TENDER DOCUMENT

FOR DESIGN, CONSTRUCTION AND SUPPLY OF TWO NON PROPELLED CUTTER SUCTION DREDGERS

TENDER NO. IWAI/MD/223/2015-16

JUNE 2015

Inland Waterways Authority of India

(Ministry of Shipping, Govt. of India)
A-13, Sector-1, Noida – 201 301 (UP)
Tel (0120) 2543931, Fax (0120) 2544041
Web site: www.iwai.nic.in,
https://eprocure.gov.in/eprocure/app
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NIT FOR PUBLICATION IN NEWSPAPER

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

TENDER NO. IWAI/MD/182/2013-14

E-Tender for Design, Construction and Supply of two Non Propelled Cutter Suction Dredgers for NW-2

Online bids/tenders are invited from experienced Shipbuilders for design, construction and supply of two non Propelled Cutter Suction Dredgers to be delivered at Kolkata Tender cost: 5000/-. Date of download of Tenders is from 17.06.2015 to15.07.2015. A pre- bid meeting is scheduled at IWAI, A-13, Sector-1, Noida - 201301 on 25.06.2015 at 12.00 hours. Last date of submission of online bids/tender 16.07.2015 up to 17:00 hrs. Date of online opening: 17.07.2015 at 11.00 hrs. For other details, terms & conditions please refer to IWAI website www.iwai.nic.in and CPP Portal website https://eprocure.gov.in/eprocure/app

CHIEF ENGINEER (P&M)

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

NOTICE INVITING E-TENDER

The Inland Waterways Authority of India (IWAI) hereby invites online tenders/bids (Technical and Financial Bid) from reputed and experienced Indigenous & International(foreign) Shipbuilders for Design, Construction and Supply of two Non Propelled Cutter Suction Dredgers for NW-2(the Brahmaputra River) to be delivered at Kolkata, India as per details given below . The Bids will be placed online at https://eprocure.gov.in/eprocure/app

Sl. No.	Description of work	Estimated cost (Rs.)	Bid Security (EMD) (Rs.)	Time of completion
1.	Design, Construction & supply of two Non Propelled Cutter Suction Dredgers with following Principal dimension: i) Length of Pontoon – abt 30.00 m ii) Length overall with ladder raised- abt 40.00 m ii) Breadth molded – abt 9.5m iii) Depth at side – 2.30m iv) Draft max loaded – 1.20m v) Capacity – Max. abt. 2600 m3 /hour of mixture with 20% concentration of solid.	52.00 Cr.	0.62 Cr.	15 months

TERMS & CONDITIONS

1. 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	**09.06.2015**
Document Download/Sale Start Date	**17.06.2015**
Document Download/Sale End Date	**17.07.2015**
Seek Clarification Start Date	**17.06.2015**
Seek Clarification End Date	**01.07.2015**
Pre Bid Meeting Date	**25.06.2015**
Bid Submission Start Date	**10.07.2015**
Bid Submission Closing Date	**16.07.2015**
Bid Opening Date	**17.07.2015**

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 favour of "IWAI FUND" payable at NOIDA/Delhi. Tender document will be available on the two above websites from 17.06.2015 to 16.07.2015**.**

3. Eligibility Criteria :

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

(i) **This invitation of bids is open to all reputed and experienced Indigenous and International (foreign) firms** having at least seven years' experience and satisfactory performance record for the design, construction and supply of Inland/Sea-going Self propelled Cuter Suction Dredgers or non propelled Cutter Suction Dredgers of various capacity & type.

(ii) The indigenous bidder may have tie up with experienced International design consultant/ firm for design, preparation of the drawing, obtaining approval from classification and statutory bodies as well as model testing and construction, commissioning, test & trial of the dredgers. The bidders may also submit a bid having a joint venture with the firm of adequate experience in the design construction & supply of the dredgers.

(iii) The international (foreign) firm/company on design, construction and supply of non-propelled/self-propelled cutter suction dredger or any other dredgers may participate directly or through their authorized agencies/suppliers in India.

(iv) The bidder must have the shipbuilding yard and requisite facilities of his own or on lease/rent basis existing on the day of submission of bid.

(v) The bidder must have the qualified and experienced technical manpower for design, construction and delivery on schedule.

(vi) The bidder should have a good record of delivering the dredgers on time.

(vii) The firm should have financial solvency of not less than Rs.20.80Cr. (40% of the estimated cost) or equivalent amount in foreign currency i.e. US $ & Euro and submit the scan copy of Solvency certificate from a Nationalized/scheduled/foreign National Bank as the documentary evidence.

(viii) Tender must be accompanied with scanned copy of all documentary evidence of credentials viz. similar works done, performance certificate, financial performance and all other documents as specified in the tender document.

(ix) The Earnest Money as in Clause 17 of ITB (Information to Bidders) in the form of Demand Draft for Rs. 20.00 lakhs and Rs. 48.00 lakhs in the form of Bank Guarantee are to be deposited from a Scheduled Bank of India or National Bank of

the Foreign Bidders along with the bid. In case of B.G. from foreign bank, same is to be endorsed by any scheduled bank of India. The original Demand Draft and B.G. 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.

(x) The firm should have average annual financial turnover during the last three years ending 31st March of the previous financial year of at least Rs. 58.00 Cr. (100% of the estimated cost) or in equivalent foreign currency.

(xi)The firm should have experience of having successfully completed similar works during last seven years ending last day of the month previous to the one in which bids are invited, either of the following:

a) Three similar completed works costing not less than Rs. 20.80 Cr. (40% of estimated cost)
b) Two similar completed works costing not less than Rs. 31.20 Cr. (60% of estimated cost)
c) One similar completed work costing not less than Rs. 41.60 Cr. (80% of estimated cost)

Similar works are as defined in para 3(i). The foreign bidders may provide the above experience and financial capability with equivalent foreign currency.

4. <u>The pre bid meeting will be held on 25.06.2015 at 12.00 hrs. in IWAI Office at Noida.</u>

5. The complete bid as per the tender documents should be placed online at https://eprocure.gov.in/eprocure/app by 17:00 hours on 16.07.2015. The technical bids would be online opened on 17.07.2015 at 11.00 hours in the presence of the representatives of the bidders, if any.

6. The proposal, or any query or clarification on the bid document shall be submitted to the following address:

Chief Engineer (P&M)
Inland Waterways Authority of India,
A-13, Sector-I,
Noida – 201 301
Tel (0120) 2543931, Fax (0120) 2544041/ 2522969
Website : www.iwai.nic.in. Mobile 9717622733/ 9910530099/9818806491

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

Chief Engineer (P&M)
IWAI

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

Section II: Instructions to Bidders

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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

Section II

Instructions to Bidders (ITB)

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

1) Possession of valid Digital Signature Certificate (DSC) and enrolment/registration of the contractors/bidders on the e-procurement/e-tender portal is a prerequisite for e-tendering.

2) Bidder should do the enrolment in the e-Procurement site using the https://eprocure.gov.in/eprocure/app option available on the home page. Portal enrolment is generally free of charge. During enrolment/registration, the bidders should provide the correct/true information including valid email_id. All the correspondence shall be made directly with the contractors/bidders through email_id provided.

3) Bidder need to login to the site through their user ID/ password chosen during enrolment/registration.

4) Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY/TCS/nCode/e-Mudra or any Certifying Authority recognized by CCA India on eToken/SmartCard, should be registered.

5) The DSC that is registered only should be used by the bidder and should ensure safety of the same.

6) Contractor/Bidder may go through the tenders published on the site and download the required tender documents/schedules for the tenders he/she is interested.

7) After downloading/getting the tender document/schedules, the Bidder should go 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 password of the eToken/SmartCard to access DSC.

10) Bidder selects the tender which he/she is interested in by using the search option & then moves it to the 'my favourites' folder.

11) From the favourites folder, he selects the tender to view all the details indicated.

12) It is construed that the bidder has read all the terms and conditions before submitting their offer. Bidder should go through the tender schedules carefully and upload the documents as asked, otherwise, the bid will be rejected.

13) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/schedule and generally, they can be in PDF/xls/rar/jpg/

14) formats. If there is more than one document, they can be clubbed together and can be provided in the requested format. Each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same can be uploaded, if permitted.

15) If there are any clarifications, this may be obtained through the site, or during the pre-bid meeting if any. Bidder should take into account the corrigendum published from time to time before submitting the online bids.

16) The Bidders can update well in advance, the documents such as certificates, annual report details etc., under My Space option and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.

17) Bidder should submit the Tender Fee/ EMD as specified in the tender. Earnest money shall be accepted in the form of Banker's Cheque or Demand Draft of a Scheduled Bank. A part of earnest money is acceptable in the form of Bank Guarantee also. In such cases 50% of Earnest Money or Rs. 20 lakh whichever is less, will have to be deposited in the shape of Demand Draft/ Banker's Cheque and balance can be accepted in form of Bank Guarantee issued by a Scheduled Bank. The original payment instruments should be posted/couriered/given in person to the Tender Inviting Authority within the due date as mentioned in this tender document. Scanned copy of the instrument should be uploaded as part of the offer, if asked for..

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

19) The bidder has to select the payment option as offline to pay the Tender FEE/ EMD as applicable and enter details of the instruments.

20) The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise submitted bid will not be acceptable.

21) The bidder has to digitally sign and upload the required bid documents one by one as indicated. Bidders to note that the very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read all sections and pages of the bid document including General conditions of contract without any exception and have understood the entire document and are clear about the requirements of the tender requirements.

22) The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid will be rejected.

23) If the price bid format is provided in a spread sheet file like BoQ_xxxx.xls, the rates offered should be entered in the allotted space only and uploaded after filling the

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

24) The bidders are requested to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission end date & time (as per Server System Clock). The TIA will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders at the eleventh hour.

25) After the bid submission, the acknowledgement number, given by the e-tendering system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and will also act as an entry pass to participate in the bid opening date.

26) The bidder should ensure/see that the bid documents submitted should be free from virus and if the documents could not be opened, due to virus, during tender opening, the bid is likely/liable to be rejected.

27) The time settings fixed in the server side & displayed at the top of the tender site, will be valid for all actions of requesting, bid submission, bid opening etc., in the e-tender system. The bidders should follow this time during bid submission.

28) All the data being entered by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered will not viewable by unauthorized persons during bid submission & not be viewable by any one until the time of bid opening.

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

30) The confidentiality of the bids is maintained since the secured Socket Layer 128 bit encryption technology is used. Data storage encryption of sensitive fields is done.

31) The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.

32) For any queries regarding e-tendering process, the bidders are requested to contact through the modes given below:

Chief Engineer (P&M)
Inland Waterways Authority of India,
A-13, Sector-1,
Noida – 201 301
Tel (0120) 2543931, Fax (0120) 2544041/ 2522969
Website : www.iwai.nic.in

A. General

1. Scope of Bid

1.1 The Owner (as defined in the Appendix to ITB) invites online bids for **"Design, Construction and supply of two nos. Non-Propelled Cutter Suction Dredgers for NW-2"** 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 both the Non-Propelled CSDs - within 15 (fifteen) months from the date of issuance of work order/letter of acceptance or from the date of opening of letter of credit in the bank as the case may be.

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

2. Source of Funds

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

3. Eligible Bidders

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

3.2 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices by the Central Government, the State Government or any Public undertaking, Autonomous Body, Authority by whatever name called under the Central or the State Government.

4. Qualification of the Bidder

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

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

(a) Copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the Bid to commit the Bidder.

(b) Total monetary value of similar works performed for each of the last seven years.

(c) Experience certificate in works of a similar nature and size for each of the last seven years with satisfactory performance certificates from clients.

(d) Evidence of availability (either owned or leased or rented) of shipyard where the vessels are proposed to be built. The bidder to submit the details of the yard owned by them, in case the yard is on lease or rented, a copy of the lease or rent agreement to be enclosed as evidence. No change of yard or place of construction will be allowed.

(e)Qualification and experience of key site management and technical personnel proposed for the contract.

(f) Reports on the financial standing of the Bidder, and a certificate from Chartered Accountant as a proof of turnover for the past five years.

(g) Evidence of adequacy of working capital for this contract [access to line(s) of credit and availability of other financial resources].

(h) Firm should have financial solvency of not less than Rs. 20.80 Cr. (40% of estimated cost) supported with documentary evidence from Nationalized Bank.

(i) Proposals for subcontracting components of the works amounting to more than 10% of the contract price.

(j) 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;

(k) Details of the contracts if any having delay in completing the work more than one year over and above contractual delivery period. In the event of no case, similar statement is to be submitted.

(l) Valid income tax clearance certificate from Indian builder/supplier. In case of foreign supplier equivalent certificate is to be furnished

4.3 <u>Joint venture or consortium</u>:

4.3.1 Bidder shall be either single firm or Joint Venture (JV) or an Indian lead firm supported by another firm (s) (Indian or Foreign). However proof of forming JV on a non-judicial stamp paper of Rs100/- / Authorization letters of supporting firm (s) should be submitted at the time of submission of bid. However, the successful bidder is required to submit proof of registration of JV before award of work. Experience of individual firm of the JV will also be considered for evaluation.

Joint venture is allowed with not more than two partners. The lead partner should have maximum equity participation. If a Bidder constitutes (under applicable laws) a joint venture they shall submit and comply with the following requirements:-

a) There shall be a Joint Venture Agreement specific for the contract between the constituent firms, indicating clearly, amongst other things, the proposed distribution of responsibilities both financial as well as technical for execution of the work amongst them. For the purpose of this clause, the most experienced lead partner will be the one defined. A copy of the Joint Venture agreement in accordance with requirements mentioned shall be submitted along with the bid.

b) The bid, and in the case of the successful bidder, the Form of Agreement, etc., shall be signed and/ or executed in such a manner as may be required for making it legally binding on all partners (including operative parts of the ensuing Contract in respect of Agreement of Arbitration, etc.). On award of work, the Form of Agreement and Contract Documents shall be signed by all partners of the Joint Venture to conclude Contract Agreement.

c) Lead partner shall be nominated as being partner-in- charge; and this authorization shall be evidenced by submitting a power of attorney, duly notarized, signed by the legally authorized signatories of all the partners.

d) The partner-in-charge shall be authorized to incur liabilities and to receive instructions for and on behalf of the partners of the Joint Venture, whether jointly or severally, and entire execution of the Contract (including payment) shall be carried out exclusively through the partner-in-charge. A copy of the said authorization shall be furnished in this Bid.

e) All partners of the Joint Venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under sub clause (c) above as well as in the Form of Bid and the Form of Agreement (in case of a successful bidder).

f) In the event of default by any partner, in the execution of his part of the Contract, the Employer shall be so notified within 30 days by the partner-in-charge, or in the case of the partner-in-charge being the defaulter, by the partner nominated as partner-in-charge of the remaining Joint Venture. The partner-in-charge shall, within 60 days of the said notice, assign the work of the defaulting partner to any other equally competent party acceptable to the Employer to ensure the execution of that part of the Contract, as envisaged at the time of bid. Failure to comply with the above provisions will make the Contractor liable for action by the Employer under the Conditions of Contract. If the Most Experienced i.e. Lead Partner defined as such in the Communication approving the qualification defaults, it shall be construed as default of the Contractor and Employer will take action under the Conditions of Contract.

g) Notwithstanding the permission to assigning the responsibilities of the defaulting partner to any other equally competent party acceptable to the Employer as mentioned in sub clause (f) above, all the partners of the Joint Venture will retain the full and undivided responsibility for the performance of their obligations under the Contract and/ or for satisfactory completion of the Works.

h) The bid submitted shall include all the relevant information as required and furnished separately for each partner of the Joint Venture.

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

(a) Number of members in a consortium shall not exceed 2 (two);

(b) The proposal should contain the information required for each member of the Consortium;

(c) Members of the Consortium shall nominate one member as the lead member (the "Lead Member"), who shall have an equity share holding of at least 51% (fifty one per cent) of the paid up and subscribed equity of the Dredging Contractor during the License Period. The nomination(s) shall be supported by a Power of Attorney, as per the format, signed by all the other members of the Consortium;

(d) The Proposal should include a brief description of the roles and responsibilities of individual members, particularly with reference to financial and technical obligations;

(e) The members of a Consortium shall incorporate a special purpose vehicle as Dredging Contractor under the provisions of Companies Act, 1956, (as their wholly owned subsidiary) to execute the Project, if awarded to the Consortium;

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

(i) Convey the intent to form with shareholding/ ownership equity commitment(s) in accordance with this TENDER, which would enter into the Dredging Contract and subsequently perform all the obligations of the bidder in terms of the Contract,

(ii) Clearly outline the proposed roles and responsibilities of each member;

(iii) Commit that in case such consortium of entities is the Preferred Bidder, the Preferred Bidder shall incorporate a wholly owned special purpose company under the provisions of Indian Companies Act, 1956, as the Dredging Contractor; in whose

subscribed and paid up capital, the Preferred Bidder shall collectively hold 100% equity during the License Period.

(iv) The Lead Member of such Preferred Bidder consortium shall at all time during the License Period hold equity equivalent to at least 51% of the subscribed and paid up capital of the Dredging Contractor. Further, other consortium members whose technical/financial eligibility shall have been used for the purpose of qualification under this TENDER shall hold at least 26% equity in the subscribed and paid up capital of Dredging Contractor/operator during the License Period; Provided however that Authority may in its sole and absolute discretion permit a consortium member to divest [in full/partially] its equity shareholding in the subscribed and paid up capital of the Dredging Contractor.

(v) Include a statement to the effect that all members of the Consortium shall be liable jointly and severally for all obligations of the Bidder consortium in relation to the Project until the expiry of the contract.

(vi) Statement of Legal Capacity ;

(vii) Copy of Memorandum and Articles of Association of the both members of the Consortium;

(viii) Providing summary of Financial capacity of the Bidder.

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

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

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

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

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

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

a) Achieved average annual financial turnover during the last 3 years, ending 31st March of the previous financial year (in all cases of ship building works/supply of dredgers only) of at least Rs. 52.00 Cr. (100% of the estimated cost of the amount prescribed in Notice Inviting – E-Tender for which bid has been invited).

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

i) Three similar completed works costing not less than Rs. 20.80 Cr. (40% of estimated cost)

ii) Two similar completed works costing not less than Rs. 31.20 Cr. (60% of estimated cost)

iii) One similar completed work costing not less than Rs. 41.60 Cr. (80% of estimated cost)

The similar work constitutes design, construction and supply of Inland/Sea-going Self-Propelled Cutter Suction Dredgers/non-Propelled Cutter Suction Dredgers.

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

4.4 B (a) Each bidder must produce:

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

(b) Each bidder must demonstrate:

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

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

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

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

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

(iii) tampered the bid document in any manner.

5. One Bid per Bidder

5.1 Each Bidder shall submit only one online Bid for the work. A Bidder who submits more than one Bid will cause the proposals with the Bidder's participation to be disqualified.

6. Cost of Bidding

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

B. Bidding Documents

7. Content of Bidding Documents

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

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

   (Part I General Conditions of Contract, and Contract Data; Part II Special Conditions of Contract)
5. Technical Specifications

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

8. Clarification of Bidding Documents

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

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

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

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

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

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

9. Amendment of Bidding Documents

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

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

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

C. Preparation of Bids

10. Language of Bid

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

11. Documents Comprising the Bid

11.1 The Bid submitted by the Bidder shall be in two separate parts:

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

I. For bidding documents downloaded from the website https://eprocure.gov.in/eprocure/app, the scanned copy of the Demand Draft for the cost of the bidding documents must be uploaded. The original Demand Draft is to be deposited in the office before the bid submission closing date.

II. A scanned copy of the Earnest Money must be uploaded. The original of the Earnest money deposit to be deposited in the office before the bid submission closing date.

III. Qualification information, supporting documents, affidavit and undertaking as specified in Clause 4;

IV. Undertaking that the bid shall remain valid for the period specified in clause 14.1;

V. Any other information/documents required to be completed and submitted by bidders, as specified in the Appendix to ITB, and

VI. A scanned affidavit affirming that information he has furnished in the bidding document is correct to the best of his knowledge and belief must be uploaded. The original affidavit is to be deposited in the office before the bid submission closing date.

VII. Form of bid.

VIII. The scanned copy of the Program and Method Statement/Work Plan and the Activity Schedule for the entire work including design, model testing, construction, procurement of major machineries, installation, testing and commissioning works for both Self-Propelled Cutter Suction Dredgers.

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

(i) Cost schedule (BOQ)

12. Bid Prices

12.1 The Contract shall be for the whole Works, as described in Clause 1.1, based on the cost schedule submitted by the Bidder.

12.2 The bidder shall quote rates and prices for all items of the Works described in the cost schedule.

12.3 All duties, taxes, royalties and other levies payable by the Contractor under the Contract, or for any other cause, shall be included in the rates, prices, and total Bid price submitted by the Bidder.

12.4 The rates and prices quoted by the Bidder shall be fixed for the duration of the Contract and shall not be subject to adjustment.

13. Currencies of Bid and Payment

13.1 The prices shall be quoted by the Indian bidder entirely in Indian Rupees. All payments shall be made in Indian Rupees. In case these are imported, the rate shall be quoted in foreign currency and payment shall be made in foreign currency.

14. Bid Validity

14.1 Bids shall remain valid for a period of 120 days after the deadline date for bid submission specified in Clause 19. The Owner as non-responsive shall reject a bid valid for a shorter period.

14.2 In exceptional circumstances, prior to expiry of the original time limit, the Owner may request that the bidders may extend the period of validity for a specified additional period. The request and the bidders' responses shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his bid security for a period of the extension, and in compliance with Clause 15 in all respects.

15. Earnest Money/Bid Security

15.1 The Bidder shall furnish, as part of the Bid, Earnest Money/Bid security, for the amount as specified in the Appendix to ITB.

15.2 The Earnest Money shall, be in the form of Bank Guarantee and 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 shall be rejected by the Owner as non-responsive.

15.4 The Earnest Money of unsuccessful bidders will be returned within 28 days of the end of the Bid validity period specified in Sub-Clause 14.1.

15.5 The Earnest Money of the successful Bidder will be discharged when the Bidder has signed the Agreement and furnished the required Performance Security.

15.6 The Bid Security/Earnest Money will be forfeited:

a) if the Bidder withdraws the Bid after its submission during the period of Bid validity;

b) in the case of a successful Bidder, if the Bidder fails within the specified time limit to

i. sign the Agreement; and/or

ii. furnish the required Performance Security.

16. Alternative Proposals by Bidders

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

17. Format and Signing of Bid

17.1 The Bidder shall submit online bid comprising of the documents as described in Clause 11 and other documents as specified in the tender.

17.2 The Bid shall be signed by a person or persons duly authorized to sign on behalf of the Bidder. All pages of the Bid shall be signed by the person or persons signing the Bid. Signed copy may be sent separately to IWAI to reach on or before the due date of opening of the bid. ***However, financial bid has to be submitted only on line.***

17.3 The Bid shall contain no overwriting, alterations or additions, except those to comply with instructions issued by the Owner, or as necessary to correct errors made by the Bidder, in which case such corrections shall be made by scoring out the cancelled portion, writing the correction and signing and dating it along with the stamp by the person or persons signing the Bid.

D. Submission of Bids

18. Online submission of Bids

18.1 The Bidder shall submit online bids.

19. Deadline for Submission of Bids

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

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

20. Modification and Withdrawal of Bids

20.1 Bidders may modify or withdraw their bids online before the deadline prescribed in Clause 19.

20.2 Withdrawal or modification of a Bid between the deadline for submission of bids
and the expiration of the original period of bid validity specified in Clause 14.1 above or as extended pursuant to Clause 14.2 shall result in the forfeiture of the Bid security pursuant to Clause 15.

E. Bid Opening and Evaluation

21. Bid Opening

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

21.1 The Owner will open the online "Technical Bid" of all the bids received , including modifications of Technical Bid made pursuant to Clause 20 in the presence of the bidders/bidders' representatives who choose to attend at the time, date and place specified in the Appendix to ITB. In the event of the specified date for the submission of bids being declared a holiday for the Owner, the Bids will be opened at the appointed time and location on the next working day.

21.2 Bidder's names, the presence of bid security and such other details, as the Owner may consider appropriate will be announced by the Owner after the opening.

21.3 After the opening of the technical bids their evaluation will be taken up with respect to bid security, qualification information and other information furnished in Part I of the bid in pursuant to clause 11.1, thereafter on fulfilling the criteria laid down in Clause 25.2, a list will be drawn up of the responsive bids whose financial bids are eligible for consideration.

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

21.5 At the time of the online opening of the 'Financial Bid', the names of the bidders whose bids were found responsive in accordance with clause 22.4 and the Bid prices, the total amount of each bid, and such other details as the Owner may consider appropriate will be announced by the Owner at the time of bid opening.

22. Process to be Confidential

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

23. Clarification of Bids and Contacting the Owner

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

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

24. Examination of Bids and Determination of Responsiveness

24.1 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.

25. Evaluation of Bids

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

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

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

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

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

(iv) Financial details

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

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

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

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

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

25.5 The evaluation of the financial bid will be based on the lowest financial offer received for the work i.e design, construction, supply & commissioning of two self propelled Dredgers. For evaluation of the price quoted for supply if made in foreign currency this shall be converted into Indian Rupees at the rate of exchange prevailing on the date of opening of financial bids

F. Award of Contract

26. Award Criteria

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

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

27.1 Notwithstanding Clause 26, the Owner reserves the right to accept or reject any

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

28. Notification of Award and Signing of Agreement.

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

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

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

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

29. Factors Affecting the Award of the contract.

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

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

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

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

30. Performance Security

30.1 Within 10 (ten) days after receipt of the Letter of Acceptance, the successful Bidder shall deliver to the Owner a Performance Security of Ten percent of the Contract Price, for the period of 28 days after the expiry of defect liability period of 12 months.

30.2 The performance security shall be either in the form of a Bank Guarantee or Bank draft in the name of the Owner, from a scheduled Bank.

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

31. Advances

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

32. Corrupt or Fraudulent Practices

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

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

Appendix to ITB

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

Instructions to Bidders Clause Reference

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

(1.1) The Works is "Design, Construction and Supply of two Non-Propelled Cutter Suction Dredgers for NW-2".

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

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

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

Place: NOIDA (will be intimated later, in case of change, if any)
Time 12:00 hrs
Date 25.06.2016

(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) The EMD/bid security which shall either be in the form of a Bank Guarantee, in the name of the Owner, from a National or Scheduled Bank of India or from a Foreign

Bank in respect of International Bidders.

