TENDER DOCUMENT

FOR

COMPLETION OF THE BALANCE WORK OF CONSTRUCTION OF 4 NOS. WORK BOATS PRESENTLY IN THE YARDS OF M/S HOOGHLY DOCK PORT ENGINEERS LTD, AT NAZIRGUNJ WORKS, HOWRAH

JANUARY - 2014

Inland Waterways Authority of India

(Ministry of Shipping, Govt. of India)
A-13, Sector-1, Noida – 201 301 (UP)
Tel (0120) 2543931, Fax (0120) 2544041/2522969
Web site: www.iwai.nic.in, E-mail: iwainoi@hub.nic.in/
suvadandapat@gmail.com

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, E-mail: iwainoi@hub.nic.in/
suvadandapat@gmail.com

File No. IWAI/MD/149/2012-13 _____ __, 2014

To

Sir,

Sub: Completion of the balance construction work of 4 nos. workboats presently in the yards of HDPEL,NAZIRGUNJ,HOWRAH.

Inland Waterways Authority of India, Noida, invites online tenders on limited basis only from the private shipyards/Ship repairing yards of Kolkata/ Howrah for the above mentioned works, which will be received on line in the office of Chief Engineer (Project & Marine) Inland Waterways Authority of India, A-13, Sector-1, Noida 201301 U.P., India", not later than 15:00 hrs. IST on 20/02/2014 If interested, the tender document may be downloaded from the website of IWAI http:\\www.iwai.nic.in. *and CPP Portal Website* *https://eprocure.gov.in/eprocure/app* from 20/01/2014 to 19/02/2014 and submit the cost of tender paper of Rs. 5000/- in form of Demand Draft of any Indian schedule bank payable to "IWAI fund" at NOIDA/Delhi.

Yours faithfully,

(S Dandapat)
Chief Engineer (Project &Marine)

Encl: As above

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(SECTION-I)

NOTICE INVITING E-TENDER

INLAND WATERWAYS AUTHORITY OF INDIA

(Ministry of Shipping, Govt. of India)
A-13, Sector 1, Gautam Buddha Nagar,
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NOTICE INVITING e- TENDER

The Inland Waterways Authority of India (IWAI) hereby invites on line tenders in two cover system (Cover-I - Technical Bid and Cover-II - Financial Bid) on limited basis from private Shipbuilders/ Ship repairers of Kolkata and Howrah for completion of the balance construction work of 4 nos. workboats presently in HDPEL, Nazirgunj Works, Howrah in all respect as per the original technical specification and to be delivered at Kolkata, as per details given below:-

Scheduled. No.	Description of work	Estimated cost per boat (Rs.)	Total estimated cost in Rs.	Bid Security (EMD) (Rs.)	Time of completion
A.	Pre & post launching work for Completion of the balance work of first two boats i.e. yard no. P-123 & 124 in the yard of M/s HDPEL at Nazirgunj Works or in the yard of the tenderer in all respect and delivery to IWAI on satisfactory completion of test & trial.	245 lakhs	490 lakhs	9.8 lakhs	P- 123 : 10 months P- 124 : 11 months
B.	Pre & post launching work for Completion of the balance work of two boats i.e. yard no. P-125 & 126 in the yard of M/s HDPEL at Nazirgunj Works or in the yard of the tenderer in all respect and delivery to IWAI on satisfactory completion of test & trial.	252 lakhs	504 lakhs	10.80 lakhs	P-125 : 11 months P-126 : 12 months

TERMS & CONDITIONS

A. 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

Publishing Date	**20.01.2014**
Document Download/Sale Start Date	**20.01.2014**
Document Download/Sale End Date	**19.02.2014**
Seek Clarification Start Date	**20.01.2014**
Seek Clarification End Date	**19.02.2014**
Pre Bid Meeting Date	**07.02.2014**
Bid Submission Start Date	**08.02.2014**
Bid Submission Closing Date	**20.02.2014**
Bid Opening Date	**20.02.2014**

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 20.01.2014 to 19.02.2014.

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. Bids shall be submitted online only at CPPP website https://eprocure.gov.in/eprocure/app. Manual bids shall not be accepted and liable to be rejected.
3. Tenderer shall agree to the terms & conditions of the tender and submit the tender online duly signed in each page for agreeing the same.

4. Tender must be accompanied with scanned copy of all documentary evidence of credentials viz. similar works done in last five years, performance certificate, financial performance, list of infrastructure, list of manpower, registration certificate of the firm, service tax, income tax, Copy of PAN no. copy of balance sheet of last five years, documentary evidence of yard that must indicate in the name of the firm, copy of EMD & cost of tender paper, solvency certificate of schedule bank etc.

5. The bids for one or more schedules can be submitted and accordingly the EMD 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 a minimum annual turnover of Rs. 298.20 lakhs (30% of the estimated cost) in each of the 3 years during last 5 years in case bidding for all two schedulers i.e 4

nos. workboats. Otherwise, it shall be proportional to the number of schedules for which the bid is submitted.

7. The firm should have done work of similar nature during last 5 years as follows:

   a. Single work of Rs.298.20 lakhs (30% of estimated cost) if bidding for two schedules or proportional to the number of schedule for which bid is submitted.

   Or

   b. Two works of Rs. 198.80 lakhs each (20% of estimated cost) if bidding for two schedules or proportional to the number of schedule for which bid is submitted

   Or

   c. Three works of Rs.149.10 lakhs each (15% of estimated cost) if bidding for two schedules or proportional to the number of schedule for which bid is submitted

8. The complete bid as per the tender documents should be placed online at https://eprocure.gov.in/eprocure/app by 1500 hours on or before 20.02.2014 as the last date for submission of the Bid Document is 20/02/2014 upto 15.00 hrs (IST). 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.

9. 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.

10. **The pre bid meeting will be held on 07/02/2014 at 1500 hrs. in IWAI Office at Kolkata. Before attending the pre-bid meeting the prospective bidders must inspect the work boats presently lying in the yard of M/S HDPE, Nazirgunj Works, Howrah and assess the balance work, condition of the hull, availability of the machineries, equipments, outfits, raw materials and necessity for further procurement, site condition etc. for completing the balance works in the yard of M/S HDPE upto the launching stage and there after shifting the boats to their yards for completing the balance works for trial and delivery etc. In order to inspect the boats, machineries etc. the bidders may contact the Director, IWAI, (Kolkata) at following address for obtaining the permission of M/S HDPE.**

    Mr. S.V.K Reddy (Director)
    P-78, Garden Reach Road, Kolkata-700043
    Ph.-033-24395570, 24395577, 24396055, 4391710
    M-09007107534

11. **It is also essential to submit a self-declaration statement regarding the inspection of the workboats machineries etc as above and assessing the balance work and satisfied accordingly for completing the work in all respect as tendered for delivery. Without the above statement attached with the bid, IWAI will not be responsible for considering the bid as a valid one.**

The further query or clarification if any on the bid document shall be submitted to the following address:

Chief Engineer (Project & Marine)
Inland Waterways Authority of India,
A-13, Sector-I,

Noida – 201 301
Tel (0120) 2543931, Fax (0120) 2544041/ 2522969
Website: - www.iwai.nic.in

Chief Engineer (Project & Marine),
IWAI

TENDER ACCEPTANCE LETTER
(To be given on Company Letter Head)

Date:

To,

_____
_____
_____
_____
_____

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: _____

Name of Tender / Work: -

_____
_____
_____
_____

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 annexure(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 , 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.

Yours Faithfully
(Signature of the Bidder, with Official Seal)

(SECTION-II)
INSTRUCTION TO BIDDERS & APPENDIX TO BID

Section II: Instructions to Bidders

Table of Clauses

Section II

Instructions to Bidders (ITB)

A. General

1. Scope of Bid

1.1 The Owner (as defined in the Appendix to ITB) invites bids for ***"Completion of the balance work"*** to be delivered at Kolkata as described in these documents and referred to as "the works". The name of the work is provided in the Appendix to ITB.

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

Delivery of 1st workboat yard no. P-123	Within 10 (Ten) months
Delivery of 2nd workboat yard no. P- 124	within 11 (Eleven) months
Delivery of 3rd workboat yard no. P-125	Within 11 (Eleven) months
Delivery of 4th workboat yard no. P-126	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 Bids is open to bidders engaged in Shipbuilding and has constructed vessels of similar type or vessels with similar or higher size/ capacity.

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 bids is open to the manufacturers and their dealers registered with the appropriate authorities under the appropriate laws for the time being in force in India.

4.2 All bidders shall include the following information and documents with their bids.

(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 five years.

(c) Experience certificate in works of a similar nature and size for each of the last five 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 completed balance construction work/built.

(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;

4.3 Bids from firms/company jointly or consortium are allowed. Memorandum of Understanding between the firms for joint bids to be submitted.

4.4 A To qualify for award of the Contract, each bidder should have in each three years during last 5 years for (a) and five years for (b):

a) Achieved minimum annual financial turnover (in all cases of ship building works only) volume of ship construction work of at least the amount prescribed in NIT for which bid has been invited.

b) Satisfactorily completed (not less than 90% of contract value), as a prime contractor of similar works <u>during last five years ending last day of month previous to the one in which bids are invited should be</u> either of the following in case of bidding for all four boats. Otherwise, it shall be on proportional basis.

i) One similar completed work costing not less than the amount equal to Rs. 298.20 lakhs.

ii) two similar completed works costing not less than the amount equal to Rs. 198.80 lakhs for each work.

iii) three similar completed works costing not less than the amount equal to Rs. 149.10 lakhs for each work.

<u>The similar work constitutes construction of vessels</u>

(Escalation factor as specified in the appendix shall be used to bring the value of the completed works at the level of current financial year i.e.2012-13)

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.

(b) Each bidder must demonstrate:

(i) Evidence of availability (either owned or leased or rented) of shipyard where the Balance Work of workboats to be completed are proposed to be carried out.

(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 Bid for the work. A Bidder who submits more than one Bid will cause the proposals with the Bidder's participation to be disqualified.

5.2 Tender documents are not transferable.

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 outcome of the bidding process.

B. <u>Bidding Documents</u>

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
6. General Arrangement Drawing

7.2 One set of the bidding document will be issued to the bidder against the payment.

7.3 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 cable ("cable" includes facsimile) at the owner's address indicated in the Notice Inviting e- 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 cable 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 transmitted without delay to all purchasers of the bidding documents. Any modifications of the bidding documents listed in Clause 7.1, which may become necessary as a result of the pre-bid meeting shall be made by the Owner exclusively through the issue of an Addendum pursuant to Clause 9 and not through the minutes of the pre-bid meeting.

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 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.

9.2 Any addendum thus issued shall be part of the bidding documents and shall be communicated in writing by registered post or by cable to all purchasers of the bidding documents. Prospective bidders shall acknowledge receipt of each addendum by cable to the Owner. The Owner will assume no responsibility for postal delays. 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 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. <u>Preparation of Bids</u>

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:- Tenders/bids including all covering letters and

information included in the bid should be submitted online in two covers systems *viz. Envelope-1 and Envelope-2 and both of these covers should be placed online in website https://eprocure.gov.in/eprocure/app* as the following terms and condition:-

11.1 Envelop-**I** This shall be named Technical Bid and shall comprise of all document are properly scanned:

I. For bidding documents downloaded from the website, the demand draft for the cost of the bidding documents must be scan and placed in the envelop-I.

II. Scan copy Earnest Money.

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. An affidavit affirming that information he has furnished in the bidding document is correct to the best of his knowledge and belief.

VII. The complete tender document in original duly filled except cost schedule, signed and sealed on every page. This part should not contain the reference to price in any manner. Any reference to price in this part may cause rejection of the bid.

VIII. Form of bid.

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

(i) Cost schedule.

11. 2 Envelop-II This cover will be opened only after the bid as submitted under Cover-I is technically qualified i.e. when IWAI is satisfied with contents of **Cover-I** as well as the qualification and experience of the tenderer. This cover will contain price bid in the specified format, all blank space dully filled in.

Price Bid in excel format (BoQ_XXXXX) provided along with this tender shall be used for quoting prices/offer.

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 (both in figures and words) 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. The Owner as non-responsive shall reject a bid valid for a shorter period.

14.2.1 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.

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) if the Bidder does not accept the correction of the bid price, pursuant to Clause 24; or
c) 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 one set of the bid comprising of the documents as described in Clause 11.

17.2 The Bid shall be typed or written in ink and 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. INSTRUCTION TO THE CONTRACTORS/BIDDERS FOR THE E-SUBMISSION

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 enroll-ment/registration of the contractors/bidders on the e-procurement/e-tender portal is a prerequisite for e-tendering.*
2) *Bidder should do the enrollment in the e-Procurement site using the https://eprocure.gov.in/eprocure/app option available "Enroll Here" on*

The home page. Portal. Enrollment is free of charge. During enrollment/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 thro' their user ID/ password chosen during enrollment/registration.*
4) *Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY/TCS/nCode/eMudra or any Certifying Authority recognized by CCA India on e-Token/Smartcard, should be registered.*
5) *The DSC that is registered only should be used by the bidder and should en-sure safety of the same.*
6) *Contractor/Bidder may go through the tenders published on the site and down-load the required tender documents/schedules for the tenders he/she is inter-ested.*
7) *After downloading / getting the tender document/schedules, the Bidder should go through' 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 pass-word of the e-Token/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 favorites' folder.*

11) *From the my favorites 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 general PDF/xls/rar/jpg 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.*

14) *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.*

15) *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.*

16) *Bidder should submit the tender Fee/ EMD as specified in the tender. 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.*

17) *While submitting the bids online, the bidder reads the terms & conditions and accepts the same to proceed further to submit the bid packets.*

18) *The bidder has to select the payment option as offline to pay the TFEE/ EMD as applicable and enter details of the instruments.*

19) *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.*

20) *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 download-ing 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 Gen-eral conditions of contract without any exception and have understood the en-tire document and are clear about the requirements of the tender requirements.

21) *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.*

22) *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 modi-fied/replaced by the bidder; else the bid submitted is liable to be rejected for this tender.*

23) *The bidders are requested to submit the bids through online e-tendering sys-tem 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.*

24) *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 evi-dence for online submission of bid for the particular tender and will also act as an entry pass to participate in the bid opening date.*

25) *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 ten-der opening, the bid is likely/ liable to be rejected.*

26) *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 submis-sion.*

27) *All the data being entered by the bidders would be encrypted using PKI en-cryption 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.*

28) *Any bid document that is uploaded to the server is subjected to symmetric en-cryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.*

29) *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.*

30) *The bidder should logout of the tendering system using the normal logout op-tion available at the top right hand corner and not by selecting the (X) exit op-tion in the browser.*

31) *Any queries relating to the tender document and the terms and conditions con-tained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.*

32) *Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 233 7315.*

19. Deadline for Submission of Bids

19.1 Complete Bids (including Technical and Financial) must be submitted on line not later than the date and time indicated 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 to the specified time on the next working day.

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.

E. <u>Bid Opening and Evaluation</u>

20. Bid Opening

The Tender Evaluation Committee (TEC) shall open the tenders/bids online in the presence of the intending tenderers who may be present at the date and time of opening informed in the bid document or subsequently. They can also see the opening of bids online on the remote end. If any of the tenderer or his agent is not present at the time of opening of tender, the TEC shall, on opening of tenders of the absentee tenderer, prepare a statement of the attested and unattested corrections in the tender over their signature[Bid openers shall record their observations of opened tenders and submit the same to TEC]. Such a list shall then be binding on the absentee tenderer.

Bid opening shall be carried out in two stages. Firstly, 'Technical Bid' of all the bids received (except those received late) 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.

20.1 The Owner will open on line bid the envelope marked the "Technical Bid" of all the bids received, 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.

20.2 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.

20.3 The Owner will prepare minutes of the Bid opening, including the information disclosed to those present in accordance with.

20.4 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.

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

20.6 At the time of the opening of the 'Financial Bid', the names of the bidders whose bids were found responsive in accordance with clause 20.5 will be announced. The financial bids of only these bidders will be opened. The responsive bidders' names, the Bid prices, the total amount of each bid, any discount/rebate, modification of financial bids and such other details as the Owner may consider appropriate will be announced by the Owner at the time of bid opening. Any Bid price, which is not read out and recorded, will not be taken into account in Bid Evaluation.

20.7 The Owner shall prepare the minutes of the opening of the Financial Bids.

21. Clarification of Bids and Contacting the Owner

21.1 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.

21.2 No bidder shall contact 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.

22. Examination of Bids and Determination of Responsiveness

22.1 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.

23. Correction of Errors

23.1 The Owner for any arithmetic errors will check the financial Bids. Errors will be corrected by the Owner as follows:

a) Where there is a discrepancy between the rates in figures and in words, the rate in words will govern; and

b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern.

23.2 The amount stated in the Financial Bid will be corrected by the Owner in accordance with the above procedure for the correction of errors and shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, the Bid will be rejected, and the Bid Security shall be forfeited in accordance with Sub-Clause 15.6(b).

24. Evaluation of Bids

24.1 Selection of the bidder for construction of the balance work of tugs and supply of tugs will be based on technical and financial evaluation.

24.2 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) Output of the shipyard in terms of number and cost of vessels during the preceding five years from the date of receipt of the bid as specified in NIT - to be furnished in format given at Appendix – 2.

iii) (Contract non-performance (during preceding 5 years) - to be furnished in format given at Appendix-3

(iv) Financial details

(a) Financial performance during preceding 5 years - to be furnished in format given at Appendix –4

(b) Annual construction turn over during preceding 5 years as specified in NIT - to be furnished in format given at Appendix – 5

24.3 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.

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

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

F. Award of Contract

25. Award Criteria

25.1 Subject to Clause-27, the Owner will award the Contract to the Bidder after evaluation as per Clause 24.

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

26.1 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 reserves the right to split the work to one or more parties depending on capability of the yard and increase/decrease the work requirement.

27. Notification of Award and Signing of Agreement.

27.1 The bidder who's Bid has been accepted will be notified of the award by the Owner prior to expiration of the Bid validity period and 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").

27.2. 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 29.

27.3. 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.

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

28. Factors Affecting the Award of the contract.

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

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

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

28.4 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.

29. Performance Security

29.1 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.

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

29.3 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.

30. 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 is "Balance Construction work of " 4nos. workboats presently in the yards of M/s HDPE, Nazirgunj Works, Howrah & delivery to IWAI as per technical specification

(4.4 **A**) (b) The value shall be as mentioned in Bid Notice.
Escalation factor (for the cost of works completed during the last 5 years) may be taken as follows:

[Cl. 4.4A(b)]

Year Before	Multiplying Factor
One ……	1.1
Two ……...	1.21
Three ……	1.33
Four ……...	1.46
Five ……	1.61

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

Place: Office of IWAI, Kolkata ,

(will be intimated later, in case of change, if any)

Time: 03.00 PM

Date : 07/2 /2014

(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 following banks would be accepted:-

i. State Bank of India or its subsidiaries,
ii. Any Indian Nationalised Bank
iii. IDBI or ICICI / HDFC Bank
iv. A Foreign Bank (issued by a branch outside India) with a counter guarantee from SBI or its subsidiaries or any Indian Nationalised Bank.
v. Any Scheduled Commercial Bank approved by RBI having a net worth of not less than Rs. 500 crores as per the latest Annual Report of the Bank. In the case of a Foreign Bank (issued by a branch in India), the net worth in respect of the Indian operations shall only be taken into account.

Or

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

The Owner's address for the purpose of Cost of tender paper & EMD submission/ any clariffication is Inland Waterways Authority of India, A-13, Sector-I, Noida – 201 301.

The deadline for submission of bids shall be:
Time & Date As prescribed in Bid Notice

(20.1) 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 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.

Appendix – 1

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

Name & Address of the Ship Builder	Detailed Particulars
(i) Slipway including fabrication/ construction bays (details including number, dimension, location and layout of shipyard to be given). Whether covered or opened.	
(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	
(iv) List of workshop machinery, equipment: (i) Welding Sets (ii) Gas Cutting Sets (iii) Grinding Machine (iv) Shot Blasting equipment (v) Material handling equipment (vi) Machine Shop Machineries (vii) Paint Shop	Description Make Quantity
(v) Source of electric power, whether captive power unit available, if so, the details thereof.	
(vi) Facilities for doing outfitting job in afloat condition indicating location and area.	

APPENDIX – 2

OUTPUT OF THE SHIPYARD DURING PRECEDING 5 YEARS

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

APPENDIX – 3

CONTRACT NON-PERFORMANCE (DURING PRECEDING 5 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

APPENDIX – 4

FINANCIAL PERFORMANCE (DURING PRECEDING 5 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

APPENDIX – 5

ANNUAL CONSTRUCTION TURNOVER (DURING PRECEDING 5 YEARS)

Year	Annual Turnover

(SECTION-III)
FORMS OF BID & BANK GUARANTEE
AND COST SCHEDULE

(Form of bid to be submitted along with Technical bid)

To

Chief Engineer (Project & Marine)
Inland Waterways Authority of India,
A-13, Sector-I,
NOIDA – 201 301.

DESCRIPTION OF WORKS: Bid for construction completion of the work of 4nos. workboats presently in the yards of M/s HDPE, Nazirgunj Works & delivery to IWAI.

REFERENCE LETTER NO. ……..

Dear Sir,

1. Having examined the Bid Documents, Instructions to Bidders, General Conditions of Contract, Special Conditions of Contract, Technical Specifications, Cost schedule for the execution of the above named works, we, the undersigned offer to execute and complete such works and remedy defects therein in conformity with the said bid documents.

2. We undertake, if our Bid is accepted, to commence the work within fifteen (15) days of receipt of the order to commence, and to complete and deliver the tugs comprised in the Contract within the period stated in the bid hereto.

3. Bid Security of Rs. ---------- in the form of ……..is enclosed herewith.

4. If after the tender is accepted, we fail to execute the contract deed within 15 days of the receipt of the order to do so, I / We agree that IWAI shall without prejudice to any terms and conditions of the tender, forfeit the Bid Security absolutely.

