote start/stop/speed control from engine panel in wheelhouse.
- Manual speed control on engine site.
- Electric transmitters for remote indication of engine speed, lube oil pressure and fresh cooling water temperature.
- Electric indicators for mounting in manoeuvring desk in the wheelhouse.
- Electric transmitters for low lube oil pressure alarm and high cooling water temperature alarm.
- Automatic stopping device at overspeed and low lube oil pressure.

- An electric diesel engine hour counters for mounting in the wheelhouse desk. Speed, clutch and brake control must be possible locally as well as remote from the steering desk.

The shop test of the propulsion diesel engines shall be carried out as per the requirements of the Classification society. The engines shall be tested in the presence of the Surveyor in the following manner:

- 4 hours continuously running at 100% load at rated speed
- 1/2 hour running at 110% load
- 1/2 hour running at 75% and 50% each of the rated speed with a load according to the propeller law
- 1/2 hour running at idling speed.
- Specific fuel consumption to be charted for each of the above running ranges.

Governors tests and safety functions shall also be performed. Shop test data and certificates shall be supplied. While testing the engines at shop floor, all fittings constituting the total supply of the engines shall be actually installed. Subject to satisfactory tests, the engines shall be numbered and stamped.

The propulsion systems shall be free from all vibrations throughout the entire working range.

The following items, common for both engines, shall be provided.

- a) Sets of Standard and Special tools and gauges for servicing, including tools for turbo-chargers, as recommended by manufacturer of engine.
- b) Crankshaft deflection gauge.

#### **4.2.2. Propulsion shafts**

Propeller shafting is to consist of intermediate and tail shaft with rigid type couplings flanges. The diameter of intermediate shaft is shall be increased by 3mm in way of shaft bearing. Tail shaft dia shall be 3% in excess of class requirements. No. of steady bearings are to be provided depending on final length and torsion vibration characteristics; with each bearing having its own lubrication system. Stern tube bearing shall be white metal lines and oil lubricated type.

Stern tube seal forward and aft assemblies shall be of approved type. Seal liners shall be of high chromium steel and housing shall be cast bronze. The aft seal is to have a circulatory type lubrication system.

#### **4.2.3 Propellers**

The vessel shall be equipped with two conventional propellers of reputed make. Strength of the fittings of the propeller system shall be in accordance with the classification society and shall be designed for the maximum vessel speed corresponding to the MCR of the Main Engine.

The propellers shall be suitable of a continuous power on the input shaft of about 20% in excess of the maximum continuous rating of the diesel engines at rated engine speed or as per the recommendation of the manufacturers and class requirements. The propeller shall be directly driven by the main engine.

The propeller units will be provided with an integrated lubrication system with built-in circulating pump and necessary arrangements for maintaining the lube oil pressure.

The conventional propeller is to be provided with a 4-blade propeller.

Necessary controls/ Alarm panels shall be provided in the engine room and the wheelhouse as applicable.

#### **4.2.4 Steering Gear**

One set of electro – hydraulic piston type steering gear shall be installed in steering gear room. The steering gear shall consist of one set of hydraulic power unit, integrated oil pipe, etc. Both the tillers arms shall be connected to the hydraulic ram and each tiller arm shall be operable independently.

All parts of steering gears will be designed and equipped in accordance with the requirements of Rule / Regulations.

The steering gear shall be capable of turning the rudder from 35° on one side to 35° on the other side within 28 seconds with the one (1) power unit with the vessel at its designed draft and running ahead at maximum ahead service speed.

The steering gear shall be capable of turning the rudder from 35° on one side to 35° on the other side.

The hydraulic pump shall be started/ stopped in the wheel house and in the steering gear room. The steering gear will be connected to the control unit in wheel house. Means shall be provided to prevent the rudders going in opposite direction.

#### **4.2.5 Bow thrusters**

One (1) fixed pitch type bow thruster of suitable capacity shall be provided in the forward part of the vessel. The thruster tunnel shall be provided as necessary. Stainless steel lining shall be provided in way of the thruster blades. The bow thruster shall be directly driven by diesel engine of approx. 100 hp capacity. The bow thruster shall be controlled from the wheel house.

#### **4.2.6 Duct for Bow Thruster**

Connection with shell plating shall be well rounded. Sides of opening shall be well faired in to shell plating. Protective grids shall be provided.

### **4.3 Diesel Generator Sets**

One auxiliary engines of reputed make coupled with alternator sets of 65 KVA and 10 kVA capacities each shall be provided. All necessary controls shall be placed at a common control panel for the gensets.

Engines and alternators shall be shop tested as per classification rule requirements.

During shop trials and during load test of generator after installation onboard, governor tests shall be carried out and instantaneous change in speed/frequency shall be noted. The tests shall be done for sudden changes in loads from 0-50%, 50% - 100% and 100%-0. Observations shall also be made regarding the initial and the final speeds of the DG set. Engine and alternator shall be shop tested together for at least two hours at 100% load, followed by a run at 110% load during half an hour.

The engine shall be equipped with standard and special tools and accessories as per manufacturer's recommendations/Class requirements - The standard mounted instrumentation, but at least a tachometer, a running hour counter, a lube oil pressure indicator and a fresh cooling water temperature indicator. Alarms on low lube oil pressure and high fresh cooling water temperature. Automatic stopping device at overspeed and for low lube oil pressure. Freshwater, river water, F.O., L.O pumps and heat exchangers shall be engine mounted.

The auxiliary set to be built together on a rigidly constructed common base-frame and the complete unit to be fitted to ship's foundation via anti-vibration mountings.

### **4.4 Engine Starting**

Main engines and Auxiliary Engines shall be Battery started and for this purpose adequate number of batteries as per manufacturer's recommendations shall be provided in the engine room as per class requirements.