Any Scheduled Commercial Bank approved by RBI having a net worth of not less than Rs. 500 crore 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.

and

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

(19.1) The Owner's address for the purpose of Bid submission is Inland Waterways Authority of India, A-13, Sector-I, Noida – 201 301.

(19.1) The deadline for submission of bids shall be:
Time & Date : As prescribed in Notice inviting E-tender

(22.1) The date, time and place for opening of the Bids are:
(A) Technical Bid
Date, Time & Place : As prescribed in Bid Notice

(B) Financial Bid (For qualified bidder)
Date, Time & Place : (Will be intimated later)

(32.1) 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.

(33.) Rate of simple interest for mobilization advance will be 15%.

Appendix – 1

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

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

Name & signature of
the authorized signatory

APPENDIX – 2

CREDENTIAL IN CONSTRUCTION OF VESSELS, DREDGERS, WORK BOATS & ACCOMMODATION BOATS OF THE SHIPYARD DURING PRECEDING 7 YEARS

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

Name & signature of
the authorized signatory

APPENDIX – 3

LIST OF CONTRACT OF NON-PERFORMANCE OF WORKS (DURING PRECEDING 7 YEARS)

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

Name & signature of
the authorized signatory

APPENDIX – 4

LIST OF CONTRACT & THEIR PAYMENT RECEIVED (DURING PRECEDING 7 YEARS)

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

Name & signature of
the authorized signatory

(SECTION-III)

FORMS OF BID, INTEGRITY AGREEMENT & BANK GUARANTEE **AND COST SCHEDULE**

PART - I

TENDER ACCEPTANCE LETTER

(Form of bid/ tender acceptance to be given on Company Letter head along with Technical bid)

Date:

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

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: IWAI/MD/223/2015-16

Name of Tender / Work: DESIGN, CONSTRUCTION, SUPPLY AND COMMISSIONING OF TWO NON-PROPELLED CUTTER SUCTION DREDGERS FOR NW-2.

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.

6. 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.

7. We undertake, if our Bid is accepted, to commence the work immediately on receipt of the order to commence, and to complete and deliver the two dredgers comprised in the Contract within the period stated in the bid hereto.

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

9. 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.

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

11. 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 authorized 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 _____ 2015

Signature _____ in the capacity of _____ duly authorized ** with official seal

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.

PART - II

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

INTEGRITY AGREEMENT

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

BETWEEN

Chairperson, Inland Waterways Authority of India represented through Chief Engineer, Inland Waterways Authority of India, A - 13, Sec. – 1, Noida.

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

AND

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

Preamble

WHEREAS the Principal / Owner has floated the Tender (No. IWAI/MD/223/2015-16) (hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for " Design, construction, supply and commissioning of two Non-Propelled Cutter Suction dredgers" hereinafter referred to as the "Contract".

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

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

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

Article 1: Commitment of the Principal/Owner

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

   (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

   (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.

   (c) The Principal/Owner shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.

2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

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

1. It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the IWAI all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.

2. The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:

a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the tender process or execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the contract.

b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.

c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.

e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

3. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

4. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.

5. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or

indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article 3: Consequences of Breach

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

1. If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days' notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.

2. Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the tender process prior to the award of the contract or terminated/determined the contract or has accrued the right to terminate/determine the contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.

3. Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a bidder or Contractor, or of an employee or a representative or an associate of a bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.

2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.

3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

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

1) The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/ sub-vendors.

2) The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.

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

Article 6: Duration of the Pact

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

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

Article 7: Other Provisions

1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal/Owner, who has floated the Tender.

2) Changes and supplements need to be made in writing. Side agreements have not been made.

3) If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.

4) Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intensions.

5) It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

Article 8: LEGAL AND PRIOR RIGHTS

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

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

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

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

WITNESSES:

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

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

Place:

Date :

SCHEDULES

SCHEDULE 'A' : Salient Features of the work.

Name of Work : Design, construction, Supply & Commissioning of two Non-Propelled Cutter Suction Dredgers for NW-2.

Estimated cost of work: The work is estimated to cost Rs. 52.00 crore

(a) Earnest Money : Rs. 62.00 lakh

(b) Performance Guarantee & Security Deposit : 10% of tendered value.

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

(i). Officer inviting tender: - Chief Engineer (P&M)

(ii). Tender Accepting Authority:- Chairman, IWAI

(iii). Time allowed for submission of Performance Guarantee as per clause 3.1 of GCC from the date of issue of letter of acceptance:- 10 days

(iv) Specifications to be followed:- As per the technical specification and other clause in the tender

(v) Competent authority of grant extension of time under clause 43:-

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

(vi) Competent authority to levy liquidated damages for delay under clause 44:-

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

(c) Chairman, IWAI, Noida (if the amount of contract is more than 500 lakhs).

(vi) Competent authority to determine the contract as per clause 45:-

Engineer-in-Charge with the prior approval of

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

(viii) Competent authority for foreclosure of contract in full or in part due to abandonment or reduction in scope of work as per clause 40:-

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

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 classification society 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 upto 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 first 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 – Secure a Lump-Sum Advance

To

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

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

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

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

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

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

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

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

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

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

For and on behalf of the Bank

(Name and Designation)

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

For and on behalf of the Chairman,

Dated……..

Note:

For proprietary concerns:

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

For partnership concerns:

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

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

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

For Companies:

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

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

(TWO NON-PROPELLED CUTTER SUCTION DREDGERS FOR NW-2)

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

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

We, ……. further agree that the owner shall have the fullest liberty, without our consent and without effecting in any manner our obligations hereunder, to vary any of the terms and conditions of the contract or to extend the time during which the contract is to remain valid and or the time for performance by the contractor of its / their obligations under the contract from time to time or to

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

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

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

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

Dated …… day of ……. Two thousand ……

Signature ……..

SEAL

AGREEMENT FORM

THIS AGREEMENT made this… .. day of …….. 2015 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 purchase of **TWO NON-PROPELLED CUTTER SUCTION DREDGERS FOR NW-2** for its own purpose and the CONTRACTOR has agreed to 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, **TWO NON-PROPELLED CUTTER SUCTION DREDGERS** 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 classification 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

(Design, construction & Supply of two Non-Propelled Cutter Suction Dredgers)

The below mentioned Commercial bid format is provided as BOQ_ two Non-Propelled Cutter Suction Dredgers along with this tender document at https://eprocure.gov.in/eprocure/app. Bidders are advised to download this BOQ_ two Non-Propelled Cutter Suction Dredgers as it is and quote their offer/rates in the permitted column and upload the same in the commercial bid.

Tender Inviting Authority : Inland Waterways Authority of India , Noida						
Name of Work: Design, construction & Supply of Two Non-Propelled Cutter Suction Dredgers for NW-2.						
Tender No: IWAI/MD/223/2015-16						
Bidder Name :						
COST SCHEDULE FOR-TWO NON PROPELLED CUTTER SUCTION DREDGERS **(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bid is liable to be rejected for this tender. Bidders are allowed to enter the Bidders Name and Values only)**						
Sl. No.	**Description of work**	**Qty.**	**Unit**	Rate per Non-Propelled Cutter Suction Dredgers in **Figures** to be entered by the **Bidder** **Rs. P**		**AMOUNT Rs. P**
				Foreign Currency		
				Figures	**Words**	**Foreign Currency**
1.00	Cost of Non-Propelled Cutter Suction Dredger complete in every respect in accordance with the attached technical specification (including Hull inventory, various attachments, tools, 500 hrs spare parts and cost of shipment & transportation, taxes and duties etc if any.)	2.00	No.		Rupees/Foreign currency	0.00
Total in Figures						**0.00**
Total in Words				**Rupees/Foreign Currency**		

SECTION-IV
CONDITIONS OF CONTRACT

PART-I

GENERAL CONDITIONS OF CONTRACT AND CONTRACT DATA

Section – IV

GENERAL CONDITIONS OF CONTRACT

C O N T E N T S

CLAUSE-34	:	LAWS GOVERNING THE CONTRACT
CLAUSE-35	:	LABOUR
CLAUSE-36	:	FORCE MAJEURE.
CLAUSE-37	:	LIABILITY FOR DAMAGE, DEFECTS OR IMPERFECTIONS AND RECTIFICATION THEREOF
CLAUSE-38	:	CONTRACTOR'S LIABILITY AND INSURANCE
CLAUSE-39	:	SUSPENSION OF WORKS
CLAUSE-40	:	FORE CLOSURE OF CONTRACT IN FULL OR IN PART DUE TO ABANDONMENT OR REDUCTION IN SCOPE OF WORK
CLAUSE-41	:	TERMINATION OF CONTRACT ON DEATH
CLAUSE-42	:	INSOLVENCY AND BREACHOF OCNTRACT
CLAUSE-43	:	CARRYING OUT PART WORK AT THE RISK & COST OF TH E CONTRACTOR
CLAUSE-44	:	POWERS OF THE OWNER TO TAKE POSSESSION OF DREDGERS AND MATERIALS IN CERTAIN CASES AND COMPELE WORK.
CLAUSE-45	:	APPEAL
CLAUSE-46	:	CHAIRMAN'S CERTIFICATE TO BE FINAL
CLAUSE-47	:	AUTHORITY AND THEIR STAFF NOT TO BE PERSONALLY LIABLE
CLAUSE-48	:	STANDARD BREAK CLAUSE
CLAUSE-49	:	PROGRAMME AND METHOD STATEMENT/WORK PLAN
CLAUSE-50	:	MANAGEMENT MEETINGS
CLAUSE-51	:	INDENTIFYING DEFECTS
CLAUSE-52	:	CORRECTION OF DEFECTS NOTICED DURING THE DEFECT LIABILITY PERIOD
CLAUSE-53	:	UNCORRECTED DEFECTS
CLAUSE-54	:	ACTIVITY SECHEDULE
CLAUSE-55	:	COMPLETION TIME AND EXTENSIONS
CLAUSE-56	:	LIQUIDATED DAMAGES FOR DELAY
CLAUSE-57	:	WHEN THE CONTRACT CAN BE DETERMINED
CLAUSE- 58	:	INSPECTION AND APPROVAL
CLAUSE-59	:	COMPLETION CERTIFICATE AND COMPLETION PLANS
CLAUSE-60	:	TAXES, DUITES AND LEVISES ETC
CLAUSE-61	:	TAX DEDUCTION AT SOURCE
CLAUSE-62	:	PAYMENT OF FINAL BILL
CLAUSE-63	:	OVER PAYMENT AND UNDER PAYMENT
CLAUSE-64	:	FINALITY CLAUSE
CLAUSE-65	:	SUM PAYABLE BY WAY OF COMPENSATION TO BE CONSIDERED IS REASONABLE WITHOUT PREFERENCE TO ACTUAL LOSS
CLAUSE-66	:	SETTLEMENT OF DISPUTES & ARBITRATION
CLAUSE -67	:	INTEREST
CLAUSE-68	:	BANNED OR DELISTED FIRMS

GENERAL CONDITIONS OF CONTRACT

CLAUSE - 1: DEFINITIONS

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

i) **Contract**: means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Chairman, Inland Waterways Authority of India and the contractor, together within the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-charge and all these documents taken together shall be deemed to form one contract and shall be complementary to one another

ii) **Contract sum**; means the amount arrived at by multiplying the quantities shown in the schedule of quantities and price by the respective item rates as allowed.

iii) **Contractor:** means the successful tenderer who is awarded the contract to perform the work covered under this tender documents and shall be deemed to include the contractor's successors, executors, representatives or assign approved by the Engineer-in-charge.

(iv) **Employer** means the Chairman, Inland Waterways Authority of India and his successors.

(v) **IWAI/ Authority/ Department/ Owner** shall mean the Inland Waterways Authority of India, which invites tenders on behalf of the Chairman, IWAI and includes therein-legal representatives, successors and assigns.

(vi) **Engineer-In-Charge (EIC)** means the Engineer officer authorised to direct, supervise and be In-charge of the works for the purpose of this contract who shall supervise and be in charge of the work.

(vii) **Engineer-in-charge representative** shall mean any officer of the Authority nominated by the Engineer-in-charge for day to day supervision, checking, taking measurement, checking bills, ensuring quality control, inspecting works and other related works for completion of the project.

(viii) **Chairman**: means Chairman of Inland Waterways Authority of India.

(ix) **Chief Engineer:** means the Chief Engineer of the Authority.

(x) **Director** means the Director of the Authority, as the case may be.

(xi) **Deputy Director** means the Deputy Director of the Authority, as the case may be.

(xii) **Assistant Director** means the Asstt. Director of the Authority, as the case may be.

(xiii) **Work Order** means a letter from the Authority conveying the acceptance of the tender/offer subject to such reservations as may have been stated therein.

(xiv) **Day** : means a calendar day beginning and ending at mid-night.

(xv) **Week** : means seven consecutive calendar days

(xvi) **Month** : means the one Calendar month.

(xvii) **Site** means the waterway and / or other places through which the works are to be executed.

(xviii) **Vessel** : **Vessel** is the ***Non propelled Dredger*** to be designed, constructed, equipped and delivered afloat in accordance with the contract and with modification, if any, as mutually agreed upon.

(xix) **Drawings** : means the drawings referred to in the specifications and / or appended with the tender document, any modifications of such drawing approved in writing by the Engineer-in-Charge and shall also include drawings/ charts issued for actual execution of the work time to time by the Engineer-in-Charge.

(xx) **Urgent Works**: means any urgent nature which in the opinion of the Engineer-In-Charge become necessary at the time of execution and / or during the progress of work to obviate any risk or accident or failure or to obviate any risk of damage to the vessel structure, or required to accelerate the progress of work or which becomes necessary for security or for any other reason the Engineer-in-Charge may deem expedient.

(xxi) **Work/ works**: means work / works to be executed in accordance with the contract.

(xxii) Schedules referred to in these conditions shall mean the relevant schedules annexed to the tender papers.

(xxiii) Tendered value means the value of the entire work as stipulated in the letter of award.

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

(xxv) The Defects Liability Certificate is the certificate issued by Owner, after the Defect Liability Period has ended and upon correction of Defects by the Contractor.

(xxvi) The Defects Liability Period is 12 months calculated from the Date of delivery of the ***two Non propelled dredgers.***

CLAUSE – 2: INTERPRETATIONS

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

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

CLAUSE-3. (a) PARTIES

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

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

A person signing the tender or any other document in respect of the contract on behalf of the contractor without disclosing his authority to do so shall be deemed to warrant that he has authority to bind the contractor. If it is discovered at any time that the person so signing had no authority to do so, the Chairman on behalf of Authority may, without prejudice to any other right or remedy of the owner, cancel the contract and make or authorize the making of a purchase of the vessels at the risk and cost of such person and hold such person liable to the owner for all costs and damages arising from the cancellation of the contract including any loss which the owner may sustain on account of such purchase. The provisions of clause 11 apply to every such purchase as far as applicable.

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

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

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

CLAUSE-4. AUTHORITY OF THE CHAIRMAN:

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

CLAUSE – 5: PERFORMANCE SECUTIRY

5.1 The contractor shall be required to deposit an amount equal to 10% of the tendered value of the work as performance guarantee in the form of either demand draft payable at any nationalized/schedule bank **OR** an irrevocable bank guarantee of any scheduled bank or State Bank of India in accordance with the form prescribed within 10 days of the issue of the work order.

5.2 Performance of contract including warrantee period of 12 months on the guarantee with the respect to workmanship and material etc. shall be initially valid up to the stipulated date of completion plus 28 days beyond that. In case the time for completion gets enlarged, the contractor shall get the validity of the performance guarantee extended to cover such enlarged time of the work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor without any interest.

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

CLAUSE – 6: RELEASE OF PERFORMANCE SECURITY/GUARANTTEE

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

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

(3) If the contractor fails or neglects to observe or perform any of his obligations under the contract, it shall be lawful for the Chairman or his duly authorized representative to forfeit either in whole or in part, the performance security furnished by the contractor. Save as aforesaid, if the contractor duly performs and completes the contract in all respects and presents in absolute

"NO DEMAND CERTIFICATE" in the prescribed form, the Chairman on behalf of the Authority shall refund the performance security to the contractor after deducting all costs and other expenses that the owner may have incurred and all dues and other money including all losses and damages which the owner is entitled to recover from the contractor.

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

i) RISK IN THE CONSTRUCTIONS:

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

(ii) RESPONSIBILITY FOR COMPLETENESS:

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

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

(iii) SUBLETTING THE CONTRACT:

The contractor shall not assign, lease or sublet or cede this contract or the benefit hereof or any part thereof or any money payable hereunder or sublet the services to be rendered as aforesaid or any part thereof to any other person or company without the previous permission of the Owner certified in writing under the hands of the Owner and no assignment, lease, cession or subletting although so permitted shall exonerate the contractor from his liability under this contract and the Owner shall not be bound or required to take notice or give effect to any such assignment, lease, cession or subletting unless the same shall have been made with such permission as aforesaid PROVIDED ALWAYS the contractor may procure any necessary materials to

be manufactured for the purposes of, this contract by any person, firm or company whose names shall have been submitted to and approved by Chairman on behalf of the Authority before the said materials are ordered but no such approval shall relieve the Contractor from any responsibility or obligations with reference to any such materials.

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

(i) Where the contractor is a partnership firm, a new partner shall not be introduced in the firm except with the previous consent in writing of the Chairman on behalf of Authority which may be granted only upon 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 not withstanding 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 48 & 56 of **GENERAL CONDITIONS** shall as far as applicable apply. The decision of the Chairman on behalf of Authority as to any matter or thing concerning or arising out of this sub-clause or any question whether the contractor or any partner of the contract firm has committed a breach of any of the conditions in this sub-clause contained shall be final and binding on the contract.

(V) ASSISTANCE TO THE CONTRACTOR:

a) The contractor shall be solely responsible to procure any material or obtain any import or other license or permit required for fulfilment of the contract and the grant by “the owner or any other authority of a quota certificate or permit required under any law for distribution or acquisition of iron and steel or any other commodity or any other form of iron and steel, or any other commodity or any other form of assistance in the procurement of the material aforesaid, shall not be construed as a representation in the part of the purchase that the material covered by such license or permit quota certificate is available or constitute any 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.

CLAUSE-8. INABILITY TO PERFORM CONTRACT:

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

CLAUSE – 9:QUOTATION OF RATES BY CONTRACTOR

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

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

CLAUSE – 10: DELEGATION OF POWERS

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

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

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

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

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

(4) Where such property is insured by the contractor against loss or fire at the request of the authority or the Owner such insurance shall be deemed to be affected by way of additional precaution and shall not prejudice the liability of the contractor as aforesaid.

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

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

CLAUSE-13: TIME AND DATE OF COMPLETION OF WORK

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

CLAUSE-14: PROGRESS REPORT

(1) The contractor shall from time to time tender reports concerning the progress of the contract in such form as may be required by the Chairman on behalf of Authority.

(2) The submission, receipts and acceptance of such reports shall not prejudice the rights of the owner under the contract, nor shall operate as a stopple against the owner merely by the reason of the fact that he has not taken notice of or objected to any information contained in such report.

CLAUSE –15: CERTIFICATE AND FEES

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

CLAUSE – 16: CONTRACT PRICE

(a) CONTRACT PRICE:

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

A. <u>Indigenous bidders:</u>

i) 15% when keel is laid against irrevocable Bank Guarantee. The Bank Guarantee will be returned after delivery of the two Non-Propelled Cutter Suction Dredgers (Vessels).

ii) 15% when 50% Hull Fabrication and erection is completed.

iii) 20% when 100% Hull fabrication and erection is completed.

iv) 20% on arrival of major machineries i.e. main engines, dredge pump, hydraulic pump, Cutter nozzle, propellers, auxiliary engines, winches, spuds etc of the two Non-Propelled Cutter Suction Dredgers.

v) 15% on launching of the dredgers.

vi) 15% on successful tests and trials and delivery of the dredgers

II. **<u>International bidders contractors:-</u>**

The payment shall be released against irrevocable letter of credit either through State Bank of India or any other scheduled Bank of India if exists in that country or though National Bank of that country in the following stages:

i. 70% On completion of hull and procurement of various engines dredge pump and other machineries.

ii. 20% On installation of engines and machineries, test, trial and shipment ie F.O.B. stage.

iii. 10% after successful test, trial & delivery of the dredgers.

(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 as in clause 16 (a) upon production of the certificate of the inspector appointed by owner for the inspection of the construction of the dredger against the installment due. The contractor must submit the bills and necessary documents allowing 30 days from the date of submission for the payment of installment subject to the condition that the amount of an installment payment shall in no case exceed the value of the work done.

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

Whenever any claim or claims for payment of a sum of money arises out of or under the contract against the contractor, the owner shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, deposited by the contractor and for the purpose aforesaid

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

CLAUSE – 18: INDEMNITY

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

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

CLAUSE – 19:TESTS

19.1 The contractor shall be solely responsible for :

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

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

CLAUSE – 20: CURRENCIES

All payments will be made in Indian Rupees for Indigenous supplier and in foreign **currency ie US Doller & Euro** only for foreign supplier for supply of 2 nos. dredgers with accessories.

CLAUSE – 21: SUFFICIENCY OF TENDER

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

CLAUSE – 22: CONTRACT DOCUMENTS

22.1 The language in which the contract documents shall be drawn up shall be English and if the said documents are written in more than one languages, the language according to which the contract is to be constructed and interpreted shall be English.

22.2 The Contractor shall be furnished free of charge certified true copy of the contract document.

22.3 A copy of the Contract Documents furnished to the Contractor as aforesaid shall be kept by the Contractor on the Site in good condition and the same shall at all reasonable time be available for inspection and use by the Engineer-in-Charge, his representatives or by other Inspecting officers of the Authority.

22.4 None of these Documents shall be used by the Contractor for any purpose other than that of this contract.

CLAUSE – 23: DISCREPANCIES AND ADJUSTMENT OF ERRORS

23.1 Detailed drawings shall be followed in preference to small-scale drawings and figured dimensions in preference to scaled dimensions. The case of discrepancy between the Schedule of Quantities and prices, the Specifications and/ or the drawings, the following order of precedence shall be observed : -

(a) Description in the Schedule of Quantities and Prices.
(b) Relevant Specifications and Special Conditions, if any.
(c) Drawings.
(d) Indian Standards Specifications of BIS.

23.2 The contractor shall study and compare the drawings, specifications and other relevant information given to him by the Engineer-in-Charge and shall report in writing to the Engineer-in-Charge any discrepancy and inconsistency which he notes. The decision of the Engineer-in-Charge regarding the correct intent and meaning of the drawings and specifications shall be final and binding.

23.3 Any error in description, quantity or price in Schedule of Quantities and Prices or any omission there from shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the work(s) comprised therein according to drawings and specifications or from any of his obligations under the contract.

23.4 If on check there is difference in the amount worked out by contractor in the schedule of quantities and prices and General summary the same shall be adjusted in accordance with the following rules:

(a) In the event of error/discrepancy occurring in the rates written in figures and words, then the rate which corresponds with the amount worked out by the contractor shall, unless otherwise proved, be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rate written either in figures or in words, then the rate quoted by the contractor in words shall be taken as correct. When the rate quoted by the contractor in figures and words tally, but the amount is not worked out correctly, the rate quoted by the contractor will, unless or otherwise proved, be taken as correct.

(b) All errors in totaling in the amount column and in carrying forward totals shall be corrected.

(c) The totals of various sections of schedule of quantities and price amended shall be carried over to the General Summary and the tendered sum amended accordingly. The tendered sum so altered shall, for the purpose of tender, be substituted for the sum originally tendered and considered for acceptance instead of the original sum quoted by the tenderer. Any rounding off of quantities or in sections of schedule of quantities and prices or in General summary by the tenderer shall be ignored.

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

24.1 The duties of the representative of the Engineer-in-Charge are to watch and supervise the works and to test and examine any materials/ parts to be used or workmanship achieved in connection with the works.

24.2 The Engineer-in-Charge may, from time to time in writing, delegate to his representative any of the powers and authorities, vested in the Engineer-in-Charge and shall furnish to the contractor a copy of all such written delegation of powers and authorities. Any written instruction or written approval given by the representative of the Engineer-in-Charge to the contractor within the terms of such delegation shall bind the contractor and the Authority as though it has been given by the Engineer-in-Charge.

24.3 Failure of the representative of the Engineer-in-Charge to disapprove any work or materials shall be without prejudice to the power of the Engineer-in-Charge thereafter to disapprove such work or materials and to order the pulling down, removal or breaking up thereof. The contractor shall, at his own expense, again carry out such works as directed by the Engineer-in-Charge.

24.4 If the Contractor is dissatisfied with any decision of the representative of the Engineer-in-Charge, he will be entitled to refer the matter to the Engineer-in-Charge who shall thereupon confirm, reverse or vary such decision and the decision of the Engineer-in- Charge in this regard shall be final and binding on the contractor.

CLAUSE – 25: ASSIGNMENT AND SUB-LETTING

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

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

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

CLAUSE – 27: COMMENCEMENT OF WORK

The contractor shall commence the work at the respective sites within 15 days of the issue of Letter of Award. If the contractor commits default in mobilization of resources, and equipment as aforesaid, the Engineer-in-Charge shall without

prejudice to any other right or remedy be at liberty to cancel the contract and forfeit the earnest money/security deposit.

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

28.1 The contractor shall execute the whole and every part of the work in the most substantial and workman like manner in strict conformity with the specifications laid down in the contract document or as may be laid down by the Engineer-in-Charge under the terms of the contract. The contractor shall also conform exactly, fully and faithfully to the designs, drawings specifications and instructions in writing in respect of the work, duly signed by the Engineer-in-Charge as may be issued from time to time.

28.2 The contractor shall be entitled to receive, on demand, in addition to the contract documents, in accordance with the provisions of contract, the documents set forth herein in respect of the work on commencement or during the performance of the contract:

(a) Specifications or revisions thereof other than standard printed specifications and charts/drawings issued to the contractor from time to time

(b) Explanations, instructions etc.

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

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

CLAUSE – 29: SETTING OUT THE WORKS

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

CLAUSE - 30: CONTRACTOR'S SUPERVISION

30.1 The contractor shall either himself supervise the execution of the works or shall appoint at his own expense, a qualified and experienced Engineer as his accredited agent approved by the Engineer-in-Charge, if contractor has himself not sufficient knowledge or experience to be capable of receiving instruction or cannot give his full attention to the works. The contractor or his agent shall be present at the site(s) and shall supervise the execution of the works with such additional assistance in each trade, as the work involved shall require and considered essential by the Engineer-in-Charge. Further the

directions/instructions given by the Engineer-in-Charge to the contractor's agent shall be considered to have the same force as if these had been given to the contractor himself.