5. If our Bid is accepted, we will furnish Performance Security (ies) in the form of a Bank Guarantee/FDR to be jointly and severally bound on us, in accordance with the Conditions of Contract.

6. We agree to abide by this Bid for the period of One Hundred and Twenty (120) days from the date of Bid opening and it shall remain binding upon us and may be accepted at any time before the expiry of that period.

We confirm our agreement to treat the Bid documents and other records connected with the works as secret and confidential documents and shall not communicate information contained therein to any other person other than the person authorised by the Owner or use such information in any manner prejudicial to the safety and integrity of the works.

Unless and until an agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding Contract between us, but without prejudice to your right to withdraw such acceptance without assigning any reasons thereof.

We understand that you are not bound to accept the lowest or any bid you may receive.

Dated this _____ day of _____ 2014

Signature _____ in the capacity of _____ duly authorised **

To sign Bid for and on behalf of

_____
(In block capital letters)

Address : _____

_____

Signature of Witness _____

Name of witness _____

Address of witness _____

_____

** Certified copy of Power of Attorney/authorisation for signature shall be furnished by the bidder.

FORM OF BANK GUARANTEE FOR BID SECURITY

The Chairman,
Inland waterways Authority of India,
A-13, Sector 1,
Noida – 201 301.

WHEREAS _____ (Name of Tenderer) (hereinafter called the Tenderers) wishes to submit his tender for work of _____ ___in the state/s of _____ herein called "the Tender" KNOW ALL PEOPLE by these present that we _____ (Name of Bank) of _____ (Name of country) having our registered office at (_____) (hereinafter called the 'Bank') are bound unto the Inland Waterways Authority of India (hereinafter called "the Owner") in the sum of the Rs. _____ (Rupees _____) *for which payment can truly be made to the said Owner. The Bank bind themselves, their successors and assigns by these presents with the common seal of the Bank this day _____ of 2014 and undertake to pay the amount of _____ Rs. _____ to the employer upon receipt of this written demand without the employer having no substantiate his demand.

The conditions of this obligation are:

If the tenderer withdraws his tender during the period of Tender validity specified in the Form of Tender.

Or

If the Tenderer having been notified of the acceptance of his Tender by the Employer during the period of tender validity fails or refuses to execute the Form of Agreement in accordance with the instructions to bidders, if required; or

fails or refuses to furnish the Performance Security, in accordance with the Instruction to Bidders.

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

This guarantee will remain in force up to and including the date 45 days beyond the validity of the bid as such deadline is stated in the Instructions to Bidders or as it may be extended by the Employer, at any time prior to the closing date for submission of the Tenders Notice of which extension to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not later than the above date of expiry of this guarantee.

SIGNATURE OF AUTHORISED REPRESENTATIVE OF THE BANK

_____

NAME AND DESIGNATION

_____

SEAL OF THE BANK

_____

SIGNATURE OF THE WITNESS

_____

NAME OF THE WITNESS

_____

ADDRESS OF THE WITNESS

_____

FORM OF BANK GUARANTEE FOR PERFORMANCE SECURITY

To

The Chairman,
Inland Waterways Authority of India,
A-13, Sector-I,
NOIDA – 201 301.

WHEREAS…… (name and address of contractor) thereinafter called “the contractor” has undertaken, in pursuance of Contract No. ……. Dated …….. to execute…….. (name of Contract and brief description of Works) (hereinafter called “the contract”).

AND WHEREAS it has been stipulated by you in the said contract that the Contractor shall furnish you with a Bank Guarantee by a Nationalised/Scheduled bank of India for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREOF we hereby affirm that we are the guarantor and responsible to you on behalf of the Contractor, up to a total of Rs…… (amount of guarantee) (Rupees……. (in words), such sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your classification society written demand and without cavil or argument, any sum or sums within the limits of …….. (amount of guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract or of the works to be performed there under or of any of the contract documents which may be made between you and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until 28 days from the date of issue of the Defects Liability Certificate.

Signature and seal of the Guarantor……

Name of the Bank

……

Address……

Date……

In the presence of ……....

1……
(Name of Occupation)

2……
(Name of Occupation)

An amount shall be inserted by the Guarantor, representing the percentage of the Contract Price specified in the Contract and denominated in Indian Rupees.

Form of Bank Guarantee (for payment of 1st installment)

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 completion of balance construction work of 4 nos. workboats in HDPEL (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 up to ……. 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

AGREEMENT FORM

THIS AGREEMENT made this… .. day of ……. 2014 BETWEEN Inland Waterways Authority of India, hereinafter called the Owner of the ONE PART AND M/s. …… an existing Company within the meaning of companies Act, 1956 having its registered office at…… as CONTRACTOR, which expression shall unless excluded by or repugnant to the context be deemed to include its successor in interest of the OTHER PART.

WHEREAS THE OWNER proposes to complete the balance construction work of 6nos. workboats presently in the yards of M/s HDPEL & deliver to IWAI completion to the original specification its own purpose and the CONTRACTOR has agreed to complete the work & supply the same on the terms and conditions mentioned below: -

1. The Contractor will design, construct and deliver at Kolkata to the order of the IWAI, 4nos. workboats in accordance with the subject to the conditions of contract, hereto annexed and marked and the specifications and schedule attached hereto all of which form part of this agreement.

2. The consideration payable therefore shall be the sum of Rs……. Payable as stated and on the condition expressed in Clause 14 of conditions of contract.

3. The following documents shall be deemed to form and be read and construed as part of the agreement viz:

a. Agreement

b. Bid Notice

c. Instructions to bidders

d. General conditions of the contract

e. Special conditions of the contract

f. Technical specifications and drawings

g. Form of bid

h. Cost schedule

i. Letter of acceptance

IN WITNESS whereof the IWAI has caused …….on their behalf to hereunto set his hand and the contractor has hereunto see his hand/the Company has caused its common seal to be affixed hereunto the day and year first society above written.

(a) Signed by …… the contractor above named in the presence of;

1. .....

2. .....

(b) * The common seal of …… was hereunto affixed pursuant to a resolution of the Board of Directorate passed at a meeting of the Board used on the ……. Day of ……. In the presence of …….. .....

Witness

Signed by …….

(Director of the Company)

Witness

Signed by …….

For and on behalf of Inland

Waterways Authority of India

A-13, Sector-1, NOIDA (U.P) 201301

(*To be used in the case of a Company)

Cost Schedule-A

(Two nos. work boats for Yard no. 123 & 124)

Note : The tenderer shall enter a firm price against each item and fill up the blanks.

Item	Quantity	Description	Price (in Rs.)
A	Two	Cost for completion of balance construction of 2 nos. workboats presently in M/S HDPEL, Nazirgunj in all respect and delivery to IWAI after successfully test & trial including the taxes & duties if any.	

Total: Rs.....……

(Rupees.....……)

(Signature of Contractor)
Dated.....
Address.....

Witness Signature..... Name in Block letters.....

Address & Occupation.....

Cost Schedule-B

(Two nos. work boats for yard no. 125 & 126)

Note : The tenderer shall enter a firm price against each item and fill up the blanks.

Item	Quantity	Description	Price (in Rs.)
B	Two	Cost for completion of balance construction of 2 nos. workboats presently in M/S HDPEL, Nazirgunj in all respect and delivery to IWAI after successfully test & trial including the taxes & duties if any.	

Total: Rs.....…….

(Rupees.....…….)

(Signature of Contractor)
Dated.....
Address.....

Witness Signature..... Name in Block letters.....

Address & Occupation.....

(SECTION-IV)
CONDITIONS OF CONTRACT

(PART-I GENERAL CONDITIONS OF CONTRACT AND CONTRACT DATA
PART-II SPECIAL CONDITIONS OF CONTRACT)

Section – IV

PART – I

General conditions of contract

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General Conditions of Contract

A. General

I. (i) Definitions

Terms which are defined in the Contract Data are also defined in the Conditions of Contract but keep their defined meanings. Capital initials are used to identify defined terms.

The Contract is the Contract between the Owner and the Contractor to execute and complete the Works. It consists of the documents listed in Clause 1 (iii) (b).

The Contract Data defines the documents and other information, which comprise the Contract.

Chairman is the Chairman of Inland Waterways Authority of India.

Authority is Inland Waterways Authority of India, a statutory body set up under Inland Waterways Authority of India Act 1985 in the Ministry of Shipping, Government of India, represented by Chairman.

Government is the Government of India.

The Owner / Purchaser means "Inland Waterways Authority of India represented by Chairman and includes his/her successor, assignees.

The Engineer-in-charge is the person named in the Contract Data (or any other competent person appointed by the Owner and notified to the Contractor, to act in replacement of the Engineer-in-charge) who is responsible for supervising the execution of the Works and administering the Contract.

The Contractor means the company, firm, person or persons or corporate body whose Bid to carry out the Works has been accepted by the Owner and includes Contractor's successors, representatives, heirs, executors and administrators unless excluded by contract.

The Contractor's Bid is the completed bidding document submitted by the Contractor to the Owner and includes technical and financial bids.

The Contract Price is the price stated in the Letter of Acceptance.

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.

Vessels are the ***workboats*** whose construction works to be completed, equipped and delivered afloat in accordance with the contract and with modification, if any, as mutually agreed upon.

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.

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.

Specification means the Specification of the Works included in the Contract & original contract with M/s HDPE.

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

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

The **Works** are what the Contract requires the Contractor to construct and hand over to the Owner, as defined in the Contract Data.

Days are calendar days; months are calendar months.

A **Defect** is any part of the Works not completed in accordance with the Contract.

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.

The Defects Liability Period is 12 months calculated from the Date of delivery of the ***workboats***.

Drawings means the drawings and plans specified in the specifications: The expression "Work" means all the works specified or set forth and required in an by the said specifications, are drawing and schedule or to be implied there from or incidental thereto or to be hereafter specified or required in such explanatory instructions and drawings (being in conformity with the said original specifications, drawing and schedule) and also in such additional instructions and drawings not being in conformity as aforesaid as shall from time to time, during the progress of the work hereby contracted for, be supplied by the owner.

(ii) MARGINAL HEADINGS:

The marginal headings or notes of each of the Clauses in these conditions shall not be deemed as a part thereof or to be taken into

consideration in the interpretation or construction thereof or of the contract.

(iii) INTERPRETATION

(a) In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined.

(b) The documents forming the Contract shall be interpreted in the following order of priority:

(1) Agreement,
(2) Letter of Acceptance, Notice to Proceed with the Work,
(3) Contractor's Bid,
(4) Contract Data,
(5) Conditions of Contract including Special Conditions of Contract
(6) Specifications,
(7) Drawings
(8) Activity Schedule; and
(9) Any other document listed in the Contract Data as forming part of the contract.

(c) These regulations for tenders and contracts shall be read in conjunction with the general conditions of the contract which are referred to herein and shall be subject to modifications, additions, suppression by special conditions of the contact and/or special specifications if any annexed to the tender form.

2. (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 Buddha Nagar Disstt (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.

3. 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.

4. DELEGATION OF POWERS:

The Chairman on behalf of Authority may from time to time delegate to any person operations to be named by him/her such of the powers, authorities and discretion's vested in him/her by the contract as he/she may think fit and the contractor shall recognize such person or persons on written notice from the Chairman of his 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/her by the Clause 21 hereof.

5. 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 vessels 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 at the risk of the contractor until their actual delivery to the representatives at the stipulated place or destination or, where so provided in the acceptance of tender, until their 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 vessels from any

cause whatever while the Vessels after approval by the inspector are awaiting delivery or are 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 acceptation 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 breech 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 27 of **GENERAL CONDITIONS AND CLAUSE 14 OF SPECIAL CONDITIONS** shall as for 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 premise, 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.

6. 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.

7. QUOTATION OF RATES BY CONTRACTOR

(i) The price quoted by contractor shall be firm with no provision for any deviation as per in the cost schedule. The price shall include the cost of the material, equipment, machineries (including import and custom duty if any), dry docking test, trial and delivery at Kolkata.

Dry docking is not necessary, if the vessels are delivered as dry cargo. 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 included.

8. SECURITY DEPOSIT / RETENTION MONEY

(1) The Performance Security equal to Ten percent of the contract price shall be provided to the owner no later than the date specified in the Letter of Acceptance and shall be issued in the form given in the Contract Data and by a scheduled commercial bank. The Performance Security shall be valid until a date 28 days from the date of expiry of Defect Liability Period.

(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.

(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.

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

(5) 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/her duly authorised representative to forfeit either in whole or in part, the security deposit and 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 security deposit and 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.

9. 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.

10. 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 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.

11. 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.

12. 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.

13. CERTIFICATE AND FEES:

All test certificates and other certificates are to be handed over to the owner or his representative on completion of the vessels by the contractor with the report that the vessels are 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 vessels.

14. (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 destinations, for the vessels including Dry Docking (import and customs Duty) 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) **For 4nos. workboats i.e. P- 123, 124, 125 & 126 at Nazirgunj works**

a. 15% of the contract price on signing of the agreement against the Bank guarantee.

b. 35% of the contract price on completion of the successful launching

c. 30% of the contract price on completion of the installation & including chalk fasting of the main & aux. engines, DG sets and pumps.

d. 20% of the contract price on successful test, trial & delivery.

(b) 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, by crossed cheque or RTGS mode in installments as in clause 14 (a) upon production of the certificate of the inspector and the Director / Dy. Director appointed by owner for 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.

15. OWNERSHIP OF MATERIALS ON PAYMENT OF FIRST INSTALMENT:

Upon payment of the first instalment of the contract price the vessels so far as then constructed and all machinery and materials either wholly / partially constructed or in preparation and set apart from time to time for the purpose of the contract shall become and shall, with all additions thereto, respectively continue to be the property of the owner subject to the purposes of the contract but the owner shall not be liable for any loss or damage by theft, fire, stress of weather or otherwise, however. Upon the due completion of contract all such materials which have not been actually used for purpose of contract shall become the property of and be relinquished to the contractor.

16. DOCK AND HARBOUR DUES, ROYALTIES AND PATENTS:

The contractor shall pay dock and harbour dues, all royalties and other sums of money which shall be or become due or payable in respect of any patented, registered or protected articles or design which shall be used by him in or about the construction of the vessels and shall at all times indemnify the owner and their officers and agents therefrom and from all actions, suits, demands and claims in respect of the said royalties and other sums of money or any of them and from all costs, charges, damages and expenses in any way arising there out or incidental thereto.

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 finalisation 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 finalisation 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.

18. INDEMNITY:

(1) The contractor shall at all-time indemnify the owner against all claims which may be made in respect of the vessels 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.

19. CORRUPT PRACTICE

(1) The contractor shall not offer or to give to any person in the employment of the Owner or working under the orders of the Chairman any gift of 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 favour or disfavor to any person in relation to the contract or any other contract with the purchaser.

Any breach of the aforesaid condition by the contract, or any one employed, by him or acting on his behalf (whether with or without the knowledge of the contractor) or the commission of any offence by the contractor or by any one employed by him or acting on his behalf under chapter IX of the Indian Penal Code, 1860 or the preservation of Corporation Act, 1947 or any other Act enacted for the prevention of corruption by public servants shall entitled the Chairman on behalf of authority to cancel the contract and all or any other contracts with the contractor and to recover from the contractor the amount of any loss arising from such cancellation in accordance with the provisions of special condition and general condition.

(2) Any dispute or difference in respect of either the interpretation effect or application of the above conditions or of the amount recoverable there under by the purchaser from the contractor, shall be decided by the Chairman on behalf of authority.

20. 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 Manger 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.

21. ARBITRATION

21.1 Except as otherwise provided herein before, all questions, disputes or difference in respect of which the decision has not been final and conclusive arising between the contractor and the authority in relating to or in connection with contract shall be referred for arbitration in the manner provided as under and to the sole arbitrator appointed as follows:

(i) Either of the parties may give to the other notice in writing of the existence of such question dispute or difference.

(ii) Within thirty (30) days of receipts 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 and three after the contractor within fifteen (15) days of receipt of such panel communicate to the Engineer-in-charge the name of one of the person from such panel and such a person shall then be appointed a sole arbitrator by the Chairman IWAI. However, the arbitrator so appointed shall not be an officer or the employee of the inland waterways authority of India.

(iii) Provided that if the contractor fails to communicate the selection of a name out of the panel so forwarded to him the Engineer-in-charge than after the expiry at the aforesaid stipulated period the Chairman IWAI shall without delay select one person from the aforesaid panel and appoint him as the sole arbitrator.

21.2 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 shall appoint another person to act as sole arbitrator, such person shall be entitled to proceed with the reference from the stage at which the predecessor left it.

21.3 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.

21.4 The arbitrator with the consent of the parties can enlarge the time, from time to time to make and publish his award.

21.5 Where the amount of claim is Rs. 1,00,000 (Rs. ONE LAKH ONLY) and above the arbitrator shall give reasons for the award for each item of Rs 75000 & more.

21.6 The work under this contract shall continue during arbitration proceedings and no valid 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.

21.7 The Arbitration and Conciliation Act 1996 together with any statutory modifications or re-enactment thereof and the rules made there under for being in force shall apply to the arbitration proceeding under this clause.

NOTE: In case of contract with another public sector undertaking the clause 21.1 to 21.7 shall stand deleted and the 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 by arbitration in term of the Ministry of Industry, department of Public/enterprises O.M. No. 3/5/93-PMA dt. 30.06.93 or any modification/amendments thereof."

The Arbitrator shall have the power to enlarge the term to rate 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.

The venue of the arbitration proceedings shall be at Noida. It is further clarified that both the parties to this agreement hereby undertake not to have recourse to civil court to solve any of their dispute whatsoever, arising out of this agreement except through arbitration.

22. LAWS GOVERNING THE CONTRACT

i) The laws of India shall govern this contract for the time being in force.

ii) Irrespective of the place of delivery the place of performance or place of payment under the contract, the contract shall be deemed to have been made at the place from which the acceptance of tender has been issued.

iii) Jurisdiction of Courts-The courts of the place from where the acceptance of tender has been issued shall have jurisdiction to decide any dispute arising out of or in respect of contract.

23. 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 of reorganization by separation of departments of the contract into separate companies or taking any steps for compounding with his creditors it shall be component 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.

24. 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.

25. 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.

26. 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.

27. STANDARD BREAK CLAUSE

1. 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 Contract or 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.

B. Time Control

28. Programme

28.1 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.

28.2 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.

28.3 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.

29. MANAGEMENT MEETINGS

29.1 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.

29.2 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.

C. QUALITY CONTROL

30. 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.

31. TESTS

31.1 The contractor shall be solely responsible for :

1. Carrying out the mandatory tests prescribed as per ship building practice and

2. For the correctness of the test results, whether preformed in his laboratory or elsewhere.

31.2 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.

32. CORRECTION OF DEFECTS NOTICED DURING THE DEFECT LIABILITY PERIOD.

32.1 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.

32.2 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.

33. 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.

D. COST CONTROL

34. 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.

35. PAYMENTS

Payments shall be adjusted for deductions for advance payments, security deposit, other recoveries in terms of the Contract and taxes at source, as applicable under the law.

36. TAX

The rates quoted by the Contractor shall be deemed to be inclusive of the sales and other levies, duties, royalties, cess, toll, taxes of Central and State Governments, local bodies and authorities that the Contractor will have to pay for the performance of this Contract. The Owner will perform such duties in regard to the deduction of such taxes at source as per applicable law.

37. CURRENCIES

All payments will be made in Indian Rupees.

38. TERMINATION

38.1 The Owner may terminate the Contract if the Contractor causes a fundamental breach of the Contract.

38.2 Fundamental breaches of Contract include, but shall not be limited to, the following:

a) The Contractor stops work for 28 days when no stoppage of work is shown on the current Programme and the stoppage has not been authorized by the Engineer-in-Charge;

b) The Contractor is declared as bankrupt or goes into liquidation other than for approved reconstruction or amalgamation;

c) The Engineer-in-Charge/Owner gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Engineer-in-Charge;

d) The Contractor does not maintain a Security, which is required;

e) The Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as defined in clause 14 of the special conditions of contract.

f) The Contractor fails to provide insurance cover as required under clause 17 of the special conditions of contract.

g) if the Contractor, in the judgment of the Owner, has engaged in the corrupt or fraudulent practice in competing for or in executing the Contract. For the purpose of this clause, “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in Contract execution. “Fraudulent Practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Owner and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid process at artificial non-competitive levels and to deprive the Owner of the benefits of free and open competition.

h) if the Contractor has not completed at least thirty percent of the value of Work required to be completed after half of the completion period has elapsed;

i) any other fundamental breaches as specified in the contract data.

38.3 If the Contract is terminated, the owner may complete the balance works at the risk and cost of the contractor.

39. COMPLIANCE WITH LABOUR REGULATIONS

During continuance of the Contract, the Contractor and his sub-Contractors shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notifications and bye laws of the State or Central Government or local owner and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local owner. Salient features of some of the major labour laws that are applicable to construction industry are given in Appendix to Part I General Condition of Contract. The Contractor shall keep the Owner indemnified in case any action is taken against the Owner by the competent owner on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Owner is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer-in-Charge/Owner shall have the right to deduct any money due to the Contractor including his amount of performance security. The Owner/Engineer-in-Charge shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Owner.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Owner at any point of time.

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 (Project & Marine)
   Address: A, 13, Sector – 1, Noida [Cl.1(i)]

3. The place of delivery is Kolkata.

4. The Start Date shall be within 15 days after the date of issue of the Notice to [Cl.1(i)] Proceed with the work.

5. (a) The name and identification number of the Contract is :
   "completion of balance Construction of 4nos. workboats presently in the yards of M/s HDPE, Nazirgunj Works"

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]

PART - II

SPECIAL CONDITIONS OF CONTRACT

INDEX

PART - II

SPECIAL CONDITIONS OF CONTRACT

(**Four work boats)**

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 aquatinted himself with the details thereof and no claim shall lie against the owner on the ground that the contractor did not examine or aquatint 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 WITH CONSENT OF OWNER

The detailed drawings so prepared from the general arrangements 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 vessel.