### **4.5 ENGINE ROOM SYSTEMS**

**4.5.1** All piping systems shall be installed such that satisfactory functioning of the installations shall be possible in accordance with the rules of the classification societies, statutory bodies and relevant standards. They shall be installed together with all fittings such as flow control valves, cocks, filters, pressure gauges, thermometers, etc. according to the practice of the yard, and approved by the Owner.

All ship service piping systems shall be installed and tested in accordance with the requirements of the class/ Statutory bodies.

All galvanized pipes shall be hot dipped galvanized after fabrication has been completed. Minor damages during installation shall be touched up by zinc paint. Piping in oil tanks shall not be galvanized.

Steel pipes and pipe ends on the machinery shall be blanked prior to final installation.

After completion of fabrication work all lubricating oil pipelines and fuel oil pipelines from daily service tanks to the consumers shall be pickled, oiled and blanked prior to final installation.

The pipes shall be carefully clamped and where necessary fitted with suitable draining arrangements for locations where the liquid is likely to stagnate. Clean plugs shall be provided in domestic and sanitary pipes, which are likely to be choked.

All piping in machinery spaces shall be marked with a coloured ring, to an approved colour scheme, to denote the nature of fluid or gas passing through it.

Remote controls from wheelhouse for valves/ pumps shall be fitted as necessary.

All valves, pumps, vent/sounding pipes shall be fitted with engraved brass nameplates in respect of their duty. Where required for their duty flexible pipe connections shall be used.

Where necessary piping may pierce girders or any structural members provided that these structures are sufficiently compensated in accordance to classification requirements.

Non pressurized pipes such as sounding, vent, scupper, etc shall be inspected by fill up and / or flow test.

#### **4.5.2 Exhaust System**

All diesel engine exhaust gas pipes shall be made of steel fitted with expansion bellows and shall be rigidly secured with brackets. Mild steel flanges shall be provided. All exhaust gas pipes shall be led to the transom after mixing with cooling header of main engines.

All precautions shall be taken to eliminate heat radiation from exhaust gas pipes to the surrounding areas and exhaust fumes shall be led away from the accommodation. Maximum total resistance in exhaust pipes shall not exceed the requirements of engine manufacturer.

Exhaust gas pipes from all the engines shall be led to atmosphere through the silencers and spark arrestors. Exhaust pipes from all the engines shall be insulated by rock wool with adequate thickness and fastened by galvanized steel wire and finished with galvanized sheet.

#### **4.5.3 Fuel Oil System**

Main propulsion engines, auxiliary engines, and other diesel engines shall use HSD oil.

One no. gear/screw type electric driven fuel oil transfer pumps of about 2 m<sup>3</sup>/hr capacity at 2 bar head with suction and delivery connections shall be provided for transferring fuel oil from bunker tanks to the daily service tanks. The pumps shall also have connections to transfer fuel oil between bunker tanks. A hand pump shall be installed as stand-by.

Day tanks shall be provided with high and low level alarms and shall be equipped with waste tray and drain. Overflow and oil level gauge shall be provided.

All fuel oil pumps shall be capable of being stopped from main deck. The control position shall be such that it will not be likely to be rendered inaccessible by a fire in the engine room. Isolation valves shall be provided as necessary.

Fuel oil/ Lube Oil bunkering lines shall be provided with manifold on main deck port and starboard. Drip tray/ coaming shall be provided to contain spillage

A set of hoses of suitable length to be stored on the main deck. Type and size of couplings according to local standards.

#### **4.5.4 Lubricating Oil System**

Each main engine, gearbox and auxiliary engine shall have its own independent lubricating oil system.

One storage tank of suitable capacity shall be provided in the engine room to cater to the requirements of Main Engine, Auxiliary Engine and Gear Boxes.

Drawing arrangement of lube oil from main engine may be provided through pipeline.

As far as possible all systems should use the same lubricant. The Yard will be required to furnish a list of lubricants to be used on machinery and equipment installed on the Vessel, in accordance with the manufacturers' recommendation

Loose tanks for lube oil storage and dirty oil shall be installed in the engine-room, each having a capacity of approx. 0.2 m<sup>3</sup>, as well as a L.O. service tank provided with a tap-cock and drip tray for filling oil cans and having a capacity of 0.05 m<sup>3</sup>.

Semi-rotary type hand pumps shall be installed for filling the oil sumps of the diesel engines and for emptying the dirty lube oil tank.

All piping to be made with steel tubes.



#### **4.5.5 River Chests**

At least two adequately sized river water inlet chests shall be provided in the engine room, integral with vessel's structure, each sufficient for total required river water capacity. Each inlet chest shall be provided with stainless steel gratings. The inlet chest shall be provided with vent pipes to the prescribed height above the freeboard deck.

#### **4.5.6 Cooling Water System**

The main parts of the cooling water system of the diesel engines shall be closed circuit unit built on the respective engines. The connected piping shall be of seamless steel tubes with diameters such that the flow velocity will be not more than 2.5 m/sec.

#### **4.5.7 Bilge/Ballast/General Service/Fire Fighting System**

Two nos. pumps to be provided for the purpose. The bilge/ ballast/ general service/ fire fighting system are to comply with the rules and requirement of classification society. The pump shall be of the self-priming centrifugal type and will have a capacity of 35 m<sup>3</sup>/hour at a pressure of 3.5 bar. Furthermore three hand driven bilge pumps to be installed, two in the engine-room and one in the store. Bilge system shall be equipped with necessary mud boxes. Ballast tanks shall be ballasted and deballasted by these pumps. An auxiliary bilge system equipped with hand pumps shall be provided for chain lockers, forward stores & steering gear compartment.

The bilge system shall be arranged with a valve manifold in engine room and pipeline of dimensions according to classification requirements.

Fire fighting connections shall be arranged on deck and engine room satisfying classification / statutory regulations.

An emergency fire pump shall be provided in the forward stores in an appropriate location.