30.2 If the contractor fails to appoint a suitable agent as directed by the Engineer-in-Charge, the Engineer-in- Charge shall have full powers to suspend the execution of the works until such date as a suitable agent is appointed by the contractor and takes over the charge of supervision of the work. For any such suspension, the contractor shall be held responsible for delay so caused to the work.

CLAUSE - 31: INSTRUCTIONS AND NOTICE

31.1 Except as otherwise provided in this contract, all notices to be given on behalf of the Authority and all other actions to be taken on its behalf may be given or taken by the Engineer-in-Charge or any officer for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge.

31.2 All instructions, notices and communications etc. under the contract shall be given in writing and any such oral orders / instructions given shall be confirmed in writing and no such communication which is not given or confirmed in writing shall be valid.

31.3 All instructions, notices and communications shall be deemed to have been duly given or sent to the contractor, if delivered to the contractor, his authorized agent, or left at, or posted to the address given by the contractor or his authorized agent or to the last known place of abode or business of the contractor or his agent of services by post shall be deemed to have been served on the date when in the ordinary course of post these would have been delivered to him and in other cases on the day on which the same were so delivered or left.

31.4 The Engineer-in-Charge shall communicate or confirm the instructions to the contractor in respect of the execution of work through a “Site Order Book“ maintained in the office of the Engineer-in-Charge and the contractor or his authorized representative shall confirm receipt of such instructions by signing the relevant entries in this book. If required by the Contractor, he shall be furnished a certified true copy of such instruction(s).

31.5 The “Hindrance Register” shall be maintained at the site of work, where any hindrance which comes to the notice of the representative of the Engineer-in-Charge shall be recorded and immediately a report will be made to the Engineer-in-Charge within a week. The Engineer-in-Charge shall review the Hindrance Register at least once in a month.

CLAUSE – 32: PATENT RIGHTS

The contractor shall indemnify the Authority, its representatives or its employees against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or material or part thereof included in the contract. In the event of any claim being made or action being brought against the Authority or any agent, servant or employee of the Authority in respect of any such materials as aforesaid the contractor shall immediately be notified thereof. Provided that such indemnification shall not apply when such infringement has taken place in complying with the specific directions issued by the Authority but the contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursement to the contractor only if the use was the result of any drawings and or specifications issued after submission of the tender.

CLAUSE – 33: MATERIALS

33.1 The contractor shall at his own expenses provide / arrange all materials required for the bona-fide use on work under the contract.

33.2 All materials/parts to be provided by the contractor shall be in conformity with the specifications laid down in the contract and the contractor shall furnish from time to time proof and samples, at his own cost, the materials/parts as may be specified by the Engineer-in-Charge. Further the Engineer-in-Charge shall also have powers to have such tests, in addition to those specified in the contract, as may be required and the contractor shall provide all facilities to carry out the same. The cost of materials/parts consumed in such tests and also the expenses incurred thereon including the cost of the testing charges, shall be borne by the contractor in all cases and also where such tests which are in addition to those provided in the contract disclose that the materials are in conformity with the provisions of the contract.

33.3 The Engineer-in-Charge or his representative shall be entitled at any time to inspect and examine any materials/parts intended to be used in the works, either on the site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or any place where these are lying or from where these are being obtained. For this, purpose, the contractor shall afford such facilities as may be required for such inspection and examination.

CLAUSE - 34: LAWS GOVERNING THE CONTRACT

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

CLAUSE - 35: LABOUR

35.1 (a) The contractor shall employ labour in sufficient numbers to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the works any person who has not completed eighteen years of age the minimum age specified in Indian Labour Law.

(b) If any foreigner is employed by the contractor on the work within the site the later shall ensure that such foreigner possesses the necessary special permit issued by the Civil Authorities in writing and also comply with the instructions issued there-from from time to time. In the event of any lapse in this regard on the part of such foreigner the contractor shall be personally held responsible for the lapse & Authority shall not be liable in any event.

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

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

i) Any accident if occurred during the said fortnight showing the circumstances under which it happened and the extent of damage and injury caused by it and.

ii) The number of female workers who have been allowed maternity benefit as provided in the Maternity Benefit Act 1961 or Rules made there under and the amount paid to them.

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

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

i) Payment of Wages Act, 1936 (Amended)

ii) Minimum Wages Act, 1948 (Amended).

iii) The Contract Labour (Regulation & Abolition) Act, 1970 with Rules framed there under as amended.

iv) Workmen Compensation Act, 1923 as amended by Amendment Act no.65 of 1976.

v) Employer's Liability Act 1938 (Amended)

vi) Maternity Benefit Act. 1961 (Amended)

vii) The Industrial Employment (Standing orders) Act 1946 (Amended).

viii) The Industrial Disputes Act. 1947 (Amended)

ix) Payment of Bonus Act.1965 and Amended Act No. 43 of 1977 and No. 48 of 1978 and any amended thereof:

ix) The Personal Injuries (Compensation Insurance) Act 1963 and any modifications thereof and rules made thereunder from time to time. The Contractor shall take into account all the above and financial liabilities in his quoted rates and nothing extra, whatsoever, shall be payable to him on this account.

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

35.5 The Contractor shall be liable to pay his contribution and the employees contribution to the State Insurance Scheme in respect of all labour employed by him for the execution of the contract, in accordance with the provision of "the Employees State insurance Act 1948" as amended from time to time. In case the Contractor fails to submit full details of his account of labour employed and the contribution payable, the Engineer-in- Charge shall recover from the running bills the contribution amount as assessed by him. The amount so recovered shall be adjusted against the actual contribution payable for Employees State Insurance.

35.6 The Engineer-in-Charge shall on a report having been made by an inspecting officer as defined in the Contract Labour (Regulation and Abolition) Act and Rules or on his own in his capacity as Principal Employer, have the power to deduct from the amount due to the contractor any sum required for making good the loss suffered by worker(s) by reason of non-fulfillment of the conditions of the Contract for the benefit of Workers, nonpayment of wages or on account of deduction made from the wages of the workers which are not justified by the terms of the contract or non- observance of the said Act and Rules framed there under with amendments made from time to time.

35.7 The Contractor shall indemnify the Authority against any payments to be made under and for observance of the Regulation Laws, Rules as stipulated in Clause-35.4 above without prejudice to his right to claim indemnity from his sub-contractors. In the event of the contractor's failure to comply with the provisions of all the Acts/Laws stipulated in Clause-35.4 or in the event of decree or award or order against the contractor having been received from the competent authority on account of any default or breach or in connection with any of the provisions of the Acts/Laws/Rules mentioned in Sub-Clause 35.4 above, the Engineer-in-Charge without prejudice to any other right or remedy under the contract shall be empowered to deduct such sum or sums from the Bill of the contractor or from his security deposit or from other payment due under this contract or any other contract to satisfy within a reasonable time the provisions of the various Acts/Laws/Rules/Codes as mentioned under Sub-Clause 35.4 above, on the part of the contractor under the contract on behalf of and at the expenses of the contractor and make payment and /or provide amenities/ facilities/services accordingly. In this regard, the decision of the Engineer-in-Charge shall be conclusive and binding on the contractor.

35.8 In the event or the Contractor committing a default or breach of any of the provisions of the aforesaid Contract's Labour (Regulation and Abolition) Act and Rules as amended from time to time or furnishing any information or submitting or filling any form/Register/Slip under the provisions of these Regulations which is materially incorrect then on the report of the Inspecting officer as defined in the relevant Acts and Rules as referred in Clause 35.4 above, the Contractor shall without prejudice to any other liability pay to the Authority a sum not exceeding Rs.50/- (Rs. Fifty only) as liquidated damages for every default, breach or furnishing, making, submitting, filling materially incorrect statement as may be fixed by the Engineer-in-Charge. The decision of the Engineer-in-Charge in this respect shall be final & binding.

35.9 The Contractor shall at his own expenses comply with or cause to be complied with the Provisions/ Rules provided for welfare and health of Contract Labour in the Contract Labour (Regulation and Abolition) Act and other relevant Acts and Rules framed there under or any other instructions issued by the Authority in this regard for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the contractor fails to make arrangements as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the contractor.

35.10 The Contractor shall at his own expense arrange for the safety or as required by the Engineer-in-Charge, in respect of all labour directly or indirectly employed for performance of the Works and shall provide all facilities in connection therewith. In case the contractor fails to make arrangements and provide necessary facilities as aforesaid, the Engineer-in- Charge shall be entitled to do so and recover the cost thereof from the Contractor. But this will not absolve the contractor of his responsibility or otherwise thereof.

35.11 Failure to comply with "Provisions/Rules made for Welfare and Health of Contract Labour" Safety Manual, or the provisions relating to report on accidents and grant of maternity benefits to female workers and the relevant Acts/Rules referred in clause 35.4 above shall make the contractor liable to pay to the Authority as liquidated damages an amount not exceeding Rs. 50/- for each default or materially incorrect statement. The decision of the Engineer-in-Charge in such matters based on reports from the inspecting Officers as defined in the relevant Acts and Rules as referred in clause 35.4 above shall be final and binding and deductions for recovery of such liquidated damages may be made from any amount payable to the contractor. In the event of any injury, disability or death of any workmen in or about the work employed by the contractor either directly or through his sub-contractor, contractor shall at all time indemnify and save harmless the Authority against all claims, damages and compensation under the Workmen Compensation Act. 1923 as amended from time to time or in other Law for the time being in force and Rules there-under from time to time and also against all costs, charges and expenses of any smooth action by proceedings arising out of such accidents or injury, disability or death of a workmen and against all sum or sums which may with the consent of the contractor be paid to compromise or compound any claim in this regard. If any award, decree or order is passed against the contractor for recovery of any compensation under the Workmen Compensation Act, 1923, for any injury, disability or death of a workman by any competent court, the said sum or sums shall be deducted by the Engineer-in-Charge from any sum then due or that may become due to the contractor or from his security deposit or sale thereof in full or part under the contract or any other contract with the Authority towards fulfillment of the said decree, award or orders.

35.12 Provided always that the contractor shall have no right to claim payments/claims whatsoever on account of his compliance with his obligations under this clause and Labour Regulations.

35.13 The contractor shall not otherwise than in accordance with the statutes ordinance and Government Regulations or orders for the time being in force import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs to permit or suffer any such import, sale, gift, barter or disposal by his sub-contractor, agent or employees.

35.14 The contractor shall not give, barter or otherwise dispose of to any person or persons any arms or ammunition of any kind or permit to suffer the same as aforesaid.

35.15 The Contractor shall employ for the execution of the works only such persons as are skilled and experienced in their respective trades and Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any persons employed by the Contractor for the execution of the works who, in the opinion of the Engineer-in-Charge, misconduct himself or is incompetent or negligent in the proper performance of his duties. The contractor shall forthwith comply with such requisition and such person shall not be again employed upon the works without permission of the Engineer-in-Charge.

CLAUSE – 36: FORCE MAJEURE

36.1 The term Force Majeure shall herein mean Riots (other than among the contractor's employees), Civil Commotion (to the extent no insurable), war (whether declared or not), invasion, act of foreign enemies, hostilation, civil war, rebellion, revolution, insurrection, military or usurped power, damage from aircraft, nuclear fission, acts of God, such as earthquake (above 7 magnitude on Richter Scale), lightning, unprecedented floods, fires not caused by contractor's negligence and other such causes over which the contractor has no control and are accepted as such by the Engineer-in-Charge, whose decision shall be final and binding. In the event of either party being rendered unable by Force Majeure to perform any obligation required to be performed by them under this contract, the relative obligation of the party affected by such Force Majeure shall be treated as suspended for the period during which such Force Majeure cause lasts, provided the party allowing that it has been rendered unable as aforesaid, thereby shall notify within 15 days of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of such cause.

36.2 For delays arising out of Force Majeure, the bidder shall not claim extension in completion date for a period exceeding the period of delay attributable to the causes of Force Majeure and neither the Authority nor the bidder shall be liable to pay extra costs provided it is mutually established that Force Majeure conditions did actually exist.

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

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

37.1 If the contractor or his labour or his sub-contractor, injure, destroy or damage, battery, solar panel, lighting system, road, fence, enclosures, water pipe, cables, buildings, drains, electricity or telephone posts, wires, trees, grass line, cultivated

land in the area in which they may be working or in the area contiguous to the premises on which the work or any part of it is being executed or if any damage is caused to any item belonging to IWAI or to any person during the progress of work, the Contractor shall upon receipt of a notice in writing in that behalf from the Engineer-in-Charge, make good the same at his cost.

37.2 If it appears to the Engineer-in-Charge or his representative at any time during the progress of work or prior to the expiration of the Defects Liability period that any work has been executed with unsound, imperfect or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the work are unsound or of a quality inferior to that contracted for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other faults found in the work arising out of defective design or defective/ improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer-in-Charge forthwith rectify or remove and reconstruct the work so specified in whole or in part, as the case may be, and/or remove the materials/articles so specified and provide other proper and suitable materials at his expense.

37.3 All damages caused by accidents or carelessness of the contractor or any of his employees or any property belonging to the Authority is wasted or is misused by the contractor or any of his employees shall be to the account of the contractor, who shall make good the loss.

CLAUSE – 38: CONTRACTOR'S LIABILITY AND INSURANCE

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

38.2 i) Neither party to the contract shall be liable to the other in respect of any loss or damage which may occur or arise out of "Force Majeure" to the works or any part thereof on to any material or article at site but not incorporated in the works or to any person or anything or material whatsoever or either party provided such a loss or damage could not have been foreseen or avoided by a prudent person and the either party shall bear losses and damages in respect of their respective men and materials. As such liability of either party shall include claims/ compensations of the third party also.

ii) Provided, however, in an eventuality as mentioned in sub-clause – 38.2 (i) above, the following provisions shall also have effect:

(a) The Contractor shall, as may be directed in writing by the Engineer-in-Charge proceed with the completion of the works under and in accordance with the provisions and conditions of the contract, and

(b) The Contractor shall, as may be directed in writing by the Engineer-in-charge, re-execute the works lost or damaged, remove from the site any debris and so much of the works as shall have been damaged and carry the Authority's T & P, Plant and Equipment, Material etc. to the Authority's store. The cost of such re-execution of the works, removal of damaged works and carrying of Authority's store shall be ascertained in the same manner as for deviations and this shall be added to the contract sum. Provided always that the Contractor shall, at his own cost, repair and make good so much of the loss or damage as has been occasioned by any failure on his part to perform his obligations under the contract or not taking precautions to prevent loss or damage or minimize the amount of such loss or damage, Final assessment of loss or damage shall be decided by the Engineer-in-Charge and his decision shall be final and binding.

38.3 The contractor shall take special precautions to see that public places and roads adjacent to contractor's yard are not blocked at any time either by his material or by his workmen. The roads are to be kept always clear and no equipment/materials shall be stacked.

38.4 The navigable waterways shall not be blocked by Contractor's vessels. The anchors dropped in the waterways shall be properly marked and removed after done with.

38.5 The contractor shall indemnify and keep indemnified the Authority against all losses and claims for death, injuries or damage to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance, of works during the contract period and also against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto, and such liabilities shall include claims/compensations of the third party.

38.6 (a) Before commencing execution of the work, the Contractor shall without in any way limiting his obligations and responsibilities under this condition, insure against any damage, loss or injury which may occur to any property (excluding that of the Authority but including the Authority building rented to the contractor wholly or in part and any part of which is used in part and any part of which is used by him for storing combustible materials) public liability by arising out of the carrying out of the contract. For this purpose the contractor shall take out, pay all costs and maintain throughout the period of his contract public liability with the following coverage.

i) Public liability limits for bodily injury or death not less than Rs. 1,00,000 for one person and Rs. 2,00,000 for each accident.

ii) Property liability limits for each accident not less than Rs. 1,00,000 ;

iii) The Contractor shall prove to the Engineer-in Charge from time to time that he has taken out all the insurance policies referred to above and has paid the necessary premiums for keeping the policies alive till expiry of the Defects Liability Period.

(b) The Contractor shall ensure that similar insurance policies are taken out by his sub-contractor (if any) and shall be responsible for any claims or losses to the Authority resulting from their failure to obtain adequate insurance protection in connection thereof. The Contractor shall produce or cause to be produced by his sub-contractors (if any) as the case may be, relevant, policy or policies and premium receipt as and when required by the Engineer-in-Charge.

(c) If the contractor and/or his sub- contractor (if any) shall fail to effect and keep in force the insurance referred to above or any other insurance which he/they may be required to effect under the term of the Contract then and in any such case the Authority may, without being bound to effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the Authority from any moneys due or which may become due to the contractor or recover the same as a debt due from the contractor.

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

CLAUSE – 39: SUSPENSION OF WORKS

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

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

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

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

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

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

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

CLAUSE – 41: TERMINATION OF CONTRACT ON DEATH

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

Engineer-in-Charge of such termination of contract shall be without prejudice to any other right or remedy which shall have accrued or shall accrue to him under the contract.

CLAUSE -42: INSOLVENCY AND BREACH OF CONTRACT:

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

(i) If the contractor being an individual or if a firm, any partner thereof, shall at any time, be adjudged insolvent or shall have a receiving order or other for administration of his estate made against him or shall take any proceeding for composition under any insolvency act for the time being in force or make any conveyance or assignment of his effects or enter into any arrangement or composition with his creditors or suspend payment or if the firm be dissolved under the partnership act, or

(ii) If the contractor being a company is wound up voluntarily or by the order of a court or a Receiver, Liquidator or 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.

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

43.1 If the contractor

(i) At any time makes default during the currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; **or**

(ii) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; **or**

(iii) Fails to complete the work (s) or items of work with individual dates of completion, on or before the date (s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.

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

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

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

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

43.4 Any excess expenditure incurred or to be incurred by IWAI in completing the part work/ part incomplete work of any item (s) or the excess loss of damages suffered or may be suffered by IWAI as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to IWAI in law or as per agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contactor shall be called upon in writing and shall be liable to pay the same within 30 days.

43.5 If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contactor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.

43.6 In the event of the above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any

engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

CLAUSE-44: POWERS OF THE OWNER TO TAKE POSSESSION OF DREDGERS 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.

CLAUSE-45: APPEAL

If the contractor desires to appeal against the decision of the Inspector against the rejection of any work as not being in accordance with the contract, he shall appeal to the Chairman within fourteen days after the Inspector's decision and if an appeal is so preferred, the decision of the Chairman on behalf of Authority shall be final and conclusive.

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

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

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

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

CLAUSE-48: STANDARD BREAK CLAUSE

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

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

a) To direct the 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.

CLAUSE-49: Program and Method Statement/Work Plan

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

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

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

CLAUSE-50: MANAGEMENT MEETINGS

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

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

CLAUSE-51: IDENTIFYING DEFECTS

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

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

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

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

CLAUSE-53. UNCORRECTED DEFECTS

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

CLAUSE-54: ACTIVITY SCHEDULE

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

CLAUSE - 55: COMPLETION TIME AND EXTENSIONS

55.1 If after the award of the work the contractor commits defaults in commencing the execution of work as aforesaid, the authority shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.

55.2 As soon as possible after the Contract is concluded, the Contractor shall submit a Time and Progress Chart get it approved by the Department. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work.

55.3 However, if the work (s) be delayed by:-

(i) Force majeure as per clause 36, or
(ii) Abnormally bad weather, or
(iii) Serious loss or damage by fire, or
(iv) Civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
(v) Delay on the part of other contractors or tradesman engaged by Engineer-in-Charge in executing work not forming part of the contract, or
(vi) Non-availability of stores, which are the responsibility of Government to supply or
(vii) Non-availability of breakdown of Tools and Plant to be supplied or supplied by Government or
(viii) Any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor's control.

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

55.4 In case the cost of the work is more than 10 crores then the total scope of work will be divided into milestones. The contractor shall submit a Time & Progress chart for each milestone and get it approved by the competent authority.

55.5 Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

55.6 In any such case as may have arisen due to any of the events, as aforesaid, and which may have been brought out by the contractor in writing, the Competent Authority may give a fair and reasonable extension of time, after

taking into consideration the nature of the work delayed and practicability of its execution during the period of extension.

55.7 Such extensions shall be communicated to the contractor by the Engineer-in-Charge in writing. The contractor shall not be entitled to claim any compensation or over run charges whatsoever for any extension granted.

CLAUSE – 56: LIQUIDATED DAMAGES FOR DELAY

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

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

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

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

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

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

56.3 In case of contracts having tendered amount less than 10 crores, if the work remains incomplete after the stipulated date of completion, the Engineer-in-

charge may withhold 10% of the tendered value of the work from the running payments of the contractor pending final decision of the competent authority on the extension of time case. If the competent authority decides to grant extension of time without levy of liquidated damages or levy part of the total liquidated damages specified above then the balance withheld amount after adjusting the amount of the liquidated damages levied by the competent authority will be refunded to the contractor.

CLAUSE – 57: WHEN THE CONTRACT CAN BE DETERMINED

57.1 Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

(i) If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or un-workman like manner shall comply with the requirement of such notice for a period of seven days thereafter.

(ii) If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.

(iii) If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.

(iv) If the contractor persistently neglects to carry out his obligations under the contract and/ or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

(v) If the contractor shall offer or give or agree to give to any person in IWAI service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of contract.

(vi) If the contractor shall enter into a contract with IWAI in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.

(vii) If the contractor shall obtain a contract with IWAI as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of integrity pact.

(viii) If the contractor being an individual, or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.

(ix) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle the court to make a winding up order.

(x) If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.

(xi) If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer -in-Charge.

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

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

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

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

CLAUSE – 58: INSPECTION AND APPROVAL

58.1 All works involving more than one process shall be subject to examination and approval at each stage thereof and the contractor shall give due notice to the Engineer-in-Charge on his authorized representative, when each stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof and the decision of the Engineer-in-Charge in this regard shall be final and binding.

58.2 No work shall be put out of view without the approval of the Engineer-in-Charge or his authorized representative and the Contractor shall afford full opportunity for examination. The contractor shall give due notice to the Engineer-in-Charge or his authorized representative whenever any such work is ready for examination and the Engineer- in-Charge or his representative shall, without unreasonable delay, unless he considers it necessary and advise the contractor accordingly, examine and measure such work. In the event of the failure or the contractor to give such notice, he shall if required by the Engineer-in-Charge, uncover such work at the contractor's expenses.

58.3 Periodic inspection will be carried out by the EIC or his representative. The contractor can have the inspection schedules finalized with the Engineer-in-charge. Generally all attempts should be made to have joint inspection

CLAUSE – 59: COMPLETION CERTIFICATE AND COMPLETION PLANS

59.1 The work shall be completed to the entire satisfaction of the Engineer-in-Charge and with in the specified time limit and under the terms and conditions of the contract. As soon as the work under the contractor is completed as a whole the contractor shall give notice of such completion to the Engineer-in-Charge. The

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

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

59.3The contractor shall submit the completion plans of the work wherever

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

CLAUSE – 60: TAXES, DUTIES AND LEVIES ETC.

The prices shall include all the taxes, levies, cess, octroi, royalty, terminal tax, excise, or any other local, State or Central taxes as applicable/ charged by Centre or State Government or Local authorities on all materials that the contractor has to purchase for the performance of the contract and services, shall be payable by the contractor and the Authority will not entertain any claim for

compensation whatsoever in this regard. The rates quoted by the contractor shall be deemed to be inclusive of all such taxes, duties, levies, etc.

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

CLAUSE-61: TAX DEDUCTION AT SOURCE

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

CLAUSE – 62: PAYMENT OF FINAL BILL

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

CLAUSE - 63: OVER PAYMENTS AND UNDER PAYMENTS

63.1 Whenever any claim whatsoever for the payments of a sum of money to the Authority arises out of or under this contract against the contractor, the same may be deducted by the Authority from any sum then due or which at anytime thereafter may become due to the contractor under this contract and failing that under any other contract with the Authority or from any other sum whatsoever due to the contractor from the Authority or from his security deposit, or he shall pay the claim on demand.

63.2 The Authority reserves the right to carry out post- payment audit and technical examination of the final bill including all supporting vouchers, abstracts, etc. The authority further reserves the right to enforce recovery of any over payment when detected not- withstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute before an arbitrator appointed under clause 48 of this contract and notwithstanding the fact that the amount of the final bill figures in the arbitration award.

63.3 If as a result of such audit and technical examination any over payment is discovered in respect of any work done by the contractor or alleged to have been done by him under contract, it shall be recovered by the Authority from

the contractor by any of all of the methods prescribed above, and if any under payment is discovered, the amount shall be duly paid to the contractor by the Authority.

63.4 Provided that the aforesaid right of the Authority to adjust over-payment against amount due to the contractor under any other contract with the Authority shall not extend beyond the period of two years from the date of payment of the final bill or in case the final bill is a MINUS bill, from the date the amount payable by the Contractor under the MINUS final bill is communicated to the contractor.

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

CLAUSE – 64: FINALITY CLAUSE

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

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

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

CLAUSE - 66 SETTLEMENT OF DISPUTES & ARBITRATION.

66.1 Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in-before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or

thing whatsoever in any way arising out of or relating to the contract, design, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter:

(i) If the contractor considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days of the receipt of decision from the Engineer-in-Charge request the Chief Engineer in writing through the Engineer-in-Charge for written instruction or decision. Thereupon, the Chief Engineer shall give his written instructions of the decision within a period of one month from the receipt of the contractor's letter. However, this will not be reason for the stoppage of work.

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

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

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

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

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

66.5 The award of the Arbitrator shall be final and binding. The Arbitrator shall decide in what proportion the Arbitrator's fees, as well as the cost of Arbitration proceeding shall be borne by either party.

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

66.7 A notice of the existence in question, dispute or difference in connection with the contract unless served by either party within 30 days of the expiry of the defects liability period, failing which all rights and claim under this contract shall be deemed to have been waived and thus forfeited and absolutely barred.

66.8 The Arbitrator shall give reasons for the award if the amount of claim in dispute is Rs. 1,00,000/- and above.

66.9 The work under this Contract shall continue during Arbitration proceedings and no payments due from or payment by the Authority shall be withheld on account of such proceedings except to the extent which may be in dispute.

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

66.11 The parties to the agreement hereby undertake to have recourse only to arbitration proceedings under for Arbitration Act 1996 and the venue of the arbitration proceeding shall be Noida/ New Delhi and the parties will not have recourse to Civil Court to settle any of their disputes arising out of this agreement except through arbitration.