7. CONTRACTOR TO CONSTRUCT, EQUIP, TEST AND DELIVER THE VESSEL.

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 vessel 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 **Workboats** 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 not withstanding 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) <u>Obligation to carryout Inspector's instructions</u>

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) <u>Inspection and testing during progress of work:</u>

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's. 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) <u>Preparing for voyage and delivery</u>

Immediately after completion of satisfactory trials the Contractor shall proceed to make the Vessel ready for the delivery at specified destination and shall thereupon deliver the vessel 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 Department 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) 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 vessel have been damaged during the delivery and that all are in good working order and that the vessel is up to 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.

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

The said delivery and re-equipment of the vessel 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 vessel 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.

(d) As to acceptance of delivery

When and as soon as the vessel 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 vessel 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.

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

If after the arrival of the vessel at the specified destination the contractor shall fail to dismantle any equipment/machineries of the vessel and re-equip and make them ready in all respects for work to the satisfaction of the 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 vessel 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 vessel 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.

(f) Penalty for deficiency in speed and draft of the workboat

The design & construction of the work boats have been progressed substantially in the yards of M/s HDPE it would be prudent for the contractor to take all the precaution and arrangement to achieve the speed and draft of the boats as close to the specification. The contractor shall avoid the extra weight as far as feasible to restrict the loaded draft within the specified. Any modification in the design and outfitting other than approved must be brought to the notice of EIC and balance work be completed.

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 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 vessel within the limit by this Contract or their liability in respect thereof.

14. Liquidated damage for delay in the delivery and Force Majeure

If the contractor fails to deliver the Workboats within the period fixed for such delivery or at any time repudiates the contract before the expiry of such period the Owner may without prejudice to his right, recover damages for breach of the contract damages equivalent to 0.5% of the price of the workboats which the contractor has failed to deliver within the period fixed for delivery for each week or part of a week subject to a maximum of 10% of workboats price, where

delivery is accepted after expiry of the aforesaid period and in case of repudiation of the contract, the security of the contractor shall be liable to be forfeited and shall also be liable for any loss which the Owner may sustain on that account. PROVIDED ALWAYS that if the Engineer-in charge shall certify in writing that such delay or any portion thereof has arisen either in connection with the works of the Contractor or their authorised subcontractor due to Force Majeure or other cause which in the opinion of the Engineer-in charge on behalf of Authority were unavoidable and could not be foreseen or overcome by the Contractor then and in such cases the liquidated damages shall not be payable in respect of the period certified to be due such cause and the Engineer-in charge on behalf of Authority shall have power to extend accordingly the time fixed for completion.

The term Force Majeure shall herein means Riots (other than among the contractor's employees) Civil commotion (to the extend not insurable), War (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, military or usurped power, damage from aircraft, nuclear fission, acts of God such as earthquake (above 7 magnitude in Richter scale), lightning, unprecedented floods, fire not caused by contractor's negligence and other such causes over which the contractor has no control and are accepted as such by the Chairman 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 required to be performed by them under this contract the relative obligation of the party affected by such Force Majeure cause lasts, provided the party alleging that it has been rendered unable as aforesaid, thereby shall notify within 15 (fifteen) days of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of such cause.

For delays arising out of Force Majeure, the bidder will 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.

If any of the Force Majeure conditions exists in the places of operation of the bidder even at the time of submission bid, he will categorically specify in his bid and state whether they have been taken into consideration in their quotations.

15. 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 vessel nor to improper management on the part of the official staff of the vessel 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.

16. 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 vessel 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 vessel 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.

17. Insurance

The Contractor shall at his own cost fully insure and keep insured in the joint names of the Owner and the Contractor the vessel 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 vessel.

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 Vessel 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 fits 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 vessel 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 of 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.

18. **Manning During Guarantee Period**

During the guarantee period of one year for effective operation and maintenance, the contractor shall provide certified Master, Driver and other four crew on board each of the workboats. Remuneration and other statutory charges e.g. ESI, PF, Insurance etc. including contractors overhead and profit shall be paid to the contractor on submission of monthly bill during the period of engagement, rates for these shall be separately quoted in the format given in the Cost Schedule.

The workboats shall be operated under the guidance of IWAI. P.O.L & other consumable shall be supplied by IWAI. However, repairs and maintenance under guarantee obligations as well as routine maintenance are to be carried out by the contractor.

On completion of guarantee period the workboats shall be handed over to IWAI after ascertaining the operational condition of various engines, machineries and other equipment. Based on which the ‘No Demand Certificate’ shall be issued as per clause no. 8(5) of General conditions of contract.

(SECTION-V)

TECHNICAL SPECIFICATIONS OF FOUR WORKBOATS

Technical specifications

1. Technical specification of workboats:-

The detail technical specification for completion of the balance work of 4 nos. workboats shall be same as the technical specification of 4 nos. workboats presently in the yards of M/s Hooghly Dock Port & Eng. Ltd. Kolkata in their works at Nazirgunj with details as follows:-

A. Nazirgunj works

1st Workboat yard No. P-123
2nd Workboat yard no. P-124
3rd Workboat yard no. P-125
4th workboat yard no. P-126

The technical specification for 4 nos. workboats as per the work order and agreement with HDPE are attached for reference. The balance construction work shall be completed followed by necessary overhauling of all engines, machineries, equipments, valves, related pipe lines, cleaning of all tanks, hydraulic equipments etc as per requirement and test, trial and delivery to be conducted in conformation to the said specification. The workboats are to be designed, constructed and delivered to IWAI as per the rules and regulation of IRS and their supervision. The boats are to be registered with IWT Directorate, Govt. of West Bengal as per the provision of I.V Act of 1917. Accordingly, all the statutory safety appliances are to conform to the rule requirement of Govt. of West Bengal for Inland vessels.

The main dimension and particulars, Construction work completed for each boat (approx.), status of the procurement of material, machineries & equipment and balance work to be attended for each boat (approx.) are as follows. However, in order to assess the actual status on the construction already completed, status of the procurement and availability of the material, machineries, equipment and outfitting, balance work to be completed etc. for submission of a competitive bid for successful execution of the work, the tenderers must inspect the workboats presently available in the yards of M/s HDPEL, Nazirgunj, Howrah. The tenderers may also have further discussion with the concerned officials of HDPEL for assessment of the actual work to be attended.

2. Main dimension & particulars:-

- Length over all (LOA)	22.0 m
-length of hull	21.0 m
-breadth moulded	7.5 m
-depth at side	2.20m
-maximum loaded draught	1.20 m
-maximum draught (no cargo)	0.80 m
-freshwater tank capacity	5.50 m^3
-cargo tanks (fuel supply)	52 m^3
-waste tanks capacity	13 m^3
-trial speed (empty cargo tanks)	8.5 knot
-steerable propulsion	2x200 kw

-fuel capacity (own propulsion) 6 m^3
-deadweight (maximum) 60 tons

3. C**onstruction works completed as on date**:

1st workboat (P-123)	=3rd stage of construction (i.e. 100% steel work completed)
2nd workboat(P-124)	=3rd stage of construction (i.e. 100% steel work completed)
3rdworkboat(P-125)	=3rd stage of construction (i.e. 90% steel work completed)
4th workboat (P-126)	=100% of the 3rd stage achieved.

3.1 General instruction for Inspection of the boats for assessing the work completion & procurement status etc.& assistance of IWAI for completing the work.

In brief the work completed for each boat is given below. However, the contractor has the responsibility to inspect each boat in the yard of M/S HDPEL, Nazirgunj, Howrah and access the extent of the work already completed, further work to be attended etc. before bidding. Similarly inspection for availability of the machineries, equipments, outfitting, raw materials if any and their condition be assessed. IWAI will assist the contractor for handing over all the machineries, equipments, outfitting's and materials from HDPEL. IWAI may also extend the required assistance & cooperation as far as feasible for completing the balance work for launching the boats in the yard of HDPEL & also shifting. Contractor must also ensure to maintain cordial relation in the yard of HDPEL for completing the work.

3.1 Work Completed for each workboat at Nazirgunje Yard of HDPEL

A. Yard no p-123

1. Forwards Transom (stem)-plate frame and brackets filled and welded – Dry Survey completed.
2. Side shell frame 39 to 46 (P&S)-plates, frame and brackets fitted and welded - Dry Survey completed.
3. Chain lockers inboard, outboard and bulkhead at frame 43-plates, stiffeners and brackets fitted and welded - Dry Survey carried out along with forepeak.
4. Transverse bulkhead at frame 39 plates stiffeners and brackets fitted and welded- Dry Survey completed.
5. Main deck between frame 39 to stem plates, longitudinal, girders beam and brackets fitted and welded- Dry Survey completed.
6. Side shell between frame 8 to 39 (P&S) plates, frame, web frame and brackets fitted & welded- Dry Survey completed.

7. Main Deck between frame 8 to Stem plates, beam, longitudinal and brackets fitted and welded- Dry Survey completed.
8. Transverse bulkhead at frame 24, 33 (P&S), 26 plates, stiffens and brackets bulkhead 500- Dry Survey completed.
9. Bulkhead 500 off C/L (P&S) between frame 26 to 39 stiffeners plates, brackets, collar plates fitted and welded- Dry Survey completed.
10. Side shell between frame 0 to 8 (P&S) plates frame & brackets fitted and welded- Dry Survey completed.
11. Main Deck frame Transom to Frame 8, plates, beam, longitudinal and brackets fitted and welded.
12. Transom, W/T Bulkhead at frame 5 & 7 plates, stiffeners and brackets fitted and welded.
13. Inboard longitudinal bulkhead of forward Tank between frame 5-7 (P&S) plates, stiffeners, brackets etc fitted and welded.
14. Longitudinal bulkhead of fuel oil Tank between frame 5-7 (P&S)-plates, stiffeners, brackets fitted and welded.
15. Bottom shell between frame 8 to stem plates, floors, girders, Keelson plates and brackets fitted and welded- Dry Survey completed.
16. Bottom Shell between frame Transverse to 8 plates, floors, girders, centre keelson and brackets fitted and welded.
17. Engine girders fabricated, erected and welded.
18. DG set girders fabricated, erected and welded.
19. Sea chest fabrication, erection of plates, stiffeners & brackets connection including logs of grids plates completed and welded – dry survey completed.
20. Tunnel works as per drawing completed.
21. All manholes pads including carlings fitted and welded.
22. All jobs related to SRP (Steerable Rudder Propulsion) casing on main deck (P&S) fitted & welded.
23. All jobs related to SRP/Kort girders fabricated, erected and welded (P&S).
24. All jobs pertaining to crane fuel oil foundation fabricated, erected & welded- Dry Survey completed.
25. Pushing arrangement at Stem (P&S) fabricated erected and welded as per drawing.
26. Skeg closing plate fitted and welded (Internal areas dry Survey Completed).
27. All drain plug fitted & welded- Welding from outside pending.
28. <u>Jobs completed for deck at frame 6.5 to 22</u>
    i) Transverse. BulkheadNo.1 frame 6.5, plates, stiffeners, carlings and brackets fitted and welded.
    ii) Transverse Bulkheadno.2 at frame 22, plates, stiffeners carlings and brackets fitted and welded.
    iii) Transverse Bulkhead no.8 at frame 10, plates, stiffeners, and brackets fitted and welded.
    iv) Transverse. Bulk head no 15 at frame 10, plates, stiffeners and brackets fitted and welded.
    v) Transverse Bulkhead no.10 and 17 at frame 14, plates, stiffeners and brackets fitted and welded.
    vi) Transverse Bulkhead no.11 and 18 at frame 15+300 plates, stiffeners, and brackets fitted and welded.
    vii) Transverse Bulkhead no.20 at frame 20 plates, stiffeners, and brackets fitted and welded.
    viii)Longitudinal-bulkhead 14 at c/l frame 6.5 to 10, plates, stiffeners, and brackets fitted and welded

xi) Longitudnal-bulkhead21 at c/l frame 15.5 to 22, plates, stiffeners, and brackets fitted and welded

x) Longitudinal-bulkhead 13 at c/l frame 6.5 to 10, 1300mm off c/l plates, stiffeners, and brackets fitted and welded

xi) Longitudinal-bulkhead 9 & 16 at 1650mm off c/l (P & S) plates, stiffeners, and brackets fitted and welded

xii) Longitudinal-bulkhead 5 at 3250 mm off c/l Fr 6.5 to 10 plates, stiffeners, and brackets fitted and welded

xiii) Longitudinal-bulkhead 3 & 6 at 2650mm off c/l (P&S) plates, stiffeners, and brackets fitted and welded

xiv) Longitudinal-bulkhead 4 & 7 at 3250 mm off c/l (P&S) plates, stiffeners, and brackets fitted and welded

xv) Longitudinal-bulkhead no 12 at 19 at 800mm off c/l (P & S) Fr 15 + 300 to 22 , plates, stiffeners, and brackets fitted and welded.

xvi) Deck house top between frame 6.5 to frame 22 plates beams, girders, longitudnal including platforms fuel oil fuel oil for step ladder fitted & welded

29 Wheel House

a)Wheel house side bulkhead(P&S) plates, stiffeners, carlings and brackets fitted and welded

b) Wheel house aft bulkhead plates, stiffeners, carlings and brackets fitted and welded

c) Wheel house ford Bulkhead plates, stiffeners, carlings and brackets fitted and welded

d) wheel house top plates, stiffeners, carlings and brackets fitted and welded

3.2 <u>Yard P-124</u>

1. Stem plates, frame and brackets fitted and welded
2. Side shell Frame. 08 to 46 (P&S) plates, frame and brackets fitted & welded
3. Main Deck frame 8 to 46 plates beams, girders longitudinal brackets fitted & welded
4. Transverse Bulkhead at Frame 24,26,33 & 39 plates, stiffeners, brackets fitted & welded
5. Chain lockers O.B & I.B (Out board & Inboard) bulkhead and Transverse. Bulkhead at frame 43-plates, stiffeners and brackets fitted & welded
6. Longitudinal bulkhead500 off C/L between Frame.26-33 (P&S)-plates, stiffeners, collar plates and brackets fitted an welded
7. Sea chest plates stiffeners and brackets fitted and welded (P&S)
8. All job related to crane foundation (i.e. insert plate, girders, brackets etc) fabricated, erected and welded
9. Engine girders fabricated, erected and welded
10. DG set girders fabricated, erected and welded
11. All jobs related to SRP Girders fabricated erected & welded
12. All jobs related to tunnel Work complete as per drawing
13. Skeg fabrication, erection welding done W/O closing plate
14. Pushing arrangement at stem as per Drawing- fabrication in progress
15. Side shell Fr. 8 to transom plates frame and brackets fitted and welded
16. Side shell Fr. 8 to frame 2/3 plates, frame and brackets fitted and brackets
17 Bottom shell Fr 8 to Transom plates, floors fitted &welded
18. Main deck Fr 8 to Transom plates, beam, girders and Longitudinal fitted and welded
19. Deck House Fr. 6.5 to frame 22 including platform for foot Step Ladders

i) Transverse. Bulkhead no.1 at frame 6.5, Transverse Bulkhead no.2 at frame.22, Transverse Bulkhead no.8 at frame.10, Transverse bulkhead no.15 at frame.10, transverse.Bulkhead no.10 & 17 at frame 14, transverse bulkhead no 11&18 at frame.15+300, transverse bulkhead no.20 at frame 20 Plates, Stiffeners, bulkhead girders, carlings and brackets fitted and welded

ii) Deck House top frame 6.5 to 22 including platform plates, girders, beams and longitudinal fitted and welded

iii) Longitudinal Bulkhead 14 at c/l from 6.5 to fr 10, longitudinal bulkhead 21 at C/L fr 15.5 to 22, longitudinal bulkhead13 at 1300 off C/L from 6.5 to 10 (P) Longitudinal bulkhead 9 & 16 at 1650 off C/L (P&S), longitudinal bulkhead 5 at 3250 off C/L from 6.5 to frame 10, longitudinal bulkhead 3&6 at 2650 off C/L (P&S) frame 10 to 15.5 longitudinal bulkhead 4 &7, 3250 off C/L bulkhead 12 & 19 at 800 off C/L frame 15+300 to from 22. Plates, stiffeners, carlings and brackets fitted & welded – removal of all strong backs and grinding of all bulkheads pending.

20. Wheel House

i) Wheel house side Bulkhead (P&S) plates, stiffeners, carlings and brackets fitted and welded

ii) Wheel house Aft bulkhead plates, stiffeners, carlings and brackets fitted and welded

iii) Wheel house ford bulkhead plates, stiffeners, carlings and brackets fitted and welded

iv) Wheel house top plates, stiffeners, carlings and brackets fitted and welded

v) Welding of butt and seam of wheel house top plating and fwd. bhd. Pending.

3.3 <u>Yard P-125</u>

1. Stem plates, Frame and brackets fitted and welded except items mentioned in pending list..
2. Transom plates, Frame and brackets fitted and welded except items mentioned in pending list..
3. Side shell plates, Frame and brackets fitted and welded. Frame. 0 to stem except items mentioned in Aft peak pending list.
4. Main deck Frame. 0 to 46 plates, Beams, Girders, Longitudinal and brackets fitted and welded
5. Chain lockers inboard, outboard and Transverse. Bulkhead at Frame. 43, plates, stiffeners and brackets fitted and welded.
6. Transverse. Bulkheads at Frame. 5, 7, 24, 26, 33, and 39, plates, stiffeners, collar plates and brackets fitted and welded.
7. Sea chest fabricated and welded w/o top plate fitment, (Plate lying in position).
8. Longitudinal bulkhead's plates, stiffeners collar plates and bulkhead erected and welded.

   (a) FW TANK I.B. bulkhead between Frame. 5 to 7 .

   (b) F. O. centre tank O.B. Frame. 5 to 7.

   (c) F. O. storage TANK 500 off C/L Frame. 26 to 33 .

9. DECK HOUSE Frame. 6.5 to Frame. 22

   All panels of deckhouse fabricated and erected only w/o any bracket connection listed below:

   (i) Transverse. Bulkhead No. 1 at Frame. 6.5

   (ii) Transverse. Bulkhead No. 2. At Frame. 22

   (iii) Transverse. Bulkhead No. 8 at Frame. 10

   (iv)Transverse. Bulkhead No. 15 at Frame. 10

(v) Transverse. Bulkhead No. 10 & 17 at Frame. 14
(vi) Transverse. Bulkhead No. 11 & 18 at Frame. 15 + 300
(vii) Longitudinal Bulkhead No. 14 at C/L Fr. 6.5 to Fr. 10
(viii) Longitudinal Bulkhead No. 21 at C/L Frame. 15.5 to 22
(ix) Longitudinal Bulkhead No. 13 at Frame. 6.5 to 10,
(x) Longitudinal Bulkhead No. 9 and 16 at 1650 off C/L (P & S)
(xi) Longitudinal Bulkhead No. 5 at 525 off C/L from 6.5 to 10
(xii) Longitudinal Bulkhead No. 3 & 6 at 3650 off C/L (P&S) Frame. 15.5 to frame 22.
(xiii) Longitudnal Bulkhead No 12 & 19 at 800 off C/L (P&S) Frame. 15 + 300 to 22
(xiv) Deck house top between Frame. 6.5 to Frame. 22 including platform .

10. Wheel House
    i. Side bulkhead (P&S): Fabricated and erected in place only
    ii. Aft bulkhead : Fabricated and erected in place only
    iii. Forward bulkhead : Fabricated only.
    iv Wheel house top fabricated only.

3.4 <u>Yard P-126</u>

1. Stem plates, Frame and brackets fitted and welded.
2. Transom plates, Frame and brackets fitted and welded.
3. Side shell plates, Frame and brackets fitted and welded. Frame. 0 to 46 (P&S).
4 Main deck Frame. 0 to 46 plates, Beams, Girders, Longitudinal and brackets fitted and welded.
5 Chain lockers inboard, outboard and Transverse. Bulkhead at Frame. 43, plates, stiffeners and brackets fitted and welded.
6 Transverse. Bulkheads at Frame. 5, 7, 24, 26, 33, and 39, plates, stiffeners, collar plates and brackets fitted and welded.
7 Sea chest plates, stiffeners and brackets fitted and welded – Dry Survey Completed.
8 All jobs related to crane foundation i.e. insert plate, girders, brackets etc fabricated erected and welded - Dry Survey Completed.
9 Longitudinal bulkhead's plates, stiffeners collar plates and brackets fitted and welded for the following:-
(a) FW TANK I.B. bulkhead between Frame. 5 to 7 (P&S).
(b) F. O. storage TANK C/L Frame. 5 to 7 (P&S).
(c) F. O. storage TANK 500 off C/L Frame. 26 to 33 (P&S).
10. DECK HOUSE Frame. 6.5 to Frame. 22
    (i) Transverse. Bulkhead No. 1 at Frame. 6.5 Plates, Stiffeners, Carlings and brackets fitted and welded.
    (ii) Transverse. Bulkhead No. 2. At Frame. 22 Plates, Stiffeners, Carlings and brackets fitted and welded.
    (iii) Transverse. Bulkhead No. 8 at Frame. 10 Plates, Stiffeners, Carlings and brackets fitted and welded.
    (iv) Transverse. Bulkhead No. 15 at Frame. 10 Plates, Stiffeners, and brackets fitted and welded.
    (v) Transverse. Bulkhead No. 10 & 17 at Frame. 14 Plates, Stiffeners, and brackets fitted and welded.

