



KHULNA SHIPYARD LIMITED

BANGLADESH NAVY

Labonchara, Khulna-9201, Bangladesh

Phone: 02-44110987, 02-477720003, Fax: 02-477720404

E-mail: contact@khulnashipyard.gov.bd, Web: www.khulnashipyard.com

Project-646/ Pilot Boat/ 622

Date: 16 August 2022

REQUEST FOR PROPOSAL (RFP) - DESIGN AND SUPPLY INSTALLATION OF PILOT BOAT

Reference:

Project Name:	Design, Manufacture and Supply Installation of Tug Boats, Survey Boat, Pilot Boat and Supply and Installation of Vessel Traffic Management System ("Package 2B")
The Number of the Invitation for Bids is:	18.13.0000.600.14.064.22
The Employer is:	Chittagong Port Authority (CPA) located in Bangladesh
The Project is:	Matarbari Port Development Project
The name of the Contract is:	Package 2B
The number of the JICA Loan Agreement is:	BD-P105

1. **Project Description.** Khulna Shipyard Ltd (KSY), Bangladesh Navy, Labanchara, Khulna-9201 a renowned shipbuilding organization intends to procure design, drawing, material package with necessary services for building 01 (One) in number Pilot Boat of Chittagong Port Authority (CPA).

2. **Quantity.** Complete design, drawing, material package with necessary services for building 01 (One) in number Pilot Boat of Chittagong Port Authority (CPA).

3. **Scope of Supply for PART-A (Pilot Boat).**

Item No	Description of Item	Unit of Supply	Qty
1.	Complete design and material package of Pilot Boat	Nos.	01

Special Notes:

- Bidder must follow the instructions/ guidelines very carefully as mentioned in the attached tender document (Attachment-1).
- Bidder should offer complete design package from a reputed international design houses/organization.
- Complete design and material package as per technical specification desired by CPA. Necessary authorization letter from designer and OEM should be provided.
- OEM support during installation, commissioning and test trial of the vessel and also during the warranty period.
- Supervision support during construction, machinery installation and in other phases as needed to complete the project.

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- f. Training of the CPA's personnel or other personnel so directed by the CPA on the operation and maintenance of the supplied Pilot Boat at the Site.
- g. KSY's scope of supply for this RFP is given in Attachment-2.
- h. Technical and financial offer should be submitted separately.
- i. Financial offer should be submitted as per attached ref tender technical specification (**section IV: Bidding Forms**)
- j. Partial/ incomplete offer is not acceptable and will be treated as non-compliant for that part.
- k. The specific brand, model, manufacturer/ OEM, country of origin or any other conditions mentioned in the technical specification are to be offered as it is.
- l. Proposed technical specification of the vessel should be given as per tender requirement.
- m. Article wise compliance statement is to be submitted for evaluation of the quotations. Stating mere 'Yes or No' will not suffice and detailed description/ information, brochures/booklet, drawing and diagram (as required) is to be given. An incomplete compliance statement in any part may attribute to cancellation of the offer. If any clause of this specification does not commensurate with the requirement, the deviation must be spelt out clearly.
- n. Relevant documents, design/ drawings, calculations, certificates, authorization letters, brochure, catalogue (as deemed necessary) to be submitted with the offer as per tender requirement.
- o. Bidder must submit all queries/ clarifications to KSY that arises before submission of the bid giving sufficient time to respond.
- p. **Bid security of 2% of the offered value must be submitted on receipt of written notification from KSY (when a bidder is technically and financially selected).** The Bid Security shall be valid for thirty (30) days beyond the original validity period of the bid or until the contract. The Bid Security may be forfeited:
 - (a) If a Bidder withdraws its bid/ offer within the period of its validity, or any extension thereto provided by the Bidder; or
 - (b) If the successful Bidder fails to sign the Contract.
- q. Bidder will furnish performance guarantee of amounting **5% of the Total contract price** from scheduled Bank of Bangladesh/ others acceptable to KSY after giving Notification of Award (NoA) (at the time of contract signing), which will remain valid up to 30 (thirty) days beyond the delivery under the contract with CPA. After delivery of the goods, Supplier will provide Bank guarantee with written undertaking that for one year warranty from the acceptance of the supplied machinery, equipment, items, and services by the Supplier amounting 5% of the TCP.
- r. Other terms and conditions of KSY related with the contract signing will be notified duly to successful bidder.



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4. Interested firm/ supplier/ dredger manufacturer/ companies is hereby requested to contact following person and to collect the RFP Schedule in this regard:

ENGR. DEBABRATA MONDAL
Executive Engineer
Design & Planning Department
Khulna Shipyard Ltd. Bangladesh Navy Khulna-9201
Cell: +8801947628703
Email: ocird@khulnashipyard.gov.bd
plannig.ksy@gmail.com
contact@khulnashipyard.com

Any query regarding this RFP, interested bidder/ firm/ supplier/ manufacturer/ company should inform/ contact in above address.