#### **4.5.8 Sanitary Water System**

A sanitary water system conforming to class requirements to be provided in the vessel. At least two nos. 500 litre tank for sanitary water system to be provided at suitable locations. Necessary filling arrangements to be provided. River water connection shall be supplied to all toilet flushes, toilets and galley. Supply of river water to the overhead tank shall be through pump.

An electrically driven freshwater supply pump to be installed in the store. A discharge connection on the main deck to be provided including a set of hoses and storage reels. Type of coupling according to local standards.

#### **4.5.9 Domestic Fresh Water System**

Fresh water storage tanks of total capacity of about 5 tons shall be provided for catering to the requirements of the crew.

One fresh water overhead tank of 250 lts. capacity shall be provided. Fresh water pump of  $2\text{m}^3/\text{hr}$  @ 2 bar shall be provided for transferring fresh water from storage tank. One semi rotary hand pump shall be provided as stand by.

Fresh water connections to Galley, Mess, Water coolers etc. shall be passed through UV sterilizers.

#### **4.5.10 Sewage System**

All scupper pipes with the inlet opening on or below-waterline level and all waste pipes shall be drained into a sewage collecting tank with a capacity of approx.  $3.5\text{ m}^3$  which is to be constructed at a suitable location.

Inside the tank a spray flushing pipe to be fitted connected to the discharge system of the general service pump.

A sewage discharge pump for emptying the tank to the general collecting tank shall be installed. The pump to be with a capacity of approx.  $2\text{ m}^3/\text{h}$  at a pressure of 2 bar. The pump to be provided with dry running protection.

#### **4.5.11 Scupper and waste pipes**

All piping to be executed conforming to the sizes and materials as per the class requirements. Waste pipes from shower, sink, washbasin etc. to have an inner diameter of not less than 35 mm and waste pipes from the toilet to have an inner diameter of not less than 100 mm and shall be connected to the sewage tank.

An emergency direct to overboard connection to be provided. Scuppers shall be so arranged that good drainage will be ensured at every spot. Scupper inlets on open decks to be provided with a welded steel grid. Horizontal pipes to be fitted with a slope to outboard. Pipes which are draining directly to overboard must have the same wall thickness as the hull at that spot.

All pipes to have sufficient cleaning possibilities fitted on easily accessible spots. All cleaning plugs to be of stainless steel.

#### **4.5.12 Filling, vent and sounding pipes**

All pipes on water tanks and dry compartments to be of galvanized steel. For pipes on oil tanks only the parts above open decks to be of galvanized steel. Upper ends of pipes to be clearly labeled.

Filling connections at least 300 mm above deck, suitable of coupling of standard supply hoses, to be shut off with blind flanges. Filling connections for fuel oil to be arranged together with a drip tray.

All built-in and loose tanks to be provided with a vent pipe, connected to the highest point of the tank.

Vent pipes of fuel tanks with flame-preventing safety gauze meeting the Class requirements. Vent pipes of the sewage tank aft to be drawn up to the top of the funnel.

Where possible, level gauges to be fitted. All built-in tanks to be provided with a sounding pipe. The upper ends shut off with a screwed bronze cap, attached to a chain.

Tanks in the engine room to be provided with a short sounding pipe with-a self-closing sounding valve with test-cock.

Air vents for drinking water tank shall be provided with insect proof net. Sleeve joints shall be used for pipes passing through decks.

Drip trays shall be provided below the valves of all oil tanks and coaming shall be provided at the bunkering points.

All built in tanks shall be provided with a sounding pipe with upper ends shut off with a screwed bronze cap, attached to a chain. Sounding pipes shall be led as vertical as practicable. Inclination of sounding pipes where unavoidable shall be less than 30 degrees from the vertical line. Sounding pipe shall be provided as close as possible to the suction and shall be well supported.

A strike protector of steel plate shall be fitted directly under each sounding pipe. Thickness of the sounding pipe shall meet the requirements of the classification society.

Tank level gauges shall be provided for all ballast tanks, fresh water tanks, peak tanks and oil tanks.

Air and sounding pipes shall be arranged near bulkheads and behind stiffeners wherever possible.

#### **4.5.13 Hydraulic installation**

Two nos. hydraulic power packs of reputed make to be provided. Each ramp shall be hydraulically locally operated, for which a complete individual power pack will be provided, installed in the store. The pump will be electrically driven. Special preventions have to be taken for starting of the pump to avoid an unacceptable generator voltage dip.

The electric motor can be vertical/ horizontal mounted of sufficient power with efficiency of 80% operating at 415 V.

#### **4.5.14 Ventilation System**

Mechanical ventilation shall be provided in the engine room through required number of axial flow fans of adequate capacity. One of the supply fans shall be reversible.

Exhaust fan shall be provided in Galley.

Watertight covers shall be arranged on all ventilation inlets as required by load line regulations. Fire dampers shall be fitted to all ventilators as required by rules.

#### **4.5.15 Miscellaneous**

##### **Piping and Valves**

All piping schematic drawings shall be approved by Owner/Class and Statutory Authorities. Pipes shall have suitable expansion arrangements wherever necessary and pipe material shall be suitable for the fluid that it will carry and shall comply with rule requirements.

All valves shall be of approved type. Valves fitted to the hull shall be of Cast steel body with internals of bronze/Stainless steel.

##### **Insulation**

In general the surface of machinery, equipment, pipes and tanks whose surface temperature is more than 60 degrees C shall be insulated.

Pipes shall be tested and painted (when necessary), before insulation is applied.

The insulation materials shall be fire resistant and shall be arranged in such a way that operation and maintenance are not hindered.

##### **Nameplates**

Engraved Al/Brass nameplates shall be provided on each pump, engine, valve, loose tanks etc., and where necessary for safety and control, the function and the medium used in that respective place shall be indicated on nameplates.

All Vent/Filling/ Sounding pipes shall be provided with nameplates for identification above main deck.