(vi) Transverse. Bulkhead No. 11 & 18 at Frame. 15 + 300, Plates, Stiffeners, and brackets fitted and welded.
(vii) Transverse. Bulkhead No. 20 at Frame. 20 Plates, Stiffeners, and brackets fitted and welded.
(viii) Longitudinal Bulkhead No. 21 at C/L Frame. 6.5 to 10 Plates, Stiffeners, and brackets fitted and welded.
(ix) Longitudinal Bulkhead No. 21 at C/L Frame. 15.5 to 22 Plates, Stiffeners, and brackets fitted and welded.
(x) Longitudinal Bulkhead No. 13 at Frame. 6.5 to 10, 1300 off C/L (P) Plates, Stiffeners, and brackets fitted and welded.
(xi) Longitudinal Bulkhead No. 9 & 10 at 1650 off C/L (P&S) Plates, Stiffeners, and brackets fitted and welded.
(xii) Longitudinal Bulkhead No. 5 at 3250 off C/L Frame. 6.5 to 10 Plates, Stiffeners, and brackets fitted and welded.
(xiii) Longitudinal Bulkhead No. 3 & 6 at 2650 off C/L (P&S) Frame. 10 to 15.5 Plates, Stiffeners, and brackets fitted and welded.
(xiv) Longitudinal Bulkhead No. 4 & 7 at 3250 off C/L (P&S) Frame. 15.5 to 22 Plates, Stiffeners, and brackets fitted and welded.
(xv) Longitudinal Bulkhead No. 12 & 19 at 800 off C/L (P&S) Frame. 15 + 300 to 22 Plates, Stiffeners, and brackets fitted and welded.
(xvi) Deck House top between Frame. 6.5 to Frame. 22 Plates, beams, Girders, longitudinal including platforms for stepladder fitted & welded.

11. WHEEL HOUSE

(a) Wheel House side bulkhead(P&S)- Plates, stiffeners, carlings and brackets fitted and welded.
(b) Wheel House aft bulkhead- Plates, stiffeners, carlings and brackets fitted and welded.
(c) Wheel House ford bulkhead- Plates, stiffeners, carlings and brackets fitted and welded.
(d) Wheel House Top- Plates, stiffeners, carlings and brackets fitted and welded.

4. Status of procurement of material, machineries & equipment.

The raw materials particularly steel, major machineries & equipment which have been procured are listed as below. For the balance material, machineries & equipment to complete the work in all respect as per the original technical specification are to be procured by the tenderer.

(i) The machineries & equipment

MAIN EQUIPMENTS

Sl No.	Item	Quantity	Description
1.	Steerable Propulsion Unit	6 Ship sets (12 nos.)	Imported from Kort Propulsion, UK, & available in the yard.
2.	Main Propulsion Engine	6 Ship sets (12 Nos.)	Procured from M/s Greaves Cotton Ltd.
3.	Diesel Generating Set	6 Ship sets (12 Nos.)	Procured from M/s Parikh Pvt. Ltd. in Sept. & Oct., 2010.
4.	Main Switch Board	6 Ship sets	3 (three) Ship sets are lying ready with M/s

			Electronic Control Corpn. Duly accepted by IRS. Awaiting for readiness of payment.'*
5.	Electro Hydraulic Deck Crane	6 Ship sets	Already procured from M/s Geeta Engineering Works
6.	Pumps	6 Ship sets (12 Nos.)	Procured - 6 nos. from M/s Roysons Engg. - 6 nos. from Roto Pump - 2 nos. from M/s B.E. Pumps Balance supplies are ready with M/s Roysons & M/s B.E. and are awaiting for payment confirmation '*
7.	Winch (Hand operated)- 6 Nos. Electric Winch - 6 Nos. Windless - 6 Nos.	6 Ship sets (18 Nos.)	Supply order not placed
8.	Anchor Handling Winch	6 NOs.	Supply order not placed
9.	Transformers & DB's	6 Ship sets	Supply order not placed
10.	Power Cables	One lot	Supply order not placed

'* Payment for receiving the material to be arranged by the yard.

Other Equipments (Already Procured)

Material already Received			**P.O. placed, but yet to be received "****
1.	Manholes	1.	Steel Doors
2.	Drain Plugs	2.	Steel Hatch
3.	Pipe Bends	3.	Side Scuttles
4.	Strainers	4.	Windows
5.	Pads, Clamps	5.	Non Ship side Valves for Bilge/GS/FF system
6.	Flanges	6.	Foot Valves
7.	Shipside Valves	7.	Hand pumps
8.	Globe Valves	8.	Mud box for Bilges/GS/FF system
9.	Anodes		
10.	Bollards (Double)		'** the tenderers may have to initiate fresh action for their procurement.
11.	Vents.		
12.	ERW (GI) pipes (For Air filling, sounding, F/f systems)		
13.	Seamless pipes		
14.	Fitting of Air Filling & Sounding Systems		
15.	Sea chest gratings		
16.	Bolts, Nuts & Washers		

Procurement Action to be taken for Cable, Anchor Handling and Towing Winches.

Items to be finalized for procurement –Anchor and Anchor chain Windlass

5. Details of the balance construction work to be completed & delivery

The list of pending jobs as verified for Yard no. PL 123 to PL 126 are given below:

Pending jobs of PL-123**:**

1. Outer hull and exposed deck dry survey with minor fairing and dressing up
2. Structural testing fuel oil for the fuel following:
   a) Waste Tank frame 24-26 (P&S)
   b) Fuel oil Storage tank frame 26-33 (P&S)
   c) Chain locker Frame. 39-43(S)
   d) Fore peak Frame. 39 to 46
   e) Fresh water tank (P&S) Frame. 5-7
   f) Fuel oil Tank frame.5-7
   Remarks: Any defects arise during test to be rectified.
3. Hose testing for the fuel following including rectification defects if any arise
   a) E/Room from 5-24
   b) General Store from 24-39
   c) Watertight bulkhead from 5-24
   d) Drain plug
   e) Sea chest (P&S)
   Remarks: Areas which are covered under pressure Test

4. Dry Survey Recommendation
   a) Welding of Deck longitudinal 1500mm off C/L (S) between frame 15-19
   b) Undulation of bulkhead33(S) remains pending to be done
   c) Fairing of Bulkhead 24(S) to be done yard
   d) General Store
   e) DC welding of 0.2 span to be done on deck Longitudinal Deep cut area on bulkhead plate to be build up and ground.
5. Sewage tank(built in type) fabrication & erection as per drawing including pressure test. Approx. weight-1225 kg.
6. Fitment of Drain plug as per drawing. Defects observed during pressure testing/hose testing to be rectified-10 nos.
7. Perforated plate fitment including frame work in chain locker.
8. Fender pipe fabrication & fitment
   Remarks: Drawing to be prepared
9. Bulwark fabrication & fitment including mooring eye as per drawing
   Remarks: Drawing to be prepared
10. Funnel construction & fitment above Main deck with E/R (Engine Room) casing as per drawing
    Remarks: Drawing to be prepared
11. Side shell opening size 1750x1650 mm approx. to be cut and re-fitted the same on completion to be carried out approx. weight 220 kg.
12. Relocation of staircase opening of E/R i.e. shifting of transverse Bulkhead Frame.20 to frame.18 C/L to 800 off C/L as per drawing no. HDPEL/P-123-128/01 Rev. F

including modification of C/L bulkhead and blanking E/R Doors existing opening on Deck House. (Aft end to be round off. Weight approx:261 Kg.
Remarks: Drawing not to be prepared

13. Galleys existing doors opening to be blanked off, bulkhead stiffeners to be fitted and new opening to be provided including door carling as per Access plan on DECK house ford end to be round off weight approx. 178Kg.
14. Fabrication and fitment with spurling pipe. Windlass seat including Anchor lowering & hoisting Arrangement. Remarks: Drawing to be made
15. Bollard fitting including under deck stiffening-06 nos.
16. Towing arrangement as per drawing. Remarks: Drawing to be made
17. Pushing arrangement as per drawing.
    Remarks: Drawing to be made
18. Mast fabrication & fitment.
    Remarks: Drawing to be made
19. Fabrication and fitment for the following as per Access plan
    a) W/T (Water Doors) Doors-05 nos
    b) WHT (Weather Tight) Doors- 03 nos
    c) Vertical ladder-20 nos
    d) Foot Step Ladder-04 nos
    e) Skylight including carlings- 04 nos
    Remarks: Drawing to be made
20. Side light fabrication & fitment -02 nos. each vessel. Remarks: Drawing to be made
21. Fabrication & fitment of portable steel ramp. Remarks: Drawing to be made
22. Work shop machinery seat fabrication and fitment & install including shifting
23. Guard Rail/Storm Rail manufacturing and fitting on board.
    Remarks: Drawing & Materials to be made available
24. Fitment & welding 14 nos Manholes and 06 nos Hatches including carling
    Remarks: 05 nos. flush type manholes only fitted. for yard no P-123
25. Fitment 13 nos. windows & 07 nos Scuttles. Remarks: Materials not available
26. Store Rack fabrication & fitment for general store & provision store
    Remarks: Drawing to be made for execution as well as materials procurement
27 18 nos. sacrificial anodes to be fitted as per drawing no HDPEL/P-12 128/09.
28. "X" ray to be done as per "X" ray plan. Any welding defects arise to be rectified
29. Fabrication & Erection of built in Lube oil tank in Engine Room
30. Fabrication & Erection of built in over flow tank in engine room
31. Fabrication & erection of Dirty oil tank (built in) in engine room
32. Leak testing of AFT Peak & Skeg Lube oil tank overflow tank & dirty oil tank
33. Chequered plate fitment including frame work in Engine room & general store
34. Paints to be procured and painted.
35. Fitment of all sea valves & OBDs
36. Complete piping works remain pending.
37. Fitment & Welding of Anodes
38. Blasting & Pending of complete hull as per technical specification.
    (Completed Blasting & Prime Coat only)
39. Complete outfitting works pending.
40. View surveys commenced in 2009 there may be requirement of re-examining the structure which has been already dry surveyed and repairs arising due to re-examination, if any to be dealt with.
41. Installation of Machinery & Equipment.
42. Installation of all Electrical & Electronics items/ equipment's.
43. Installation, Panelling & Flooring.

44. Accommodation Furnishing.
45. Test, Trials & Commissioning.

<u>List of the pending jobs for yard no 124</u>

1. Dry survey of Aft peak-frame,0-5 except HRP girder/tunnel related work. On completion of work area to be offered for dry-survey followed by leak test, most probably following are the pending job.
   a) Side shell fabrication and fitment between frame.0-2+300 man (port), i.e. carder plate (aprx:215 Kg)
   b) 3 nos bulkhead Girder fabrication, fitment and welding at Transom (Approx.Wt:62.5 Kg)
   c) All button and top brackets fabrication, fitment and welding at transom except i.e. HRP Girder. (Approx. wt.: 119.4 Kg)
   d) Mismatched of centre Keelson's FB with floors FB to be rectified (Frame, 1,2,3 & 4) approx. length 200mmx4 nos
   e) Welding of side shell transom floor bulkhead to be done Approx13 meter- 6 run, 18.5 mtransverses-4 run
   f) Welding of frame transom and side shell Approx length 6 meters
   g) Dressing up i.e. cleaning, chipping, grinding build up removal of strong back etc to be the surveyors satisfaction
   h) Any other remarks made by surveyor during inspection to be attended

2. Dry survey of Aft peak-frame,0-5 except SRP girder/tunnel related work. On completion of work area to be offered for dry-survey followed by leak test, most probably following are the pending job
   a) 05 nos collar plates to be made and fitted welded, approx. weight 28 kg
   b) 20 nos brackets to be made and fitted and welded. Approx weight 80 kg
   c) Bottom welding of bulkheads and floors to be completed
   Approx length : 7800mm-4 run
   : 4000 mm-4 run
   d) Mismatched of centre Keelson's FB with floors FB to be rectified (Floor 6()- approx. length 200 m
   e) Side shell welding with Main Deck and bottom shell (P&S) approx. length 3.000 mm-6 run)
   f) Dressing up i.e cleaning, chipping, grinding build-up of removal of strong back etc. to be done to the surveyors satisfaction
   g) Any other remarks made by surveyor during inspection to be attended

3. Carried over edges of bottom plate and Deck plate frame side shell needs to be trimmed and ground between frame 0 to 14 (P&S) (approx. RM 30 mtr).
4. Side Shell welding with Main Deck and bottom shell between frame. 7-12 (P&S) (approx. RM 5 mtr).
5. Skeg closing plate including fwd. & Aft end pipe fitment and welding as per drawings. On completion pressure testing to be done Approx. weight-130 Kg.
6. Carried over edges of Main Deck and bottom shell to be ground smooth Approx. length 90 mtr.
7. Dry Survey of superstructure and wheel house including funnel casing (P&S) to be carried out to the surveyors satisfaction. Any remarks made by surveyor to be carried out. Most probably pending works are as follows:
   a) Total running welding: 232 mtr

b) Bottom door carlings to be fitted and welded-7 nos.
c) Boundary Bulkhead carried over edges (coming plate) to be trimmed and ground smooth. Approx. Length 14 mtr
d) Funnel opening on M/Deck to be marked and cut to size. Approx size 1900x900 m-2 nos
e) 08 nos. Brackets to be made and fitted. Weight approx. 16 kg only for yard P-123
f) Dressing up i.e cleaning, chipping, grinding build up removal of strong back etc to be done to the surveyor satisfaction
g) Any other remarks made by surveyors during inspection to be attended.

8. Outer hull and exposed deck dry survey with minor fairing and dressing up
9. Structural testing for the following:-
   a) Waste tank frame. 24-26 (P&S)
   b) FUEL OIL storage tank frame.26-33 (P&S)
   c) Chain locker frame. 39-43 (S)
   d) Fore Peak frame. 39 to 46

   Remarks: Any defects arise during test to be rectified
10. Hose testing for the following including rectification of defects if any arise:
   a) E/Room frame.5-24
   b) General Store Frame. 24-39
   c) Watertight bulkhead frame.5-24
   d) Sea chest (P&S)

   Remarks : Area which are not covered under pressure test
11. Dry survey recommendation:
   a) Welding of Deck longitudinal. 1000 off C/L frame 10-12 (yard P-124 only).
   b) Welding of Deck longitudinal 1500 off C/L (S) between frame 15-19.
   c) Undulation of bulkhead33 (S) remains pending to be done
   d) Fairing of bulkhead24 (S) to be done yard P-123
   e) General Store yard 123.
   f) DC welding of 0.2 span to be done on deck Longitudinal Deep cut area on bulkhead plate to be build up and ground
12. Sewage tank (built in type) fabrication & erection as per drawing including pressure test. Approx. weight-1225 kg.
13. Fitment of Drain plug as per drawing defects observed during pressure testing/hose testing to be rectified-10 nos.
14. Perforated plate fitment including frame work in chain locker

    Remarks: Drawing N.A
15. Fender pipe fabrication & fitment Remarks :Drawing to be prepared
16. Bulwark fabrication & fitment including mooring eye as per drawing Remarks: Drawing to be prepared
17. Funnel construction & fitment above M/DECK with E/R casing as per drawing.

    Remarks: Drawing to be prepared
18. Side shell opening size 1750x1650 mm approx. to be cut and re-fitted the same on completion to be carried out. Approx. weight 220 kg.
19. Relocation of staircase opening of E/R i/e shifting to transverse. Bulkhead frame. 20 to frame 18 C/L to 800 off C/L as per drawing no HDPEL/P-123-128-01 Rev F including modification of C/L bulkhead and blanking E/R doors existing opening on Deck House (Aft end to be round off) weight approx. 261 kg Remarks: Drawing to be prepared

20. Galleys existing doors opening to be blanked off, bulkhead stiffeners to be fitted and new opening to be provided including door carling as per access plan on DECK house ford end to be round off weight approx. 178 kg
21. Fabrication and fitment with spurling pipe windlass seat including Anchor lowering & hoisting arrangement
    Remarks: Drawing to be prepared
22. Bollard fitting including under deck stiffening-06 nos
23. Towing arrangement as per Drawing Remarks: Drawing to be made
24. Pushing arrangement as per drawing Remarks: Drawing to be made
25. Mast fabrication & fitment Remarks: Drawing to be made
26. Fabrication and fitment for the following as per Access plan
    a) W/T Doors-05 nos
    b) WHT Doors -03 nos
    c) Vertical Ladder- 20 nos
    d) Foot Step Ladder-04 nos
    e) Skylight including carlings-04 nos
    Remarks: Drawings to be made
27. Side light fabrication & fitment-02 nos each vessel
    Remarks: Drawing to be made
28. Fabrication & fitment of portable steel Ramp as per Drawing
    Remarks: Drawing to be made
29. Work shop machinery seat fabrication, fitment and installation including shifting
30. Guard Rail/Storm rail manufacturing and fitting on board
    Remarks: Drawings and materials
31. Fitment & welding 14 nos Manholes and 06 nos Hatches including carling
32. Fitment 13 nos windows & 07 nos scuttles
    Remarks: Materials not available
33. Store Rack fabrication & fitment for General Store & provision Store
    Remarks: Drawing to be made for execution of work as well as materials
34. 18 nos Sacrificial anodes to be fitted as per Drawing no HDPEL/P-12 128/09.
35. "X" ray to be done as per "X" ray plan. Any welding defects arise to be rectified
36. Fabrication & Erection of Lube oil Tank built in engine room bottom shell
37. Fabrication & erection of Dirty oil Tank built in Eng room bottom shell
38. Fabrication & erection of overflow Tank built in Eng room bottom shell
39. Leak testing of Lube oil tank, overflow Tank and dirty oil TANK
40. Chequered plate fitment including frame work in engine room & General store.
41. Under water paint to be procured & painted.
42. Fitment of all sea valves & OBDs
43. Complete piping works pending.
44. Side shell b/w Frame-0-3 (P&S) fitment & welding pending along with all structural connection to side shell.
45. Fitment & Welding of Anodes
46. Blasting & Pending of complete hull as per technical specification.
    (Completed Blasting & Prime Coat only)
47. Complete outfitting works pending.
48. View surveys commenced in 2009 there may be requirement of re-examining the structure which has been already dry surveyed and repairs arising due to re-examination, if any to be dealt with.
49. Installation of Machinery & Equipment.
50. Installation of all Electrical & Electronics items/ equipments.
51. Installation, Panelling & Flooring.

52. Accommodation Furnishing.
53. Test, Trials & Commissioning.

List of Pending job for yard no. 125

1. Engine girders fabrication and erection .
2. DG set girders fabrication and erection.
3. Structural modification I.W. O engine room staircase (entrance from Main Deck)
4. Structural modification I.W. O galleys inboard bulkhead (ford) ie. radius to be made and C W O galleys entrance door
5. Structural Modification due to relocation of provision store.
6. Crane foundation erection and all other related job ie. deck plate to be cropped and insert plate to be fitted.
7. Tunneling job including modifications of floors and bulkhead
8. SRP fitting erection and all other related works. i.e. modification of floors bulkhead etc.
9. SRP casing fabrication and erection on Main Deck.
10. Fabrication and erection of sewage tank.
11. Bollard fitment welding and erection.
12. Bollard fitment welding including under deck stiffening- 6 nos .
13. Pushing arrangement at Stem
14. 14 nos manholes pad with cover fitment, welding including under deck stiffening.
15. 13 nos. drain plug fitment and welding.
16. Windlass sheet, Anchor lowering and hoisting arrangement including bitter end connection.
17. Fabrication and erection of bulwark including mooring eye.
18. Watertight hatch covers fabrication and fitment. – 06 nos.
19. W/T Door/WHT Door fabrication and fitment – 8 nos.
20. Connection of funnel above bridge deck
21. X ray to be done as per X ray Plan
22. Mast fabrication and erection.
23. Towing arrangement as per drawing
24. Guard railing.
25. Fabrication and fitment of 02 nos Portable steel ramp including stowage arrangement.
26. Perforated plate making and fitment in chain locker including frame work.
27. 18 nos fitment of sacrificial ANODES. AS PER DRAWING.
28. Fitment of 14 nos. windows.
29. Fitment of 07 nos side scuttles.
30. Workshop machinery seat fabrication and fitment.
31. Skylight fabrication and fitment as per access Plan.
32. Chequered plate fitment including frame work in engine room and general store.
33. Store rack fabrication and fitment as per drg for provision store and general store.
34. Structural Testing
    a) Fresh water Tank (P & S)
    b) Fuel Oil tank (Centre)
    c) Sewage Tank
    d) Water tank (P & S)
    e) Fuel Oil Storage Tank (P & S)
    f) Fore Peak
    g) W/T Bulkhead 24 & 39

h) Chain locker

35. Leak testing a) Aft Peak & b) Skeg.
36. Hose Testing - area which is not covered by structural testing and leak testing such as engine room, general store, sea chest, W.T. bulkhead etc
37. Outer hull and exposed deck dry survey require chipping, grinding, build up, removal of strong back.
38. Side light fabrication and fitment (P & S)
39. Sewage Tank fabrication and fitment (Built in type)
40. Dirty oil tank fabrication and fitment (built in type)
41. Overflow tank fabrication and fitment (built in type)
42. L.O. tank (S) fabrication and fitment (built in type)
43. Underwater paints to be procured and painted.
44. <u>Forepeak frame 39 to 46</u>
    a) Aft bulkhead wavy to be faired.
    b) CI welding done on c/l girders web with deck instead D.C. welding.
    c) Bottom bkts I.W.O. chain locker forward bulkhead at 2000 and 2500 off C/L (S) not fitted.
    d) Top bkt I.W.O chain locker forward bulkhead at 2500 mm of C/l having hard spot to be ceased with the help of carling.
    e) Bkts not fitted IWO dk longl and Chain locker longl bhd at Fr 43 (S)
    f) Welding IWO of floor's F/F and side girders/ C/L girder's F/F not done.
    g) Btm. Bkts at stem C/l 1500, 3500 & 4000 of C/l IWO fr. and floors not fitted (P & S)
    h) Dk longl 3500 & 4000 off C/L (P & S) not connected with stem
    i) Bu welding of floor's F/F pending at Fr 43 and 44
    j) Carling I WO hatch covers not fitted (P & S)
    k) Weld length IWO bkts to various places less than 75mm
    l) Carling IWO chain locker M/H found C.I. welding to be D.C. welding.
    m) Free end angle flange and web's flat face not snipped to be snipped and ground.
    n) Turn welding not done at various places ie. IWO scallop , bkts. Etc.
    o) 6 nos. TV made & fitted at Tr. Beam at fr 42 area required to be dressed up ie. removal of strong back, grinding, build up etc. prior to dry survey followed by structural testing.
45. <u>Chain Locker Fr. 39 to 43 (stbd)</u>
    a) Weld length IWO bkts toe to be increased.
    b) Limber of hole to be provided.
    c) Turn welding left out in way of scallop and limber hole to be done.
    d) Perforated plate to be curved to size and fitted with securing arrangement area to be dressed up i.e. removal of strong back grinding, build up etc. prior to dry survey followed by structural testing.