5. Interested bidder must check KSY website for further amendment, corrigendum and addendum on this RFP.

6. **Bidder's Qualification Documents to be submitted.**

- a. Valid Trade License.
- b. Business Registration Certificate/ Article of incorporation/ association.
- c. TIN/ equivalent certificate.
- d. Bank Solvency Certificate.
- e. Income tax payment certificate.

7. Interested bidder should submit their technical and financial offer for each part at KSY premises on dated **15 September 2022 before 1400 hrs.**

8. Offer validity will be 180 days from the submission of offer.

9. **KSY reserves all the right to accept/ reject all or any part of the bidder's offer against this RFP without showing any reason.**

AL AMIN CHOWDHURY
Captain BN
For Managing Director

BIDDING DOCUMENT

for

**Design, Manufacture and Supply Installation
of Tug Boats, Survey Boat, Pilot Boat**

and

**Supply and Installation of Vessel Traffic
Management System**

(“Package 2B”)

IFB No. : 18.13.0000.600.14.064.22

Employer : Chittagong Port Authority (CPA)

Country : Bangladesh

JICA Loan No. : BD-P105

Project : Matarbari Port Development Project

Contract : Package 2B

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PART 1 – BIDDING PROCEDURES

OPTION A:
Single-Stage Two-Envelope Bidding

Section I. Instructions to Bidders

Section I. Instructions to Bidders

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A. General

1. Scope of Bid

- 1.1 In connection with the Invitation for Bids **specified in Section II, Bid Data Sheet (BDS)**, the Employer as **specified in the BDS** located in the country, as **specified in the BDS**, issues this Bidding Document (hereinafter referred to as “Bidding Document”) for the procurement of Design Build Plant and Works as specified in Section VI, Employer’s Requirements.

The name of the Project and the name of the Contract are **specified in the BDS**.

Bids may also be invited for multiple lots of the Project, as **specified in the BDS**. Bids may be submitted either for individual lots or for multiple lots in any combination.

- 1.2 Throughout this Bidding Document:

- (a) the term “in writing” means communicated in written form and delivered against receipt;
- (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) “day” means calendar day;
- (d) “firm” means a private entity, a state-owned enterprise or institution;
- (e) “Joint Venture” or “JV” means any combination of two or more firms in the form of a joint venture, consortium, association or other unincorporated grouping under an existing agreement or with the intention to enter into such an agreement supported by a formal letter of intent; and
- (f) the word “Works” is synonymous with the words “Design-Build Plant and Works” and “plant and installation services”.

2. Source of Funds

- 2.1 The Borrower **specified in the BDS** has received or has applied for a Japanese ODA Loan from the Japan International Cooperation Agency (hereinafter referred to as “JICA”), with the number, in the amount and on the signed date of the Loan Agreement **specified in the BDS**, towards the cost of the Project. The Borrower intends to apply a portion of the proceeds of the Loan to payments under the

Contract(s) for which this Bidding Document is issued.

- 2.2 Disbursement of a Japanese ODA Loan by JICA will be subject, in all respects, to the terms and conditions of the Loan Agreement, including the disbursement procedures and the applicable Guidelines for Procurement under Japanese ODA Loans **specified in the BDS**. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the loan proceeds.
- 2.3 The above Loan Agreement will cover only a part of the project cost. As for the remaining portion, the Borrower, the Project Executing Agency and the Employer will take appropriate measures for finance through other sources **specified in the BDS**.

3. Corrupt and Fraudulent Practices

- 3.1 It is JICA's policy to require that the Bidders and the Contractors, as well as the Borrowers, the Project Executing Agencies and the Employers, under contracts funded with Japanese ODA Loans and other Japanese ODA, to observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, JICA:
- (a) 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.
 - (b) will recognize a Contractor as ineligible, for a period determined by JICA, to be awarded a contract funded with Japanese ODA Loans if it at any time determines that the Bidder or the Contractor has engaged in any corrupt or fraudulent practice in competing for, or in executing, another contract funded with Japanese ODA Loans or other Japanese ODA. The list of ineligible firms and individuals is available at the electronic address **specified in the BDS**.
 - (c) will recognize a Contractor as ineligible to be awarded a contract funded with Japanese ODA Loans if the Contractor or subcontractor, who has a direct contract with the Contractor, is debarred under the cross debarment decisions by the Multilateral Development Banks. Such period of ineligibility shall not exceed three (3) years from (and including) the date on which the cross debarment is imposed.