The nameplates fitted on weather decks and on aluminum parts shall be of stainless steel. The lettering on nameplates shall be black, however on safety and emergency valves red coloured lettering shall be adopted.

## **Instruments**

The scales of instruments for pressures, temperatures etc., shall be such that the working range is not more than 70% to 80% of the full scales. The maximum allowed values shall be marked with a red line on the scale.

The temperature gauges shall be provided with scales marked in degrees centigrade. Gauges for temperatures over 300 degrees C shall be of the pyrometer type.

## **4.6 LAY-OUT OF MACHINERY SPACES**

### **4.6.1 Engine-room**

The machinery shall be arranged in such a way that easy operation and maintenance shall be possible.

All machinery and equipment shall have shut-off valves to disconnect them from the connecting pipe systems.

The floor shall be made of steel plates of suitable thickness with raised non-slip pattern fitted on galvanized steel bearers by countersunk non-corrosive screws.

Hinged hatches for easy access to equipment under the floor shall be arranged.

Hoisting eyes or lugs have to be provided on direction of the IRS.

## **4.7 GENERAL REQUIREMENTS REGARDING MATERIALS AND WORKMANSHIP**

### **4.7.1. Auxiliary pumps**

In general, pumps to be with flanged pipe connections except for inside diameters of less than 25 mm. Pressure gauges to be provided on inlet- and outlet side.

Pumps to be coupled to the driving motors via flexible couplings. Output of driving motors should be at least suitable for the required shaft power. In general pump speeds shall not exceed 1500 rpm. The Yard must submit QH-curves, and power characteristics of all pumps. The information to be based on the specified liquids.

The pumps to be of BE pumps or equivalent and conforming to the Class requirements.

#### **4.7.2. Valves and accessories**

All valves and accessories to be at least suitable for pressure stage 10 according to the BIS standards or equivalent DIN-standards, where no higher system pressures are described.

In general, the material of valves to be as follows:

Body & Cover	-	cast iron
Inner parts	-	bronze

In the bilge and fire fighting system, valve inner parts to be of sea-water resistant bronze.

Hull valves to have cast-steel or bronze body and cover.

Fire fighting/deck wash valves with bronze body and cover, rubber lined disc-type valve and provided with coupling.

Butterfly valves to be with rubber lined cast-iron or steel body, bronze disc and stainless steel shaft.

Valves with a diameter of 25 mm or less may be completely of forged steel when fitted in steel pipe systems or bronze in case of non-ferro pipes.

Dimensions of the valves according BIS-standards and with flange connections for a diameter of 32 mm and more and with screwed connections for the smaller diameters.

Safety- and relief valves to be adjusted on the maximum admissible pressure of the system and to be locked in that position. They will be of the direct acting, spring-loaded type and mounted in such a way that no injury/damage occurs when they come into action.

Each pipe system should also include a list of all valves and accessories, stating type, makes, type-numbers, nominal diameter, materials of casing and inner parts, the built-in length, flange dimensions with number and size of the bolt-holes, working pressure, working temperature and test pressure. This list must be submitted to the Owner/ Class for approval prior to the placing of orders.

#### **4.7.3. Piping**

Pipe-sizes according the Class requirements and also strictly in accordance with the system-pressure, but in any case suitable for a working pressure of 5 bar/10 bar. Flange dimensions according to BIS-standards or equivalent. Where pipe diameters are stated without further nomination the inside diameter is meant.

Pipes and flexible joints with a diameter of 25 mm and more to be connected with flanges. Welded-on plate flanges to be used.

Copper or copper alloyed pipes to be connected by means of hard solder bronze rings and loose steel flanges. For pipes and flexible joints with a

diameter of less than 32 mm screw coupling of the standard type may be used.

Flexible connections of the flexible steel tube type to be used for machines and apparatus, which are mounted on anti-vibration mountings.

Where galvanized pipes pass through gas, oil or watertight bulkheads or decks, these penetrations will be executed with so-called three-flange type pipe-pieces.

Pipes should be mounted in such a way that expansion or contraction can occur without remarkable increase of stress. Piping to be fixed suitably by means of steel clamps of flat bar. Where steel clamps are used for copper or copper alloyed pipes, they shall be provided with a lead or nylon lining.

Drain cocks to be provided on all lowest points of all pipe systems and venting connections on all highest points. All pipes intended for transfer of fuel, lubricants or such like oils, are to be pickled, neutralized and washed with freshwater after manufacturing is completed. If time lag between cleaning and actual operations is big, then the pipes to be applied with a film of oil and adequately protected against foreign particles during the lay-off period. After completion of the installations, the pipes to be flushed with the liquid they are destined for.

All pipe-systems to be tested after installation with at least 1.5 times the working pressure. This with a minimum of 6 bar.

Insulated pipes and pipes behind paneling to be tested before insulation and paneling are fitted.

#### **4.7.4. Insulation of piping**

Pipes to be tested and painted (when necessary), before insulation is applied.

Thickness of insulation to be at least in such a way, that the surface temperature will not be more than 25° C above the ambient temperature when the engine room ventilation is working. Where the insulation runs the risk of damage or where hot pipes run within normal reach, they have to be provided with a sufficient protection.

The exhaust gas piping and silencers to be insulated with rock wool blankets on wire gauze finished with a glued layer of glass fiber cloth and the whole to be covered with aluminum sheets. The flanges and expansion joints have to be covered with insulating mattresses filled with glass wool. Cold water lines in accommodation to be finished with 2 cm anti-condense insulation.

The application of asbestos as insulating material is not permitted.

#### **4.7.5 Instruments**

The instruments for pressures, temperatures etc. to be such that the working ranges is not more than 70% to 80% of the full.

#### **4.7.6 Loose Tanks**

Loose tanks to be made of steel, reinforced where required. Large tanks to be provided with a manhole, small tanks with a hand hole and further with connections for a level gauge, filling and vent pipes, a drain valve and the necessary system connections. Drip trays to be provided below oil tanks.