46 <u>General Store Fr. 24 to 39</u>
    a) Floors and web fr. found CI instead of DC welding.
    b) Flange of S/L fr not snipped to be snipped and ground.
    c) Tr. bhd 39, girders welding length from ends found less than 0. Span will be done as per welding schedule.
    d) Bottom welding of Tr. bhd (ford) not done 3000 off C/L to 3500 off C/L
    e) Carling to be provided IWO water tight hatch (port).
    f) Top & Bottom bkts. not fitted at fr. 26& 33 500 off C/L (P&S)
    g) 'V' stiffener (bhd stiffener) not fitted at ford bhd 500 off C/L (S) including Top & Btm bkts.

h) Weld length of DK longl. IWO web beam at Fr. 36 found less than 75 mm to be increased.
i) 6 nos. TB not fitted IWO DK longl. and web beam at fr. 36.
j) Weld lengthy IWO bkts toe less than 75 mm to be increased.
k) Tr. bhd at fr. 33 (S) wavy spot fairing required.
l) Excessive gap IWO scallop between DK length and web beam observed at Fr. 36 400 off C/L (Port)
m) Round up welding IWO scallop and bkts. pending to be completed.
n) Area to be dressed up i.e. removal of strong back, grinding, built up etc. fro dry survey.

47 Fuel Oil Storage Tank Fr. 26 to 33 (Port)

a) Weld length IWO of bkt's toe observed less than 75 mm to be increased.
b) Free end of Flat face and Angle flange not snipped to be snipped and ground
c) Tr. beam at Fr. 9,500 off C/L to 1500 off C/L found wavy.
d) Carling to be IWO manhole.
e) TB not fitted at web beam 26.
f) Area to be dressed up i.e. removal strong back, grinding build up etc. and to be cleaned thoroughly for dry survey.
g) Limber hole to be provided as required.

48 Fuel Oil Storage Tank Fr. 26 to 33 (stbd)

a) Weld length IWO of bkt's toe found less than 75 mm to be increased.
b) Top & Btm bkts at bhd 26& 33, 1500 off C/L not fitted.
c) Carling to be provided IWO manhole.
d) Limber hold to be provided as required.
e) Area to be dressed up and through cleaning required for dry survey.

49 Waste Tank Fr.24 to 6 (P&S)

a) Tr. bhd (Ford) wavy (Spot fring to be done)
b) Weld length found less 75 mm at Dk longl 4000 mm off C/L IWO bkts. Toe to be increased.
c) Bkts. not fitted 500 off C/L longl. bhd to be made and fitted (fr.25)
d) Carlings to be provided IWO water tight manhole complete area to be dressed up and offer for dry survey.

50 Engine Room Fr. 05 to 24

a)TB not fitted at Web beam at Fr. 10,14 & 19 IWO Dk longl.
b) Top & bottom bkts. not fitted at bhd fr. 5 2000 and 500 off C/L (P&S)
c) Collar not welded IWO centre F.O storage Tk and FW Tk (P&S)
d) Free end of Fr. and stiffener not snipped, to be snipped
e) Web beam at Fr. 10, C/L to 1000 off C/L (S) sagging.
f) Web beam at Fr. 14, C/L to 1000 off C/L (P) sagging.
g) Bkt fitted IWO bhd. Girder at ford bhd. Crossing the floor FF at fr.22 to be modified (P&S).
h)Weld length IWO bkts. to be increased.
i) Carling to be provided IWO W/T hatch/skylights
j) Limber hole to be provided.
k) Scallop/limber hole to be ground

Complete area to be thoroughly cleaned dressed up i.e. removal of strong back, grinding build up prior to offering for dry survey.

51 Sea Chest (P&S) Fr. 17-19

Sea chest Top plate cut to size only to be fitted and welded with all bkts connection. Side shell to be cut as per drgs. For the fitment of Top Plate and same to be offered.

52 F.O. Storage TK fr. 5-7

a) Weld length IWO bkts toe to be increased.
b) All free end of Angle and F/F do not snipped.
c) Carlings not fitted IWO M/holes.
d) Limber of Air escape hole not provided.
e) Btm & Aft bhd not welded.
f) Area yet to be made for DS

53 FW TR FR 5-7 (P&S)

a) Weld length to be increased IWO bkt's toe.
b) Carlings to be provided IWO Man holes.
c) Limber hole not made to be provided.
d) Free end of Angle to be snipped and ground.
e) One no. bkt on (Port) fitted but not welded.
f) Minor chipping/Grinding need for dry survey.

54 Aft Peak Fr. 0-5

a)All floors made of fitted in tack position
b)Transom Bhd girder 1500 off C/L (P&S) not made & fitted.
c) Carlings IWO hatch not fitted.
d) C.I Welding done on deck beam instead of DC.
e)Tunnel work not under taken IWO HRP except floor's work.
f) Corner closing plate btm part approx.. 600mm height, Fr. 0 to Fr.2 + 200 mm not made & fitted (P&S) top portion fitted in tack position only.
g) Btm & Top welding of Transom pending.
h)Transom bhd stiffener at 3500 off C/L not yet fitted including bkts.
i) 10 nos. bkts to be made & fitted.

55 Sewage TK Fr. 2 to 4 (S)

a) Built in type TK not yet started.

56 Bulwark on Main DK at Ford work not yet started.

57 DK house structure all the Tr. and longl bhd pre fabrication (i.e. stiffener fitted and 70% welding completed) erected in position W/O any bkt connection in and fashion plate. Side bhd of master & driver and crews cabin found 25 mm short to be rectified.

58 W/House structure pre-fabricated and erected in position, DK & Fort bhd yet to be erected. Stiffener/Beam welded with deck/bhd 60% only.

59 **Skeg**- 40% work is done only closing plate fabrication & erection is still pending.

60 **Bottom Shell:**

a) Outside welding IWO K&A remains pending btwn Fr. 0-18 (S) and 0-11 (P), 35-36 & 37-38 (P).
b) Minor chipping grinding and spot fairing remains pending.
c) Btm shell carried over edges from side shell to be trimmed & ground at Fr. 3 to transom.

Side Shell:

a) Side shell top fitting with deck plate found wavy (Bulge out) btwn frame 19 to 22/23 and Fr. 33-35 (S) to be rectified.
b) Side shell welding with bottom shell remains pending btwn fr. 17-0 (P)
c) Ford closing plate btwn fr 41 to 46 (P&S) wavy to be faired.

Main Dk:

a) Carried over edges to be trimmed and ground
b) SRP casing to be fabricated & fitted in position.
c) Minor fairing required

61 Fitment of all sea valves & OBD's
62 Complete piping works pending
63 Fitment & welding Anodes
64 Blasting & painting of complete Hull as per technical specification
65 Complete outfitting works pending
66 View surveys commenced in 2009 there may be requirement of re-examining the structure which has been already dry surveyed and repairs arising due to re-examination, if any, to be dealt with.
67 Installation of Machinery & Equipment.
68 Installation of all Electrical & electronics item/equipment's.
69 Installation. Paneling & Flooring.
70 Accommodation Furnishing.
71 Test, Trials & Commissioning.

List of pending job for yard no. 126

1. Engine girders fabrication and erection .
2. DG set girders fabrication and erection.
3. Structural modification I.W. O engine room staircase (entrance from Main gate)
4. Structural modification I.W. O galleys inboard bulkhead (ford) i.e. radius to be made and I W O galleys entrance door.
5. Structural Modification IWO modified probation store aft bhd.
6. Crane foundation erection and all other related job i.e. deck plate to be cropped and insert plate to be fitted.
7. Tunnel job including modification of floors and bulkhead.
8. SRP fitting erection and all other related works. i.e. modification of floors bulkhead etc.
9. SRP casing fabrication and erection on Main Deck.
10. Fabrication and erection of sewage tank.
11. Fender pipe fabrication & erection.
12. Bollard fitment welding including under deck stiffening – 6 nos.
13. Pushing arrangement at Stem
14. 14 nos manholes pad with cover fitment, welding including under deck stiffening.
15. 13 nos. drain plug fitment and welding.
16. Windlass sheet, Anchor lowering and hoisting arrangement including bitter end connection.
17. Fabrication and erection of bulwark including mooring eye.

18. Watertight hatch covers fabrication and fitment. – 06 nos.
19. W/T Door/WHT Door fabrication and fitment – 8 nos.
20. Construction of funnel above bridge deck
21. X ray to be done as per X ray Plan
22. Mast fabrication and erection.
23. Towing arrangement as per drawing
24. Guard railing.
25. Fabrication and fitment of 02 nos Portable steel ramp including stowage arrangement.
26. Perforated plate making and fitment in chain locker.
27. 18 nos fitment of sacrificial ANODES. AS PER DRAWING.
28. Fitment of 14 nos. windows.
29. Fitment of 07 nos side scuttles.
30. Workshop machinery seat fabrication and fitment.
31. Skylight fabrication and fitment as per access Plan.
32. Chequered plate fitment including frame work in engine room and general store.
33. Store rack fabrication and fitment as per drawing for probation store and general store.
34. Structural test/air pressure test/hose test as per testing plain.
35. Outer hull and exposed deck dry survey with fairing, if required.
36. Side light fabrication & fitments- 2 nos.
37. Fabrication of built in tank for over flow.
38. Fabrication of build in tank for dirty oil.
39. Fabrication of build in tank for lube oil.
40. Under water paints to be procured and painted.
41. Fabrication of sewage tank in engine room.
42. Fitment of all sea valves and OBD's.
43. All floors face plates joint with longitudinal pending at many location throughout the vessel.
44. Complete piping works pending.
45. Trimming of excess carnied plate throughout the vessel.
46. Complete outfitting work pending.
47. View surveys commenced in 2009 there may be requirement of re-examining the structure which has been already dry surveyed and repairs arising due to re-examination, if any, to be dealt with.
48. Installation of Machinery & Equipment.
49. Installation of all Electrical & electronics item/equipment's.
50. Installation. Paneling & Flooring.
51. Accommodation Furnishing.
52. Test, Trials & Commissioning.

5.1. Pre-launching work for 4 nos. Workboats (Yard No.P-123, P-124, P-125 & P-126)

SI. No.	Description of jobs

1	Aft Peak - Fr. 0-5 (a) All jobs related to HRP/Kort Girder as per drawing no. 55-18 (Rev.G). (b) Top welding of Transom Bhd. from outside. (c) Floors, Girder & Bulkhead bottom welding with bottom shell to be completed. (d) 3 nos. Bhd. Girder fabrication and fitment at transom. (e) Bottom and top bkts at transom bhd. fabrication and fitment. (f) Side shell Fr. 0 to 2 + 300 mm (port) fabrication and fitment with frames. (g) Mismatched of side shell Fr. 0 to 2 + 300 mm (Stbd) fitted in tack position. (h) Welding of Fr. 3 & 4 with S/Shell (P&S).
2	All bottoms welding of floor, bhd& girders between frame 5 to 7 remains pending to be completed.
3	Side Shell welding with Main Dk. And bottom shell between Fr. 0 to 12 (P&S)
4	Bottom plate and deck plate carried over edges from side shell not trimmed and ground from Fr. 0 to 14 to be completed.
5	Skeg closing plate with end pope fitment remains left out to be completed including pressure testing as per drg. No HDPEL/P-123-128/07
6	Sewage tank (built in type) fabrication & erection as per drg. No. SK/P-123-128/14.
7	Fitment of Drain plug as per drg. No. HDPEL/P-123-128/14.
8	Sea chest (P&S) top plate fitment including brackets connection and grid plate.
9	Engine girder and DG Set girder fabrication and fitment as per drg. No. 55-18 Rev. G.
10	Funnel (P&S) inboard longitudinal bulkhead to be shifted from 1650 off C/L to 1300 off C/L and subsequently Ford Transverse bulkhead length to be increased as per drawing no. HDPEL/P-123-128/01 Rev. F & G.A Ni, HDPEL/P-123-128/01 Rev. F- if required.
11	Relocation of Staircase for engine room i.e. shifting of transverse bulkhead at fr. 18 as per drg no. HDPEL/P-123-128/01 Rev. F including modification of C/L Bhd. & blanking of existing opening off E/R doors.
12	Dry Survey of superstructure and wheelhouse including funnel (approximately 70%) and dressed up i.e. removal of strong back chipping, grinding, build up etc. after fitment of 13nos. Windows and 07 nos. scuttles.
13	Outer hull/exposed deck dry survey with Local fairing and minor dressing-up.
14	(a) Galley6's existing doors to be blanked off including bhd stiffeners and new opening to be made as per drg. HDPEL/P-123-128/01. Rev. F. (b) Fitment of 14 nos. manhole covers and 06 nos. hatches including carlings.
15	Structural testing for the following:- (a) F.w. Tank Fr. 5 to 7 (P&S) (b) F.O. Tank (c) Fr. 5 To 7 (C) (c) Sewage Tank Fr. 22 to 24 (P) (d) Waste Tk Fr. 24 to 26 (P & S) (e) F.O. Storage tank Fr. 26 to 33 (P&S) (f) Chain locker Fr. 39 to 43 (S) (g) Fore Peak Fr. 39 to 46.

16	Hose testing for the following:- (a) E/Room Fr. 5 to 24. ⎫ bottom shell and side shell which are not (b) General Store Fr. 24 to 39 ⎬Covered under pressure testing. (c) Watertight bulkhead Fr. 5 to 24 ⎭ (d) Sea Chest Fr. 17 to 19 (P&S)
17	Leak test of Aft peak on completion of all structural work.
18	Welding of deck longitudinal 1000 off C/L (P&S) between Fr. 10-12 for yard P-124 only.
19	Left out welding of dk longitudinal 1500 mm off C/L (S) between Fr. 15 to 19 (S).
20	General Store Fr. 24 to 39 : (a) DC welding of 0.2 span on deck longitudinal at ends (b) Deep cut area on bhd plate to be built up and ground. (c) Waste stank Fr. 24 to 26 (S) bhd 24 wavy to be faired.
21	Mismatched of center keelson FB with Floor's FB observed between Fr. 1-6 to be rectified.
22	Welding of Side dk girder 3500 off C/L (P&S) Fr. 10-14 in Engine Room.
23	FB fitment and welding between 2500 off C/L to 3500 of C/L at Fr. 13 (P&S).
24	Removal of strong back fitted all over the ship used for fairing including weld tack grinding build up cavity upto Main Deck.
25	"X" ray to be done as per X-ray plan and rectification of defects, if any.
26	Crane Foundation erection as per drawing no. 55-19 Rev. B including shifting of crane foundation from machine shop to onboard.
27	Tunnel work between Fr. 0 to 7 (P&S).
28	keel sighting arrangement to be made including blocking and fortnightly reading to be taken,
29	Fitment of anodes - 18 nos.
30	Draft mark as per approved drawing.

List of outfit job :

SI. No.	Description of job for yard nos. P-123 &P-126
1	Portable Steel Ramp fabrication, fitment including stowage arrangement.
2	Railing/storm rail.
3	Fitment of 05 nos. WT and 03 nos. WHT Doors, 20 nos. vertical ladders, 04 nos. Foot step ladder and 04 nos. skylight as per Access Plan drg. No. HDPEL/P-123-128/03 Including Hose Testing.
4	Bollard fitting including under deck stiffening.
5	Towing arrangement.
6	Perforated plates fitment in chain locker including frame work.
7	Winch seat and anchor stowage arrangement for forward and aft anchor.
8	Other Machinery seats.
9	Mast fabrication & Fitment.
10	Side light fabrication and fitment

11	Workshop machinery instillation including shifting onboard.
12	Chequred plate work at engine room and general store.
13	Funnel above bridge deck construction & fitment as per drawing.
14	Fender pipe fabrication & fitment to be done as per drawing.
15 16	Fabrication & Erection of Bulwark including mooring eye. HRP casing on main deck fabrication & erection
17	Carling in way of skylight.
18	Installation and commission of crane including shifting from machine shop to onboard
19	Chain locker sparling pipe and perforated plated.

5.2. Post launching work, Commissioning of machineries, Test & trial and delivery for 4 nos. workboats (P-123,P-124,P-125&P-126)

5.2.1 Scope of work for machinery

A) Main Engine

(i) Installation of SRP unit (2nos.) into foundation including drawing of base reference line and also checking of keel sighting
(ii) Installation of main propulsion engine including chock fasting
(iii) Installation of hydraulic system for propulsion system including hydraulic pump & piping system
(iv) Alignment of SRP & main engine
(v) Erection & fixing up of shafting system/coupling between main engine & SRP units.
(vi) Installation of 1 no. 50 KVA & 1 no. 25 KVA genset.
(vii) Installation/lagging of exhaust system of main engine &genset engine with all relevant material.

B) Aux Engine

I) Installation of bilge/GS/fire pump (one motor driven one genset driven)
II) Installation of F.O. transfer pump
III) Installation of F.W. transfer Pump
IV) Fabrication & erection of sewage holding tank
V) Installation of sewage handling pump including pipe lines.

C) Deck Machinery

i) Installation of window & related work for securing of Anchor/rope etc.
ii) Installation of Anchor handling winch & related work
iii) Installation of stern winch including anchor etc.
iv) Erection of pedestal with the ship structure for crane & installation of crane & securing.

* Commissioning of all M/c as stated in (A),(B) & (C) and test/trial as necessary in compliance with the requirement of IRS/IWT/IWAI.

5.2.3 Accommodation

(I) Lining out work:

Marking and fitting of various items e.g. cable, Trays, Hangers, WT/NWT Deck/ Bhd. Gland Box, flat bar type cable ways for electrical, electronic, navigation &

communication equipment and all other electrical items in all compartments, various spaces as per relevant cable route layout drawings and as per instruction of Engineer In-charge. On completion of making of each compartments/spaces, the same is to be inspected. Subsequent rectification/modifications, if any, are to be carried out by the contractor free of charge, as advised by Engineer In-charge or inspection authority.

(II) CABLE ROUTE WORK:

Preparation of cable route including all necessary hot work, fitment of lugs, hairs for cable hangers and trays, fitment of hangers & trays, piercing and fitment of cable glands (including running and final welding) as per Cable Route/Installation layout drawing. The contractor shall also be required to do painting of lugs, chairs, trays, hangers etc. whatsoever is laid by them. The cable trays are to be, as far as practicable, straight and accessible and as high as possible above bilges in the engine room. The cable bends should be such so that these are not subjected to movements by expansions. Cable runs normally bends should be such so that these are not subjected to movements any expansions. Cable runs normally should not include joints is necessary, it is to be carried out with prior approval and with due consideration to the methods of splicing that does not impair the properties of cable and which ensures that all conductors are adequately secured.

Cables exposed to risk of mechanical damage are to be protected by metallic channels/casings/conduits, so that the protective covering can withstand the possible damage. These casings are to be galvanized for corrosion prevention. Cables are to effectively supported and secured in a manner that prevents damage to their coverings. Penetration of WT Bhds./Dk.hds is to be carried out with packed gland boxes ensuring watertight integrity and strength of Bhds/Dk.hds.

(III) OUTFITTING WORK INCLUDING INSTALLATION OF EQUIPMENT:

This job involves hot work i.e. fitting/welding of seats of equipment, lugs, pads etc. of all equipment fittings with necessary vibration dampers wherever necessary as per drawings/specification requirement. The contractor will also be required to do painting of the hot work area i.e. lugs, brackets and other equipment mountings. Installation of electrical, electronics and navigation items are to be carried out as per required drawings. *A list of major equipment/items and the list of light and associated fittings which are to be installed is given in Annexure –II*. It may not be possible to provide drawings showing exact locations for all items, which will be mutually decided at Site with Engineer in charge of HDPEL.

(IV) LAYING DRESSING AND CLAMPING OF CABLES:

(i) The job involves taking measurements of cable lengths based on cable schedule, taking approval of HDPE on measured length, laying of cables, dressing of cables and finally clamping of suitable strips (to be provided by the contractor). The distance between supports for horizontal and vertical runs of cables is to be decided according to type/size of cables, meeting IRS rule requirement. The cables will be required to be laid on trays, hangers, and conduits or M.S strip as applicable throughout the Vessel, as per system drag. *Estimated lengths of cables to be laid and BOM for cable hangers, m.s strip, trays, lands etc.* The job involves end preparation of cables and termination of cables to various equipment/fittings related to all the electrical and electronic

equipment and machinery of the vessel. All items whatsoever are required to complete cable termination as per IRS rules, are to be treated as covered in the scope of work. Fitting of cable glands or replacement of cable glands by correct size wherever necessary will form a part of this job.

(ii) The entire electrical installation, cable laying/dressing identification marking termination, fitment of equipment etc. shall be as per relevant IRS rule requirement/contract specifications. Any rework necessary to satisfy the requirement of the IRS authority/Engineer In-charge, should be carried out free of charge. Any faulty installation or workmanship by the contractor has to be rectified within the agreed time frame.