NOTE: In case of contract with another Public Sector Undertaking, following Arbitration Clause shall apply: "Except as otherwise provided, in case of a contract with a public Sector Undertaking if at any time any question dispute or difference whatsoever arises between the parties upon or in relation to, or

in connection with this agreement, the same shall be settled in terms of the Ministry of Industry, Department of Public Enterprises O.M No. 3/5/93-PMA dt.30.06.93 or any modifications / amendments thereof. "The arbitrator shall have the power to enlarge the term to publish the award with the consent of the parties provided always that the commencement or continuation of the arbitration proceeding shall not result in cessation or suspension of any of other rights and obligations of the parties of any payments due to them hereunder.

CLAUSE 67: INTEREST

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

CLAUSE 68: BANNED OR DELISTED FIRMS:

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

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

Contract Data to General Conditions of Contract

Clause Reference

1. The Owner is IWAI represented by [Cl.1(i)]

   Chairman, IWAI
   Address: A-13, Sector-1, Noida.

2. The Engineer-in-charge is:

   Designation: Chief Engineer (P & M)
   Address: IWAI, A-13, Sector 1, Noida 201301 [Cl.1(i)]

3. The place of delivery is Kolkata.

4. The Start Date shall be from the issuance of Work Order/ Letter of Acceptance [Cl.1(i)]

5. (a) The name and identification number of the Contract is :

   "Design, Construction and supply of two Non-Propelled Cutter Suction Dredgers for NW-2".

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]

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CONDITIONS OF CONTRACT

PART-II

SPECIAL CONDITIONS OF CONTRACT

SECTION – IV

PART - II

SPECIAL CONDITIONS OF CONTRACT

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SECTION – *IV*

PART - II

SPECIAL CONDITIONS OF CONTRACT

(**Two Non-Propelled Cutter Suction Dredgers for NW-2)**

1. PERFORMANCE OF THE WORK:

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

2. SPECIFICATION:

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

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

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

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

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 dredgers 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 **Non-Propelled Cutter Suction Dredgers**, construction, testing, installation of the equipment/machineries and delivery complete in working order in all respects of the dredgers 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) Inspection and testing during progress of work:

The Contractor shall offer the Owner or the Inspecting authority or Officer all proper and reasonable facilities for examining inspecting and testing the materials, machinery and workmanship used or intended to be used or employed during the progress of the construction and installation of equipment of the vessel and on completion thereof shall also supply free of charge such apparatus, materials, tools or labour as may be required from time to time for the purpose of such examinations, inspections and testing. The Owner, the Inspecting authority or officer shall have access to the place or places where any part of the machinery or equipment is being constructed or is stored at all reasonable times during the execution of this Contract and in case any part of the work shall have been covered or closed without previous inspection the Contractor shall if required open such part or parts wherever necessary to enable the Owner or Inspecting authority or Officer to inspect the part so opened up at the expense of the Contractor.

(c) Intimation for Inspection & Cost involved

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

10. Replacement of defective work, material and fittings

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

If the Inspector shall find any work to be not in accordance with the contract, he shall be entitled to give the Contractor notice thereof and the Contractor shall forthwith make the defective work good or alter the same to make it comply with the requirements of the contract. Should he fail to do so within a reasonable time (as to which the Inspector shall be the judge), the owner may reject and replace at the cost of the contractor the whole or any portion of the work as the case may be, which is defective or fails to fulfil the requirement or the contract. Such replacement shall be

carried out by the Owner within a reasonable time to the same specifications and under competitive conditions. The Contractor's full and extreme liability under this clause shall be satisfied by the payment to the owner, of the extra cost, if any, of such replacement delivered and / or constructed as provided for in the original contract, such extra cost being the ascertained difference between the price paid by the Owner, under the provisions above mentioned, for such replacement and the contract price for the work so replaced, and the repayment of any sum paid by the owner to the Contractor in respect of such defective work. Should the Owner not so replace the rejected work within reasonable time, the Contractor's full and extra liability under this clause shall be satisfied by the repaying of all money paid by the Owner to him in respect of such work.

11. TRIALS

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

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

12. DELIVERY

(a) Preparing for voyage and delivery

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

crew and all engines and other necessary and usual stores and equipment are to be provided for the delivery by the Contractor and all costs and charges of every description in connection with the delivery are to be borne by the Contractor and all dock, canal and harbour dues and charges are to be paid by him.

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

(b) Spare Parts

Manufacturers recommended spares for 500 hours operation to be supplied for major machineries and equipment without extra cost along with the delivery of the dredger. Accordingly, the cost of the same is to be included in the price bid which shall be part of the financial evaluation.

The list Spare parts for major machineries and equipment as in the technical specification clause no.1.9 & 7 for 2000 hrs operation as per the manufacturers recommendations is to be submitted with the cost, terms and condition if any for placement of supply order separately. The supply of the spare parts however shall be made along with the dredgers. The offer may be submitted along with the technical bids in a separate sealed cover which should reach on or before the opening of the technical bid. This cost will not be considered for financial evaluation.

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

(c) Provision as to Trials

As soon as the dredgers 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 dredgers have been damaged during the delivery and that all are in good working order and that the dredgers 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 at the cost of the contractor.

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

The said delivery and re-equipment of the dredgers 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 dredgers 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 dredgers by any means or from any cause either during the delivery or before acceptance by the Owner then and in any such case the Contractor shall at his own expenses forthwith make good such loss subject in the case of total of constructive total loss to the provision of this contract.

(e) As to acceptance of delivery

When and as soon as the dredgers 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 dredgers shall be delivered to the representative of Owner who shall thereupon give to the Contractor or to such other persons who may be appointed by the contractor to receive the certificates of such delivery and of the date thereof and the granting of such delivery and of the date thereof and the granting of such certificates shall along be evidence of the acceptance by the owner of the delivery and of the date thereof.

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

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

(g) Penalty for deficiency in performance of the dredgers

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

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

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

If the deficiency in actual speed of the dredger upon said trial runs, is more than 0.5 knot below the guaranteed speed as provided herein above, and the builder is not able to rectify even by an extension of the delivery period, then the owner at his option may reject the dredger and rescind this contract or may accept the dredgers at a reduction in the price as may be agreed between the parties.

(h) Penalty for deficiency in draft of the dredger

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

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

Up to 25 mm of draft (1.225 m draft): **5% of the basic cost of the dredger.**

Up to 50mm of draft (1.250 m draft): **10% of the basic cost of the dredger.**

If the actual draft of the dredger is more than 1.250 m and builder is not able to rectify even by an extension of delivery period, then the owner at his option may reject the dredger and rescind the contract or may accept the dredger at a reduction of the price as may be agreed between the parties.

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

The contractor shall at all times during the progress of the construction and installation of equipment and machineries of the dredgers and subject to the limits of his control in the matter of labour employment and sufficient number of skilled workmen and labourers with necessary overlooks and proceed with the works hereby agreed to be executed (hereinafter referred to as the "workers with such despatch as in the opinion of the Owner or Inspecting Owner or Officer shall be necessary in order to secure the due completion of the dredgers 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 dredgers 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 dredgers within the limit by this Contract or their liability in respect thereof.

14. Defect Liability

In the event of any defect being discovered in any part of the dredgers, the machineries or equipments or fittings (which is not attributable to fair wear and tear of the dredgers nor to improper management on the part of the official staff of the dredgers during a period of 12 calendar months from the date of the delivery certificate, the Contractor shall supply to Owner or their representative at the specified destination new parts to replace any that may be proved to have been so defective or shall pay to Authority such sum as it would cost the Contractor to supply such parts for replacement from the Contractors works.' The cost of receiving any such defective parts and or fitting such parts in replacement thereof shall be borne by the Contractor or be adjusted as liquidated damages from the security deposits/payment of last instalment of the contract price to such amount as it would in the opinion of the Owner have cost the contractor if the removing and replacing had been done at their works. The contractor shall also be entitled to have any workmanship or material claimed to be defective inspected by a representative to be appointed by them for that purpose or should the Contractor so require, Owner shall be bound to consign to the Contractor at his works in and at the Contractors expenses the parts claimed by the Owner to be defective so that the contractor may have an opportunity of satisfying himself as to the defect complained of and also be in position to operate his relief if any against any sub-contractor in respect of such defective parts.

15. Registration of Vessels

The Contractor shall give all such builders and other certificates and documents and do such other acts and things as may be necessary or proper on his part for the

registration of the dredgers 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 dredgers 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 dredgers to the specified destination shall be paid by the Contractor or may be deducted from the money payable to him under this contract and he shall indemnify the Owner, the representative and the said agent respectively there from and from all claims, actions, suits and proceeding and all costs, charges and expenses in respect thereof.

16. Insurance

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

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 dredgers 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 dredgers shall not be delivered to and accepted by the Owner during the term of such policies) renew and said insurance and pay and continue to pay all premium which shall become payable in respect of such insurance and within seven days from the date when such renewed insurance is effected or premium paid shall deliver to the Owner the policy or policies thereof and the receipts for such premium PROVIDED ALWAYS that in case of default by the Contractor to keep up the said insurance or to effect any such renewal insurance as aforesaid then the Owner if they shall think fit shall be at liberty to do so and thereupon the Contractor shall repay the owner the amount of the premium paid by them or the Owner shall be at liberty at his option to deduct the amount thereof from any sums payable to the Contractor under this contract PROVIDED ALSO that nothing wherein contained nor anything done or omitted to be done by the Owner in pursuance hereof shall be deemed to release the Contractor from diminish or affect his obligation to keep the dredgers 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 dredgers 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 dredgers are covered against War Risks the premium on the account shall be payable by Owner.

(SECTION-V)

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION FOR A CUTTER SUCTION DREDGER

1. GENERAL

1.1. GENERAL PROVISIONS

The purpose of this Specification is to outline the conditions and functional requirements for the construction and delivery of cutter suction dredger (hereinafter called the "Dredger" or "Vessel").

The Dredger shall be used for service on NW-1 (the river Ganga) and NW-2 (the river Brahmaputra) in India throughout the year and shall be designed, constructed, equipped, completed and delivered in conformity with this Specification. Anything not described or left out of this Specification, but is considered as normal and necessary for the intended service, is to be supplied and fitted without extra charge.

1. 2. DESIGN CONDITIONS _AND BASIC REQUIREMENTS

The Dredger to be designed for dredging loose to medium packed sand, silt, sediment & mixture of both at a water depth between 1 and 6 m with a maximum water capacity of at least 2600 cub.m/hr with 20% concentration of solids at 1.3 t/cub.m density suitable for a 500 m horizontal transport of mixture by one suction/ pressure pump.

1.2.1. 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.

1.2.2. Basic requirements

The following basic requirements apply to the Dredger:

a) The Dredger 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 1.2 m for the Dredger in transport condition with the cutter ladder above water and with 50% stores (fuel and freshwater) on board.

c) The Dredger to be able to dredge a channel upto a maximum depth of 6 m below water level and dredge a channel with a width of at least 30 mtrs for a dredging depth at 3 mtrs by one swing at 30 degrees on either side of the centre line.

d) Tank capacities for fuel- and freshwater to be suitable for at least 350 operating hours at 80% of maximum continuous rating of engines.

e) The Dredger to be designed with one suction/pressure pump suitable for transporting the mixture via a 300 m floating pipeline and an additional 200 m fixed pipeline to the shore with a horizontal discharge at a height of 4 m above water level (assuming a spoil density of 1.30 ton/cub.m and a mixture capacity of at least 2600 cub.m/hour).

f) The dredging installation also to be capable for jetting the mixture directly overboard via a large nozzle with a throwing distance adjustable up to at least 80 m aside the Dredger to both sides (assuming a spoil density of 1.30 ton/cub.m and a mixture capacity of at least 2600 cub.m/ hour)

g) The dredger shall be designed and built in accordance with the requirement of the rules and regulations of any classifications society being a member of IACS (International Association of classification society) for operation in Inland Waterways of India. **Notation will be '+IWT +IY, Dredger, Zone 3' of Inland Vessels. The dredger shall be registered with IWT Directorate, Govt of West Bengal, as per the provisions of I.V. Act of 1917.**

h) All materials, equipment and machinery required for the construction of the Dredger shall be of high quality and suitable for the 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 Inspecting Authority..

i) For passing bridges the maximum height of the Dredger above waterline to be less than 6.0 m (Dredger in transport condition).

j) Special measures to be taken to protect the equipment and engines against the effects of sand-dust storms.

1. 3. DESCRIPTION OF DREDGER

The Dredger will be a non-propelled cutter suction dredger suitable for dredging operations in protected (inland) waters, such as NW-1 (the river Ganga) and NW-2

(the river Brahmaputra) in India. The pontoon/pontoons will be constructed of steel and the Dredge machineries & equipment of standard & good performance from reputed manufactures are to be installed. The hull of the dredger shall be of multi pontoons or single pontoon built of ship building quality steel and shall be classified as non-propelled dredger for Inland Dredging.

The general lay-out will be such that the pontoon can carry the complete dredging installation with other necessary equipment and 30 tons of stores, fuel and fresh water at a maximum draught of 1.2 m.

The main installations are:

- cutter ladder with cutter and cutter drive
- ladder hoisting system with gantry and winch
- dredger swing system with two side winches
- suction and discharge installation with one dredge pump and drive.
- Auxiliary engine(s) with auxiliaries
- Hydraulic system with power unit
- Spud system with spud carrier, two spuds and hoisting arrangements etc.
- operating cabin
- deck crane
- floating pipe lines.

The principal dimensions and characteristics are as follows: -

- length of pontoon	30.0 m approx.
- length overall with ladder raised	40.00 m approx.
- breadth moulded	9.5 m
- depth at side	2.3 mt approx.
- maximum draught (with 30 tons stores)	1.2 mtr
- Maximum dredging depth	6.0 m
- Inside diameter of suction pipe	500 mm
- Inside diameter of discharge line	450 mm
- Dredge pump drive	1050 HP- 1150 HP
- Auxiliary engine no. 1 (hydraulic power unit)	440 hp
- auxiliary engine no. 2	150 hp approx.
- cutter drive (hydraulic)	150-170 HP
- Cutter Speed	max. 35 r.p.m.
- fuel capacity	at least 80 m3
- freshwater tank capacity	at least 4000 1tr.
- Capacity	capacity of at least 2600 cub.m/hr with 20% concentration of solids at 1.3 t/cub.m density

The pontoon will be subdivided by watertight transverse and longitudinal bulkheads into the following compartments:

: two ballast water tanks on either side of the spud carrier well
: two stores
: machinery space with dredge pump and four fuel tanks along the sides
: two stores on either side of the ladder well.

The accommodation and operator's control cabin will be built on deck with a width of about 4.3 m. The accommodation will have a day time crew arrangement, and a double berth.

At the forward end of the pontoon a hoisting gantry mounted on heavy pins will be arranged (with a total height above water of less than 6.0 m).

Dredging equipment

For making the productional swing the Dredger is to be equipped with two hydraulically driven side winches, mounted on the main deck forward of the operator's control cabin. The dredged channel width to be at least 30 m (swing 2 x 30 degrees) for a dredging depth of 3 mtr.

Also the cutter will be hydraulically driven (two slow running motors) through a watertight gearbox. The cutter ladder hoisting winch will be Identical to both side winches.

For production and delivery of spoil one high pressure sand pump with a mixture capacity of at least 2600 m3/h to dredge fine sand from 6 m water depth and deliver the spoil via 500 m floating and fixed pipeline ashore to be installed.

The Dredger will also be capable to dredge with satisfactory production at a minimum depth of 1.0 meter. The diesel engine and hydraulic installations (winches + cutter drive) shall be remotely controlled from the operator's cabin, so that dredging operation can be controlled by a single person.

After disconnecting the floating/fixed discharge pipe line and mounting a jetting nozzle on board the mixture can be thrown on either side of the Dredger up to a distance of at least 80 m.

For positioning the Dredger is equipped with two tubular steel spuds in the aft ship, one spud acting as fixed positioning spud, the second spud mounted in a spud carrier, movable by a hydraulic cylinder to make steps in the forward direction of the Dredger.

A simple hoisting crane with a lifting capacity of at least 3 tons shall be installed.

1. 4. CLASSIFICATION, REGULATIONS AND CERTIFICATES

The Dredger shall be designed and built in accordance with the requirements of the rules and regulations of any classifications society being a member of IACS (International Association of classification society) for operation in Inland Waterways of India.

2. The Inland Vessel Act 1917 and as modified on December 7th, 1977 and other relevant regulations of the national authorities shall be applicable.

The Dredger shall be built under the inspection of the above mentioned Classification Societies and to be classified as a non-propelled cutter Dredger suitable for inland waterways:

The main diesel unit shall also be subject to the rules and regulations of the Class and certificates have to be supplied covering this engine. The survey of the Class regarding the machinery installation will be restricted to the manufacturing and delivery of the main diesel and to the bilge ballast system including the pumps in this system. ;

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

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

Other usual certificates including those (as 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 dredger shall be registered by the Owner with the IWT Directorate, West-Bengal at Kolkata as per Inland Vessel Act.

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

1.5 STABILITY, DRAUGHT AND TRIM

Within four weeks after signing the Contract the Contractor will prepare an accurate

weight calculation and determine the maximum loaded draught for the transport condition (with spuds and cutter ladder horizontal above water and 30 tons of stores).

In case of exceeding of the maximum allowable draught (1.20 m) the breadth of the Dredger to be increased until this basic requirement is fulfilled. These calculations to be approved by the Classification Society.

The Dredger shall have ample stability under all loading conditions. The initial GM shall not be less than 80 cm in the transport condition and at least 130 cm for all working conditions.

No permanent or fixed ballast shall be used.

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

A report regarding the above mentioned inclining test with final trim, draught and stability for various loading conditions shall be submitted for approval of the Inspecting Authority.

1.6. STANDARDS AND BUILDING METHODS

The construction and outfitting of the Dredger shall be carried out in accordance with good marine practice, using materials, outfit, machinery and equipment produced in compliance with internationally recognized marine standards.

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

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

1.7. DRAWINGS, SCHEMES, CALCULATIONS AND MANUALS

Prior to commencement of the design of the Dredger, the Contractor shall submit to the Class for approval a list of plans/drawings and calculations required for approval by the Class 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 Class three copies of the plans/ drawings of concerned construction prepared by him and all technical descriptions/specifications of machinery and equipment to be ordered.

The approval procedures as governed by the Contract.

Final drawings and manuals

The Contractor shall, before the date of the checking trials of the Dredger, submit to the Owner 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 operation and maintenance-, spare parts- and other instruction manuals in five (5) sets necessary for good operation, maintenance and repair of the Dredger.

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

- General Arrangement plan
- Bilge scheme
- Safety plan
- Electrical key diagram.
- Capacity 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.

1.8. PLANNING AND PROGRESS OF WORK

No construction or manufacture of any part of the Dredger 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 Class/Owner/Society.

Within 2 weeks after signing the Contract a program of the complete building period, fitting-out and testing of the Dredger, with dates of the delivery of the principal parts, will be furnished by the Contractor to the Class for approval. As soon as a delay occurs in the progress according to this program, the Contractor will inform the Owner immediately and will take all necessary measures to correct this delay, to the satisfaction of the Owner.

The launching of the Dredger will not take place before, in the opinion of the Survey Authority, the construction of the hull is advanced far enough, requirements with regard to testing of tanks are fulfilled and external and internal paints and bit mastics, specially the underwater parts are applied.

1.9 SPARE PARTS, INVENTORIES AND TOOLS

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

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

The parts shall be administered, packed, preserved properly.

1.10. 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 and dredging trials
d) checking and/or demonstration trials at the place of delivery.

in the presence of the representatives of the Owner , 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 owner 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 owner for approval.

The main items of the machinery, equipment, hydraulic components, winches, dredging equipment etc. to be tested with continuously recording measuring instruments.

The costs of these tests and trials are on account of the Contractor, including those for additional measuring devices and means.

If under tests or trials any part of the Dredger fails to fulfil adequately the specified requirements, the faulty part shall be altered, removed or replaced and the test shall be repeated at the Contractor's expense.

1.10.1 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 owner for approval.

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

1.10.2 **Installation trials**

When the Dredger is completely equipped to the satisfaction of both the owner and the Classification Society, the installation trials shall be carried out (at or near to the Contractor's shipyard). The Dredger with all installations, systems, equipment, dredging installations; winches, crane, piping systems, hydraulic installations, spud system, electric/electronic installation, ventilation, measuring systems etc. to be tested by the Contractor to prove their good working, capacities and characteristics, separately as well as, working simultaneously 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 complete series of tests for the dredging installation including capacity measurements of the dredge pump system (pumping river water) and determination of the pressure and throwing distance for the jetting system.

For testing this suction/discharge installation at the maximum required pressure some additional temporary measures to be arranged i.e. an adjustable (and calibrated) discharge device or equivalent to be mounted. The cost on these additional measuring devices and/or instruments are on account *of* the Contractor.

For special test requirements regarding engine installations and electrical installations to be carried out as indicated in the respective section.

1.10.3 **Dredging trials**

Before starting these trials all shore trials have to be completely finished. Dredging trials to be carried out with all dredging equipment in operation and dredging fine to medium sand. Testing *of* cutter drive, side wire winches and suction/discharge installation (with measurements *of* mixture density, velocity and pressures) to be carried out. The Contractor shall prepare a detailed program for these dredging trials, and submit this program to the owner for approval.

1.10.4.**Checking trials**

Shortly before and after the transport by shipment *of* the Dredger to the place of delivery the vessel has to be inspected in dry condition in the presence of owner's representative for examination *of* the underwater part of the pontoon, for cleaning, restoring the paint system and when applicable for applying the last coat *of* paint.

On delivery of the Dredger the Contractor shall perform a checking trial at a river water area near the site of delivery in the presence of the survey authority and the Owner. This demonstration to include 3 days *of* dredging trials.

1.11. **DELIVERY**

After the checking trials (at the site of delivery) and the approval of owner of these trials with reports etc. the Dredger to be handed over to the Owner in a proper and clean condition with at least 50% of Liquid stores on board (fuel, Lub oil and freshwater). The costs for transport, additional painting, checking trials and handing over and with the above-mentioned stores are borne by the Contractor. All relevant documents, certificates, tools, inventories, spare parts etc. are to be on board at the time of handing over.

2. **HULL STEELWORK**

The pontoon including deckhouse, cutter ladder and spud carriage shall be constructed of steel throughout. The scantlings of all structural members shall comply with the Rules and Regulations of the Classification Society. 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.
The Dredger shall have a single bottom construction and one continuous main deck.

Openings in hull and deck, discontinuities in way of ladder well and spud carriage well, heavy loaded parts under ladder gantry, winches, spuds and discharge line shall be compensated and/or reinforced by plating of increased thickness.

2.1.1. **Materials**

General

All materials used shall be of excellent quality. The Contractor must guarantee that only approved materials will be used in the construction of the Dredger.

If required by the Class, samples of materials to be submitted for approval.

If any material is used, which has defects, or which is not considered suitable for the

purpose intended, it must be replaced without loss of time and without compensation of cost for carrying out these replacements.

Rolled steel

Hull materials and all other rolled steel, to be tested as per 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 used in the construction, rust and mill scale must be removed by means of steel grit blasting according to approved Standard. Immediately after the steel grit blasting, one coat of approved shop primer with a thickness of approx. 20 micron to be applied as a temporary protection.

Cast steel

Steel castings shall be only from 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, sidelights 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 to Class requirements.

Ball and roller bearings

As far as possible ball and roller bearings should be of one make, to be approved by the OWNER (SKF or equal)

Bolts and nuts

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

Steel wire rope

All steel wires to be of approved make, type and quality and to be delivered with the required certificates. Tensile strength of the wires to be at least 180-199 kg/mm2 and of suitable construction, depending on function. All wires are to be galvanized.

Wood

All the wood for linings, floors, decks, furniture and other carpenter's work to be of excellent quality. The wood submitted for approval must be sawn, dry and reasonably

free from sap, laburnum, knots, cracks and other defects.

The layers of plywood shall not be more than 3 mm thick. These layers to be dried, glued for tropical conditions with waterproof glue and to be heated during pressing. All wood to be impregnated against rot and insects.

Grease nipples

All grease nipples used throughout on the Dredger to be of one type and size and to be fixed in consultation with the IACS

2.1.2 **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. Plates and rolled sections to be cleaned and preserved.
A drawing of the constructional sub-division in sections and panels is to be submitted by the Contractor for approval.

Holes in steel construction for trunk passages and pipes or other passing, to be carried out in concert with the survey authority and the Class.

In way of watertight doors in bulkheads and in way of manholes, adequate additional stiffening to be provided.

All tanks, watertight bulkheads and other constructions to be pressure- or hose-tested after the work has been finished, in accordance with the requirements of the Class. A tank-testing plan to be timely submitted for approval.
Before pressure-testing or hose-testing of any compartment or construction is carried out, it has to be offered for survey to the Class.

During the building, the correct line of the keel and the bottom sides are to be inspected regularly of determine any deformation of the hull, as a consequence of welding .

Care should be taken that all parts of the hull remain accessible and where this is not possible, these places are to be coated with hot bitumastic and/or to be filled-up with cement.

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 is 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. 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 and sequence for welding specific parts or respective steps in the process of assembling the structural blocks of the hull shall be selected in consultation with the surveyor of the Classification Society.

A complete welding list to be submitted for approval to the Class.
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. Generally every part of the construction to be connected with continuous welds. Intermittent welding only to be performed with special permission of the Class.

During the welding the relevant construction shall be dry.

Heavy parts of spuds and spud guides, cutter ladder gantry etc. to be preheated and annealed, accordance with the instructions of the Class

The welding to be performed with 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 welds by X-ray or similar methods to be carried out to the satisfaction of the class if considered necessary by 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 60 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 standards.

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.

2.1.4. **Painting and galvanizing**

Painting

The painting systems for hull, dredging equipment, floating discharge line are described separately..

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 firm 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 influences of climate, such as open railings, sheaves, stanchions, grates, parts of the rigging, small wrought pieces etc., to be galvanized.

2.2 **PONTOON**

2.2.1. **Dimensions, lay-out and watertight subdivision**

The pontoon shall be designed to give the necessary structural strength to plating and stiffeners to meet the requirements for dredging operations.
Dimensions of plantings and stiffeners shall be according the Class requirements, if not indicated otherwise in these Specifications.
The pontoon will be constructed with a rectangular shape throughout.

On centerline forward a ladder well is part of the pontoon, aft a spud carriage well is incorporated.

The pontoon shall have following compartments:

Ballast water tank	P&S
Stores	P&S
Engine Room	
Fuel Oil Tank	P&S
Dry space	P&S
Fuel Oil Tank	P&S
Stores	P&S

All compartments shall be separated by watertight bulkheads.