#### **4.7.7. Nameplates**

On each pump, engine, valve, loose tank and where necessary for safety and control, the function and the medium to be indicated on nameplates.

Anyway each valve to be provided with a nameplate on or near the cover in addition to nameplates on the hand wheels.

The nameplates of bronze or brass with engraved letters. On weather decks and where fitted on aluminum the nameplates should be of stainless steel. The lettering to be black, however on safety and emergency valves red colored lettering to be adapted.



## **5 ELECTRICAL SYSTEM**

### **5.1 General**

All installations, materials and constructions must be according to good marine practice, fully adapted to tropical and sailing conditions and suitable for this type of Vessel. The complete electrical installation and workmanship shall be in accordance with the rules and regulations of the classification society and statutory authorities applicable to this type of vessel. All electrical fittings and fixtures to be of relevant BIS Standards and with BIS mark.

The electrical rotating machinery, transformers and other electrical equipment shall work satisfactorily at an ambient temperature of 45<sup>0</sup> C. All the electrical equipment shall be arranged for easy accessibility for repair and replacement.

The equipment installed shall work satisfactorily at voltage and frequency variations as specified by classification society.

Each control panel shall be provided with relevant drawing, wherein the fuse ratings of feeders shall be clearly mentioned.

All the relevant electrical drawings and plans including load chart shall be submitted to the classification society for approval prior to placement of orders for equipment/installations.

### **5.2 Power Supply**

#### **5.2.1 General**

A 415 Volts A.C 3 phase, 50 Hz electrical supply shall be used for feeding the main bus bar, and 220 volts A.C. 50 Hz electrical system shall be used for all domestic and necessary lighting requirement.

Provision for shore supply connection shall be made for powering the 220 volts system while the vessel is at harbour.

#### **5.2.2 Main supply**

The generators shall be continuously rated and shall have class 'F' insulation, suitably tropicalised and shall be designed for a temperature rise, after continuous full load working, not exceeding the temperature limits specified by the classification society.

The vessel shall have a 50 Hz. A.C. supply power generation.

One No. diesel engine driven alternators each of 65kVA (minimum) and 10 kVA capacity shall be installed. The 65 KVA alternator shall be able to take the entire load of the vessel with 30% margin. The 10 KVA one will be able to supply required power when the vessel is at rest. Both alternators shall have

automatic voltage regulators to maintain constant voltage within the permissible limits specified by classification rules, and shall have drip proof enclosures. They shall be fitted with all necessary alarms and protections.

### **5.2.3 Emergency Supply**

- (i) Adequate battery shall be provided for catering to emergency load.
- (ii) Adequate sets of storage batteries with charging panels for Main engines, D.G. Sets, Navigation panels and lights, emergency lights, etc. shall be provided.

### **5.2.4 Shore supply**

A shore supply box complete with a four-core supply cable 50 m long with necessary plug and socket fittings, necessary switch, fuses, voltmeter, frequency meter and phase sequence indicator shall be provided on the main deck. A voltage available indicating lamp shall be provided on the panel. All cable, insulation, etc., shall suit the location and duty requirement shall comply with relevant rules.

## **5.3 Supply and Distribution**

### **5.3.1 Main Switch Board**

One main switch board of metal clad, drip proof, dead front type, mounted on resilient mountings shall be fitted on a raised platform in the engine room. The switchboard shall be completely closed at the rear and is to be serviceable from the front.

The alternator panels shall have meters for the measurement of voltage, frequency, current, power factor, and power and earth leakage. The two alternators shall be protected through, circuit breakers of adequate capacity and shall have necessary protective circuits for under voltage, over current, reverse power and short circuit. All the outgoing feeders and the shore supply shall be protected through suitable circuit breakers.

The switchboard shall be designed and installed with ample space for repairs and maintenance.

The construction and installation of switchboards shall be as per rules and they shall be fitted with all necessary alarms and fuse and switch gear.

Switchboards and all enclosed gear must be accessible for maintenance. All the emergency loads shall be powered from Emergency Switchboard (ESB). During normal operation the emergency switchboard shall be powered from the main switchboard (MSB) through a tiebreaker. In the event of a failure of MSB, the tiebreaker shall trip and ESB bus will cater the emergency requirements.

### **5.3.2 Distribution Boards**

Suitable number of lighting distribution boards and power distribution boards shall be provided. All the panels shall be drip proof type, sheet metal enclosed and shall be provided with suitable schematic drawings.

Whenever electrical equipment is located at a distance from its distribution board, a local control panel shall be provided. The local control panel shall have necessary control switches. In such cases suitable interlock shall be provided to prevent accidental starting during maintenance. Ammeters shall be provided either at group starters or at local control panels.

### **5.3.3 Transformers**

Supply to lighting loads and small power loads shall be 220 V single phase through 415 V/220 V transformers. The system shall consist of three single-phase transformers, two connected in delta-delta and one standby.

### **5.3.4 Motors**

In general squirrel cage induction motors of marine type suitable for 3 phase, shall be used. The motors shall be of drip proof or weather proof as required by the location and shall be of approved type. For specific equipment like fans, etc. motors shall be as supplied by the manufacturer and shall meet the rule requirements of Classification society. All motors shall be protected through fuse, overload relay and breakers of adequate capacity. Unless specified by the maker motors with low starting current shall be of direct on line starting type.

### **5.3.5 Battery**

Adequate number of sets of Sealed Maintenance free accumulators shall be installed for the following purpose:

- (i) Main engine starting
- (ii) Generator engine starting
- (iii) Navigational & communication system
- (iv) Emergency lighting
- (v) Lights and fans in the wheel house, crew and officers accommodation and also at deck and engine room during night in the off hours.

The batteries shall be placed on a raised platform, in a well-ventilated box fitted with non absorbent insulating supports and shall be secured properly to avoid any movement during sailing.