(iii) Following activities are also to be carried out by the contractor:-

(a) Earthling of various equipment as per standard ship building practice.
(b) Providing of W.T. Glands to the satisfaction of IRS surveyor/Engineer In-charge.
(c) Fitment of cable identification tally and equipment tallies.
(d) Fitment of conduits for mechanical protection.
(e) Fitment of cable glands on equipment and bulkheads/decks etc. as applicable.
(f) Filling of WT and NWT gland boxes with compound.
(g) Insulation test of entire installation to the satisfaction of IRS surveyor/Engineer In Charge and submitting signed test records/ins
(h) Section report Engineer In-charge.

(iv) All piercing of deck/bulkhead and fitting/welding of deck tube/bhd. Glands, WT multiple glands, NWT coamings are to be carried out by the contractor. Necessary marking on the bhd/deck, after clearance by Engineer In-charge, cutting of deck/bhd., tack welding and running welding are to be done by the contractor and for NWT glands and comings filling of compound and proofing by approved method should also be done by the contractor. Fitment of individual deck tube/bhd. Gland to suit the cable sizes at suitable locations is to be carried out by the contactor. Filling compound for multiple glands will be provided by contractor. Multiple cable gland WT and NWT to be manufactured by the Contractor without any extra cost. Other filling and associated items are to be supplied by the contractor.

(v) Seating/mounting for all equipment/fittings shall be fabricated and created at site by the contractor. Drill holes and minor modifications of seats in the event of mismatching at the time of equipment installation on seats shall be carried out by contractor without any cost implications. All fasteners for fitment of equipment/fittings, nuts and bolts for cable tray, fasteners for cable hangers, cable clips, cable binding ties, fenders, cable identification brass clips, PVC sleeves/tapes, glass fiber tapes, and grommets for paneled compartments will have to be supplied by the contractor. Normally all equipment will be supplied with loose/fitted cable glands. However, in the event of any short supply/mismatching of cable glands, the contractor shall have to fit the same. Loose cable glands supplied with the equipment are to be fitted by the contractor on equipment.

(vi) It is the responsibility of the contractor to conduct and assist EIC or inspection authority for successful testing/trials of all electrical equipment like main and auxiliary D.G. Sets, main switch board, control panels etc. Necessary tools and tackles manpower in connection with the testing//trials are to be provided by the contractor. Rest of electrical items like Motor starters, control panels etc. to be commissioned by contractor.

(vii) **WHEEL HOUSE :**

The panel box within the wheel house is to be fabricated/erected and all the gauges, steering wheel etc. to be installed as per the approved drawings. Similarly the joinery, paneling, flooring, insulations, ventilation to be installed to the satisfaction of IWAI.

5.2.4 COMMISSIONING, OF ALL THE MACHINERIES & EQUIPMENT, TEST, & TRIAL.

All the machineries i.e. Main engine, auxiliary engines, genset, & other equipment are to be commissioned and thereafter made ready for test and trial to achieve their performance.

5.2.5 STATUTORY APPLIANCES:

All the statutory appliances, i.e, FFA, LSA, LSS, etc. are to be supplied, & installed. The material as available shall be provided & balance to be supplied by the contractor.

5.2.6 PAINTING:-

All the painting & hull preservation in accordance to the contract provision is to be carried out.

5.2.7 RIVER TRIAL:-

All the test & trial in the presence of IRS, IWT Directorate, Govt. of W. Bengal for the workboats as per the shipbuilding practice and as in the technical specification are to be carried out satisfactorily for final delivery.

5.2.8 DELIVERY:

The contractor shall make all the arrangement ready for delivery of the workboats as per the provision of the contract.

5.2.9 DRAWINGS:

IWAI may issue two sets of working drawings if available to the contractor otherwise the contractor to prepare the same. The contractor should ensure proper care/custody of the drawings till the completion of the job.

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TECHNICAL SPECIFICATION
WORKBOAT

1. GENERAL

The Vessel to be designed for working in co-operation with a cutter suction dredger i.e. cutter repair operations, fuel supply and transport of cutter suction dredger by towing or pushing.

1.1. Design conditions

The following design conditions to be taken into account:

Climatic conditions

- Maximum outside air temperature 48° Celsius with a relative humidity of 30%
- Minimum outside air temperature 2° Celsius with a relative humidity of 95%
- A relative humidity of 90% to be taken into account with an air temperature up to 40° Celsius
- Maximum river water temperature: 30° C
- Occasionally occurring sand storms with wind. speeds up to 40 m/sec.

1.2. Basic requirements

The following basic requirements apply to the workboat:

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 main dimensions to be chosen in such a way that the maximum draught will be less than 0.8 m and with a trim of less than 0.15 m for the Vessel in working condition with 50% stores on board and with empty cargo tanks.

c) The Vessel to be constructed and built for inland waters and as such classified by class with IRS (Indian Register of Shipping). The building to be carried out under the survey of this classification society.

d) The Vessel shall be able to sail continuously at a speed of 8.5 knots for the working condition.

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 a crane positioned on the fore deck. The capacity of this crane to be at least 3 tons at 8 m.

g) The Vessel shall have a simple living space to accommodate 7 crew members .and a wheelhouse with a good view all around.

h) The Vessel shall have an own fuel storage capacity of at least 6 m3 and a freshwater storage of about 1.3 ton and stores for three weeks 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 IRS

j) For passing bridges the maximum height of the Vessel above waterline to be less than 6 m

k) 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, trials, efficient working of all systems on board, transport and delivery of the Vessel.

The approval of the IRS 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/IRS during the building period, the contractor has to take effective precautions to prevent damage by fire or water.

Sub-contractors

The Contractor will also bear the full responsibility for all deliveries and work executed by sub-contractors. Sub-contractors are subject to approval by the IRS. It is required that the name and relevant documentation of Subcontractors proposed by the Contractor, to supply and deliver any material, machinery, equipment, outfit, installation, works, painting, assembling, will be submitted to the IRS, giving sufficient technical information, so that the IRS can judge whether the work to be carried out and the materials to be used, are in accordance with the Specification and the drawings. The Contractor shall make it clear to the Subcontractor (by writing) that all deliveries and works have to fulfill the requirements of this Specification. The IRS will receive three copies of all orders to Sub-contractors.

1.4. Description of Workboat

The Vessel will be a twin-screw propelled workboat with a crane suitable for assisting a cutter suction dredger and operating in protected (Inland) waters, such as the river Ganges & Bramaputra in India. The hull will be constructed of steel and the Vessel will be classified as a workboat for inland waters.
The principal dimensions and characteristics are as follows: -

- length of vessel (total)	22.0 m
- length of hull	21.0 m
- breadth moulded	7.5 m
- depth at side	2.20 m
- maximum loaded draught	1.20 m
- maximum draught (no cargo)	0.8 0 m
- freshwater tank capacity	5.5 0 m^3
- cargo tanks (fuel supply)	52 m^3
- waste tanks capacity	13 m^3
- trial speed (empty cargo tanks)	8.5 knot
- propulsion engines	2x200 kw
- fuel capacity (own propulsion)	6 m^3
- deadweight (maximum)	60 tons

The hull will be subdivided by watertight transverse and longitudinal bulkheads into several compartments as indicated on the General Arrangement plan.

The accommodation and the wheelhouse cabin shall be built on deck with a width of abt 6.0 m. Propulsions and steering to be remotely controlled from the wheelhouse.

At the forward end of the Vessel a crane will be arranged (with a total height above water of less than 6.0 m).

1.5. Classification, Regulations and Certificates

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

1. Class with IRS (Indian Register of Shipping)
2. The Inland Vessel Act 1917 and as modified.

The Vessel shall be built under the inspection of the above mentioned Classification Societies and to be classified as a twin-screw propelled workboat suitable for inland waterways:

The main diesel units will also be subject to the rules and regulations of the Class and certificates have to be supplied covering these engines. The survey of the Class regarding the machinery installation will be restricted to the manufacturing and delivery of the main diesels and to the biige/ballast system including the pumps in this system.

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

The Contractor shall obtain the following certificates and furnish the same in triplicate to the Owner at time of delivery:

- Classification certificate
- Certificates of applied materials
- Tonnage certificate
- Safety equipment
- Certificate of Registry
- Builder's certificate
- Machinery certificates.

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 Owner with the IWT Directorate, West Bengal at Kolkata as per Inland Vessel Act will register the Vessel.

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

1.6. Stability, Draught and Trim

Within four weeks after signing the Contract, the Contractor will prepare an accurate weight calculation and determine the maximum draught for the working condition.

In case of exceeding of the maximum allowable draught (0.80 m), the breadth of the Vessel to be increased until this basic requirement will be fulfilled. These calculations to be approved by the IRS.

The Vessel shall have ample stability under all loading conditions. The initial GM shall be not less than 200 cm in loaded condition and at least 300 cm for all working conditions. The trim in loaded condition with abt 40 tons fuel(load) and 5 tons freshwater to be less than 0.20 m (if necessary the ballast water capacity in engine-room to be used) .

No permanent or fixed ballast shall be used.

Upon substantial completion of the Vessel, an inclining test shall be carried out to determine the weight, the center of gravity and the draught in presence of the Classification Society and the IRS.

A report regarding the above-mentioned inclining test with final trim, draught and

stability for at least 8 loading conditions shall be submitted for approval to the IRS.

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 internationally recognized marine standards, provided that these standards are approved by the IRS.

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

Building methods shall be in agreement with good marine practice and are to be approved by the IRS.

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 attended by the IRS and will be carried out in accordance with the protocol "Particulars of Inspections and Testing" of the manufacturer, submitted for the IRS ts approval and mutually agreed between the IRS and the Contractor.

The reports of inspection find testing shall be submitted to the IRS. The IRS is entitled to reject and refuse work and material which do not comply with the specified requirements. The Contractor will admit the IRS 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 IRS to carry out their inspections efficiently. Supervision by the IRS does not release the Contractor from any of his obligations under the Contract.

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. The Contractor will explain his own project organization to the IRS within two weeks after signing 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, to 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 IRS, 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 IRS for approval, and explain fully all consequences of the proposed alteration(s).

1.10. Drawings, Schemes, Calculations and Manuals

Prior to commencement of the design of the Vessel, the Contractor shall submit to the IRS a list of approved plans/drawings and calculations required for approval by the IRS at a later stage. This includes drawings and diagrams etc. prepared by sub-contractors. Before commencing the respective works, the Contractor shall submit for approval to the IRS three copies of the plans/ drawings of concerned construction prepared by him and all technical descriptions/specifications of machinery and equipment to be ordered.

Final drawings and manuals

The Contractor shall, before the date of the checking trials of the Vessel, submit to the IRS five (5) sets of all final (as fitted) construction-, arrangement drawings, schemes and calculations and one set of reproducible main drawings, including a list of final (as fitted) drawings, reports of various tests and inspections made, detailed lists of all standard and extra spare parts, inventories, tools and additional tools. The Contractor shall also submit the operations and maintenance-, spare parts- and other instruction manuals in five (5) sets necessary for good operation, maintenance and repair of the Vessel.

The following drawings to be plastified, framed and fitted on board (reduced to A3-format) :

- General Arrangement plan
- Tank capacity plan
- Bilge scheme
- Safety, plan
-Electrical key diagram.
-Docking plan.

The following preliminary booklets/diagrams (out of the 5 sets) shall be on board at time of the technical trials:

- Trim and Stability Booklet, including the report of the inclining experiment with hydrostatic and cross-curves of stability.
- Shore trials report
- One set of drawings. schemes and calculations
- One set of instruction manuals etc.

1.11. Planning and Progress of Work

No construction or manufacture of any part of the Vessel shall be commenced before the drawings or the order to any sub-contractor relating to the matter in question has been approved or noted by the IRS. Within 2 weeks after signing the Contract, a program of the complete 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 IRS for approval. As soon as a delay occurs in the progress according to this program, the Contractor will inform the IRS immediately and will take all necessary measures to correct this delay to the satisfaction of the IRS.

1.12. Spare Parts, Inventories and Tools

Spare parts, inventories and tools shall be provided in accordance with:

- the requirements of the Rules and Regulations of the Classification Society
- the Contractor's/Manufacturers' standard

1.13. Tests and Trials

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 India)

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 IRS for approval (in 3-fold). Final reports to be delivered in 5-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 IRS for approval.

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 fulfil adequately the specified requirements, the faulty shall be altered, removed or replaced and the test shall 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 to be tested and calibrated at the manufacturers' workshops.

Reports of tests and calibrations to be submitted to the IRS for approval.

Testing of water tightness of steel constructions to be carried out in accordance with the requirements of the Classification Society.

1.13.2.Installation trials

When the Vessel is completely equipped to the satisfaction of both the IRS and 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, crane installations, 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, center of gravity etc. and further (as far as possible) a series of tests for the crane installation.

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 IRS 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 IRS with the Vessel at a trial draft of abt 0.80 m with a load equivalent to half of the fuel and freshwater stores (cargo tanks empty) and with a minimum amount of ballast water in order to reduce the trim to abt 0.15 m (by the stern):

1) Speed trials at 50%, 75%, 100% revolutions of with measurements of torque, shaft speeds
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 and 2 hours at towing or pushing

conditions

i) Anchoring test

j) Test of crane operations, with measurements of keel and trim.

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 IRS 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.

On delivery of the Vessel the Contractor shall perform a checking trial at a river water area near the site of delivery at Kolkata in the presence of the IRS and Owner. This demonstration to include one (1) day of crane operational tests.

2. STEEL CONSTRUCTION

2.1. GENERAL

2.1.1. Introduction

The scantlings 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 to be of excellent quality.
The Contractor must guarantee that only approved materials will be used in the construction of the Vessel.
If required by the IRS or 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 blasting according to class Standard. Immediately after the steel

grit blasting, one coat of approved shopprimer with a thickness of approx. 20 micron 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.

Brass/copper

Brass for fittings etc. to be of two parts of copper and one part of zinc. Those parts which must have a high elastic limit, such as for bolts and pins for hinges, Delta-metal or similar to be used. Copper pipes shall be according Class requirements.

Bolts and nuts

All bolts and nuts to be of one approved standard. Throughout metric thread is to be used.

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 will not be allowed, 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 per the Specification.
The sub-division into blocks and panels and the sequence of the execution of the welding shall be fixed in concert with the IRS.
A drawing of the constructional sub-division in sections and panels is to be submitted by the Contractor for approval. The blocks and panels shall only be placed on the berth after inspection and approval by the IRS.
Holes in the construction for pipes, cables, trunk passages or other passing are to be determined in concert with the IRS and Class.
In way of doors, manholes and windows extra stiffeners to be fitted.
All tanks, watertight or oil tight compartments and other constructions as considered necessary, to be pressure tested in accordance with the requirements of the Class and to the satisfaction of the IRS.
The testing must be carried out after the construction work has been finished and approved and before painting preserving of the concerning compartment and adjacent space has been started. A tank testing plan to be timely submitted for approval.
During building the correct line of the bottom center is to be inspected regularly, to determine any deformation of the hull.

Welding

All welding 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 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 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 IRS and the Classification Society.
A complete welding list to be submitted for approval to the IRS. In this list particulars 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.
It is not allowed to perform welded connections with notches. In general every part of the construction to be connected with continuous welds. Intermittent welding only to be performed with special permission of the IRS. During the welding the relevant construction shall be dry. The welding to be performed with coated electrodes of approved make. Welders, specially those who are working on the main connections, must be qualified and regularly tested. A regular check of the quality of the steel as well as aluminum welds by "X"-ray or similar methods to be carried out to the satisfaction of the IRS and/or the Class. If
considered necessary by the IRS 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.
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 is left.

1.1.4. Painting and galvanizing

Painting

1.1.5 Hull Preservation / Painting

The hull is to be cleaned of mill-scale by blast cleaning and coated with an approved good quality primer prior to fabrication. After installation of engines, auxiliaries etc. damaged paintwork is to be repainted in original colours and quality.

Painting work shall be executed in accordance with paint manufacturers' recommendations. Copper alloy, aluminium, aluminium alloy, stainless steel, non-ferrous materials and galvanised surfaces shall not be painted unless otherwise specifically required.

Painting scheme in general shall be as given below:

Painting scheme for parts or spaces which is not specified in "painting scheme" shall be similar to surrounding space or comparable space.

Painting Scheme

Item No.	Surface	Scheme	Avg. Thick (Microns)
A.	1. Bottom/Underwater hull including all appendage up to 150mm above load water line	1xEpoxy primer 1xCoaltar Epoxy 1x Coaltar Epoxy 1X Chlorinated Rubber Sealer coat 1x Chlorinated rubber anti fouling	1x25 1x100 1x100 1x30 1x50
	2. Top side areas	1x Epoxy primer 1x Coaltar Epoxy 1x Chlorinated rubber Sealer Coat 2x Chlorinated Rubber finish	1x25 1x100 1x30 2x30
	3. Vessel's name, port of registry, Marking of hull	2x Alkyd gloss finish	2x30
B.	Tanks: 1. Fresh water tank	1x Epoxy primer 2x Epoxy finish	1x 25 2x100
	2. Oil Tanks	1x Mineral Oil	1 Coat
	3. Fore Peak Tank	1x Coaltar Epoxy 1x Coaltar Epoxy	1x100 1x100
	4. Aft peak and void space below accommodation	2x Bituminous paints	2x40
C.	Super Structure, Decks & Others: 1. Exposed steel deck including wheel house top and 150mm dia around all deck structure and machinery seating	2x Red lead primer 2x Non skid alkyd deck paint	2x 40 2x 40
	2. Top of chequered plates in Engine room	2x red lead primer 2x Alkyd deck paint	2x40 2x40
	3. Engine room underside of chequered plate including floor, engine girder, machinery seats, bilges of	2x Bituminous paint	2x 40

	other spaces		
	4. Steel deck under deck composition	2x Bituminous solution	2x40
	5. Deck fitting such as bollards, towing posts etc.	2x Zinc chromate primer 2x Alkyd gloss finish paint	2x 40 2x 40
	6. Anchor	2x Bituminous solution	2x 40
	7. Air pipes, winch etc.	2x Zinc chromate primer 2 x Alkyd gloss finish paint	2x 40
	8. Outside exposed bulkheads, super structure, hand rail, stanchions, stays and ladders	2x Zinc chromate primer 2 x Alkyd gloss finish paint	2x 40 2x 40
	9. Port light screen	2x Zinc chromate primer 2x Alkyd gloss finish paint	2x 40 2x 40
	10. Standard light screen	2x Red lead primer 2x Alkyd gloss finish paint	2x 40 2x 40
	11. Mast & davit etc.	2x Zinc chromate primer 2x Alkyd gloss finish paint	2x 40 2x 40
	12. Inside steel bulkhead and deck heads of engine room	2x Zinc chromate primer 2x Alkyd gloss finish paint	2x 40. 2x 40
	13. Wooden doors	2x Varnish	2 coats
D.	Machinery and Piping		
	1. Main Engine	2x Zinc chromate primer 2x Heat and oil resistant alkyd finish paint	2x 40 2x 40
	2. Exhaust pipe	2x Heat resistant aluminium paint	2x 25
	3. Fire pump, fire main & hydrants	1x Eton primer 1x Zinc chromate primer 2x Heat and oil resistant alkyd finish paint	1x 6 1x 40 2x 40
	4. Pipes	2x Zinc chromate primer 2x Heat and oil resistant alkyd finish paint	2x40 2x 40

Galvanizing

Zinc to be at least 98% pure. When galvanizing is required, it should be done in a hot bath.

The galvanizing shall consist of a continuous coat of pure zinc in uniform thickness and so applied that it adheres firmly to the iron and steel surface.
Galvanizing to be done only when all burning, welding, bending etc. has been finished.

All smaller parts which are generally exposed to influence of climate, such as open railings, sheaves, stanchions, grates, parts of the rigging, small wrought pieces etc. to be galvanized.

2.2. HULL

2.2.1. Lay-out

The hull shall be designed to meet the requirements for handling and repair of anchors, dredging parts and delivery of liquid stores.

The lay-out of the hull shall be:
- aft peak/propeller compartment
- engine-room with some tanks
- fuel storage bunkers
- store with tanks in the sides
- fore peak.

All compartments shall be bordered by watertight bulkheads.
The fuel compartments in way of the work deck shall be kept free from this deck by means of cofferdams.
The complete hull shall be built of steel according the transverse framing system.

Frame spacing 500 mm.

2.2.2. Bottom construction

The entire bottom shall have a single bottom construction. The bottom plating shall have a thickness of at least 7 mm. The keel to be of a flat plate-type with a thickness of 10 mm. Plate floors to be constructed at every frame. 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 aft shall be raised in such a way that they can accommodate two rudder propellers with a minimum diameter of 700 mm.
Bottom plating, floors, girders and brackets in way of the rudder propellers of increased thickness and arranged in such a way that a sturdy construction will be obtained.
At centerline aft a double plate skeq to be constructed.
At the forend, the bottom to be raised as indicated on the General Arrangement plan.

The bottom plating in way of the raised fore and aft shall be well rounded.
In the sides a bilge plate shall be provided with a height of 300 mm. Plate under 45 degrees with baseline. Thickness 7 mm. Where bilge connections are fitted drain wells to be provided.

2.2.3. Shell plating and framing

The shell plating shall have a thickness of 7 mm.
Web frames shall be provided with a maximum spacing of 2 m.

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.
On the stern, plating of increased thickness shall be provided in way of pusher stools.

2.2.4. Deck and beams

The main deck shall be stiffened according the transverse system, with beams/brackets every 500 mm distance. The beams shall be supported by longitudinal girders, which are place in line with the bottom longitudinal.
In way of the work deck the stiffening to withstand a deck load of 5 tons per m2.
Local reinforcements shall be integrated in way of anchor winch, bollards, deck crane, deck winch, HRP hatches, pusher stools, fairleads etc.

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 following watertight and/or oil tight bulkheads are to be erected:
- aft peak bulkhead.
- forward engine-room bulkhead.
- forward fuel storage bunkers bulkhead.
- fore peak bulkhead.