Part bulkheads: shall be interconnected by means of heavy web frames.

In general the pontoon shall be built according the transverse framing system with floors and longitudinal girders in the sides.

Pillars to be placed at the web frames in the engine-room.

Where the suction line enters the pontoon a recess shall be constructed at-least 25 mm plate thickness efficiently stiffened to take the loads from the suction tube.

2.2.2. Bottom construction

'The bottom plating shall be constructed with a plate thickness of at-least 9 mm.

In way of the corners of ladder well, spud well and sea-inlet openings the plate thickness however shall be atleast12 mm.

The bottom construction shall be made with transverse floors at every frame. Frame spacing 500 mm.

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 and dredge pump.

In each compartment next to the ladder well a longitudinal girder shall be fitted in line with the longitudinal bulkheads of the fuel oil bunkers. Aft of these longitudinal bulkheads as far as practicable also longitudinal girders to be fitted.

Care to be taken that there are sufficient openings in number and size for easy flow of water of the suction lines of the ballast and bilge systems. In tanks air holes to be provided for a good escape of air between the structural members.

To avoid that the spoil entering into the full bottom surface of the engine-room, when opening the dredge pump, a compartment to be made in this space, surrounded by watertight floors and girders, providing a compartment of sufficient capacity to contain the amount of spoil in the pump and the suction line.

2.2.3. Side shell plating and framing

The thickness of the shell plating in the sides shall be atleast 7 mm from bottom till 1700 mm above base. A sheer strake shall be fitted from 1800 mm till 2300 mm above base, with a thickness of atlease 14 mm.

The end bulkheads fore and aft shall be constructed of atleast 7 mm plating throughout.

The plating of the ladder well shall be of atleast 7 mm plate thickness over the full height. In way of the cutter ladder hinges plates of increased thickness to be fitted.
The end bulkhead in the ladder well shall be made of atleast 14 mm plating.

The spud carriage well in general shall be constructed with atleast 7 mm plating where necessary for support of the spud carriage, plating of increased thickness of shall be fitted.

Web frames shall be provided in the engine-room and other necessary places, such as in way of the main gantry.

2.2.4**. Deckplating and beams**

The main deck shall be built without sheer and with a slope of 150 mm from 1500 mm till full breadth.
The deck suitable for a deck load of 3 ton/m2.

The thickness of the deck plating shall in general be atleast 7 mm.

The main deck shall be stiffened according to the transverse system with beams every 500 mm distance. The beams shall be supported by longitudinal bulkheads and girders, which are placed in line with the bottom longitudinal.

Plates with a thickness of atleast 14 mm to be inserted at the corners of the cutter ladder well, in way of the cutter ladder bearing recesses, at the corners of the openings in deck in the engine- and pump-room on corners of the hatch opening, and other deck openings. Openings with well rounded corners, with a minimum radius of 100 mm.

Inserted plates with a thickness of atleast 14 mm to be fitted under winch foundations, sheaves, bollard and in way of gantry and spud supports.

2.2.5 **Pillars and girders**

Girders shall be provided under the deck if required from the viewpoint of the design of the Dredger. Reinforcement shall be fitted in combination with, and at the same positions of the web frames provided in the engine- room and other necessary places. Pillars shall be arranged such as to minimize obstruction to passage inside the engine room.

Special care shall be taken in provision of pillars and girders to minimize the influence of engine vibration to the operating cabin above.

In way of winch foundations, gantry and spud-supports and other places where heavy loads occur, extra partial web frames and/or girders to be fitted, if necessary supported by tubular pillars as will be required.

2.2.6**. Bulkheads**

Watertight and/or oil tight bulkheads shall be constructed in required positions:

The construction of the bulkheads shall be according to the Class requirements, with at least a thickness of 7 mm. All bulkheads shall be stiffened vertically and where necessary supported by horizontal stringers.
Where the bulkheads from part of the shell plating, i.e. in way of sea-inlet chests etc. the thickness of the plating should be at least the same as the adjacent shell plating.

In way of suction pipe passage, shafts of dredge pumps, spud gantry foundations etc.

inserted plates of increased thickness, as will be required by the Class to be provided.

All bulkheads framing boundaries of tank compartments, are to be pressure tested to ascertain tightness.

2.2.7 **Foundations**

In the engine-room strong foundations shall be constructed for the diesel dredge pump unit and for the auxiliary diesel sets. These foundations are to be incorporated as much as possible in the bottom construction.

In way of gearbox, thrust block, dredge pump bearing and dredge pump the foundation shall be carefully designed with adequate local stiffening and in such a way that continuity of strength is maintained.

Top plates of foundations shall be supported by brackets on every frame. Top plates to be placed with a slope of 1% for easy fitting of filling pieces.

Top plates shall be machined in way of filling pieces. In way of bolt heads the underside of the top plates shall be machined.

Except for the dredge pump, fillings for machinery may be carried out with Philadelphia Resin or equivalent.

Foundations for deck machinery, winches etc. shall be made with top plates welded on coamings and supported by a sufficient number of brackets. Where necessary additional supports under deck shall be provided.

2.2.8. **Box cooler chests**

In both compartments of the stores aft SB and PS, chests for box coolers to be integrated in the hull construction.

Plating of increased thickness shall be inserted in way of these boxes in order to compensate the section.

At sufficient height above the bottom a horizontal bulkhead to be provided. This bulkhead with suitable comings on which the box coolers are to be mounted.

In bottom and side shell well rounded openings with removable galvanized perforated grids to be provided for circulation of outside water. Openings to be compensated by inserting plating of increased thickness.

The box cooling chests at the inside to be treated (painted) as for outside shell.

2.2.9. **Hull openings**

Outboard water inlet chests

For ballast, dredge pump flushing, fire-fighting and deck wash facilities two outboard water inlet chests shall be arranged in the storage spaces aft of the engine-room. The chests are placed next to the spud carriage well and shall be provided with an opening in the well plating. Plating around the opening to be compensated with inserted plating of increased thickness.

The openings shall be provided with galvanized gratings. Gratings to be removable and fitted with secured stainless steel bolts.

Air pipes shall be fitted on each chest.

Both chests shall be connected via cast steel slide valves and a coarse filter to a cross-over pipe for the various consumers.

2.2.10. Spud carrier guides

For guiding of the spud carrier wheels heavy guiding constructions shall be provided on top of the longitudinal spud well bulkheads.

The spud carrier shall be provided with vertical and horizontal wheels.

The spud carrier guides shall consist of a V-shaped construction of heavy plating, of which the lower plate is part of the deck plating and serves as the guiding for both vertical and horizontal wheels.

The upper guiding of the vertical wheels shall be placed 420 mm higher. The whole U-shape shall be supported by heavy brackets bordered with flat bar and placed at every frame.

Inside of the pontoon also heavy brackets with face plates shall be fitted over the full length of the spud well.

Care shall be taken that the distance between the guiding plates for the horizontal wheels is constant. The deviation shall be maximum 10 mm. The clearance on the wheels shall be maximum 10 mm.

2.2.11.**Spud well door**

For protection of the spud well from floating particles a spud well door shall be provided. Height of the door shall be such that the underside in any loading condition is below water level.

The door shall be constructed with heavy hinges on both sides. The hinge pins shall

be of sufficient length to support the door in upper and lower hinge and shall be easy removable when the spud has to be lowered.

The door of single plate construction with stiffeners inside.

2.3. ACCOMMODATION AND CONTROL CABIN

2.3.1. Accommodation

A combined day/watchmen's accommodation shall be placed on main deck .

The deckhouse shall be provided with a cabin, a separate lavatory and a cable trunk.

The deckhouse shall be built of atleast 5 mm plating and reinforced with stiffeners of flatbar. Where necessary web frames and girders of angle bars shall be fitted.

The height of the deckhouse shall be 2500 mm, except in way of the control cabin where the floor is at 2000 mm above main deck

The cable trunk shall be provided with a bolted flush hatch at the outside.

2.3.2. Control cabin

On top of the accommodation the control cabin shall be erected.

The control cabin shall be built of atleast 5 mm plating and strengthened with flat bar stiffeners.

A steel sun awning with a breadth of 250 mm shall be fitted all around. The awning shall be of 3 mm plating and bordered with a galvanized steel pipe of 30 x 25 mm diameter.

All around windows shall be provided for an unobstructed view over the Dredger. Entrance to the control cabin shall have a wooden door.

A steel platform with steel stair shall be provided on the side of the accommodation. Platform shall be constructed of galvanized steel angle bars with 5 mm steel chequered plates fitted with M 8 flush stainless steel tap screws.

2.3.3. Engine-room entrance

The engine-room entrance shall be built of 5mm steel plate and provided with a steel door. The entrance will also serve as a support for the lowered spud pole.

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. Climbing steps to be provided for access and maintenance.

All tanks shall be preserved according to the requirements of class.

2.4.2. Manholes and hatches

Manholes

On main deck the fuel oil tanks, ballast water tanks and void spaces in the sides shall be provided with manhole covers.

The freshwater tank and the sewage tank shall be provided with manhole covers in the tank tops.

The manhole covers for fuel oil day tank, lube oil storage tank and dirty oil tank shall be placed in the longitudinal bulkhead.

As a rule every compartment shall be provided with two manhole covers. The covers shall be placed in such a way that with opened covers a good ventilation and also a good accessibility is obtained.

Smaller tanks such as fuel oil daily service tank, lube oil storage tanks and dirty oil tank may be provided with one cover.

The covers shall have dimensions of 600 x 400 mm. Thickness of the cover shall be 12 mm and fixed on a welded coming ring with tap bolts and nuts of stainless steel. Two thread holes for press bolts shall be provided in each cover. Vertical covers with handgrips to be provided.

All covers shall be provided with oil resistant packing of the O-ring type. An a-ring chamber shall be machined in the coming ring.

Hatches

The following hatches shall be provided:

Above the main engine above the dredge pump for entrance to the stores aft for entrance to the stores fore, the hatches for engine and dredge pump shall be provided with a coaming of 450 mm height. Other hatches shall be fitted with a coaming of 150 mm.

All hatches to be made watertight execution with rubber seal, hinged clamping bolts in stainless steel and with brass butterfly nuts. Plate thickness shall be at least 7 mm.

The hatch above the main engines shall be provided with smaller flaps for maintenance purposes.

The entrance hatches to the stores shall be of the hinged type with two adjustable hinges and a device for keeping in open position.

The hatches on engine-room and dredge pump shall be provided with hoisting eyes for removing by crane.

2.4.3. Ladders, stairs and railings

Ladders

Ladders shall be placed in way of each manhole, under the entrance hatches to the stores, on the ladder gantry and along the control cabin.

All ladders shall be removable type. Fixing lugs to be welded to stiffeners or girders, not on plating.

Ladders to be hot galvanized, except for fuel oil tanks. Ladders shall have square rungs and a breadth of 300 mm.

Stairs

A removable steel stair shall be placed on the deckhouse for access to the control cabin.

Further a steel stair to be placed in the engine-room entrance. The stair shall be constructed with beams of bulb flat bar 180x7 mm. Steps of non-slip construction and at the underside a dust catcher of 1.5 mm galvanized plating to be provided.

The complete stair to be hot galvanized after welding and placed in position with bolts on eye plates and shall be removable.

Railings

Along the sides of the pontoon, including the ladder well, railings shall be placed. Further railings to be placed where required. Height of the railings shall be1000 mm. Stanchions shall be of flat bar 65x16 mm. Top rail shall be of pipe 48.3x2.6 mm diameter and one intermediate stainless steel wire of 10 mm. diameter shall be fitted in the sections between the bollards. Top rail and stanchions in galvanized. In the sides a foot rail of 25 mm solid bar, placed on distance pieces at a height of 100 mm above deck.

2.4.4. Steel door

One steel splash-watertight door shall be provided on the engine-room entrance. The door shall have a free passage of 1800x700 mm and a threshold of 250 mm.

Two adjustable hinges with grease nipples, two 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 he provided. Padlock also to be delivered.

2.4.5. Bollards

Bollards shall be placed in the sides of the pontoon. They shall be placed generally as indicated on the General Arrangement plan, including:
2 double bollards aft (PS and SB)
2 double bollards fore (PS and SB)
3 single bollards (PS and SB).

The distances between the 3 single bollards shall be kept evenly.

Bollards shall be constructed of thick-walled pipe 3l8x278 mm diameter, placed in heavy foundations with a height of about 200 mm. Total height of the bollard shall be 500 mm.

Bollard pins shall be provided of 30 mm solid round bar.

Deck in way of bollards shall be strengthened with inserting 14 mm plating, and internal stiffeners under deck.

2.4.6 Name and draught marks

The name of the Dredger shall be placed on PS and SB fore. The name shall be cut of steel plate letters and/or figure, which will be welded on a steel plate board. The board shall be fitted to the railing and removable. Letters and board shall be 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_.

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

2.4.7. Towing/pushing arrangement

Against the stern next to the spud carriage well a towing/ pushing arrangement shall be provided.

The lay-out of this arrangement is indicated on the General Arrangement plan.

The construction shall be done over the full height of stern plating.

In way of the constructions the stern plating thickness to be increased to atleast 14 mm.
Internal strengthening shall be provided in the water ballast tanks and combined with

reinforcements for spud and swivel bend.

3. EQUIPMENT AND OUTFIT

3.1. MOORING EQUIPMENT

For moving the dredger from one location to other and for mooring, the following equipment shall be delivered:

- Four mooring ropes with a length of 60 m each. Ropes of manilla or synthetic, with a breaking strength according Class, minimum 30 mm diameter.
- One towline of 60 m length and breaking strength of 12 ton.

When in towing/transport condition one of the swing wire anchors shall be stored in such a way that it is ready for immediate use. Therefore, an anchor table shall be constructed at the fore ship, complete with cable clamp.

3.2 VENTILATION

Natural ventilation

All spaces and compartments which are not connected to a mechanical ventilation system shall be provided with natural supply and exhaust ventilators.

Fuel oil tanks, water ballast tanks and freshwater tanks shall be provided with ventilation means as required.

Other spaces as specified hereafter:

- For stores aft, each store to be provided with two 150 mm diameter goosenecks.
- For dry spaces_ each space to be provided with two 100 mm goosenecks.
- For stores fore, each store to be provided two 150 mm diameter goosenecks.
- For control cabin two 150 mm diameter mushroom ventilators with 'closing device to be provided.
- For accommodation two 300 mm diameter mushroom ventilator to be provided.
- For lavatory one 80 mm diameter torpedo fan on top deck to be provided.

All goosenecks shall be galvanized after welding and provided with non-corrosive wire gauze.

In each space one gooseneck shall be lengthened upto 200 mm above floor level.

Where necessary fire-isolating flaps to be fitted at the openings. In general the ventilators to be placed in way of the railings.

Mechanical ventilation

The accommodation shall be provided with a fixed mounted oscillating fan. The fan

shall have a capacity of at least 1600 m3/hr, two speeds and oscillating 85 degrees.

Air-conditioning

On the accommodation deck by the side of the control cabin an air-conditioning unit shall be installed serving the control cabin. Capacity of the unit shall be such as to maintain a temperature of 8° Celsius below outside air temperature (in case of outside air temperatures above 32° Celsius).

3.3 ACCOMMODATION AND CONTROL CABIN

3.3.1. General

An accommodation deckhouse with day/watchmen's cabins and lavatory shall be installed.

On top of this deckhouse a control cabin shall be placed as shown in the General Arrangement plan,

The day/watchmen's cabin shall be made with floor, lining, ceiling, insulation door and fixed lights.

The control cabin shall be made with floor, lining, ceiling, insulation, door and windows.

The lavatory shall have a tiled floor.
Further the following equipment shall be provided in the day/watchmen's cabin

- one table with hard plastic top
- one settee
- two chair
- two built-in bunks
- one dresser with sink and cupboard
- one coldwater tap
- one electric cooking plate
- one electric coffeemaker
- three lockers
- one clock
- two double coat hooks
- two fixed ashtrays
- one radio shelf
- one key locker

In the control cabin

- one set of roller blinds
- one portable fire extinguisher
- one VHF-set (on ceiling)

- one clock
- one compass
- two double coat hooks
- two operator's desks
- one low dredging process panel
- one operator's chair
- one built-in chart table
- one chart drawer in above
- two drawers in above
- two window wipers.

In the lavatory

- one shower/bath
- one toilet
- one washbasin with one cold water tap

3.3.2. Floors, covering, lining, ceiling and insulation

Floors

In the day/watchmen's 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 of at least 30 mm.
Permissible pressure load at least 80 kg/cm2. Boundary finishing to be watertight. In the control cabin 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 shall have sloping to the drain well.

Covering

The day/watchmen's cabin shall be provided with a vinyl floor covering. On the under floor in the control cabin a rubber floor covering shall be provided.

The covering shall be anti-slip, removable with close undersize and at least 25 mm thick.

Lining

The day/watchmen's cabin shall be lined completely. In the control cabin 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

Lining shall be fitted on first quality spruce grounds. The grounds to be impregnated against mould and insects.

Spaces between windows are not to be lined.

Ceiling

The day/watchmen's cabin and the control cabin 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 removable and fitted on first quality spruce grounds which shall be impregnated against mould and insects.

Insulation

Behind the linings and ceilings insulation consisting of a layer of 30 mm glass wool with a minimum weight of 30 kg/m3 shall be fitted.

The glass wool with a dampen fireproof 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.

3.3,3 **Furniture and Hardware**

Furniture

Furniture shall be of mahogany veneered plywood with mahogany framework. The top of the table shall be covered-with hard plastic laminate. The dresser with a stainless steel top with sink. Shall be provided.

A double berth shall be placed in the day/watchmen's cabin. Berth of mahogany veneered plywood with plywood bottoms and drawers under the lower berth. Berth to be provided with foam rubber mattresses. Dimensions 1900 x 850 mm.

The settee to be upholstered with foam rubber and cloth.

The chairs with steel frame and upholstered with foam rubber and cloth.

For the operator a swiveling chair with arm rests and adjustable in height shall be delivered.

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

The chartable in the control cabin with a height of 850 mm and the space between table top and deckhouse top shall be provided with one chart drawer and two smaller drawers.

3.3.4. **Desks and instruments**

At the front side of the control cabin the operators control desks shall be placed.

The desks shall contain all necessary instruments for control of engines and dredging process. Also the lighting panel to be incorporated in the desk.

The desks with sloping topplate shall be constructed of durable materials and first class furnished.

Switches for searchlight and window wiper shall be placed in the vicinity of the apparatus.

3.3.5. **Doors and windows**

Doors

The deckhouses shall be provided with three hard wooden doors. The doors shall be made of 50 mm teak and the control cabin door shall be provided with a fixed light in the upper part.

All doors shall be provided with three 10 mm draw bars.

Windows and lights

The control cabin shall be provided with windows all around. In the front two openable windows and in the aft one openable window shall be fitted. These windows hinged at the upper side and provided with gas-filled window openers. The fixed centerline front window shall be placed over the full height of the cabin.

All windows shall be fitted in brass frames and provided with panes
of at least 8 mm thickness, toughened quality. Height of the windows shall be at least

800 mm, for the door 600 mm.

Three fixed lights with brass frame and a diameter of 300 mm shall be fitted in the day/watchmen's cabin.

Two fixed lights with brass frame, having diameter of 200 mm and opaque glass shall be fitted in the lavatory.

One fixed light with brass frame and having diameter of 200 mm shall be fitted in the engine-room entrance door.

3.3.6. **Freshwater supply**

A freshwater hydrophore installation shall be placed in the engine-room

The following points shall be connected to the hydrophore:
- Drinking Water RO System
- sink in- day/watchmen's cabin
- showerbath - washbasin
- toilet (Asian type)
- separate tap in lavatory
- window wipers
- separate tap in engine-room

3.4. **SUN AWNINGS**

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

The awning shall be of durable first class marine awning heavy cloth in white colour.

The supports shall be of galvanized steel with stainless steel bolts.
Height of the awning shall be about 2600 mm.

3.5. **STORES**

Stores shall be provided for the following :
-wire and rope store
-general store
-dredging stores

All stores shall be provided with a 38 mm wooden floor of first class fir mounted directly on the steel floors.
The wire and rope store shall be equipped with two hand operated cable drums fitted on the floor.

Further a small work bench with vice, racks for shackles, hooks for tackles and ropes

shall be fitted.

The general store shall be equipped with 10 sqm racks with fiddles and a double door locker of steel plate.

The dredging stores shall be equipped with racks steel locker for bolts etc., rods and hooks and a work bench with vice.

3.6 MAST

One aluminum mast shall be installed on the deckhouse deck. The mast shall be of tiltable type and equipped with a yard on each end of which two electric dredging lights shall be mounted.

Further an electric top light shall be fitted and necessary provisions to be made for hoisting of signaling shapes and for flags.

Lowering arrangement of the mast with help of a small hand winch shall be such that lamps are reachable from main deck. The mast stayed is be fitted.

3.7 NAVIGATONAL EQUIPMENT

The following navigational equipment shall be provided and installed:
- one VHF-set in control cabin
- one searchlight on top of control cabin
- one electric horn under awning of control cabin.

3.8 CREWBOAT

For communications and crew transport a small FRP crew boat with 25 HP outboard motor shall be provided. Boat to be stored on a cradle on main deck within the reach of the deck crane.

3.9 DECK CRANE

On main deck a deck crane having capacity 3 tons at an outreach of abt 6 metres with fixed arm shall be provided. Capacity 3 tons at an outreach of abt 6 metres. Height of the arm about 4m above main deck. Hoisting height shall be about 8 m.

The crane column shall be bolted to a deck foundation. The foundation shall be constructed with vertical flat and heavy top strip with knees between the bolt holes. Under deck extra stiffeners shall be provided.

In way of arm a roller bearing shall be fitted in the column for 360 degree swing. The arm shall have a section suitable for mounting he arm with a section suitable for a 3 tons trolley. The trolley shall be provided with a 3 tonne tackle. Trolley and tackle

shall be hand-operated.

For handling and securing the crane necessary eye plates for fixing of handling ropes shall be provided at the end of the arm and at convenient places on deck or control cabin.

3.10. LIFE-SAVING EQUIPMENT

Life-saving equipment shall be delivered according to Class and national Indian authorities sufficient for 5 persons.
The equipment shall be stored and fitted at convenient places in at least the following numbers:
-1 Life boat
- 5 life jackets stowed in a g.r.p. box placed.
- 1 safety hammer in control cabin
- 4 round shaped life-buoys, two with a floating line of 30 m, fitted on the control cabin and two fitted on aft ship
- 1 first-aid kid with instruction book.

3.11 FIRE-FIGHTING EQUIPMENT

Fire fighting equipment is accordance with the requirement of relevant rules of inland vessels regulating authority shall be supplied and installed on board. However the following item shall be provided on board as minimum
- one Halon system for engine-room as required by the Authorities

- two deck wash/fire-fighting hoses with brass store coupling and nozzles each with a length of 15m and stored on a hose drum one portable extinguisher, 7 kg dry powder in day/ watchmen's cabin
- one portable extinguisher, 7 kg dry powder in control cabin
- one portable extinguisher, 4.5 kg CO_2 dry powder in engine-room

3.12 PAINTING

3.12.1 Initial Surface Preparation

Before processing all steel places and sections to be used shall be short or grid blasted 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, aluminium, while metal, zinc, stainless steel, rubber and wooden items shall be cleaned and pre-treated by an approved method according the requirements of the class 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 colours for identification. No weather exposed painting shall be carried out in adverse weather condition.

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

The specified film thickness is meant as dry thickness 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 coat so that adequate protection has been obtained.

3.12.3 Code List

The following types of paint shall be applied :

Coating	Code	Dry Film thickness
Undercode	A	50 microns
Tar Epoxy	B	125 microns
Sealer	C	50 microns
Longlife anti-fouling	D	75 microns
Finishing paint	E	50 microns
Primer	F	90 microns
Deck Paint	G	35 microns
Bitumin paint	H	90 microns
Cold Bitumin	I	150 microns
Cold Bitumin (test/odourless)	J	150 microns
Varnish	K	30 microns

3.12.4 Paint List

Generally, the various constructions shall be treated as follows :

	Consecutive Coats
Hull below waterline	A, 2xB, C, 2xD
Hull above waterline	A, 2xB, E
Cutter Ladder in and outside	A, 2xB, E
Exposed deck	F, G

Deckhouse, gantry, spud carriage and dredgeline	F,A,G
Deckhouse inside	F,A,G
Engine room inside	E, E,
Steel behind paneling	2 x H
Ballastwater tank	2 x I
Freshwater tank	2 x J
Stores	F, E
Void spaces	H

Fuel oil tanks, loose tanks for lub.oil , hydraulic oil to
Be treated with oil destined for.

Colours shall be chosen in concert with owner

Wooden floors in stores	F,A,E
Hard Wooden parts	4 x K

4. MACHINERY INSTALLATION

4.1. GENERAL

4.1.1. General requirements

The installations shall be delivered in a complete and well operational condition.

The installations shall be arranged in such a way, that good accessibility to all the machinery installed in the engine room for control and maintenance is assured.

Further they shall 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° C
- Maximum outboard water" temperature,	320 C
- Relative humidity (average)	90%

4.1.2. Drawings and calculations

Among others, following calculations to be submitted to the owner for approval:

- Calculations for torsional critical of shafts to show that the entire installation is free from not permitted critical speeds within a range between 85% of minimum and 115% of maximum operating speed.
- Calculations of the capacities, back pressures, flows, heat transfers etc. where applicable.

4.1.3. **Tests and trials**

Important machinery such as diesel engines and alternators, gearboxes, winches etc. shall be tested at the workshop of the manufacturer as one unit as far as possible. Copies of test reports shall be submitted to the owner.

For the main diesel engine the shop-test to consist of 4 hours continuous running at 100% load, followed by runs at 85% and 70% of rated speed with 100% torque, each for one hour.

Further runs at 110% load, 75% load, 50% load and 25% load, each for 30 minutes, and also a run on no load for half an hour shall be done. Additionally safety functions and governing tests shall be performed.

The auxiliary engine and harbour engine tests to consist of 4 hours continuous running at 100% load and consecutively runs at 110% load, 75% load and 50% load, each for half an hour.

The fuel rack limitation will be set at 100% load for the dredge pump engine and at 110% load for the auxiliary and harbour engines.

The shop tests of the auxiliary and harbour diesel engines shall be performed together with the relevant alternator and under the ambient conditions for engine room and outboard water temperature.

After the shop tests have been accomplished, one of each type of engine shall be opened and one complete line (cylinder head with valves and valve gear, piston with rod and big end bearing) and a main bearing shall be dismounted for inspection, if considered necessary by the owner.