An adequate space shall be provided above the cells for maintenance of the same. Battery space shall be well ventilated.

Battery charger shall be provided with necessary meters for reading the battery charging voltage, charging current and load current. The charger shall have necessary protective circuits for over current and reverse current.

## **5.4 Cables**

### **5.4.1 Type**

All cables shall be flame retardant and comply with rules of classification society.

### **5.4.2 Installation**

All the cable runs shall be straight and accessible as far as practicable. Cables shall be installed on galvanized trays and shall be secured properly. Cables passing above main deck and wherever there is a risk of mechanical damage shall be led through galvanized pipes. Cables passing through decks and bulkheads shall be led through suitable coamings or individual watertight glands. The piercing shall be filled with approved filling material for water tightness. Vinyl bushes shall be used for penetrations through 'B' Class bulkheads. Alternatively Multi Cable Transit Gland of reputed make may be used. Where cables pass through non-watertight bulkhead or structural steel the holes shall be bushed with lead or approved materials. Cables passing close to radio and navigation equipment shall be properly screened. As far as possible cables for automation and instrumentation shall be laid in separate trays or when laid on same channel the distance between them shall be as per the rules.

## **5.5 Lighting and cabin fans**

The lighting installation consists of a network of 220 V A.C. systems.

The network is to be powered from the main 220 V supply. In general all the light fittings shall be of weather proof, drip proof or non-watertight as required by the location and shall be suitable for marine application.

In general 2x20 Watts fluorescent fittings shall be used. All lighting fixtures to be of approved make. However stores, level gauge lighting and weather deck lighting may be incandescent type.

Illumination levels in various areas shall comply with the rules of classification society and relevant statutory authorities as applicable to this class of vessel.

The fittings shall be installed for easy maintenance as far as practicable.

In addition to the above at least one set of lights and a fan in the cabins and one set of lights at all passages, engine room, wheelhouse will have provision for 220 V AC power supply from battery bank through a suitable inverter.

### **Lighting for Accommodation**

All the cabin and passage lights shall be of fluorescent type. Switches and sockets in accommodation shall be of flush type. Watertight fittings shall be used in the toilets and galley. Hinged type chart table lights with incandescent lamp and dimmer shall be provided.

### **Machinery Room Lighting**

Fluorescent light fittings shall be used in the engine room for general illumination. Incandescent type lamps shall be used for tank level gauges. All the switches and sockets used shall be of watertight type.

### **Portable lights**

Six number 40 Watts, 220 V portable hand lamps shall be provided with watertight socket and 8 meters flexible cable. Watertight and cabin type sockets / plug shall be of two pin earth type. For portable lamps and for locations in exposed decks watertight type switch sockets shall be provided.

### **Rechargeable lights**

2 numbers handheld chargeable lights will be provided for emergency use.

### **Cabin fans**

Adequate number of circulating fans shall be provided in cabins, messes and wheelhouse.

## **5.6 SPECIAL INSTALLATIONS**

### **Tank contents indicating**

Fuel oil, freshwater, bilge water and sewage storage-tanks to be provided with a tank contents indicator. Start and stop of the pumps to be installed as well near the pump as near the supply/charge/discharge pipe connection.

### **Fuel flow counting**

For the supply of fuel oil and freshwater to provide a flow meter with counting facility giving the supplied quantity.

## **5.6 Navigation and Communication Equipment**

### **5.7.1 Navigation Equipment**

The equipment to comply with minimum standards as per the class requirements.

### Echo sounder

A depth echo sounder to be installed with digital display on the wheelhouse desk and provided with adjustable acoustic minimum depth alarm. Power supply 24 V DC.

### Electrical Horn

To install on top of the wheelhouse an electrical horn with pushbutton control in the wheelhouse desk.

### Window wiper

The front windows to be provided with parallel type window wipers. Power supply 220 V. One connection to the 220 V network after the inverter and the others connected to the main network 220 V.

## **5.7.2 Communication Equipment**

The equipment to comply with minimum standards as per the class requirements.

### V.H.F.

To install a VHF communication set with DSC Channel 70, radiotelephony 16, 13 and 6.

## **5.7.3 Navigational Lights**

Two sets of electrical navigational lights shall be provided as per rules.

One set shall be powered by the emergency supply. The other set shall be powered from the regular power supply. Navigational lights shall be controlled from a control panel mounted on bridge console. The panel shall indicate the status of the lamps and shall give an audible alarm in case of fused bulb. Signal light of approved make shall be fitted as per rules. The lights to be mast head light, portside light, starboard side light, stern light, anchor light, NUC light and other lights as per rules.

## **5.7.4 Search Lights**

In addition to normal light fittings two search light (swiveling type) of 1000 Watts with ballast shall be fitted, one on each end of the vessel.

## **5.7.5 Flood Lights**

Open decks and ro-ro space shall be illuminated with sufficient number of floodlights. At least 6 nos. flood lights shall be fitted, 2 on each sides and 2 around midship.

### **5.7.6 Navigational Console**

One Navigational console having aesthetic design shall be erected in the wheelhouse and all necessary equipment/controls, including the following shall be fitted on it.

- operating equipment for follow-up and non follow-up steering and speed adjustment of the propellers. Steering controls and rudder angle indicator. Signal/ indication equipment for the propellers. start/stop/control indicators for the main diesel engines. one console;
- echo sounder
- VHF
- Remote alarm panel for engine room alarms
- Navigational, search lights and deck lights controls
- Loud hailer
- Electrical air horn
- Window wiper control
- Main engine control
- Main engine load indicator
- Walkie talkie (2 sets)
- Propeller rpm indicator
- Compass
- switch emergency stop ventilation - switches for deck lighting
- ampere and voltmeters batteries.
- Public Address System

### **5.7 Automation and Instrumentation**

An alarm control panel shall be installed in the engine room. It shall monitor temperature, pressure of main & auxiliary engines and steering gear alarms. The alarm panel shall also monitor certain important tank levels.