Partly transverse bulkheads are to be erected in the engine-room bordering ballast water tanks and fuel oil tanks.

Water- and/or oil tight longitudinal bulkheads erected at the following places:

- ballast water tanks
- fuel oil tanks
- fuel storage bunkers
- sewage/bilge water tanks
- freshwater bunker.

Furthermore steel bulkheads to be erected for freshwater tank and chain locker.

The scantlings of the bulkheads will be in accordance with the Classification Requirements, but the lower tier with a height of at least 750 mm to have a thickness of not less than 6 mm.

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.

In aft peak strong welded foundations shall be constructed for the rudder propellers.

Foundations for deck machinery, winches etc. shall be executed with topplates welded on coamings and supported by a sufficient number of brackets. Where necessary additional supports underdeck shall be provided.

2.2.8.Cooling channels

For cooling of main engines cooling channels shall be fitted on the bottom plating.
The channels mainly consisting of channel bars welded inside the hull running through the floors.
For each engine a separate channel system shall be constructed.
Preferably all channels shall be placed in the engine-room between the main engines.
The cooling capacity of the channels shall be chosen 30% in excess of the calculated capacity necessary under tropical conditions.

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 and the IRS.

2.2.10. Platform at stern

A platform against the stern to be installed. Top plate made from grating. In way of aft anchor, the top plate to be left out.

2.3. DECKHOUSE AND WHEELHOUSE

2.3.1.Deckhouse

A deckhouse shall be placed on maindeck.

The deckhouse shall be provided with a crew cabins, a separate lavatory, cable trunk, ventilation trunks, decks tore , engine-room skylights and engine-room entrance.

The deckhouse shall be built of 5 mm plating and reinforced with stiffeners of flat bar. Where necessary web frames and/or girders of angle bar shall be placed.

The lower part shall have a width of 2500 mm and houses the deck store, the ventilation trunks and the cable trunk.On both sides the engine-room skylights shall be constructed on coamings of 450 mm height.

In front of the deckhouses the engine-room entrance shall be constructed.
For fixed lights, doors, furniture, linings, insulation, floors, IRS may be consulted.

2.3.2.Wheelhouse

On top of the lower deckhouse part, the wheelhouse shall be erected.
The wheelhouse shall be constructed of 5 mm plating and strengthened with flat bar stiffeners. Height of the wheelhouse 2500 mm.
A steel awning with a breadth of 250 mm shall be fitted all around. Plating 3 mm bordered with a galvanized steel pipe 30 x 25 mm.
Entrance to the wheelhouse via ladder and platform board side.

Platform of steel angle bars with galvanized grating.

The wheelhouse shall be provided with windows all around.

2.4. MISCELLANEOUS

2.4.1.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.
Bottom plugs of stainless steel, 50 mm diameter for oil tanks and 38 mm diameter for all other tanks. 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.

2.4.2. Manholes and hatches

Manholes
Each compartment shall be least two) manhole covers accessibility. The covers with opened covers a good
provided with as much (but at as needed to provide a good shall be placed in such a way ventilation will be obtained. Smaller tanks may be provided with one cover. The covers shall have dimensions of at least 400 x 450 mm. Thickness of the cover 12 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 of the a-ring type. An a-ring chamber shall be machined in the coaming ring.
The tanks in the engine-room shall be provided with manholes in the vertical bulkheads.
On the work deck area two manholes shall be arranged at convenient places.
Bilge water, sewage and freshwater bunkers shall be provided with manholes in the vertical bulkheads.
Forepeak ballast tanks shall be provided with one manhole in the deck area and one in the vertical bulkhead (or crane foundation) in the store.

Hatches

The following hatches shall be fitted:

- propeller compartment entrance	600x 600 mm
- emergency -exit engine-room	600x 500 mm
- skylights engine-room	2500x1200 mm
- main store	1000x1000 mm.

Arrangement plan.

The entrance hatch to the propeller compartments, the two escape hatches and the skylights to be of the hinged type with two adjustable hinges and a device for open position.
All hatches in watertight execution with rubber seal and hinged clamping bolts of stainless steel with brass butterfly nuts if applicable.
The hatch above the store shall be provided with hoisting eyes for removing by crane.
On maindeck on top of the rudder propellers aft hatches shall be provided for maintenance purposes. The hatch coamings with circular shape of sufficient height and with flatbar 75 x 16 on top.Cover plating shall have the same thickness as the main deck plating. Cover to be reinforced with flatbar stiffeners, provided with rubber packing and bolted to the coaming.

2.4.3. 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 600 mm and hot galvanized after construction.

Railings

On main deck aft and fore railings shall be placed.
Entrance ladder to wheelhouse including platform and engine-room ladder 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
65x16 mm with a top rail of pipe diameter 48.3 x 2.6 mm and with one intermediate rail of stainless steel wire of 10 mm diameter with stretching screws top rail and stanchions in galvanized execution.

The work deck area in the sides and at the front between the pusher stools shall be provided with a complete removable railing consisting of two stainless steel wires and galvanized pipe stanchions.
Wires of 10 mm diameter and provided with turn buckles.

Bulwark

A bulwark with a height of 600 mm and on top a railing of 400 mm shall be placed on the fore ship as indicated on the General Arrangement plan.
Bulwark of 6 mm plating with flat bulb stanchions every 2000 mm and on top a pipe 76.1 x 2.9 mm.

2.4.4. Hawse pipe and chain locker

Hawse pipe
On starboard side the bow anchor shall be installed.
The hawse pipe from the shell to the deck to be made of seamless steel tube with a thickness of 10 mm and a diameter suitable for the anchor shaft.
At the outside a heavy pipe support shall be provided for proper storing of the anchor.
Position of the hawse pipe to be such that the anchor is always nested in the right position.
Collars of 30 mm solid round bar to be welded at both ends
of the hawse pipe.
A chain pipe from the anchor winch to the chain locker to be
lee through the main deck and to be provided at both sides with conical ends with solid round edges. The pipe to be extended adequately below the top of the locker.

Chain locker
A totally closed chain locker shall be arranged in the fore
peak. The locker of sufficient capacity to contain the bow anchor chain. On the bottom of the locker a galvanized and perforated steel plate to be laid, under this floor plate a
mud box to be provided. For drainage of the box a self-closing valve with drain to the bilge of the fore peak to be installed.
On the top of the chain locker a safety device to be installed for fixing the last link of the

anchor chain.
In the wall near the top of the locker a manhole with hinged cover to be made for access to the locker.

2.4.5. Bollards

Seven double bollards to be provided on the main deck as indicated on the General Arrangement plan.
The bollards with a diameter of 267 x 243 mm 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.

2.4.6. Steel doors

One steel watertight door shall be provided on the engine room entrance.
The door 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.

2.4.7. Pushing- and towing arrangement

Pushing stools

Against the forepeak next to the ramp opening a pushing arrangement shall be provided.
The lay-out of this arrangement as indicated on the General Arrangement plan and according the pushing arrangement on the dredger. The construction shall be made over the full height of stern plating. In way of the fender the height shall be 1650 mm. Fender in hollow-D section.
In way of the constructions the stern plating thickness to be increased till 14 mm.
Internal strengthening shall be provided in the water ballast tanks.

Towing arrangement

On the aft ship corners towing eyes shall be shall consist of two eye plates and one pin running trough the eye plates.
Distance of the eye plates such that the spliced eye of the towing wire fits between the plates.
Internal strengthening under decks to be provided in the propeller compartment.

2.4.8. Name and draught marks

The name of the workboat shall be placed on PS and SB fore. The name shall be cut of steel plate letters and/or figures which will be welded on bulwark.
Letters of 5 mm steel plate.
An Owner's mark or -board of steel plate with painted letters and/or figures to be placed on SB and PS of the accommodation deckhouse. Board of 3 mm steel plate.

Draught marks in welded figures to be welded with stainless steel electrodes on the sides fore and aft. Marks in metric system.

3. EQUIPMENT AND OUTFIT

3.1. GENERAL

This paragraph of the Specification contains the descriptions of equipment and outfit of the workboat, except those concerning machinery installation, electrical installation and crane.
All requirements laid down in other paragraphs are also valid in this paragraph as far as applicable. requirements regarding painting are also valid for the constructions and equipment.

3.2. ANCHOR- AND MOORING EQUIPMENT

The anchor- and mooring equipment to be in accordance with the requirements of the Class as long as no higher requirements are specified hereafter.

3.2.1. Anchors, chains and wires

Bower anchor: 250 kg anchor of high grad, anchor chain with a minimum length of 50 m to be supplied/provided.

3.2.2. Mooring wires

Four mooring ropes of synthetic material with 50 m each and a breaking strength of abt. 160 kN to be delivered.

3.2.3. Anchor winches

On the fore deck one electrically operated anchor winch to be installed. Winch also suitable for manual operation. The anchor winch to have one chain pulley/sprocket and one warping head. Lined brakes and couplings to be provided for independent operation of the pulley and the warping head.
On the aft deck one manually operated anchor winch to be installed. The anchor winch to have a drum suitable for the steel wire of the anchor and a warping head. Lined brakes and couplings to be provided for independent operation of the drum and the warping head.

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 rudder propeller compartment, the space shall be provided with two 250 mm diameter goosenecks
- for cofferdam between main deck and fuel oil bunkers, the space shall be provided with four 250 mm diameter goose necks
- 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
- for lavatory one 80 mm diameter torpedo fan on top deck - for wheelhouse two 150 mm diameter mushroom ventilators on wheelhouse 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.
In general the ventilators to be placed in way of railings. For work deck area in concert with the IRS.

Mechanical ventilation

The crew's accommodation shall be provided with a fixed mounted oscillating fan.
Fan capacity at least 1600 m3/hr, two speeds and oscillating 85 degrees.

3.4. DECKHOUSE AND WHEELHOUSE

3.4.1. General

A deckhouse with 7 crew's accommodation lavatory and store shall be installed on top of this deckhouse a wheelhouse shall be placed. The crew's accommodation shall be executed with floor, lining, ceiling, insulation, door and fixed lights.
The wheelhouse shall be executed with floor, lining, ceiling, insulation, door and windows.
The store shall be provided with a rack and some hooks. In the lavatory a tiled floor shall be laid.

Further the following equipment shall be provided:

In the crew's accommodation
- one double berth cabin for Master and Driver
- one cabin for 5 nos. crew's
- one toilet
- chairs, tables, locker and other furniture to be provided for crew's
- one ~~pan~~ Galley with fittings to be provided

- one dresser with sink and cupboard
- one coldwater tap
- one electric cooking plate
- one electric coffeemaker
- one clock
- two double coathooks - two fixed ashtrays - one radio shelf
- one key locker.

In the wheelhouse

- one set of roller blinds
- one portable fire extinguisher
- one VHF-set (on ceiling)
- one clock
- two double coathooks
- two 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
- one fixed ashtray

In the lavatory
- one shower/bath
- one Asian type of closet bowl - one washbasin with one coldwater tap

3.4.2. Floors, covering, lining, ceiling and insulation

Floors

In the crew's accommodation cabin a sound insulating under floor shall be laid on the main deck.

The floor shall consist of:
- asphalt
- mineral wool, 25 mm thick with a density of 75 kg/m3 - special foil
- latex cement top layer, reinforced by expanded metal, with a thickness o f at least 30 mm.

Permissible pressure load at least 80 kg/cm2. Boundary finishing to be watertight.

In the wheelhouse a latex cement under floor shall be laid with a thickness of at least 10 mm.

In the lavatory a tiled floor to be laid consisting of: - bitumen, hot applied and directly covered with stone chipping

- port land cement
- double baked anti-slip tiles with rounded plinth tiles and coved up at the sides over a height of 150 mm. Floor sloping to the drain well.

Covering

The crew's accommodation cabin shall be provided with a vinyl floor covering. On the under floor in the wheelhouse
a rubber floor covering shall be provided.
The covering type anti-slip, removable with closed underside and at least 25 mm thick.

Lining

The crew's accommodation shall be lined completely. In the wheelhouse the surface under the windows shall be lined. The linings shall be of 8 mm waterproof and tropical resistant plywood. Both sides covered with plastic laminate of at least 1 mm thickness. Colors to be agreed upon.
Lining shall be fitted on first quality spruce grounds. The grounds to be impregnated against mold and insects. Spaces between windows not to be lined.

Ceiling

The crew's accommodation and the wheelhouse shall be provided with a ceiling. The ceiling shall be of 8 mm waterproof and tropical resistant plywood. Both sides covered with plastic laminate. Ceiling shall be fitted removable on first quality spruce grounds which shall be impregnated against mould and insects.

Insulation

Behind the linings and ceilings insulation shall be fitted consisting of a layer of 30 mm glass wool with a minimum weight of 30 kg/m3. The glass wool with a damp- en fire-proof reinforced foil shall be fixed on welded pins. Stiffeners, beams and other structural members also to be covered. After fitting and before placing of linings or ceilings all damages to the insulation to be repaired and together with seams to be finished with adhesive tape in order to get a closed surface.

3.4.3. Furniture and hardware

Furniture

Furniture shall be of mahogany veneered plywood with massive mahogany framework. The top of the table covered with hard plastic laminate. The dresser with a stainless steel top with sink. Double berth in the crew's accommodation Berth of plywood bottoms and drawers under the lower berth. Berth to be provided with foam rubber mattresses. 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.

The dresser shall be provided with one drawer and cupboard next to the sink. The space under the sink to be closed with a door Board in the cupboards to be provided. Further a radio self shall be placed at a convenient place.

Hardware

Hardware shall be of non-corrodable heavy construction. Day- and night-locks shall be placed on crew's accommodation and wheelhouse doors. Locks with phosphor-bronze internal parts and four 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 workboat's name. Key locker shall be fitted in the control cabin.

Doors shall be provided with three brass ball hinges. Doors of lockers, cupboards and other furniture shall be fitted with stainless steel piano 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.

3.4.4. Desks and instruments

At the front side 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 .5. Doors and windows

Doors

The deckhouse shall be provided with three hard wooden doors. The doors shall be made of 50 mm teak and the wheelhouse door shall be provided with a fixed light in the upper part. All doors shall be provided with three 10 mm drawer.

Windows and lights

The wheelhouse shall be provided with windows all around.
In the front two opening windows shall be fitted and in the aft one opening window. These windows hinged at the upper side and provided with gas filled/hydraulic window openers.
All windows shall be fitted in brass frames and provided with panes of at least 8 mm thickness, security quality. Height of the windows at least 800 mm, for the door 600 mm.
In the front and aft wall each three windows, and in the starboard wall two windows and one pane in the door and in the ports side wall three windows.
Three fixed lights with brass frame and a diameter of 300 mm shall be fitted in the crew's accommodation.
Two fixed lights with brass frame, a diameter of 200 mm and opaque glass shall be fitted in the lavatory.
- One fixed light with brass frame and a diameter of 200 mm shall be fitted in the engine-room entrance door.

3.4.6. Freshwater supply

A freshwater hydrophore installation shall be placed in the engine-room.
The following consumers shall be connected to the hydrophore: - sink in crew's accommodation
- shower bath
- washbasin - toilet
- separate tap in lavatory
- window wipers
- separate tap in engine-room.

3.5. SUN AWNINGS

The exposed area of the engine-room and propeller compartment aft shall be provided with a dismountable sun awning.

The awning with a height of 2400 mm in the sides and 2600 mm at centerline.
Over the accommodation deck and the wheelhouse top deck including the entrance platform also a sun awning shall be erected.
The awning of durable first class marine awning heavy cloth in white color.

The supports in galvanized steel execution with stainless steel bolts.

3.6. STORES

Stores shall be provided as follows:
- in the deckhouse a deck store.
- in the hull a general store.

The deck store shall be provided with two steel grating doors, complete with padlock eyes and padlocks.
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 of first class fir directly mounted on the steel floors.

3.7. MAST

One aluminum mast shall be installed on the deckhouse,deck.

The mast shall be of the tiltable type and equipped with the necessary lights and yards for hoisting flags and signals.

Lowering of the mast shall be with help of a small hand winch. The mast to be stayed.

3.8. NAVIGATIONAL EQUIPMENT

The following navigational equipment shall be provided and installed:

- one VHF-set in wheelhouse
- one searchlight on top of wheelhouse
- one electric horn under awning of wheelhouse.

3.9. CREWBOAT

For communication- and maintenance work a small steel crew boat with 5 HP outboard motor shall be provided. Boat to be stored on a cradle on main deck within in the reach of the crane.

3.10. LIFE-SAVING EQUIPMENT

Life-saving equipment shall be delivered according Class and national Indian authorities sufficient for 7 persons.

The equipment shall be stored and fitted on convenient places in at least the following numbers:

- 1 life boat for 7 person.
- 5 life jackets stowed in a g. r. p. box placed in concert with the IRS
- 1 safety hammer in the wheelhouse
- 4 round shaped life-buoys, two with a floating line of 30 m, fitted on the control cabin and two fitted on aft ship

3.11. FIRE-FIGHTING EQUIPMENT

The following fire-fighting equipment of approved make and type shall be delivered and fitted:

- one Halon system for engine-room as required by the Authorities.
- two deck wash/fire-fighting hoses with brass coupling and nozzles. Each with a length of 15. m and stored on a hose drum.
- one portable extinguisher, 7 kg dry powder in crew's accommodation.
- one portable extinguisher, 7 kg dry powder in wheelhouse - one
- portable extinguisher, 4.5 kg CO_2 dry powder in engine-room
- one spare re-fill for each extinguisher.

All outfit shall comply with national regulations.

3.12. PAINTING

3.12.1. Initial surface preparation

Before processing, all steel plates and sections to be used shall be shot- or grit blasted to Class Standard Directly hereafter all surfaces shall be treated with one coat of long-lasting shop primer with a dry film thickness of at least 20 microns.
Copper, brass, aluminum, chromium, white metal, zinc, stain_ less steel, rubber and wooden items shall be cleaned and pre-treated by an approved method according the requirements of the IRS and/or paint manufacturer's inspectors.

3.12.2. Execution of painting

Prior to the application of the first coat of the main paint system, all weld-spatters, rust, grease and other contaminants shall be removed from weld areas and plate surfaces, if necessary by means of blast-sweeping.

Time intervals between application of coats shall be strictly in accordance with the paint manufacturer's instructions. Subsequent coats shall have different colors for identification. No weather exposed painting shall be carried out in adverse weather conditions.

Application shall be done as far as possible by airless spray, but where spraying is not practicable, brush or roller application may be employed.

The specified film thickness is meant as dry thickness and indicates the minimum acceptable values.
Spaces and structures which will become inaccessible after mounting of engines, ducts, cableways, switchboards shall be painted with the indicated number of coatings before mounting the engines, ducts etc.

Before launching the outside hull and the inside hull below the waterline shall be painted with sufficient coats so that adequate protection has been obtained.

4. MACHINERY INSTALLATION

4.1. PROPULSION INSTALLATION

4.1.1. General

Two propulsion units shall be installed in the E.R., each unit mainly consisting of a diesel engine, a pneumatically operated clutch, a shaft line arrangement with two short cardan shafts and a steerable rudder propeller with nozzles.
The propulsion installation shall be remotely controlled from the wheelhouse.

Further this installation to be in accordance with the Rules and Regulations of the Class and suitable for working in the following conditions:

- maximum ambient temperature in engine room	: 50^0 C
- maximum outboard water temperature	: 32^0 C
- relative humidity (average)	: 90%

4.1.2. Main diesel engines

The two main diesel engines shall be of the non-reversible naturally aspirated marine type.

Each engine to have following main features:

Make: Manufacturer must have a representative in India with facilities for repair and overhaul work.

1) Continuous service rating	at least 200 kW (depending on speed requirements)
2) Rated speed	max. 1800 rpm

Each engine equipped with at least:

- A main drive shaft with flywheel, a high elastic coupling and a torsional vibration damper.
- An exhaust system with (water-cooled) manifold and a stainless steel expansion bellows.
- Electric start motor 24 V DC.
- An AC-alternator, output 28 V DC, 35 Amp. with voltage regulator for charging batteries.
- A wet type charge air filter.
- A fuel system with booster pump, full flow duplex filter, pressure pumps and double walled h.p. fuel pipes.
- A mechanical governor for variable speed control.
- Remote start/stop/speed control from engine panel in wheelhouse.
- Manual speed control on engine site.
- A lube oil system with a deep oil sump, an engine driven pump, cooler, full flow duplex filter and a hand-operated carter drain pump.
- A cooling system designed for cooling water keel cooled and to consist of engine driven fresh cooling water pump, thermostatic controlled valve, expansion tank and engine driven fan.
- 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 have to be delivered loose by the supplier of the engine and are to be mounted by the Yard.
- 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 counter for mounting in the wheelhouse desk.
- A power take-off for coupling of a hydraulic pump for the rudder propeller.

The piping on the engine to be of steel.

A torsional vibration analysis of the entire propulsion system shall be submitted. The installation shall be free from critical speeds over the whole range from 15% below the minimum working speed up to 15% above the maximum working speed.
The shop test of the propulsion diesel engines shall consist of:

- 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.

Governing tests and safety functions shall also be performed.

4.1.3. Diesel engine and controls

Speed, clutch and brake control must be possible locally as well as remote from the steering desk.
The remote control shall be adapted to the requirements of the manufacturer of the rudder propellers.

4.1.4. Pneumatic clutch and disc brake

The elastic coupling shall be installed between engine flywheel and input shaft of the pneumatic clutch. This pneumatic clutch will engage above idling speed. The clutch to be suitable for transmitting the maximum engine output.
Controls to be provided in such a way that engagement of clutch is not possible at too high engine speeds.
On the output side of the pneumatic clutch a pneumatically controlled disc brake to be provided to prevent rotation of the propellers in opposite direction and fix the shaft line arrangement at zero revolutions when clutch is disengaged. The brake is holding under air pressure and spring returned.

Alarm to be provided for low control air pressure.