After the shore tests and dredging trials have been carried out, the inspections must be repeated.

4.2. **MAIN ENGINE INSTALLATION**

4.2.1. **Main diesel engine**

The main diesel engine shall be of the non-reversible supercharged marine type. The engine suitable for sudden load variations inherent to dredge pump drives as well as for variable speeds at full load torque, down till 70% of rated speed. This latter especially relating to the engine driven pumps.

The cooling circuit of the engine being entirely with freshwater, employing box coolers installed in the bilge keels.

The engine to have following main features:

Make	:	Caterpillar or equipment
Continuous service rating	:	not less than 1050 H.P
Rated speed	:	1200 rpm

Capacity depending on load requirements of all driven equipment.

The engine shall be equipped with at least:

- A main drive shaft with flywheel, an elastic, pneumatically operated, clutch several P.T.O. ‘s, a torsional vibration damper and a shaft extension.
- An exhaust system with water cooled manifold and a stain less steel expansion bellow.
- Air start equipment for a starting pressure of 30 bar.
- Charge air filter with silencer.
- A fuel system with built-on booster pump and a full flow duplex filter.
- A hydraulic/electronic governor for variable speed control by means of pneumatic speed setter.
- Local start/stop/speed control on engine site.
- Remote speed control and emergency stop in dredging desk.
- A lub. oil system with a deep oil sump, an engine driven pump, cooler, full flow duplex filter and. a hand-operated carter drain pump also acting as priming pump.
- A cooling water system designed for bilge or keel cooling and to consist of engine driven fresh cooling water pump, thermostatic controlled valve and an expansion tank.
- The cooling system with increased capacity for DP-gearbox cooling.
- Local instruments according to engine maker's standard.
- Electric transmitters for remote indication of engine speed, lub. oil pressure and fresh cooling water temperature.
- Electric indicators for mounting in dredging desk have to be delivered loose by the supplier of the engine and are to be mounted by the Contractor.
- Electrician transmitters for low lub. oil pressure alarm,
- lnb. oil filter fouling alarm, high cooling water temperature alarm and low expansion tank level alarm..
- An over speed relay.
- A diesel engine hour counter and local/remote control selection device fitted in the engine panel.
- Hand-turning device.
- The piping on the engine to be of steel.

4.2.2. **Dredge pump clutch**

Between the diesel engine and the gearbox to install a flexible, pneumatic operated clutch, suitable for continuously transmitting of nominal output at rated speed and variable loads as well as intermittent two times the nominal torque, all at a maximum

air pressure of 6 kg/cm2.

The clutch to be provided with safety equipment, which will disengage the clutch when the pump speed drops down the minimum speed, clutch slipping and low air pressure. Pre-warning to be provided.

The control of the clutch shall be from the dredging desk, however interlocked with DP-gland and flushing pumps (flow) and local safety switch near dredge pump.

The clutch to be positioned in such a way that if can be directly mounted to the flywheel of the diesel engine and -it shall be possible to dismount the clutch without moving the relevant diesel engine or gearbox.

4.2.3. **Dredge pump (DP) gearbox**

General

The dredge pump gearbox to be fabricated with welded steel or cast-iron casings, pinions gear wheels with hardened and ground tooth flanks.

The gearbox has to be designed for a calculated lifetime of 50,000 hours for the bearings and infinite for the gears.

The input shaft of the gearbox has to be hollow bored for air supply to the pneumatic operated clutch via a rotor seal on the free end of the shaft.

The gearbox has to be suitable for the load and torque variations and for short transmitting of 2 times the nominal torque.

The output shaft shall be directly connected to the dredge pump shaft-via a tooth coupling

The gearbox to be provided with a lubricating system consisting of:

- A built-on gear pump for pressure lubrication of the gear and bearings, suitable to deliver the full quantity of oil at 65% of the rated speed.
- A filter/cooler, cooled by freshwater from the diesel engine cooling water system.
- A pressostat for low lub. oil pressure alarm.
- A magnetic suction strainer.
- Thermometers on inlet and outlet of cooler.

4.2.4 **P.T.O.'s**

The diesel engine to be provided with power take off(s) for driving the pumps. The pump drives to be provided with a clutch coupling local manual operated. This may be one combined clutch for all three pumps, depending on arrangement.

4.2.5 **Mounting**

The diesel engine, gearbox, shaft bearings and dredge pump to be rigidly mounted on the ship's foundation with machined cast or mild steel chocks with a minimum thickness of 25 mm between top plates and settings in way of each holding down bolt.

The foundations will be part of the ship's construction and need the approval of the engine, and gearbox maker.

The diesel engine, gearbox and dredge pump foundations each shall be with at least two reamed bolts.

Diesel engines and gearboxes to be guarded against athwart ships and longitudinal movements by shock fasteners.

Alternatively cast-resin fillings may be applied if sufficient sealing surface is available.

4.3 DIESEL-GENERATOR SETS

4.3.1. General

One auxiliary set shall be installed in the engine room, with the main-shaft coupled to a set of four hydraulic pumps and the second p.t.o. flexible coupled to an alternator.

This set shall be suitable to supply the total required load for small repair work during normal dredging duties.

A second set shall be installed for harbour duties, driving a smaller alternator and a general service pump.

Exhaust manifold & scavenge manifold shall be provided with water drain cook and drain pipe.

4.3.2. Auxiliary diesel engine

The diesel engine shall be of the turbo charged marine type.
The engine to have the following characteristics:

Make	- Caterpillar or equipment
Continuous output	- at least 440 H.P
Rated speed	-1500 rpm
Direction of rotation	- counter-clockwise, seen against the fly wheel.

The engine to be equipped with:

- A main drive shaft with flywheel, an auxiliary p.t.o. flexible couplings and vibration dampers for the drive of 4 identical hydraulic pumps and one A.C.-generator,
- An exhaust system with water cooled manifold and a stainless steel expansion bellow.
- Air start equipment for a starting pressure of 30 bar.
- An air-inlet filter
- A fuel system with built-on booster pump, full flow duplex filter, pressure pumps and double-walled h.p. fuel pipes.
- A standard mounted governor suitable for constant speed control with electric speed setting motor.
- Local start/stop control on engine site.
- Remote speed adjustment in main switchboard and emergency stop dredging desk.
- 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, also acting as priming pump.
- A cooling water system designed for bilge or keel Cooling and to consist of engine driven fresh cooling water pump, thermostatic controlled valve and an expansion tank.
- The cooling system with increased capacity (or additional engine driven pumps) for hydraulic system cooling.
- Local thermometers for exhaust gas on manifold, for lub oil, for cooling water on outlet manifold.
- Instrument panel on engine with tachometer, lub oil pressure gauge, cooling water pressure gauge and a running hours counter.
- Electric transmitters for low lub oil pressure alarm cut of, low level expansion tank alarm and high cooling water temperature alarm & cut of.
- An over speed relay.
- Hand-turning device.
- The piping on the engine to be of steel.
- Exhaust manifold & scavenge manifold shall be provided with water drain cook and drain pipe.

4.4.3 **Emergency/harbour diesel engine**

The harbour diesel engine to be of the naturally aspirated marine type with cooling fan and radiator and to have the following characteristics:

Continuous output	-	at least 50 H.P
Rated speed	-	1500 rpm
Direction of rotation	-	counter – clockwise seen against Fly wheel

The equipment of the engine in general the same as for the auxiliary diesel engine, with the following alterations:

- The emergency/harbour diesel to drive an AC-generator and a general service pump via a second shaft extension and hand-operated clutch. Between the alternator and the pump a flexible clutch coupling of the make Vulcan or equivalent to be installed.
- 24 V DC electric start equipment with built-on brush less dynamo and locally installed accumulator. The system suitable for remote (automatic) starting and stopping.
- Radiator type cooling system.

4.3.4. **Mounting**

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The auxiliary sets shall each be built together on rigidly constructed common base-frames and the complete unit shall be fitted to ship's foundations via anti-vibration mountings.

The anti-vibration mountings with built-in deflection limiters.

4.4 DIESEL ENGINE AUXILIARY INSTALLATIONS

4.4.1. 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.

A silencer with spark arrestor shall be incorporated in each of the exhaust pipes. The silencers to have a damping effect of at least 35 dB.

Upper ends of pipes to be with 90 degrees bend to prevent rain water entry.

The pipes shall be fitted and supported in such a way that tension-free expansion is possible without any excessive transfer of sound vibrations to the shipping 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.

The exhaust pipes shall he insulated over their full length.

Seal pot shall be provided.

4.4.2. Start air system

For the start air system two electrically driven air compressors and two start air receivers shall be installed in the E.R. All suitable for a system pressure of 30 bar.

Each start air compressor shall have an effective capacity of 20 m3 free air/h. They

shall be of the air cooled type and each to be equipped at least with a suction filter, safety valves, pressure gauges, automatic start device, oil and water separator (with automatic drains) and oil level indicator.

The compressor sets fitted to a ship's foundation via anti vibration mountings.

Each air receiver shall have a capacity of 250 ltr. and equipped with a charging valve, a start air valve, a whistle air valve, a safety valve, a pressure gauge and a drain valve.

The conducting to be done with steel pipes. The air velocity in the feed line not to exceed 20 m/sec. The minimum diameter of the main start air line to be 5mm.

A low pressure alarm is to be fitted on the main start air line. A connection shall be provided for feeding the working air and instrument air systems as required.

4.4.3. **Fuel oil system**

The fuel oil bunkers, the daily service tanks and the fuel overflow tank shall be part of the ship's construction. The fuel overflow tank is to be provided with a high level alarm switch and the daily service tanks with low level alarm switches.

Storage and day service tanks should be fitted with quick closing valves operable from deck.

One fuel transfer pump with a capacity of about 10 m3/h to be installed in the engine room.

Piping must be fitted below floor level as far as possible.

Piping to be made of steel tubes. Liquid velocity in suction lines not to executed 1.5 m/sec. and in pressure lines not to exceed 2.5 m/sec.

4.4.4 .**Lubricating oil systems**

Each diesel engine installation and the DP-gearbox shall have its own independent system. As far as possible all systems should use the same lubricant. The Contractor 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/Engineer's approval.

The initial fills of the systems may be from the readily available types in the country of building, provided the fills are fully compatible and intermixable with the available types in India.
A lube oil storage tank shall be part of the ship's construction.

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.

Piping to be made with steel tubes. Liquid velocity in suction and rain pipes not to exceed 1.0 m/sec. and in pressure line not to exceed 3 m/sec.

4.4.5. **Cooling water systems .**

General

The entire cooling/inter-cooling system of the machinery installation shall be with fresh water circulation.
At least the following installations shall have their own independent cooling circuit:
- the main engine, including DP-gearbox
- the auxiliary engine, including the hydraulic plant.

The expansion tanks for each diesel engine to be installed in accordance with engine supplier's recommendations.

Pumps

The cooling circuit of each diesel engine to be circulated by engine mounted direct driven pumps.

The piping to be made with steel tubes and the suction and discharge pressure not to exceed 1.5 m/s and 2.5 m/s respectively.

4.5 GENERAL AUXILIARY INSTALLATIONS

4.5.1 Water inlet system

The water inlet system mainly consists of two water inlet chests, a hull valve, a strainer and a separating valve on the ship's centre line

The basket with perforations of 5mm. The total cross section of the perforations to be such, that the pressure drop in the strainers is less than 0.25 m W.G. in normal operating conditions and clean strainer.

The main water inlet line to have at least 300 mm inner diameter and minimum wall thickness of 10 mm. The following systems to be provided with their respective branch-offs from this main line:

Dredge pump gland/flushing system
- Cutter bearing flushing system
-Deckwash/fire fighting system
-Deckwash/fire fighting system
- Ballast system.

Each of the above systems to have isolating valves in their respective branch lines.

4.5.2 Bilge/deckwash- and fire fighting system

Two identical general service pumps shall be installed in the engine room, one electrically driven and one driven by the emergency harbour diesel engine. The pumps shall be of the self-priming centrifugal type and each will have a capacity of 25 m3/h at a pressure of 2 bar and 15 m3/h at a pressure of 3 bar respectively at a speed of 1450 rpm.

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 water suction valves shall be rubber lined butterfly valves.
An oily bilge water separator shall be installed in the engine room. The capacity will be 0.5 m3/h

At least two fire fighting connections shall be arranged on deck and one in the accommodation space.

4.5.3. Gland and flushing systems

Gland and flushing pump for dredgepump

Two main diesel driven horizontal, non self-priming centrifugal type pumps shall be installed in the engine room. Each pump shall have at least a capacity of 45 m3/h at total head of 65 m W.G. at rated dredge pump speed.

Flushing pump for cutter bearing

One main diesel engine driven horizontal non self-priming centrifugal type pump shall be installed in the engine room of equal type and size as the DP-gland pump.

The discharge pipe to the cutter bearing to be provided with a fixed orifice to adjust the pressure.

4.5.4 **Working and instrument/control air-systems**

One working air/instrument air receiver shall be installed with a capacity of about 300 ltr. and suitable for a pressure of 10 bar. The receiver to be connected to the start air system via pressure reducers.

At least three working air connections to be fitted; two in the engine room, one on deck.

Instrument air and control air connections to be provided for the clutch control and all other equipment with pneumatically controlled gear and any other place where considered necessary. All air supplies to controls such as clutch control must be provided with a filter, a condensate trap and a lubricator.

The working air system and the main supply lines of the instrument air and control air system to be made with steel tubes. The remainder air lines to be of copper. On outside decks the lines to be of stainless steel seamless tubes.

5.4.5 **Sanitary water systems**

A sanitary fresh water pressure installation shall be installed in the engine room. The installation to consist of a hydro-pneumatic pressure tank of 50 1. 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 drain cock and a pressure switch for automatic operation of the installation. The pipes to be of annealed copper tube with brass fittings.

4.5.6 **Sewage installation**

The waste pipes from toilet, shower, sink and washbasin to be led to a sewage collecting tank which is part of the ship's construction.

There shall be a pumping arrangement to discharge the sewage to shore reception facilities. One power driven pump of sufficient capacity exclusively for the purpose in addition to hand pump along with necessary piping system is to be provided. A sewage treatment plant of appropriate type and capacity to be installed.

4.5.7 **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 for coupling of standard supply hoses, to be shut off with bronze blind flanges. Filling connections for fuel oil tanks to be arranged together.

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 Wired or equivalent.

Where possible, level gauges to be fitted. All built-in tanks to be provided with a sound pipe. The upper ends shut off with a screwed bronze cap, attached with a chain.

Tanks in the engine room to be provided with a short sounding pipe with a self-closing sounding cock with test-cock.

4.5.8 **Engine room ventilation**

The engine room to be ventilated by means of two electrically driven supply fans, each with a capacity of about 7500 m3/hr. One of the fans can be exhaust and supply type. The supply openings with rain and dust protecting filter and-inside a water trap. The entry of the air preferably at the fore end of the engine room.

The engine room on the aft side to be provided with two exhaust ducts of sufficient capacity. The inlet and exhaust openings to be provided with closing devices against dust storms.

4.5.9 **Details of engine room**

The machinery shall be arranged in such a way that easy operation and maintenance shall be possible.

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.

Hatches for easy access to equipment under the floor shall be arranged.
Stairs to be constructed of cheeks of bulb flat, non-slip grate steps and dust catching gutters.

All stairs to be removable. Platforms removable only if necessary for maintenance or transport duties.

Railings and stanchions to be fitted along platforms and stairs and around openings or transporting it to under the hatch

In front of the dredge pump hoisting provisions to be arranged for dismounting the impeller and transporting it to under the hatch.

Additional hoisting eyes or lugs have be provided on direction of the OWNER.

A steel plate with 150 mm vice has to be installed.

Above these a tool board to be fitted.

A nozzle tester to be fitted near the workbench.

4.6 HYDRAULIC INSTALLATIONS

4.6.1 General

The following hydraulically driven equipment shall be installed:
- cutter drive
- two side winches
- one ladder hoisting winch
-two spud hoisting arrangements
- one spud carrier
- spud handling winch
- dredging valve.

The total required power for all above installations shall be delivered by a pump-unit driven by the aux. diesel engine, consisting of four equal pumps,

For emergency cases one electrically driven pump unit to be installed.

4.6.2. Couplings and gearbox

The four hydraulic main pumps shall be connected to a gearbox which will be driven by the auxiliary diesel engine via manually operated clutch,

The pumps connected to the gearbox by means of elastic couplings.

If lube oil cooling is required, it shall be connected to the cooling water system of the diesel engine.

4.6.3. Detailed standards for hydraulic installations

The following requirements are valid for all hydraulic installations, unless specified otherwise in the concerning paragraphs.

All components fitted in the hydraulic circuits shall be suitable for a continuous working pressure of at least 30% higher than the working pressure specified for the relevant system and the. allowable peak pressures shall be at least 50% above the normal working pressures.

Maximum operating temperature of the oil is 60° c.

The same type hydraulic oil shall be used in all hydraulic systems if separate systems are installed.

The pressure in the cylinders may not exceed 75% of the supplier stated continuous working pressure.

Hydraulic tanks are to be provided with a. sloping bottom to a handhold for clearing purposes and for inspection.

The tanks shall be equipped with breathing caps or vent pipes with fine filter, filling pipes also with filter, level gauges, system pipe connections, foam breaking walls, magnets, drains, thermometers etc.

The pump(s) shall be of the heavy duty plunger type. The pump bearings will have a calculated lifetime of at least 10,000 hours under normal working conditions. Small pumps (les than 20 l/min.) for pilot purposes may be of the geared type. Low pressure (less than 30 bar) boost pumps may be of the vane type.

The pump(s) shall be flexibly coupled to the respective prime movers. Pump units shall be built together with circulation tanks and valve panels to complete modules ready for resilient mounting on the ship's foundation.

The complete pump unit to be provided with a drip tray.

All pipe connections with pumps and motors shall be with metal strengthened flexible joints.

Pumps in open systems will have their own suction connection equipped with coarse filters. Fine filters of 10 m u shall be fitted in the pressure or return lines.

All filters shall be of the full-flow type with fouling indications and alarm contacts.

In general hydraulic cylinders shall be with end damping where necessary. The rods for plungers and cylinders to be of chromium plated polished stainless steel. Seals shall be seawater resistant. A dust scraper ring shall be incorporated in the seals. The cylinder housings shall be provided with a seawater resistant coating.

Shut-off valves shall be fitted in all supply and return lines of motors, cylinders and plungers where these are connected to combined systems.
Valves shall be of the ball type with stainless steel or hard chromium plated ball and forged steel body. Remote controlled valves shall be with oil bath-solenoids of 24 V DC type, with led-indication in plug and suitable for continuous operation.

A number of mini mess connections shall be provided in such a way that the pressure can be measured in any part of the installations. A control-box with measuring tube and precision manometers for different pressure ranges shall also be delivered.
Pressure gauges shall be of stainless steel, with oil bath damping in the casing and connected to the system via a needle valve. Remote pressure measuring is to be made with electric pressure transmitters, via needle valves. These valves to be fitted direct to the main lines.

In general as far as possible all control components (specially the electric controlled components) to be built on centralized spots inside the ship's hull, preferably the engine room.

The number of different kind and types for O-rings, solenoids, regulating valves etc. to be reduced to a minimum. A list of these items is required.

The pipe work in general shall be done with seamless steel precision pipe.
On open decks or in contact with outboard water stainless steel pipes and couplings to be applied.

Pipes with an outside diameter of more than 20 mm shall be connected with flanges. Smaller pipes may be connected with screw couplings. Both flanges and couplings shall be with O-ring tightening.

Where sudden pressure fluctuations can be expected, suitable damping devices to be provided, via accumulators.

Hoses shall be standardized as much as possible and shall have an admissible working pressure equal to the test pressure of the relevant system. The bursting pressure is to be at least 2 times the test pressure. If bursting of hoses can result in unsafe conditions or can cause damage, safety devices shall be fitted.

Flow velocities in pipes shall be not more than 4 m/sec.

The pipes shall be mounted in nylon clamps with steel plates under the fixing bolts and in such a way that expansion will be possible. Maximum clamp distances 0.75 m. Pipe bends shall have a radius of at least 3 times the inner diameter.

Care is to be taken that the necessary drains and de-aerators are provided.

The systems shall be flushed by using special flushing pumps and filters and with a flow velocity of the flushing oil of not less than 8 m/sec. during at least four hours.

Testing of the whole installation with a pressure of 1.5 times the working pressure, shall be done after completion and after filtered flushing has taken place.

The installation shall be provided with fresh filters ready for operation at delivery of the Dredger to the Owner.

The Contractor shall submit detailed working diagrams of the installations.

Simplified flow diagrams in plastified cover and frame shall be fitted near each valve panel for service purposes.

4.7. GENERAL REQUIREMENTS REGARDING MATERIALS AND WORKMANSHIP

4.7.1. Auxiliary pumps

In general all 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 15% in excess *of* the required shaft power. Motors for pumps with variable heads as bilge pumps, general service pumps, fire fighting pumps etc. to be suitable for working on every point *of* the QH-curve. In general pump speeds shall not exceed 1500 rpm. The Contractor must submit to the owner QH-curves, NPSH values and power characteristics *of* all pumps. The information to be based on the specified liquids. When vertical pumps should be used they must have an open support and coupling spacer for easy removal *of* impeller.

Centrifugal pumps may have cast-iron casings and bronze impeller where no other materials are specified. Centrifugal pumps must be cavitations 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. Where self-priming centrifugal pumps are required, the priming capability has to be operational under all circumstances.

4.7..2 Coolers

General

The coolers and heat exchangers to be made in such a way and to be fitted in such a manner that the pipe bundles can be drawn out without removing the connected piping or other obstacles. Thermometers must be fitted on both sides *of* each medium.

The cooling surface required for rated working condition to be increased with 30% for fouling condition. Where fouling or corrosion can only appear on one side, an increase of 15% will be sufficient.

Box coolers

The box cooler bundles to be made in such a way that easy withdrawal is possible for maintenance purposes. The bundles to be of thick walled steel pipe and hot galvanized on outside after fabrication.

Each of the cooling circuits of main engine and auxiliary engine to have an independent tube bundle. The tube bundles shall be housed in cooler chests

which have to be drawn up to the main deck.

The mounting plate of the cooler bundles shall be at about low waterline level.

The box cooler chests to be provided with flushing connection from the general service circuit. An adequate number of jet nozzles to be installed for effective flushing of marine growth in this area The details and execution of the flushing nozzles to be decided in consultation with the supplier of the coolers.

4.7..3. **Valves and accessories**

All valves and accessories to be at least suitable for pressure stage 10 according to the DIN-standards or equivalent ISI-standards, where no higher system pressures are described.

Materials of valves in general cast-iron for body and cover and bronze inner parts. Outboard water systems with bronze inner parts.

Hull valves to have cast-steel or bronze body and cover. Start air valve to have forged steel body and stainless steel inner parts.

Fire fighting/deck wash valves with bronze body and cover, rubber lined disc-type valve and provided with hose international 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 to BIS-standards or equivalent IS1 and with flange connections for a diameter of 25 mm and more and with screwed connections for the smaller diameters.

Emergency valves with direct remote control by means of hand hydraulic activators. Each valve to have its own individual activator.

All valves to have a rising spindle and of a diameter of 40 mm and more, with screw thread on spindle outside the valve. In general, globe valves to be applied. Butterfly valves may be used on suction side of water pumps and where it will be preferable by lack of space. Where remote controlled valves are used they shall also have the possibility of local manual control. Sight glasses should be provided with illumination. 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 damage/injury occurs when they come into action.

Each pipe system should also include a list of valves and accessories, stating types, 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 for approval prior to placing orders.

4.7..4. **Piping**

Pipe-sizes according the I.A.C.S. recommendation 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 to 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. For working pressure of not more than 30 bar welded on plate flanges to be used For higher working pressures special flanges to be used, suitable for high pressure and with O-ring tightening.

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 less than 25 mm. and a working pressure of not more than 30 bar screw couplings of the type may be used. For pipes with higher working pressures approved O-ring type couplings to be applied. Flexible connections of the flexible steel tube type to be used for machines and apparatus, which are mounted on anti vibration mountings, as well as for all connections to the main engines where galvanized pipes pass through gas, oil or watertight bulkheads or decks, these penetrations will be carried out with so called free flanged type pipe pieces.

Pipes should be mounted in such a way that expansion or contraction can occur without any significant 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.

Hydraulic pipes are to be fixed with nylon clamps with a steel base and steel rings under the nuts or studs. Distance of these clamps to be about 0.5 m.

Drain cocks to be provided on all lowest points of all pipe systems and venting connections on all highest points. All pipes intended to transfer fuel, lubrication or such like oils, are to be pickled, neutralized and washed with fresh water and preserved with oil after manufacturing is completed. Further after completion of the installation, the pipes to be flushed with the liquid they are destined for.

All pipe-systems, to be tested after installation with at least 1.5 times the working pressure. 'This with a Minimum of 6 bar.

Insulated pipes and pipes behind paneling to be tested before insulation and paneling are fitted.

4.7.5. **Insulation of piping**

Pipes to be tested and painted (if 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 suitable material 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 and all hot water lines to be finished with 20 mm. Armaflex or equivalent insulation.

The application of asbestos as insulating material is not permitted.

4.7.6. **Loose tanks**

Loose tanks to be made of steel if not specified otherwise, re-inforced where required and treated as the other parts of the relevant system. Tanks intended to contain lub. oil to be grit blasted.

Large tanks to be provided a with a manhole, small tanks with a hand hole and further with connections for a level gauge, filling and vent pipes, a drain valve and the necessary system connections. Drip trays to be provided below oil tanks.

4.7.7. **Instruments**

The scales of instruments for pressures, temperatures etc. to be such that the working range is in between 60% and 90%. of the full scale. The maximum allowed values to be marked with a red line on the scale. Essential instruments with a scale length of at least 80 mm.

The pressure gauges to be of the glycerinol filled type with scale in bar, with connections of 16 mm pipe screw thread on the outside and a mounting flange on the back side. The diameter to be not less than 100 mm.

Gauges for pressures above 50 bar with stainless steel inner parts.

The temperature gauges to be provided with scale in degrees centigrade.

Gauges for temperatures over 300°C to be dial type pyrometers, other gauges of the blue colored mercury-in-steel type. Gauges for raw water systems with stainless steel tail pieces.

The selected scale and range of the thermostats/pressostats should effectively

cover and suit the system for which they are installed.

The level gauges of the strengthened bronze reflection type. Level gauges on oil tanks with self closing valves.