An audible and visual alarm shall be given in the event of a fault.

A remote indication with audible alarm for all the monitoring points shall be provided in the wheelhouse.

### **5.8 Earthing**

In general all the electrical motors, control panels and generators, unless specified by the supplier, shall be earthed as per the rules. Suitable size of conductor shall be used for earthing purpose depending upon the current capacity of the appliance. The conductor shall be properly crimped at both the ends and one end shall be connected to the earth bolt provided on the equipment, while the other end to an earth bolt welded to the steel structure. Suitable washers and conductor terminals shall be used so that a reliable contact is made.

## **6 SPARE PARTS, INVENTORIES AND TOOLS**

### **6.1 SPARE PARTS:**

Manufacturers recommended spares for 2000 hrs. operation to be supplied for major machineries and equipment without extra cost. Major machineries and equipment to include Main Engines, Auxiliary Engines, Propellers and Anchor Winch. List of spares to be supplied along with manufacturers recommendations to be forwarded on selection of major machineries and equipment prior to Owners approval.

### **6.2 TOOLS:**

Maker's Standard tools and special tools necessary for overhaul during the life of the vessel are to be delivered by all the manufacturers of the major machineries with their supply.

### **6.3 INVENTORIES:**

The following inventory to be supplied along with the vessel

#### **Deck:**

21. 2 quartz battery for marine clocks
22. 2 black balls and 2-round/1-diamond shape
23. 3 flash lights (200 % batteries)
24. 1 hand lead line (3 kg, 25m)
25. 2 boat hooks
26. 1 heaving line (30 fathom 3/4")
27. 4 rubber fenders (12" diameter)
28. 1 grease gun for hinges
29. 1 tin with 10 kgs grease
30. 1 marline spike
31. 1 triangular rule (300 mm engine divided for chart type)
32. 1 bucket with line 5m
33. 1 tank sounding tape 5 m with plumb
34. 1 drum pump
35. 5 padlocks
36. 2 sounding rods
37. 1 measuring tape (steel, 6 metres)
38. 1 measuring tape (steel, 2 metres)
39. 1 carpenter hand saw 400 mm long
40. 1 carpenter mallet 500g with handle (road type)

#### **Domestic**

39. 12 dishes flat 10", 9" and 7" (porcelain)
40. 12 plates 6" (porcelain)
41. 2 table knives (stainless steel)
42. 12 soup/dessert spoons (s.s)
43. 2 set pots (coffee & tea) 6 nos. per set (porcelain)
44. 2 sugar basins (porcelain)
45. 12 tea spoons
46. 2 bowls for salad & pudding 6" (porcelain)



47. 2 water jugs (s.s) medium size
48. 2 bread knives (s.s)
49. 2 rice bowls 10" (s.s)
50. 12 cups with saucer for tea & coffee
51. 1 water filter
52. 12 stainless steel thali plates 12"
53. 12 katori
54. 2 flat frying pans 30 cm (aluminium)
55. 2 tawas 30 cm (iron)
56. 2 trays (formica)
57. 2 mixing bowls (available size)
58. 1 bottle opener
59. 1 chakibelna
60. 1 cook's knife 6" blade
61. 2 steel buckets with lead 10 lt., 12 lt. And 15 lt.. each
62. 1 can opener
63. 1 potato peeler knife (s.s)
64. 1 bread toaster
65. 2 dusters
66. 1 chopping board (standard size)
67. 1 teakettles 30 cm (aluminum)
68. 1dekchies with lid 20 cm, 25 cm, 35 cm, 50 cm each (aluminium)
69. 2 coir brooms
70. 2 hair brooms
71. 2 lavatory brushes
72. 2 scrubbing brushes
73. 2 single bed sheets (for each person)
74. 2 pillows (for each person)
75. 1 bath towels (for each person)
76. 1 face towels (for each person)

#### **Machinery installation:**

72. 1 hand lamp with 10m cable and plug
73. 1 set of compressions lugs up to 6 sq. mm with plier
74. 1 hand tachometer
75. 1 axe
76. 1 iron saw with 12 blades
77. 1 set of bearing pliers
78. 3 grease gun
79. 1 oil can
80. 1 tank sounding tape 5m with plumb
81. 1 stainless steel inside calipers
82. 1 thermometer
83. 1 marking 'V' block
84. 1 portable electric grinder
85. 1 portable electric drill and chuck 13 mm
86. 1 set straight shank drills up to 13 mm
87. 1 set taps & round dies with case
88. 1 set spanners (normal size, single ended)
89. 1 set spanners (double ended)

90. 1 set box spanners
91. 1 monkey wrench
92. 1 pipe wrench
93. 1 set of screwdrivers
94. 1 set of screw drivers (cross head type)
95. 1 set of combination pliers
96. 1 set files (shape half round)
97. 1 set files (shape flat)
98. 1 set files (each round/ half, round/ traughter)
99. 3 file handles
100. 2 file brushes
101. 2 hand hammers
102. 1 lead hammer
103. 1 claw hammer
104. 1 centre punch
105. 1 cutting punch
106. 1 chisel (flat crossout)
107. 1 chisel (oil groove cut)
108. 1 pair of scissors for packing
109. 1 pair of scissors for metal (flat & round)
110. 1 hacksaw frame and hacksaw for iron and aluminium
111. 1 hand vice
112. 1 stone with bed
113. 1 set wire rope slings of various SWLs.
114. 1 manila rope slings
115. 1 set shackles
116. 1 rope pulley block
117. 1 chain pulley block ½ ton
118. 1 crow bar
119. 1 set Allen keys
120. 1 oil hopper with filter screen
121. 1 grease pump
122. 1 oil pan with strainer
123. 1 paint can
124. 1 set painting brushes
125. 1 set eye/lifting bolts
126. 2 waste boxes
127. 1 set of different sizes steel washers
128. 1 set of different sizes bolts & nuts
129. 1 set of different sizes studs & nuts
130. 1 set of different sizes split pins
131. Steel and aluminium plates
132. Steel wire
133. emery cloth
134. grinding powder
135. valve grinding paste
136. rubber insertions (joining 800 mm x 800 mm)
137. packing materials
138. inspection mirror
139. gland packing
140. 1 steel square