The clutch and brake shall be remotely controlled from the wheelhouse and locally controlled in the engine-room.

4.1.5. Propulsion shafts

Each propulsion shaft line will consist of two short cardan shaft sets, one on engine side and one on rudder propeller side interconnected by an intermediate shaft and a short intermediate shaft (floating shaft), passing the watertight bulkhead.

The intermediate shafts are to be supported by a sufficient number of self-adjusting type roller bearings, all of the same size. One of the bearings to be designed for taking the full

axial load on the shaft. The intermediate shaft is to be fabricated of high quality steel with a minimum tensile strength of 500 n/mm2 and shall be provided with journals in way of the roller bearings.
The watertight bulkhead passage shall be provided with an oil lubricant lip seal in combination with a roller type shaft bearing.

4.1.6. Rudder propellers

Both propulsion units of the steerable rudder propeller type shall be installed in a well box in the stern of the ship's structure. The units will be of approved make. The units shall be suitable of a continuous power on the input shaft of at least 20% in excess of the maximum continuous rating of the diesel engines at rated engine speed.

The rudder propeller units consist of an upper and a lower bevel gearbox interconnected by a vertical stem and a propeller and nozzle.

The units shall be provided with case hardened and ground bevel gears, high alloyed steel shafts and all bearings of the anti-friction roller type.

Furthermore, the units to be provided with hydraulic powered steering for 360-degree stem rotation with a steering installation of the electrical-hydraulic type with hydraulic motor built on the rudder propeller units.

Each rudder propeller shall have its own complete hydraulic pump unit coupled to the main diesel engine with hydraulic tank and valve panel.

Capacity of hydraulic pump to rotate the rudder propeller 360^0 in 30 seconds.

The stem shall be provided with a thrust block suitable for full thrust in all directions.

The propeller units will be provided with an integrated lubrication system with built-in circulating pump and the lube oil shall be kept under pressure by means of separate header tanks for each unit. These header tanks to be provided with low level alarm switches.

The rudder propeller to be provided with a 4-blade cunial-bronze propeller turning in a steel nozzle with stainless steel plating inside the nozzle.Turning direction of propellers will be outboard.

4.1.7. Mountings

The main diesel engines shall be mounted onto the ship's foundations via machined mild steel chocks. The chocks to have a minimum thickness of 20 mm. A number of fitted bolts to be provided as directed by the engine manufacturer, but at least one on either side of each engine. The bearing surfaces of bolts and nuts to be machined. Sea fasts to be provided by means of side chocks. The circular well box for the rudder propeller units

shall be machined and a suitable watertight packing must be used according to the manufacturer's recommendations. A sufficient number of thrust pads to be installed between well box and rudder propeller unit.

4.2. AUXILIARY ENGINE ALTERNATOR SETS

4.2.1. Auxiliary alternator set

An auxiliary alternator set shall be installed, consisting of a radiator cooled naturally aspirated marine type diesel engine, flexibly coupled to a 220 V A.C. alternator of approx. 50 kVA. The set shall moreover be equipped with a general service pump, driven via a manually operated friction clutch.

The diesel engine shall have the following characteristics:

1)	Continuous output	approx. 40 kW
2)	Speed	1500 rpm
3)	Direction of rotation	counter-clockwise

The engine is at least to be equipped with:
- Flexible coupling on flywheel.
- Hydraulic start equipment with engine driven pump, hand pump and hand operated start valve.
- A fuel system with full flow filter, a booster pump, a pressure pump and shielded h.p. fuel pipes.
- A standard mounted governor for constant speed operation.
- An A.C. alternator, output 28 V D.C., 35 Amps with voltage regulator for battery charging.
- A lube oil system with engine driven pump, cooler and full flow filter.
- A cooling system designed for radiator cooling and consisting of engine driven fresh cooling water pump, engine driven fan, thermostat, radiator and expansion tank.
- The standard mounted instrumentation, but at least a tacho meter, 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.

Engine and alternator shall be shoptested together for at least two hours at 100% load, followed by a run at 110% load during half an hour.

4.2.2. Mounting

The auxiliary set shall be built together on a rigidly constructed common base-frame and the complete unit shall be fitted to ship's foundation via anti-vibration mountings.

4.3. AUXILIARY INSTALLATIONS

4.3.1. Exhaust systems

Every diesel engine shall have a separate exhaust pipe, the diesel manufacturer has to

give his approval for the exhaust pipe lay-out.
Exhaust gas silencer of the combined absorption/resonation type with spark arresters shall be installed on all engines.
The pipes shall be fitted and supported in such a way that tension free expansion is possible without any excessive transfer of sound or vibrations to the ship's structure. They are to be supported on steel frames via rubber springs and should have sufficient stainless steel expansion bellows.
The gas velocity in the pipes should not exceed 35 m/sec.A facility against rain to be provided at the end.

The exhaust pipes of all engines to be insulated over the full length.

4.3.2. Fuel oil system

The two fuel oil bunkers for delivery to other vessels and the two fuel oil tanks for own use shall be part of the ship's construction.
The diesel engines will draw the fuel oil directly from the bunkers or from a small service tank when installation arrangement requires for it.
A fuel oil transfer/supply pump with a capacity of about 20 m3/h and 3 bar to be installed in the engine-room.
If a service tank should be installed it shall be filled by the transfer pump.
A hand pump shall be installed as stand-by.
Piping must be fitted below floor level as far as possible. Piping to be made with steel tubes.

A set of hoses of suitable length to be stored on the main deck. Type and size of couplings according to local standards.

4.3.3. Lub. oil system

The following installations shall have their own independent lube oil system:

- each diesel engine
- each rudder propeller unit.

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 for Owner's/IRS's approval.

Loose tanks for lube oil storage and dirty oil shall be installed in the engine-room, each having a capacity of approx. 0.2 m3, as well as a L.O. service tank provided with a tap-cock and driptray for filling oil cans and having a capacity of 0.05 m^3.

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.

4.3.4. Cooling water systems

The main parts of the cooling water system of the diesel engines are built on the respective engines. The oil coolers of the rudder propeller units (if fitted) shall be connected to the cooling water system of the concerning diesel engine.
The connected piping to be of seamless steel tubes with such diameters that the flow velocity will be not more than 2.5 m/sec.

4.3.5. Bilge/deckwash- and fire-fighting system

One general service pump driven by the auxiliary diesel engine shall be installed in the engine-room. The diesel driven pump shall be of the self-priming centrifugal type and will have a capacity of 25 m3/h at pressure of 2 bar and a speed of 1450 rpm.
Furthermore two hand driven bilge pumps to be installed, one in the engine-room and one in the store.

All piping of steel galvanized after completion. Pipe sizes as required by the Class. Where no Class requirements are valid suction velocities shall not exceed 1.5 m/sec. and discharge velocities shall not exceed 2.5 m/sec.
Outboard suction valves shall be rubber lined butterfly valves.
At least two fire fighting connections shall be arranged on deck and one in the accommodation space.

4.3.6. Sanitary water systems

A sanitary fresh water pressure installation for own use shall be installed in the E.R. The installation to consist of a hydro-pneumatic pressure tank of 50 l. capacity and an electrically driven pump with a capacity of 0.8 m3/h at a pressure of 1.5 bar. The hydro-pneumatic pressure tank to be galvanized and provided with a level gauge, a safety valve, a pressure gauge, a hand-hole, a draincock and a pressure switch for automatic operation of the installation. The pipes to be of annealed copper tube with brass fittings.
An electrically driven freshwater supply pump to be installed in the store. A discharge connection on the maindeck to be provided including a set of hoses (about 25 meters) and storage reels. Type of coupling according to local standards.

4.3.7. 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 m3 which is to be constructed in the double bottom.

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 on the manhole cover in such a way that the pump is submerged inside the tank

and the driving E-motor is fitted on top of the manhole cover. The pump to be of the mono-pump type and with a capacity of approx. 7 m^3/h at a pressure of 3 bar. The pump to be provided with dry running protection. Another pump to be installed in the store for discharging the general collecting tank. The discharge pipe to be drawn up to above deck and provided with a 50 mm hose connection with closing cap.

4.3.8. Scupper- and waste pipes

All piping to be executed with seamless steel galvanized tubes. Scupper pipes shall have an inner diameter of not less than 40 mm. 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.

Scupper inlets in accommodation spaces to be provided with a removable bronze grid, fastened with bronze screws.
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.

4.3.9. 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 bronze 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 cowls, vent pipes of oil tanks also with air filters. Upper ends of vent pipes to be provided with a vent cap with floating ball, make Winel or equivalent.
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.

4.3.10 Hydraulic installation

The deck crane 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 maximum working pressure in the system lines shall not exceed 175 bar.
The power pack outfitted with controls, safety devices, alarms, cooling facilities, hydraulic oil tank, appendages, etc.
The several movements do not have to operate simultaneously.

4.3.11. Compressed air system

A working air receiver shall be installed in the engine-room with a capacity of about 300 ltr and suitable for a pressure of 10 bar.
For filling the receiver to install an electrically driven air compressor with an effective capacity of 20 m3 free air/h. The compressor air cooled and equipped with at least safety valves, automatic start device, pressure gauge, oil and water separator and oil level indicator. The compressor set fitted to a ship's foundation via anti-vibration mountings.
To provide working air connections in the engine-room, two on the main deck and one in the store.
The system to be executed with steel pipes. Furthermore the compressed air system has to be used for the clutches and the brakes of the propulsion sets.

4.4. LAY-OUT OF MACHINERY SPACES

4.4.1. 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 5 mm thick aluminum plates 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

4.4.2. Store

To fit in the store a welding transformer of about 400 Amps welding current at 50 percent duty cycle. The set complete with a welding cable of sufficient length to cover the whole work deck and other required tools. The set complete with condensers for power factor increasing.

4.5. GENERAL REQUIREMENTS REGARDING MATERIALS AND WORKMANSHIP

4.5.1. 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.

Centrifugal pumps may have bronze or cast-iron casing and stainless steel or bronze impeller, stainless steel shaft, alum bronze wear rings and standard stuffing box. Centrifugal pumps must be cavitation free.

Screw or gear type pumps used for oil must have cast-iron housing; alloyed steel inner parts and stainless steel shaft. They must be provided with an adjustable pressure relief valve.

4.5.2. Coolers and heat exchangers

Coolers to be made with Alum bronze tubes, Muntz metal pipe plates and steel water boxes.
The keel cooling channels to be calculated for at least 30% spare in cooling surface for fouling condition.

4.5.3. Valves and accessories

All valves and accessories to be at least suitable for pressure stage 10 according to the BIS standards or equivalent ISI-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.

Emergency valves with direct remote control by means of hand hydraulic activators. Where remote controlled valves are used they shall also have the possibility of local manual control.

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/IRS for approval prior to the placing of orders.

4.5.4. Piping

Pipe-sizes according the I.RS recommendations and also strictly in accordance with the system-pressure, but in any case suitable for a working pressure of 10 bar. Flange dimensions according to BIS-standards or equivalent ISI standard. 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 antivibration 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.

4.5.5. 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.

4.5.6 Instruments

The instruments for pressures, temperatures etc. to be such that the working ranges is not more than 70% to 80% of the full.

4.5.7. 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 handwheels.
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 INSTALLATION

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. Voltage and frequency dips, caused by switching consumers, must be reduced by applying special provisions.
A standardization of makes and types is required as well as easy accessibility and replacement of all components.
All parts of the installations which may cause harmful interferences, shall be provided with a suitable screening and/or suppression. If required by the system or apparatus, voltage stabilizing equipment has to be added.
Flame retarding cables with flexible conductors have to be applied.
All wiring, terminals and components in switch panels, junction boxes etc. shall be marked according to "as fitted" drawings.
Circuits to be protected as far as possible by circuit breakers. For protection of instruments, glass-type fuses 20x5 mm can be used.
Final capacities to be based upon the final load balance unless otherwise indicated.
All drawings, calculations, etc. have to be approved by the IRS prior to the execution of the work.

Drawings and nameplates shall be in English.

Nameplates on deck made of stainless steel, the rest of resopal or equal All fastened with screws/rivets and in colors to be agreed upon.

5.2. POWER FOR CONSUMPTION

For the supply of the electrical consumers and installations the following networks to be provided:
- two power and lighting networks 220 Volt, 50 Hz
- two battery networks 24 V DC for diesel engine starting and for supply of the 24 Volt consumers.

All networks insulated from earth.

Networks 220 V

For the supply of the main 3 x 220 Volt networks, an alternator of at least 50 kVA will be installed. The final output of the alternator to be determined after approval of the power calculation. The alternator to be of the brushless type, with class B insulation.

A 1 x 220 Volt network will be fed by a static inverter from the 24 V DC network. This network for supplying a part of the lighting and consumers which have to be in operation when the main alternator is not running.

The alternator to be protected by a circuit breaker. The 220 V switchboard to be provided with an ammeter with phase selector switch, a voltmeter with phase selector switch, a frequency meter and an earth fault indicator.

Furthermore, the main switchboard can be fed by shore power of 60 Amps, 3 x 220 V phase. This shore connection via a male socket-outlet (with a voltage available light) and a cable with a length of 40 meters, complete with plug and store facilities.

Networks 24 V DC

As well the network for starting of the diesel engines as the network for supplying the several 24 V consumers and installations will be provided with a lead-acid battery of at least 200 Ah. The batteries placed in a coated- and ventilated box in the engine-room.

The batteries have to be float-charged by three diesel driven alternators running in parallel and /or static charger fed by the 220 V network.
The system to be provided with diodes to be sure of a complete separate network for starting and a separate network for 24 V consumers. All diodes with voltage surge protection.
A set of flexible cables will be delivered for connection in emergency cases the start motors of the propulsion diesel engines to the other battery.
Each battery to be provided with:
- a means for complete isolation
- a charge for charge/discharge ammeter fitted in the wheelhouse
- a condition meter fitted in the wheelhouse
- a short circuit protection as short as practicable to the battery terminals (not if valid for the start battery) .

Set of tools and maintenance equipment to be supplied with the batteries.
Each diesel engine to be equipped with an alternator of
28 Volt, 35 Amps. The alternator for supplying full load at idling speed. The three phase voltage of the alternator to be rectified by built-in diodes.
Each alternator to be provided with:
- an ammeter
- a voltage regulator
- a voltage surge protection unit to prevent damage caused by open circuiting at running alternator.

When a 3 phase shore power is not available, another shore power connection of 1 x 220 V, 25 Amps, should be provided to feed the static charger 24 V DC.

5.3. LIGHTING

The lighting installation consists of a 220 V AC lighting system. Some fittings have to be connected to the supply after the inverter, to be sure of lighting allover the Vessel when the diesel engine alternator set is not running.

Often switched space lighting such as in lockers, stores, etc. to be of the incandescent type, all the others of the fluorescent type, 1 x 18 Watt.

Special lighting fixtures to be installed near/above survey equipment to be sure of a well adapted illumination at daylight as well as at night. Lighting fixtures outside and in wet spaces of a bronze type with quard.

Switches for the lighting fixtures near the door of the concerning room and for the outside lights in the wheelhouse.

On top of the wheelhouse to install a search light of 500 Watt/ 220 V, controllable in the wheelhouse.

The foredeck to be lighted by two halogen flood lights, each 250 W. Furthermore, a 100 Watt light to be fitted on the boom of the crane.

Special attention has to be paid that the deck lighting does not disturb the view of the master.

All spaces and foredeck to be provided with a sufficient number of socket-outlets 220 Volt for the use of .handlamps and tools. Socket-outlets 24 Volt in the engine-room, on the foredeck and in the wheelhouse. Socket-outlets outside for *220 Volt of the bronze* HNA-type, the socket-outlets for 24 Volt of the bronze concentric type.
To deliver for each installed socket-outlet a plug.

5.4. NAVIGATION LIGHTS

To install navigation lights required according to the international rules, viz.:
- 1 mast head light
- 1 ports ide light
- 1 starboard light
- 1 stern light
- 1 anchor light
- work lights as required by the local authorities

The supply of the lights selectable from two feeders, one feeder from the 220 V main system via a transformer 220/24 V and one feeder from the 24 V DC network.

The navigation lights controllable and signalized in the wheelhouse.

5.5. SPECIAL INSTALLATIONS

Engine-room alarms

To install an alarm system with at least alarms for:
Each diesel:
- too low lube oil pressure
- too high coolingwater temperature
- overspeed
- required by the diesel engine manufacturer.

Each rudder propeller:
- too low lube oil pressure

- too high lube oil temperature - too low level lube oil
- hydraulic oil pressure
- hydraulic oil tank level.

Miscellaneous:
- too high level bilgewater
- too high level sludge oil tank
- too low airpressure
- too low level fuel oil day tank - too high level fuel oil day tank
- 2 spares.

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.

5.6. NAVIGATION- AND COMMUNICATION EQUIPMENT

5.6.1. Navigation equipment

Echosounder
A depth echosounder to be installed with digital display on the wheelhouse desk and provided with adjustable acoustic minimum depth alarm. Power supply 24 V DC.

Whistle

To install on top of the wheelhouse an electric compressor type whistle with pushbutton control in the wheelhouse desk. Power supply 24 V.

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.

Steering desk

To install in the wheelhouse a steering desk containing among others the following equipment:
- operating equipment for follow-up and non follow-up steering and speed adjustment of the rudder propellers
- signal/indication equipment for the rudder propellers
- start/stop/control indicators for the main diesel engines
- alarms according to par. 5.5.
- echo sounder

- control loudhailer
- pushbutton whistle
- indicators and switches navigation lights
- control window wipers
- switch emergency stop ventilation - switches for deck lighting
- ampere- and voltmeters batteries.

Distribution panels against the front of the desk, with the circuit breakers behind a transparent door.

5.6.2. Communication equipment

V.H.F.

To install a VHF communication set with 55 channels, 25 Watt transmitter output for dual watch and duplex.

Loudhailer

To install on top of the wheelhouse a turnable loudhailer of 35 Watt with control in the wheelhouse.
The transistorized amplifier and hand-microphone in the steering desk.

6. SPECIAL EQUIPMENT

6.1. GENERAL

The workboat shall be provided with the following special equipment:
- One electro-hydraulic marine crane shall be installed on the fore ship on portside as indicated on the General Arrangement plan.
- One electric handling winch shall be placed on centerline forward of the deckhouse.
- Two landing ramps shall be provided at the foreship, complete with fixation and storing means.

6.2. CRANE

For handling the anchors, floaters, pipe lines etc. and maintenance/repair work and hoisting purposes an electro-hydraulic crane shall be placed on a sturdy foundation on the portside fore ship on frame 36.

The crane construction shall be based in general on the requirements specified hereafter:

Hoisting capacity at maximum horizontal reach	3	tons.
Maximum reach	8	meters
Minimum reach	1	meter

Slewing circle	360	degrees
Hoisting height	at least 15	meter
Hoisting speed without load	20	m/min.
Hoisting speed with load	8	m/min.
Fine hoisting speed	0.5	m/min.

Hoisting, slewing and luffing shall be electrically/hydraulically operated.

Slewing at full load shall be possible with a heel of the workboat of 5 degrees and 2 degrees trim.

Luffing of the jib with maximum load must be possible at any reach up till 80 degrees with the horizontal.

The crane to be mounted on strong welded foundation with machined topplate, sufficiently supported in the hull construction.

The pillar type supports to be completely closed and provided with an inspection cover.

The hoisting winch to be driven by a hydraulic motor of the radial piston type for two directions of rotation with a built-in automatic brake with damper.

The winch to be equipped with a limit switch ,for the prevent ion of overloading.

The slewing to be performed by hydraulic motors with pinions engaging with the slewing ring, provided with roller bearing and toothed ring and brake with damper.

The luffing of the jib to be performed by one or two hydraulic cylinders with built-in safety valves, suitable for luffing from horizontal up to 80 degrees above the horizontal.

The cylinder rods to be of chromium plated stainless steel execution.

In case of failure it must be possible to lower the jib to the retracted rest position by manual operation.

The operating handles to be fitted on a portable control panel together with start-stop switches of the pump motors, running lights, indicators etc.

All operations of the crane to be performed by easy and accurate adjustable handles. When the handles are released, they have to spring back to the zero position. It should not be possible to start the pump motors when all handles are not in zero position.
Maximum load moment safety device, overload and slippage protection to be provided for the various crane functions.

The crane and its components to be suitable for installation on open deck and therefore to be of storm-proof execution. All moving and rotating parts to be provided with grease

nipples of standard size. Wires to be of galvanized steel. Canvas covers to be delivered for important crane components.

Cranes, including motors, winches etc. to be delivered with certificates of Class and test certificates of manufacturer.

6.3. HANDLING WINCH

For anchor handling and towing purposes an electrically driven handling winch shall be installed on the maindeck.
The winch shall be provided with an electric motor of about 14 kW.
Further the winch shall be provided with a hand-operated band brake and a mooring head.
The handling winch shall be further conform to the requirements specified here after:

Drum length	minimum	560 mm
Drum diameter	minimum	325 mm
Drum capacity max.5 layers	at least	150 m
Wire diameter		18 m
Hauling pull on first layer		40 KN
Hauling speed continuous		12 m / min.
Hauling pull on first layer (reduced speed)		60 kN
Hauling speed reduced torque		8 m/min.
Veering speed maximum		25 m/min.
Band brake static braking capacity		150 kN.

The winch shall be provided with a watertight operation pedestal in way of the brake lever.

A sturdy deck foundation shall be placed on the main deck complete with sea fasteners.

6.4. RAMPS

For loading and unloading vehicles two ramps shall be delivered. The ramps with a length of abt 6 m and a breadth of 0.80 m. The distance between ramps to be suitable for vehicles and chosen in concert with the IRS.

Ramps shall be constructed of chequered steel plate with sufficient reinforcements to withstand the occurring loads (maximum weight of vehicles abt 3 tons). The ramps to be stored along the fixed railings in the sides. Fixation means shall be provided on the fore ship deck when the ramps are in use.