4.7.8. Name plates and codifications

On each pump, engine, valve, loose tank and where necessary for safety and control, the function and the medium to be indicated on name plates. Fixation of name plates to be by means of rivets.

Each valve to be provided with a name plate on or near the cover in addition to name plates on the hand wheels.

The name plates of bronze or brass with engraved letters. On weather decks the nameplates should be of stainless steel. The lettering to be black coloured, however on safety and emergency valves, with red coloured lettering.

5. ELECTRICAL AND NAUTICAL EQUIPMENT

5.1. INTRODUCTION

5.1.1. Basic requirements

The electrical installation and associated components have to be delivered complete and in good working order suitable for the intended service.
Safety provisions, interlocking devices, etc. should be carefully included in order to avoid damage in case of inexperienced handling. All items of these installations have to be installed in such a way that good accessibility is assured.
The lay-out of the system has to be simple and well organized to facilitate easy maintenance and repair.

Further the electrical installation to be based on:

- A maximum relative humidity of 100%
- Maximum ambient air temperature 50°C.

It is to be noted that all the requirements laid down in one of the other parts of the specifications, are also valid for this part, as far as applicable.

5.1.2 General lay-out

Following prime movers will be installed and the following controls etc. have to be included:

a. One main diesel engine in E.R. for the dredge pump drive with:
- local starting
- local and remote stopping
-local and remote speed adjustments
-local supervision with alarm points in the E.R. and resulting alarms in dredging control stand.

b. One auxiliary diesel engine for the dredging auxiliaries and ship's network with:
- local starting
- local and remote stopping
- local supervision including alarm points in the E.R. alarm panel.

c. One harbour diesel engine with:
- local electric (automatic) starting
- local and remote stopping
- local supervision and with alarm points on the ER-alarm panel.

For the supply to the electrical consumers and installations the following networks and circuits to be provided, viz:

a. One power-network and lighting network, nominal tension 230 Volts, 3 phase AC, 50 Hz.

b. Two battery networks, nominal tension' 24 Volts DC, one for emergency duty and one for harbour diesel engine starting duty.

5.1.3. **Loose parts**

The following parts have to be supplied:

a**.** **Measuring gear**

- 1 Universal meter with test leads and carrying case
- 1 voltage tester

b. **Special tools**

All special tools for maintenance and dismantling electric gear (such as fuse-retainers, bulb-retainers, special keys, battery-testers) have to be supplied by the Contractor.

5.1.4. **Tests and trials**

Alternators and special designed gear as switchboards, alarm panels, desks, etc. to be shop tested in the workshops of the manufacturer.

Before trial trips are carried out the complete installation to be tested, including:

- alternator load tests (4 hours full load), governor adjustment test, switching tests, relay tests etc.
- checking of all overload protections and speed regulating systems
- making and listing of a megger-test per circuit and per consumer.

After all tests and trials are finished, all bolts, nuts, screws etc. of the electrical connections, copper bars, terminals to be checked and to be extra fastened.

5.2 . GENERAL REQUIREMENTS FOR INSTALLATIONS AND MATERIALS

5.2.1. General

All installations and materials are to be of first class quality, carefully designed and sufficiently shockproof for use on this type of ship, sailing under tropical, saline and moisture conditions, rat- and ant-proof.

The elements to be easily interchangeable and as much as possible with standardized parts.

The design shall be as specified below and in consultation with the surveyor.

5.2.2 Selectivity and voltage drops

The settings, timing of interruption, delays etc. to be such that only the part of the network in which the fault occurs is disconnected.

Voltage drops, at normal consumption, must nowhere exceed:
- 2 Volts for low voltage (24 Volt) network
- 2 percent at the end of feeders in AC networks
- 5 percent at the terminals of individual (not low voltage) consumers

5.2.3 Cabling

Cables to be as much as possible of the fixed type and with a minimum number of junction boxes.

a. **Fixed cable's**

For this purpose, Ozone proof and flame retarding type cables to be used, with standard pure copper cores, vulcanized cross- linked polyethylene insulation, vulcanized chlori-sulphonated polyethylene sheathed and polyvinyl-chloride covered.

Cabling for control and instruments shall be screened type.

For lighting branches in accommodation and in some special cases, single-core wiring in tubing may be used according to an approved method.

Cores of feeder cables to be at least 4 sq. mm. For power consumers, low voltage networks and essential circuits the minimum size to be 2.5. sq. mm. For the rest the minimum conductor size is 1.5 sq.mm.

b. **Flexible cables**

Use of flexible cables to be restricted to the minimum and have to be of the

neoprene double sheathed or equivalent type.

Free hanging cables in masts etc. to be with an extra steel supporting core.

c. **Fixing of cables**

Cables to be mounted with galvanized steel clips and galvanized bolts at about 25 cm. spacing on cable-ways.

The number of cables in a bundle not to exceed 2 layers of 6 cables. Cable-bundles not exceeding 5 cables with maximum 20 mm. diameter and outside engine room, may be mounted with colson-type nylon strips.

The cableways to consist of:

- Galvanized pipe or galvanized 3 mm. sheet steel trunks on open decks, in bilges, at unprotected spots and such like

- Rust cleaned ,twice lead painted and finished ladder type trays for large sizes in enclosed spaces (thickness of material minimum 4 mm.)

- The rest *may* be of the standard galvanized performed sheet steel type.

- The cableways so arranged that in all cases, metal parts behind these ways can easily be repainted and the cables can be replaced.

Sharp edges to be smoothened by means of lead parts or equivalent.

Penetration through watertight bulkheads and decks to be with long brass cable glands or other approved method.

Main routes of cableways to be indicated on the combination drawings and to be handed over for approval of the owner.

Between engine room and control stands a special provision for easy and straight cable routing has to be provided in the design.

In the vertical routes to the control stands, horizontal fireproof penetrations to he fitted, in way of the decks.

d. **General**

Cables damaged during construction must be completely removed and replaced.

5.2.4. **Busbars, insulation, wiring and terminals**

Bus-insulators, bushings, contact insulators, terminals and such like, are to be surface where fuses are applied, these have to be of approved standard type creep age proof material (such as melamine, steatite, rosite or equivalent).

Wirings and cores at least at ends to be provided with markers according the "as fitted" diagrams and to terminate in solderless lugs, fixed to terminals by means

of locked cadmium plated steel bolts or screws or some other equivalent method.

For electronic gear below 250 Volt, glass type cartridges of approved size may be applied. The carriers and cartridges with steatite or, equivalent insulation material and silver-plated copper contacts with spring pressure may be used.

5.2.5. **Circuit breakers and switches**

All breakers and switches to be with quick closing and opening main current contacts, with surface creepage proof insulation materials (as steate, melanite, mycalex, teflon, a.s.o.) and with arc chambers or shutes.

Circuit breakers to be of trip-free type.

Master switches and such like controllers to be of the cam operated type.

Limit, flow, pressure, temperature, floating switches, control-stations and such like have to be carefully selected, standardized and all in robust, watertight enclosure with cable glands. The limit switches on the deck as much as possible of the "Reed" type otherwise the enclosures to be provided with anti-condensation heating. The proximity switches short-circuit proof.

5.2.6**.** **Socket-outlets**

Socket outlets as far as possible shall be according to approved standard.

Socket outlets for general purpose to be of the single phase 220 V-IS Amps type with earthing.

The outlets for 24 Volts shall be of the concentric type.
Socket outlets in wet spaces and on open decks to be made of robust watertight construction.

5.2.8. **Distribution systems**

Distribution boards, boxes, panels etc. to be totally enclosed and (except for the engine-room power) provided with a main switch in the supply.

Distribution boxes for 220 Volts lighting to be equipped with small circuit breakers.

All distribution systems to be provided with at least 15% spare supplies in number and 15% spare capacity in the supplying cable(s).

5.2.9. **Starter, contactor-panels etc.**

Starters in totally enclosed marine construction, with main switch, ammeter (for motors of 2.5 kW and over), contactor and thermal relays.

Starters for automatic control must have a three position selector switch (auto-

off-on). More complicated panels in principle as prescribed for the starters, but with additional contactors, timing devices and/or relays.

Where the starter is not fitted near the motor, an isolating device has to be installed near the motor. Where more starters are built together in a starter panel metal separation screens to be fitted between the several starters. If a master switch is applied, a zero position inter-lock has to be provided.

Special approval is required for non-standard materials.

All starters/switch panels inside to be provided with a scheme-holder and the latest revision schemes.

5.2.10 **Contactors, relays, modules, solenoids**

Coils for contactors, relays and solenoids for valves, magnets etc. have to be tropically finished, without taps for temporarily over-exciting, suitable for continuous duty and easily replaceable. Main contacts of contactors and relays are to be of silver or silver-alloy with arc-shutes.

Auxiliary contacts shall be heavy silver-plated.

5.2.11.**Semi-conductors**

Semi-conductors to be avoided as much as possible, but if applied, to be of the marine, silicon type. They have to be ample sized (at least two-fold in current and tension) and protected against damage, due to short-circuits and over voltages.

All semi-conductors and their controls to be electrically isolated from the ship's networks by means of transformers.

5.2.12. **Measuring instruments**

Measuring instruments have to be of the vibration proof tropically finished type, with a class of accuracy of 1.5 or less.

Primary voltages over 250 Volts and/or currents of more than 20 Amps to connect via isolating transformers or if transformers are not possible, with resistors (shunts).

All instruments as much as possible shall be of moving-coil type.

The scale with red marks at maximum allowable or nominal limits and green marks at constantly preferred values.

5.2.13.**Lamps and holders**

Lamp holders for fluorescent tubes to be of the phenolic type.

Lamp holders for incandescent bulbs, with ceramic insulation:

-	for 24 Volts up to 25 Watts	B 15d (mignon bayonet)
-	for 220 Volts up to 100 Watts	E 22 (normal bayonet)

For 24 Volts signal lights/illumination in desks and panels, a lamp holder Ba 9S may be applied, however insulated from earth.

As far as possible, incandescent bulbs to be installed vertically. Where it seems necessary the fittings to be mounted on shock absorbers.

5.2.14.**Transformers**

Power transformers to be air-cooled noise proof marine type, with max. 3% impedance, max. 1 cm. ventilation openings, surface creep age proof terminals and pull-eyes. Insulating class B.

Pilot-transformers ample sized with 20% (but not less than 20 VA) extra output and suitable to withstand the expected inrush currents.

5.2.15. **Electric motors**

Electric motors standardized as much as possible to size and type and with insulating class F, with a temperature rise for class B. Dimensions according to approved standards.

For regulated motors the control characteristics have to be submitted.

All motors to be supplied with manufacturer's protocol

5.2.16 .**Desks, instrument panels, operating components etc.**

The directions of movements and position of handles, levers, knobs, sticks, hands, pointers, etc. must be carefully considered, so that each order and the corresponding results have the same trend.

The colours of lenses of signal lights and push buttons shall be standardized.

The signal lights in control stands etc. (except the red fault condition alarm lights) to be with adjustable intensity by signal light dimmers.

Indicating instrument-lighting in control stands also with dimmers as for the signal lights. Dimmers for signal lights and instruments not to be combined.

A socket outlet for repair purposes to be provided in or near each desk.

5.2.17 **Pilot circuits and pilot gear**

Remote control, measuring, and signaling circuits preferably to have a voltage of 24 Volts. This is in any case the maximum value for situations where several foreign circuits enter into a common panel, for instance in alarm panels. Under other circumstances the maximum allowable tension for these circuits is 250 Volts. (starters).

5.2.l8. **Class of enclosures**

Motors and gear on deck to be in robust, watertight, sea and weatherproof construction at least IP-56 spec. (with heaters).

In other spaces all motors and all gear in totally enclosed construction, at least IP-44.

In clean and dry spaces switch gear may be of the protected drip proof type, at least IP-23.

5.2.19 **Labels**

All parts of the installation as boards, boxes, panels, switches, fuses, relays, including junction boxes for special installations, plug-sockets, etc. to be labeled with sufficient information, in the English language.

These labels on deck shall be made of stainless steel. The rest of resopal or equal, all fastened with screws and in different colors.

5.3. **SUPPLY AND MAIN DISTRIBUTION**

5:3:1. **Alternators - load balance**

The following alternators (AC), driven by the prime movers to be installed.

a. 1 main alternator, 3 x 230 Volts, 50 Hz, at least 100 kVA, p.f. 0.75

b. 1 emergency/harbour alternator, 3 x 230 Volts, 50 Hz, at least 45 kVA, p.f. 0.8

The total normally required power during dredging has to be delivered by the main alternator.

In case of black-outs the harbour set acts as emergency generator set feeding a part of the main switchboard.

In harbour a part of the power has to be delivered by the shore connection or by the harbour alternator.

The alternators to be:

- of approved marine type, make approved by' the owner; dimensions to IEC-standards
- in horizontal, splash proof construction with fine air inlet filters
- With insulation class F, temperature rise according class B, tropically finished of the brushless type with solid state- auto-voltage regulators
- with all parts well protected, but (especially the solid state gear) easily accessible
- with embedded thermistors and anti-condense heater.

A spare auto-voltage regulator of each type to be delivered in a well sealed case.

A load balance to be included with the quotation and to be regularly updated during the building-time.

5.3.2. **Shore connection**

To fit on the main switchboard provisions for a shore connection consisting of a main (selector) switch fuses, voltmeter, ammeter, phase-rotation indicator, the necessary signal lights, cables, terminals and further more to deliver 50 meters flexible cable. The capacity to be not less than 125 Amps.

The shore connection-breaker has to be inter-locked with the alternator circuit breakers.

For the shore-cab1es to provide a bulkhead penetration with cover, a connection box, a clamping device and a cable reel in the engine-room entrance.

5.3.3. **Switchboard 3 x 230 Volts**

A main switchboard of the totally enclosed dead front marine type, not accessible from the backside to be installed in the engine-room. Isolating devices to be provided in the busbar chamber for safe working inside each panel during service.

At least the following panels are to be provided:

- two ship's network alternator-panels, each complete with a circuit breaker, alternator protecting devices, Wattmeter, ammeter with switch, frequency meter, Voltmeter with switch, the necessary signal lights, etc.
- Normal and automatic closing of the circuit breaker only via a black-out (without parallel running).
- one shore connection panel,
- one distribution panel for 3 x 220 Volts .

The harbour generator feeding only a part of the network for harbour duty. The panel with additional selector switch hand-automatic starting, including auto start device. Auto-starting in case of power black-out.

All instruments and control circuits to be provided with their own fuses.

Each panel to be provided with an anti-condense heater.

5.3.4**. Networks 24 Volts**

a. **Battery network**

To install in the engine-room a 24 Volts DC network consisting of:

- 1 rectifier, suitable for anticipated load (dredging)

- 1 battery charger, suitable to charge the battery in 24 hours including the anticipated load.
- 1 lead-acid type battery of at least 200 Ah, placed in containers, on drip pans and in well ventilated battery boxes
- 1 main distribution panel, including Ammeter, fuses, switches, earth fault indicator lamps etc.

All 24 Volts special installations and the 24 Volts emergency lighting to be connected to the battery network via final distribution boxes.

b. **Starting battery network**

The harbour diesel engine to be equipped with a starting battery, built-on battery charging generator, voltage regulator, starting contactor, safety devices, instruments etc.

c: **General**

The rectifier and chargers including the necessary-protections, Volt and Ammeters etc.

The batteries placed in well-sealed and ventilated containers.

For checking and maintenance of the batteries to deliver a transportable battery charger (quick charging type), the necessary tools and instruments.

5.4. POWER INSTALLATIONS

5.4.1. General

In general each electric motor to be provided with a starter erected near the relevant motor. In the other cases, to fit a stop switch near the consumer.

Near one of the engine room entrances (ajdacent to the stop valves) to locate individual stop switches for engine-room ventilators, fuel transporting gear and lubricating oil gear. The accommodation ventilation with common stop switch in dredging control house.

5.4.2. Engine-room

In general all pumps to be locally started.

The air compressors and hydrophores to be pressure-control led. Each set to be provided with its own pressure switch (dual type). Several stand-by pumps have to be started and stopped automatically.

To install near the engine-room workbench a test panel with sections for 3 x 220 V, 1 x 220 V and 24 Volt (AC/DC), all with their own 15 Amps. breaker, loops for clamp-ammeter, terminals and leads. Further, all applied lamp holders, socket-outlets and including a fuse tester, with series lamp, also to be installed in the test panel.

5.4.3. **Ship's auxiliaries**

The hydraulic pump set for emergency hoisting of the ladder to be provided with facilities for unloaded starting.

The accommodation fans with control switches near the entrance.

The heating elements for anti-condensation to be connected , to a special distribution box for this purpose only.

Each outgoing section to be provided with a check signal lamp.

For the deck crane to provide a main isolating switch against the crane column.

The cable connection between the isolating switch and the terminal box inside the crane to be of the heavy flexible (torsional) type.

One welding set to be installed in the workshop corner of the engine-room.
The welding set of the splash proof, primary 3 x 230 Volts 50 Hz (via flexible cable connected to wall mounted circuit breaker with socket-outlet), secondary about 300 Amps DC (with tools, flexible cable, 1:.wo connectors.,' etc.), trans 'I, portable (but fixed fitted on the ship) type. The set to be equipped with a voltage reduction relay.

5.5. LIGHTING INSTALLATION

5.5.1. General and distribution

The normal lighting installation will be supplied from the 220 Volts AC-network.

24 Volts emergency lights have to be fitted in all enclosed spaces.

Battery emergency lights have also to be fitted near essential gear such as main switchboard, diesel engines, battery distribution panel and along the path to this gear and to the outside.

In general socket-outlets are not to be connected to the same supply as the lighting fixtures.

,5.5.2. Control of illumination ,

The lighting in control stands and surroundings, the general and work lighting on deck and the lighting which may be annoying for the navigation, to be controlled near the control stands.

The lighting in passages, corridor and so on to be controlled on the distribution boxes.

The lighting in engine-room to be switched on and off by circuit switches on the distribution box in the engine-room.

The lighting fixtures near bilges including local switch.

The battery lights to switch on automatically when normal lighting fails.

The desk-lights, cabin washstand lights and such, to be controlled on or near the fixture.

The remainder generally controlled by switches, placed near the entrances to the relevant room or space.

5.5.3. **Type and quantity of fittings**

The deck lighting by means of incandescent type lamps for passages, platforms, corners etc.

Lighting in dredging control stand (dimmable), lavatory, bilges and corners in machinery spaces as well as often disconnected space lighting, such as in lockers, small stores, to be of the incandescent type.

The rest of the fluorescent type. Only tubes of 20 Watt may be applied.

A total number of about 60 lighting fixtures (220 V) to be installed over the Dredger, including desk-lights, bed lights etc.

Further to be installed, at least:

- several socket-outlets 220 V for general purpose, spread over the dredger.
- about six floodlights of the w.t. type for dredging illumination to install.

All fixtures of the very robust sea-watertight type, suitable for expected vibrations.

5.5.4. **Battery lighting**

At least 10 battery lights 24 Volts to be installed .
The system to switch on automatically when the 220 V power fails.
Battery backup shall be provided for navigational lights and communication system.

5.6 **SPECIAL INSTALLATIONS**

5.6.1. **General and control stations**

All the control equipment to be combined in desks, cabinets, panels etc. Desks and cabinets to be provided with handrails and adequate lighting.

In general all equipment to be of the built-in type and all instruments of the same size and construction.

The instruments etc. to be arranged in a well-ordered and rational manner and the lay-out based on ergonomical principles. Drawings of lay-out of the various desks, panels etc. to be forwarded to the OWNER.

All desks, cabinets and panels to be of sturdy construction and to have the same colours other equipment in the same room.

Installation parts not specified before to be placed in consultation with the OWNER.

The following main control stations to be arranged:

a. Engine-room switchboard corner

In this corner to place the following items:
- main switchboard with auxiliary engines control,
- engine-room alarm panel,
- hydraulic dredging control panel,
- talk-back extension fitted in a sound reduction booth,
- writing desk
- swiveling chair
- clock

b. Engine-room entrance

Near entrance to place a panel containing the following

controls of the concerning engine-room space:
- individual emergency stop/closing controls for: fuel oil pumps,
fuel oil day tank valve
fuel oil bunker valves
mechanical ventilation,
w.t. door controls/indicators,
Fire Extinguisher

5.6.2. **Special installations engine-room and others**

a**) Engine-room alarm installation**

This alarm installation shall be according to closed-circuit principle, with as much as possible plug-in type solid-state units, built into a separate panel and mounted in the engine-room control corner.

The installation to be split up into more systems each monitoring maximum 12 points, each with a protection, a voltage available light, a silencing pushbutton, lamp/alarm tester, main switch and handling only one unit as there may be sections : one for the main engine, two for auxiliary engines and two for general purpose.

The main switch has to switch on the system when the unit is put into service and to switch off the system when the relevant unit is deliberately stopped.

All present alarm points have to be monitored and there above ten spare

positions shall be provided of which five including cables and with sensors. In addition to above, each instrument panel of the diesel engines to be provided with a common red and green light for indication if one of the points has been acting or not. The same for fitting in the dredging control stand, however this including a yellow light (for indication if action has taken place).

Further to install a yellow rotary light in engine-room, acting simultaneously with the siren.

The alarm panel to be placed near the main switchboard.
Bilge alarm, Fire alarm etc should be covered.

b) **General alarm system**

An electrically operated alarm system of bells or horns or sirens shall be provided. The signals shall be clearly audible throughout the entire accommodation and machinery spaces.

The system shall be operated by a switch near dredging desk. The switch to be of "Lever" pattern of the "At will/lock on" type. Protection against inadvertent operation to be provided.

All bells shall be suitably labeled and painted in selected colour indicating that they are part of the general alarm system. The system shall be supplied from the emergency battery of the 24 Volts system.

b**) Dredging/navigation lights/day signal**

To install on the navigation mast 4 dioptric (two on each side) dredging lights and 1 top light. All with flexible cable, plugs and socket outlets near the mast.

Further to install on forward- and aft end of the dredger socket-outlets for anchor lights.
All lights to be 24 Volt DC separately controlled by switches into the dredging desk.

To deliver two anchor lights with flexible cable and plug.

Day signal equipment to be provided.

c) **Search light**

To install on top of the control cabin a non Ferro searchlight with pedestal and control below deck, 250 Watt, 24 Volt, with switch placed near the control handle.

d**) Whistle**

To install on top of the control cabin an air whistle with hand/pneumatic operating by means of a rope inside the control cabin to an air valve.

e) **Window wipers**

On window of the control cabin to install 3 pantograph type window wipers, 24 Volt with control switches on the dredging desk.

f**) Clocks**

To install in the control cabin and in the mess room each one six-day marine chronometer, with luminous points and handles.

g) **Talk-back system**

To install in the dredging desk, a marine-type talk-back installation with amplifier for connection to 24 V DC.

Further with a switch, speaker, microphone, main switch, running light, bell, call lights and selector switches for connections to:

- watertight wide beam speaker turn-able from control cabin
- two stations on deck
- 1 ditto in engine-room

The microphone in wheelhouse with listen/speak switch.

The engine-room extension with extra head set with about 20 m long flexible cord with plug.

h) V.H.F. installation

In the control cabin to be mounted one 24 Volts DC approx. 15 Watts 12 channels transistorized VHF-installation, complete including the required crystals.
An interruptible listening speaker to be provided in the room of the watchman.

6.0 DREDGING EQUIPMENTS

6.1 **GENERAL REQUIREMENTS**

6.1.1 **Steel constructions**

Ladder and gantry to be of robust construction. Suitable and safe access to all dredging equipment including ladder, gantry, spud arrangement etc. to be provided by means of ladders, platform, stairs with railings. These items to be partly dismountable and all of them galvanized. Platforms of galvanized grid type or equivalent.

6.1.2 **Winches**

The ultimate strength or winches with foundations and/or supports to be based upon 80 percent of theoretical breaking strength of wires. At nominal working loads the stresses are to be less than 45 percent of yield. stress. All gearings or speed reductions shall be of the completely closed type.

The capacity of drums to be suitable for the specified wire length plus one layer.

Roller bearings to be based upon an average lifetime of 50,000 hours and provided with watertight seals. Each winch to have a lubricator block to which all bearings are to be connected.

Shafts and bearings of gearboxes and motors to be based upon rate power and speed with suitable overload and for a L 10-lifetime of 10,000 hours. The gears to be calculated for an infinite lifetime, taking into account application factors as suitable for the relevant winches and a safety factor of at least 1.8 against pitting and a safety factor of at least 2.5 against breaking.

Gearboxes to be of approved make and in totally closed execution with watertight sealing and level gauges.

6.1.3. Pipelines

All dredge pipelines to be of steel St. 42 with a thickness of at least 10. mm for straight parts and 13 mm for bent parts. In general bends with a radius at centre line of minimum 90.0. mm. Flanges to be machined after welding and designed for connections with a minimum of bolts (20. or less). Rubber packing between flanges with a thickness of at least 4 mm and with canvas inlay. All pipe pieces to be numbered by welded-on letters and provided with hoisting eyes. Suction lines with an inside diameter of 50.0..mm and pressure lines with 450. mm I.D.

6.1.4. Hoses

All flexible rubber hoses with inside surface of hard and wear- resisting rubber, suitable for a working pressure of about 8 bar under unfavourable bent conditions.
Section hoses also to be designed for 100.% vacuum simultaneously with maximum bending.

6.1.5. Sheaves and wires

All sheaves to have a diameter on centerline of at least 20. times the were diameter and running on roller type bearings provided with seals (underwater sheaves with double seals). Swiveling sheaves to be hinged on aluminum bronze bearings with shafts of Steel. .
All wires and stays to be galvanized.

6.1.6. Greasing system

All bearings to be connected to a greasing system. Greasing of sheaves, bearing etc. in general to centralize in groups where practicable. Standard type of nipples to be applied.

6.2 CUTTER INSTALLATION

6.2.1 General

The cutter installation to be designed for cutting loosely to medium packed sand with a cutting power of at least 200 HP. The main objective is to achieve a large dredged area coverage per unit of time. The thickness of cutting will vary between about 0.2 m and 1.0 m with an average of about 0.70 m. Therefore relative large cutter dimensions in relation to the suction diameter to be chosen in combination with a high swing speed.

The dimensions, weight, ballast etc. of cutter ladder with cutter head and drive to be chosen in such a way that with ladder down the virtual weight in hoisting system will not be less then 180 kN (cutter free from river bed).

6.2.2. Ladder hoisting gantry

The hoisting gantry on the fore ship to be an A-frame steel construction mounted via hinge constructions with an angle of about 60 degrees relative to the main deck. The maximum height to be less than 5.50 m above water level for, the dredger in transport condition with 10 percent stores and zero water ballast.