141. 1 steel scale
142. 1 cloth tape measure (30m)

#### **Electrical Installations:**

19. Watch maker's screw drivers
20. Watch maker's screw driver cross head size (2 mm)
21. Magnetic spanners
22. Screw drivers cross head size 0-4
23. Screw driver for hexagon socket heads 1 1/2 – 6 mm
24. nut drivers 4 – 7 mm
25. 1 circlip plier for inside rings
26. bended flatnose plier (long grip)
27. 1 tweezer flat nose
28. 1 tweezer bended nose
29. 1 inspection mirror
30. 1 saw frame (junior) with 12 blades
31. 1 set of needle files
32. 1 pair (b) 200 mm
33. 1 pair wire cutting pliers 150 mm
34. 1 pair flat nose pliers 125 mm
35. 1 pair round nose 125 mm
36. Electrician's screw drivers, for wood/leather
  - 1 (a) 3 mm x 75 mm
  - 1 (b) 6 mm x 100 mm
  - 1 (c) 8 mm x 150 mm
  - 1 (d) 10 mm x 250 mm

#### **LIST OF DOCUMENTS TO BE SUPPLIED BY THE BUILDER**

##### **BASIC DESIGN DRAWINGS:**

- d) General arrangement plan
- e) Lines plan
- f) Docking plan

##### **CALCULATIONS:**

- g) Equipment number calculations
- h) Hydrostatic particulars
- i) Tonnage calculations
- j) Freeboard and minimum bow height
- k) Tank capacity calculations and sounding tables
- l) Trim and Stability Booklet

##### **STRUCTURAL DRAWINGS**

- n) Midship / Typical transverse section
- o) Profile, Decks and Bottom plan
- p) Watertight / Oil tight bulkheads
- q) Shell expansion
- r) Deck house / Superstructure

- s) Engine foundation
- t) Hawse pipe details
- u) Welding schedule
- v) Skeg construction, if any
- w) Fore peak and aft peak structure
- x) Engine Room Construction
- y) Hatch opening details
- z) Details of Ramp

### **MACHINERY DRAWINGS**

- i) Engine room layout
- j) Engine room ventilation schematic
- k) Air vent system schematic
- l) River chest details
- m) Fuel oil system schematic
- n) Lubricating oil system schematic
- o) Cooling water system schematic
- p) Main engine / Auxiliary engines exhaust system  
schematic

All class approved drawings and other drawings prepared for the constructions of the vessels are to be supplied.

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# **ANNEXURE-1**

## **GA**



## **ANNEXURE-2 SKETCH OF JETTY**





## **ANNEXURE-3**

### **RECOMMENDED VENDOR DETAILS**

<b>Main Engine</b>	: Caterpillar Greaves Cummins Bauduin Yanmar Volvo Penta Hyundia
<b>Steering Gear</b>	: Lourenco Marine Vetus Rexroth
<b>DG Set</b>	: Cummins/ Greaves KOEL
<b>Bow Thruster</b>	: ZF Marine Schottel Veth Rolls Royce Steerprop Italdraghe Podotti
<b>Hydraulic Power Pack</b>	: Rexroth Vickers Perry Smithson Fluid Power Vetus Suvera

### Cost Schedule

#### **Schedule A “Design, Construction and Supply of RO-RO Vessel Carrying 12 trucks and 200 passengers (100 seated)”**

The below mentioned Commercial bid format is provided as BoQ\_XXXX.xls along with this tender document at <https://eprocure.gov.in/eprocure/app> . Bidders are advised to download this BoQ\_XXXX.xls as it is and quote their offer/rates in the permitted column and upload the same in the commercial bid.

Note : The tenderer shall enter a firm price against each item and fill up the blanks.

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Unit price</u> <u>(in Rs)</u>	<u>Price</u> <u>(in Rs.)</u>
A	One	a) Basic cost of one <b>RO-RO Vessel Carrying 12 trucks and 200 passengers (100 seated)</b> in every respect in accordance with the attached specification (including Hull inventory and tools).  b) Taxes and duties etc.  <b>Sub- Total</b>  c) Any transportation cost for delivery at Dhubri.		

Total: Rs.....

(Rupees.....)

(Signature of Contractor)

Dated.....

Address.....

Witness Signature.....

Name in Block letters.....

Address & Occupation.....

### Cost Schedule

#### **Schedule B “Design, Construction and Supply of RO-RO Vessel Carrying 8 trucks and 100 passengers (50 seated)”**

The below mentioned Commercial bid format is provided as BoQ\_XXXX.xls along with this tender document at <https://eprocure.gov.in/eprocure/app> . Bidders are advised to download this BoQ\_XXXX.xls as it is and quote their offer/rates in the permitted column and upload the same in the commercial bid.

Note : The tenderer shall enter a firm price against each item and fill up the blanks.

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Unit price</u> <u>(in Rs)</u>	<u>Price</u> <u>(in Rs.)</u>
A	One	a) Basic cost of one <b>RO-RO Vessel Carrying 8 trucks and 100 passengers (50 seated)</b> in every respect in accordance with the attached specification (including Hull inventory and tools  b) Taxes and duties etc.  <b>Sub- Total</b>  c) Any transportation cost for delivery at Dhubri.		

Total: Rs.....

(Rupees.....)

(Signature of Contractor)

Dated.....

Address.....

Witness Signature.....

Name in Block letters.....

Address & Occupation.....