Longitudinal stability and strength to be arranged by two diagonal steel pipes alongside the ladder well, with bolted or hinged connections on both ends.

Safe access to the sheaves etc. on top of this gantry to be provided for inspections and/or maintenance/greasing.

6.2.3. Cutter ladder

The top part of the cutter ladder to be an open box type steel construction with high stiffness and the lower part to be a steel pipe with a diameter of at least 1200 mm. The displacement of the ladder to be kept as small as possible.

Discontinuities in the steel constructions to be avoided and/or sufficient overlap to be chosen. In general edges of openings to be reinforced by strips or equivalent. The ladder to be hinged to the main pontoon at about 0.9 m below deck level by means of heavy trunnions.

For the hoisting system a number of sheaves to be mounted on the ladder. For the swing system two walking sheaves at top end of ladder, two guide rollers at halfway of the ladder and further two swiveling sheave blocks on the lower end of the ladder to be provided.

For the cutter drive and all other equipment etc. mounted in or on the ladder suitable foundations and local strengthening to be arranged.

Means to be provided for fixing the ladder in up-position at deck level (hand operated heavy locking pins or equivalent).

Watertight parts in the ladder to be designed where sand deposits can be expected at inaccessible locations. These parts to be kept as small as possible,

well preserved and filled with polyurethane foam or equivalent.

6.2.4. **Ladder hoisting winch**

The ladder to be hoisted by a 4 parts hoisting arrangement and a hydraulic driven winch positioned directly in front of the operator's control cabin. This winch to be exactly identical to the side wire winches. The wire length to be suitable for a maximum dredging depth of 6 m with a minimum of 34 m wire on the drum. The highest position of ladder to be such that with one spud down, 10 percent stores and no water ballast cutter head repair or replacement operations can be carried out

6.2.5. **Side wire winches**

Two side wire or swing winches to be installed on the main deck in front of the operator's control cabin These winches to be driven by slow-running heavy duty radial piston hydraulic motors. Further each winch to be provided with a hydraulic operated band-brake fitted on the winch drum. Braking of the releasing winch to be adjustable at some braking torque levels between 10 and 40 percent of nominal torque. Reversing of winches to be effected by remote control from the operating desk. For securing the winches with hand-operated locking pins to be provided.

The capacities and drum dimensions are:

- drum diameter	min. 520 mm
- drum length	min. 500 mm
- drum wall thickness	at least 32 mm
- drum capacity (max. 4 layers)	at least 140 mm
- wire diameter	28 mm
- wire breaking strength	560 KN
-hauling pull on first layer (nominal)	130 KN
-ditto, peak-stalling (intermittent)	160 KN
- nominal continuous hauling speed	18 m/min.
- maximum intermittent hauling speed (reduced torque)	24 m/min
- maximum veering speed	35 m/min
-band-brake dynamic braking capacity	160 m/KV
- band-brake static braking capacity	200 KN

The length of each side wire to be at least 150 m.

6.2.6. **Cutters and cutter drive**

Driving system

The cutter will be driven by two slow running hydraulic motors (identical type and size as side winches) via a gearbox, both mounted on the cutter ladder. The hydraulic motors to have a total rated output power of at least 200 HP at nominal speed, capable to deliver the nominal rated torque in a speed range from 40% to 100% of nominal speed. The gearbox to have a reduction such as

necessary for a nominal cutter speed of 30 r.p.m.

The direction of rotation of the cutter to be clockwise seen from the motor.

Coupling cutter drive

Between gearbox and cutter shaft a gear-type coupling with thrust plate based on the rated power and a machine factor of at least 2. The gear type coupling of approved make to be of the single type and to be provided with outboard water resistant rubber tightening sleeves.

Gearbox cutter drive

The gearbox to be specially designed for cutter driving , suitable for working below waterline level under all occurring angles and down to a water depth of about 12 m. The gearbox suitable for the required power.

The gearbox with built-in thrust bearing suitable for a continuous thrust of at least 15 tons.

The gearbox to be designed with a calculated average lifetime for the bearings of 40,000 hours and infinite lifetime for the gears (both for breaking and pitting, taking into account a machine factor of 2).

Cutter shaft and bearing

The cutter shaft to be designed for the required torque, possible overloads and further dynamic shock loads as can be expected under practical circumstances (large stones and/or local limestone areas).

Cutters

Two cutters of plain or seretted type with removal tooth or any latest model of appropriate diameter will have to be delivered and mounted, one cutter for handling light compact sand and one cutter for handling medium to heavy packed sand. Both cutters with identical hubs, buttress thread, inside ring diameter and distance ring base/hub.

The light packed sand cutter shall have 5 blades and plain edges (crown type or equivalent). The medium packed sand cutter shall be with serrated plain edges. Cutters shall be suitable for the installed power, revs, ladder angles and suction mouth dimensions. Cutter material to be of high tensile manganese steel. Make of cutters, IHC, Esco or equivalent. Geometric design of cutters to be chosen in concert with OWNER.

Lub. oil system

The gearbox for the cutter drive shall be pressure oil lubricated. This lub. oil system to be provided with pressostat and thermostat.

Flushing water system of rubber bearing

One V-belt driven type centrifugal pump shall be installed in the engine-room for flushing water supply to the rubber bearing of the cutter shaft.

The pump shall have a capacity of at least 15 m3/h at a total head of at least 40 mwc.

Fixed and partly flexible pipeline connection between pump and bearing on ladder to be provided with appendages etc.

Grease lubricating system

For grease lubrication of the swivel shafts of the ladder to install on the aft side of the ladder an electrically driven grease dosing pump with a grease container of some adjustable discharge connections. The discharge connections to connect to the lubrication points by means of copper pipes 8xl.5 and coupled with screw-type bronze. .

6.2.7 **Anchors, sheaves and guides**

Four swing anchors of Delta-type or equivalent; two anchors with each a mass of 500 kgs and two with each a mass of about 1400 kgs to be supplied. Fluke area and fluke angle shall be worked out for maximum holding power in loosely packed fine sand.

The swiveling sheaves for side wires to be balanced and with suitable guiding plates for outgoing wire.

At the top of the ladder two walking sheaves and at about halfway of the cutter ladder two additional conical shaped rollers for guiding the side wires to be mounted.

Further for two 1500 kgs anchors separate short (hoisting) wires with floating balls complete with connections etc. to be delivered.

For each side wire two floating drums to be delivered (keeping wire free from river bottom).

6.3 SPUD INSTALLATION

6.3.1. General

The spud installation consists of a spud carrier with a working spud and one fixed spud acting as positioning spud (to keep the dredger in position during forward moving of spud carrier) .

Each spud to be mounted in twin guides with a vertical distance of at least 2.5 mtr. All spud guiding to be built up of two or more parts easily dismountable in order to make the lowering of spuds into horizontal position possible.

The spud system to be designed for a horizontal external force of 170 kn acting at 1.0 m above bottom end of spud for all water depths up to 6 m. and taking into account a bottom penetration of 3 m and a maximum allowable ideal stress of 60 percent of yield stress unless otherwise prescribed.

The above mentioned external force is mainly the result of current loads. Therefore directions between zero degrees (along the longitudinal axis of the pontoon) and up to 40 degrees deviations for the above mentioned force to be taken into account.

The spuds to be hoisted by means of sling wires operated by hydraulic cylinders and further arrangements for taking over to he provided.

Safety measures are to be taken in order to prevent and/or to stop the swinging operation in case of two simultaneously lowered spuds.

6.3.2. Spud carrier

The movable spud carrier is to be fitted in a well at the aft ship and guided by four vertical wheels running between an upper and lower rail at main deck level. Slide bars at two levels to be fitted inside the well and onto the carrier for horizontal guiding.

The spud carrier to be movable by means of a hydraulic ram with a maximum working force of 170 kN and a stroke of 5 m having a spherical type bearing connection to the carrier.

6.3.3. Spud guides and clamps

All spud guides to be easily dismountable and therefore consisting of two or more parts. The lower spud guides to be positioned at about 1.30 m above baseline of the pontoon. The top spud guides to be positioned at least 2.5 m above the lower guides and combined with the spud clamps. The spud clamps to be operated hydraulically and designed for vertical forces of at least 2.5 times the weight of the spud.

On both sides of the top spud guides additional supports to be constructed with removable horizontal pin elements for vertical fixation of spuds.

The lowering of spud into horizontal position will be possible by a rotation around the above mentioned pin element.

6.3.4. Spuds

Both spuds with an outside diameter of at least 650 mm to be identical and with a length sufficient for a water depth of 6 m, a 3.0 m penetration of bottom and an additional 1.5 m length as margin.

The maximum allowable ideal stress for the spuds to be taken at 70% of yield stress.

The tolerances for roundness and outside diameter of spuds to be less than 0.6 percent.

Each spud to be provided with six transverse steel tubes (welded into the spud) in which holes a pin can be inserted for fixing and/or lowering the spud(s) into horizontal position. One hole to be located at about. 1.5 m above the center of gravity of spud (for lowering spud into horizontal position

Each spud to be provided with a dismountable pointed end, built up around a central rod, conically shaped shell with increased thickness. On top of the spuds hoisting eyes, a watertight steel cover and at bottom side two drains with plugs to be arranged.

The spuds to be coated internally by one layer of coal tar of at least 100 micron.

All materials of spuds with certificates.

6.3.5. **Spud hoisting and lowering systems**

The spuds to be hoisted by sling-wire systems with hydraulic cylinders and sheaves fitted on top of these cylinders. These cylinders or rams to be designed for hoisting the spuds at least 3.5 m in one stroke and suitable for a virtual spud weight of abt 3 times the weight of spud but at least 200 kN.

This hoisting arrangement to be suitable for a free fall of the spuds and also to be able to lower the spuds slowly. Wires to be applied with a breaking strength of at least 500 kN.

Additional structures and means to be provided for lowering the spuds into horizontal position by rotation around a horizontal transverse pin and with centre of gravity of spud about 1.5 m below this point of rotation.

The spuds in horizontal position to be supported by two supports or steel frame structures with rollers and fixation arrangements.

The lowering of spuds to be arranged by means of a wire connected to the top of the spud and a separate small hydraulic driven winch with all further necessary blocks, guiding sheaves etc.

6.4 SUCTION AND DISCHARGE INSTALLATION

6.4.1. General

The suction pipe line mounted at the underside of the ladder will deliver the spoil to the pump, driven by a diesel engine.

The dredge pump will be positioned as low as possible inside the pontoon and to be designed as a high pressure sand pump. The mixture or spoil capacity to be at least 2600 cub.m/hr with a density of 1.3 ton/cub.m, assuming a discharge distance of about 500 m.

This single pump installation will be able to deliver the spoil ashore through a 500 m floating pipe line and a 500 m fixed pipe line with a diameter 450 mm. After disconnecting these pipelines, the installation will also be able to deliver the mixture through a jetting nozzle system at a (throwing) distance of at least 80 m aside the dredger with a mixture capacity of at least 2600 cub.m/h with a density of 1.2 t/cub.m. The required pump pressures to be calculated by the Contractor and submitted to the OWNER for approval.

6.4.2. **Dredge pump**

The single walled centrifugal as a high pressure sand pump mentioned in par. 6.4.1. The pump and 5-blade impeller to be designed for high efficiency, a pressure of at least 65 mwc at a nominal speed of about 450-500 revs. The pump to be able to attain a vacuum of about - 6 mwc (an absolute pressure of 0.4 bar) at nominal speed and without significant cavitation. The pump casing to be a single piece steel casting with a wall thickness for unprotected areas of at least 75 mm. Suction cover and shaft cover to be provided with wearing plates.

The impeller with a diameter of about 1.25 m to be of cast steel with an average blade thickness of at least 40 mm and fitted to the shaft by a thread connection.

One additional impeller with a smaller diameter to be delivered suitable to deliver a maximum quantity of spoil at nominal speed in case of a discharge distance of about 500 m and a spoil density of 1.3 t/cub.m. The required pressure for this condition will be significantly less than 65 mwc (approx. 40-45 mwc) and has to be calculated by the Contractor. Design and calculations of capacity, pressure and required power to be submitted to the OWNER for approval.

Between pump and gearbox a tooth coupling to be installed. Further a barring arrangement and hand-turning means to be provided.

Flushing and gland water to be supplied on suction and shaft side of the sand pump. Each pump to deliver at least 45 m3/h in case of mixture jetting conditions (sand pump pressures above 65 mwc).

These flushing and gland water pumps to be driven by the main engine (via heavy V-belts).

6.4.3. **Suction pipe**

The suction mouth to be dimensioned with an area of about 0.25 m2, suitably shaped into the cutter with a height of about 0.25 to 0.30 m and a width of about 0.8 - 1.0 m. Easy mounting/replacement of suction mouth without dismounting the suction line and/or cutter shall be possible.

A rubber suction hose with smooth inner surface and with a length of at least 1100 mm will connect the suction line of the ladder with the suction pipe line

on board. This hose to be suitable for 100% vacuum with a suitable safety factor.

Geometrical position and connections of this hose (including geometrical design of ladder at this location) to be designed for easy replacement. Additional means as ladders and small platforms etc. for carrying out these replacements to be provided.

The suction pipe line on board to be connected to the dredge pump by means of an expansion pipe with quick-release type connections.

6.4.4. **Discharge pipe line (on board)**

The pressure pipe line on board to be installed with expansion pipe pieces provided shortly after the sand pump discharge opening.

At the aft end of the pontoon a swivel bend (rotation over 180 degrees) with stuffing box to be mounted for connection to the floating pipe line.
The pipe lines to be supported by a suitable number of steel frame structures, taking into account the requirements for jetting .

The discharge line on board to be fitted with a non-return valve.

6.4.5 **Jetting nozzle**

For jetting purposes one pipe piece of the discharge line to be replaced by a jetting arrangement consisting of a pipe piece with bend and nozzle pieces. This pipe piece with bend connected by bolts to the discharge line on the forward side (to sand pump) and via a horizontal foundation with blind flange to the ft part of the discharge line. The nozzle to be mounted pointing upwards under several angles between 15 and 45 degrees. Therefore additional bend pieces with flanges to be delivered; 2 x 15 degrees, 2 x 20 degrees and 2 x 25 degrees. Radius of bend pieces about. 1200 mm for centre line of pipe.

Throttle to be connected to the bend pieces via a flange connection with a rubber sealing ring, hinge on one side and a low number of breaking bolts on the flange opposite side.

An additional pipe piece of about 3.5.m length to be delivered, mounted on supports and suitable for ._connection to bend pieces and nozzle for jetting to other side.

The outlet diameter of the nozzle to be calculated for the required throwing distance, mixture capacity of at least 2500 m3/h and a specific density of 1.2 t/m3. Nozzle to be constructed of wear-resistant steel with 20 mm plate thickness and to consist of a conical part (diameters 450 mm to about 170 mm) and a straight pipe piece (diameter about 170 mm) each with a length of at least 500 mm. Inside of _nozzle to be designed-for an efficiency of at least 85%.

For the above described structures with foundations and supports the reaction

forces of this jetting arrangement to be taken into account.

One complete spare nozzle to be delivered.

6.4..6. **Floating discharge pipe line**

Floating discharge pipeline of 500 mtr. length to be supplied along with the dredger.

The pipes to be made of HDPE and duly coupled with flanges and stubends on both ends and enable to easy fitment by use of Gaskets and Galvanized nuts & bolts. The pipe shall by of 6 mtr in length an 450 mm ID interconnected by 2 mtr long rubber hoses. Each length of pipe line to be supported by 2 nos. high Impact polyethylene floating elements made in two halves having length of about 1 mtr. each. The floating element to be designed for keeping the dredge pipe line afloat when pumping a mixture with a density of 1.6 t/cub.m and with am margin of 15% displacement.

All flange connections to be designed with a rubber sealing ring a minimum of bolts and fro an axial load due to current of at least 80 KN.

Further for anchoring this pipe line all elements to be provided with suitable connections, and in total 15 anchors I (weight abt. 150 kgs each) with each anchor connected with a 30 m length wire to be delivered.

6.4.7. **Valves and appendages**

At the highest point of the suction line a de-aeration valve or equivalent to be provided.
Further a non-return flap valve to be fitted in the discharge line on board.

6.5 **HYDRAULIC INSTALLATIONS**

6.5.1. **General**

The number of makes and types of the components to be used shall be reduced much as possible by standardization. The installations shall therefore be delivered and installed by one sub-contractor.

Installation of the hydraulic units, the hydraulic components fitted to the controlled installations, fitting of the interconnecting piping, flushing and testing of the entire installation shall be carried out verify carefully under the super vision of the Contractor, which shall be fully responsible for a first class performance of the complete procedure.

A sufficient number of spare parts must be available on board when testing of the hydraulic installations will start so that failing components can be changed immediately.

6.5.2. **Hydraulic power unit**

The hydraulic supply unit shall be built-up with four identical type and size variable axial piston pumps, normally used for:

- one for side winch drive
- two for cutter drive
- one for general purpose such as pilot, ladder hoisting, spud control etc.

In case of failure of one of the main pumps .(in single pump systems only) there must be a possibility to use one of the pumps for the cutter drive for this duty.

In this case the cutter will be driven by one pump and one motor.

In case of auxiliary diesel failure (for emergency hoisting of ladder or for repair/check/spud handling winch operations) electrically driven hydraulic pump set of about 5 kW shall be installed with required hydraulic pressure.

All main pump units to be equipped with a power limiting, a pressure limiting and a flow limiting device, based on an open circuit hydraulic loop.

Zero position interlocking to be provided for all controllers during starting-up of the pump set.

Further additional controls to be added as follows:

a) For the cutter drive and side winches

Flow control from the dredging desk (speed control).

b) For the distribution unit

A load sensing device, regulating the pressure between 30 bar (pilot pressure) and max. 160 bar (depending on the maximum required highest pressure during control of one or more simultaneously used consumers).

The normal working pressures (based on the in this specification mentioned lifetime), shall be:

- for the cutter drive (2 pumps and 2 motors) : 100 bar
- for the side winches : 100 bar
- for the distribution system : 30-160 bar.

The hydraulic pump installation is to be built as one complete unit with the tank, filters, cooling unit, valve panels, accumulators, remote control relays, interconnecting piping,

instruments and cabling assembled on a common frame which as a unit will be fitted on the ship's foundation.

The tank must have a capacity of approx. 1.5 m3 and provided with all

necessary accessories, including low level, high temperature and dirty filter alarm, level indicator, temperature indicator etc.

It must be possible to fill the hydraulic tank from deck. The filling line to be provided with filter. The filling connection to be lockable, e.g. by means of a padlock.

6.5.3. **Cutter drive**

The cutter drive consists of two hydraulic motors, each connected to a variable displacement pump, parallel operating by pressure equalizing (equal torque).

The speed control from the dredging desk to be stepless by displacement control of both pumps up to about 30 revs/min. of the cutter.

In case of one of the pump units should be used for one of the other systems or is out of use, then the cutter will be driven by one pump-motor combination. In this emergency case the cutter speed range to be the same as for the normal condition.

The max. power per motor to be limited at: - for combined 2 motors drive
- for emergency I motor drive (intermittent duty)

The max. system pressure to be limited at 160 bar.

Interlocking to be provided against running without cutter bearing flushing water (flow).

6.5.4. **Ladder winch drive**

The hydraulic motor to be connected to the main hydraulic distribution network and shall be stepless speed controlled from the dredging desk via a pilot controlled two directional proportional valve.

The hoisting and lowering speed to be limited at about 18 m/min. The hoisting force limited at 160 kN. Both on the second layer.

The highest and lowest position of the ladder to be automatically limited by limit switches on the ladder.

For ladder position indicator and pre-warnings of end positions, see par. 6.7.4.

6.5.5 **Side winches control**

Both side winches, each with one hydraulic motor, will be controlled via one variable displacement pump unit in such a way that only the hauling winch shall be speed-controlled (stepless) from the dredging desk via the flow control of the pump unit.

The other winch is then disconnected from the pump and is normally veering, with a braking torque adjustable form the dredging desk in five steps between

10% and 40% of the nominal hauling force.

The controls of both winches to be combined in one joy-stick with in horizontal direction the dredging speed control to PS or to SB (including mid-scale zero position) and in vertical direction the braking torque control of the veering winch (without zero position).

The selection "hauling winch-veering winch" will be determined by the (horizontal direction) joy-stick position to PS or to SB, and changes every time when passing the midscale position (stop position).

For separate winch control a 4-position selector-switch to be added in the dredging desk for the following duties:
- individual control PS-winch
- stop (off)
- individual control SB-winch

- combined control (normal dredging).

Joy-stick zero-interlocking to be provided during duty selection.

In the "individual control" condition veering shall be also speed-regulated (as hauling).

Running interlocking to be provided against combined-control with two spuds aground.

Protection of "rolling cutter" to be built in the hauling direction of the SB-winch (e.g. min. hauling torque), which prevents cutter passing the side wire during dredging in case of rolling.

6.5.6. **Spud carrier control**

The spud carrier cylinder to be controlled, in two (individual, pre-adjustable) speeds for both desk. controlled, in two (individual directions,' from the dredging Limit switches to be provided for disconnection on the end positions.

The maximum pressure limiting devices to be suitable for the full nominal flow.

6.5.7. **Spud hoisting control**

Both spuds including the clamps to be controlled from the dredging desk.
The hoisting speed (one step) based on about 75% pump capacity.
The spud cylinder to be provided with a built-on pilot pressure relieve valve on plunger side, and two amply dimensioned built-on relieve valves with common return line. The latter to be as short as possible and to be based on 0.5 m/sec. at rated oil delivery (75% of pump). The spud cylinder on plunger side to be supported by means of a spring or small cylinder with accumulator, for compensation of its weight.

Lowering of the spud should be possible via the cylinder (controlled) or in free fall by means of the clamps.

The necessary time relays should be built-in for interlocking the controls of spud and clamps simultaneously to prevent wrong operation.

The system with two pressure switches or equal system for indication of highest position and unloaded condition.

6.5.8. Valve control

The delivery valve fitted in the DP-pressure line to be controlled from the dredging desk.
Limit switches for position-signal lights to be provided.

6.6 DREDGE CONTROL AND MEASURING SYSTEMS

6.6.1. General and control cabin

The main dredge controls and instruments to be fitted in the following desks and panels viz.

a. Dredging desk

A dredging desk to be installed in the centre of the control cabin, consisting of three parts, viz.
- a left hand-desk, mainly for the cutter and dredge pump control

- a centre forward instrument panel for the indicators and the profile control unit
- a right hand-desk, mainly for the side and winches, the spud control etc. essential dredging ladder hoisting

b. Instrument rack

A so-called 19" Instrument rack to be installed for as much as possible all electronic amplifiers, calculators and special instrumentation, such as:
- calculation pint for dredge profile computer
- power supply for density measuring system_
- correction unit for ditto
- amplifier for speed measuring
- space for production calculator
- power supply for pressure and vacuum indicators.

6.6..2. Dredge pump control

The dredge pump diesel engine to be remote speed controlled directly from the dredging desk.
For this purpose a complete pneumatic installation has to be delivered. Care must be taken to ensure reliable and smooth control of the speed; for this reason to incorporate the necessary delays and interlocking.

Further to provide an emergency stop (via the diesel engine) and clutch control push-buttons and signal lights, including the necessary interlocking.

6.6.3. **Vacuum/pressure indicators**

To install two special designed pressure transmitters including instruments for measuring of pressure and vacuum.

6.6.4. **Ladder position indicator**

To install on the ladder a watertight special designed pendulum type transmitter of the synchro-type connected to a calculator and including dredging depth indicator in the dredging desk.

6.6.5. **Draught measuring device**

To install near the ladder turning hearings a draught pressure transmitter for correction of the dredging depth.

6.6.6. **Spud carrier position indicator**

To install near the spud-carrier a spring-loaded wire drum with position transmitter and 2 limit-switches. The position indicator to be fitted together with warning end-position signal lights in the dredging desk.

6.6.7. **Dredge profile computer**

To install in the dredging desk a simple type dredge profile computer.

6.6.8. **Gyro compass**

For cutter position calculation, together with the profile computer to install a special selected gyro compass.

6.6.9 **Dredge density meter and production calculator**

A density meter based on non radiometric principle is to be installed with production calculator for measurement of dredged material. The density meter should be able to operate in most hostile and demanding conditions and capable of carrying out measurements of all kinds of liquids and bulk materials. They should be able to provide a maintenance free operation as far as possible.

7.0. **SPARE PARTS**

The spare parts consist of:
- All spare parts as required by the Class for the service intended.
- Standard spare parts according manufacturer's standard.
- All those spare parts which are strictly mentioned in this technical Specification.

The above spare for 500 hours shall be supplied along with the dredger

without any additional cost. However, a list of spare parts for 2000 hours operations shall be submitted along with the technical bids and the price for consideration separately. The list may include the spare cutter, wearing plate, impeller, hydraulic fitting's, flexible rubber hoses.

7.2.1 TOOLS AND INVENTORY

The tools and inventory for supply with the dredger without additional cost shall consist of :

- Makers standard tools and special tools necessary for overhauls during the life of the vessel are to be delivered by all the manufacturer with their supply.

- Those parts as mentioned elsewhere in this Specification.

- Deck inventory

- The Following inventory to be delivered :

- 1 Set of utensils for 4 crew accommodations.

Further :

- 1 National flag)
- 1 towing flag) with lines and hooks etc. for hoisting
- 3 Black balls)
- 1 Bronze fog bell
- 1bammeter / thermometer
- 2 Quartz battery marine clocks
- 1 set of prismatic binoculars (7x50)
- 1 radar reflector
- 1 grease gun for hings.
- 1 tin with 10 kgs of grase
- 1 spanner for manhole covers
- 1steel toolbax, containing.
- 2 jaw/ring spanners 30mm
- 1 bench hammer 500 gr.
- 1 pair of pincers 200 mm
- 1 single end adjustable wench 350 mm
- 2 screwdrivers 200-300 mm
- 1 set of "Allen" Hex keys 2-17 mm
- Pair of engineers combination pliers 150 mm
- 1 water pump pliers 250 mm
- Bench vice

7.2.2 Additional items

1. Bilge alarm shall be provided as per requirement of classification society.
2. Oily Bilge Separator (OBS) system shall be provided.
3. Smoke sensors shall be provided in accommodation and in engine room as per requirement of classification society.

4. Battery box shall be kept in separate space on the deck.
5. Vessel vibration and noise level shall be as per requirement of classification society.

The above items are to be supplied without additional cost.