“Cross debarment decisions by the Multilateral Development Banks” is a corporate sanction in accordance with the agreement among the African Development Bank Group, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank Group and the World Bank Group signed on 9 April 2010 (as amended from time to time). JICA will recognize the World Bank Group’s debarment of which period exceeds one year, imposed after 19 July 2010, the date on which the World Bank Group started operating cross debarment, as “cross debarment decisions by the Multilateral Development Banks.” The list of debarred firms and individuals is available at the electronic address **specified in the BDS**.

JICA will recognize a Bidder or Contractor as ineligible to be awarded a contract funded with Japanese ODA Loans if the Bidder or Contractor is debarred by the World Bank Group for the period starting from the date of the Invitation for Bid, if prequalification has not been conducted, or the date of the Advertisement for Prequalification, if prequalification has been conducted, up to the signing of the contract, unless (i) such debarment period does not exceed one year, or (ii) three (3) years have passed since such debarment decision.

If it is revealed that the Contractor was ineligible to be awarded a contract according to above, JICA will, in principle, impose sanctions against the Contractor.

If it is revealed that a subcontractor, who has a direct contract with the Contractor, was debarred by the World Bank Group on the subcontract date, JICA will, in principle, require the Borrower to have the Contractor cancel the subcontract immediately, unless (i) such debarment period does not exceed one year, or (ii) three (3) years have passed since such debarment decision. If the Contractor refuses, JICA will require the Borrower to declare invalidity or cancellation of the contract and demand the refund of the relevant proceeds of the loan or any other remedies on the grounds of contractual violation.

- 3.2 If the Employer determines, based on reasonable evidence, that any Bidder has engaged in any corrupt or fraudulent practice, the Employer may disqualify such Bidder after notifying the grounds of such disqualification.

- 3.3 Furthermore, the Bidders shall be aware of the provision stated in Sub-Clause 15.6 of the Conditions of Contract.

4. Eligible Bidders

- 4.1 The Bidder may be a single firm or a JV. In the case of a JV:
- (a) all members shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms.
 - (b) the JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.
 - (c) A Bid submitted by a JV shall include a copy of the JV Agreement entered into by all members. Alternatively, a formal letter of intent to enter into a JV in the event of a successful Bid shall be signed by all members and submitted with the Bid, together with a copy of the proposed Agreement. The JV Agreement or the proposed JV Agreement, as the case may be, shall indicate at least the part(s) of the Works to be executed by each member.
- 4.2 The Bidder shall not have a conflict of interest. The Bidder shall be disqualified under any of the circumstances set forth below, where it is determined to have a conflict of interest throughout the bidding/selection process and/or the execution of the Contract unless the conflict has been resolved in a manner acceptable to JICA.
- (a) A firm shall be disqualified from providing goods or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of a project that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm. This provision does not apply to the various firms (consultants, contractors, or suppliers) only due to the reason that those firms together are performing the Contractor's obligations under a turnkey or design and build contract.
 - (b) A firm that has a close business relationship with a professional personnel of the Borrower (or the Project Executing Agency, or the Employer), who are directly or indirectly involved in any part of: (i) the preparation of the Prequalification Document (if any prepared) and/or the Bidding Document for the Contract, (ii) the

prequalification evaluation (if any conducted) and/or the Bid evaluation, or (iii) the supervision of such contract, shall be disqualified.

(c) Based on the “One Bid Per Bidder” principle, which is to ensure fair competition, a firm and any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm shall not be allowed to submit more than one Bid, either individually as a single firm or as a member of a JV. A firm (including its affiliate), if acting in the capacity of a subcontractor in one Bid, may participate in other Bids, only in that capacity.

(d) A firm having any other form of conflict of interest other than (a) through (c) above shall also be disqualified.

4.3 The Bidder shall meet the requirements as to eligibility of the Bidders as specified in Section V, Eligible Source Countries of Japanese ODA Loans.

4.4 The Bidder that has been determined to be ineligible by JICA in accordance with ITB 3.1 shall not be eligible to be awarded a Contract.

4.5 This bidding is open only to the prequalified Bidders unless **specified in the BDS.**

4.6 The Bidder shall provide such evidence of its continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

5. Eligible Goods and Services

5.1 The goods and services comprising the Works to be supplied under the Contract and financed by JICA shall meet the requirements specified in Section V, Eligible Source Countries of Japanese ODA Loans.

B. Contents of Bidding Document

6. Sections of Bidding Document

6.1 The Bidding Document consists of Parts 1, 2, and 3, which include all the Sections specified below, and which should be read in conjunction with any addenda issued in accordance with ITB 8.

PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)

- Section III. Evaluation and Qualification Criteria (EQC)
- Section IV. Bidding Forms
- Section V. Eligible Source Countries of Japanese ODA Loans

PART 2 Employer's Requirements

- Section VI. Employer's Requirements

PART 3 Conditions of Contract and Contract Forms

- Section VII. General Conditions (GC)
- Section VIII. Particular Conditions (PC)
- Section IX. Contract Forms

- 6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.
- 6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Bidding Document, responses to requests for clarification, the minutes of the pre-bid meeting (if any), or addenda to the Bidding Document in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer shall prevail.
- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document and to furnish with its Bid all information and documentation as is required by the Bidding Document. The information or documentation shall be complete, accurate, current, and verifiable.

7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting

- 7.1 The Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address **specified in the BDS** or raise its enquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received no later than fourteen (14) days prior to the deadline for submission of Bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. If so **specified in the BDS**, the Employer shall also promptly publish its response on the Employer's web page **identified in the BDS**. Should the clarification result in changes to the essential elements of the Bidding Document, the Employer

shall amend the Bidding Document following the procedure under ITB 8 and ITB 22.2.

- 7.2 The Bidder is advised to visit and examine the Site and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a Contract for execution of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
- 7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
- 7.4 If so **specified in the BDS**, the Bidder's designated representative is invited to attend a pre-bid meeting. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
- 7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than seven (7) days before the meeting.
- 7.6 Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by the Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting. Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

8. Amendment of Bidding Document

- 8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Document by issuing addenda.

- 8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3. If so **specified in the BDS**, the Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITB 7.1.
- 8.3 To give the Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may extend the deadline for the submission of Bids, pursuant to ITB 22.2.

C. Preparation of Bids

- 9. Cost of Bidding** 9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- 10. Language of Bid** 10.1 The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Employer, shall be written in the language **specified in the BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language of Bid, in which case, for purposes of interpretation of the Bid, such translation shall govern.
- 11. Documents
Comprising the
Bid** 11.1 The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Bid containing the documents listed in ITB 11.2 and the other the Price Bid containing the documents listed in ITB 11.3, both envelopes enclosed together in an outer single envelope.
- 11.2 The Technical Bid shall comprise the following:
- (a) Letter of Technical Bid, in accordance with ITB 12.1;
 - (b) Bid Security, in accordance with ITB 19;
 - (c) Power of Attorney, authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2 and ITB 20.3;
 - (d) copy of the JV Agreement, or letter of intent to enter into a JV including a draft agreement in the case of a Bid submitted by a JV in accordance with ITB 4.1;
 - (e) documentary evidence in accordance with ITB 17

establishing the Bidder's eligibility and qualifications to perform the Contract if its Bid is accepted;

- (f) documentary evidence in accordance with ITB 16.2 establishing that the Works offered by the Bidder conform to the Bidding Document;
- (g) Technical Proposal in accordance with ITB 16;
- (h) Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans (Form ACK), which shall be signed and dated by the Bidder's authorized representative; and
- (i) any other document **required in the BDS**.

11.3 The Price Bid shall comprise the following:

- (a) Letter of Price Bid, in accordance with ITB 12.1;
- (b) completed Schedules in accordance with ITB 12.1 and ITB 14, including completed Price Schedules, completed Schedule of Payment (unless otherwise provided) and completed Schedule of Adjustment Data (if any required in accordance with ITB 14.7) but excluding any Schedule(s) required in ITB 11.2; and
- (c) any other document **required in the BDS**.

12. Letters of Bid and Schedules

12.1 The Bidder shall complete the Letters of Technical Bid and Price Bid and the Schedules, including the Price Schedule, Schedule of Payment (unless otherwise provided) and the Schedule of Adjustment Data (only if required in ITB 14.7), using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

13. Alternatives to the Bid Requirements and Alternative Bids

13.1 **If so specified in the BDS**, alternative times for completion will be permitted, and the method of evaluating different times for completion shall be as specified in Section III, Evaluation and Qualification Criteria.

13.2 **If so specified in the BDS**, alternative Bids will be permitted, and the Bidders, wishing to offer technical alternatives to the Bid requirements, may in addition to the substantially responsive Bid (hereinafter referred to as "Base Bid") submit an alternative Bid. The alternative Bid shall be complete with all information necessary for a complete evaluation of the

alternative by the Employer including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology and other relevant details.

Only the alternative Bids, if any, submitted by the Bidder whose Base Bid is determined to be the lowest evaluated Bid under ITB 36.1 shall be considered by the Employer.

14. Bid Prices and Discounts

- 14.1 The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Price Bid and in the Price Schedule shall conform to the requirements specified below.
- 14.2 The Bidder shall fill in rates and prices for all items of the Works described in the Price Schedule. Items against which no rate or price is entered by the Bidder shall be deemed covered by the rates and/or prices for other items in the Price Schedule and will not be paid for separately by the Employer.
- 14.3 The Bidder shall give a breakdown of the prices in the manner and detail called for in the Price Schedule included in Section IV, Bidding Forms.
- 14.4 The latest edition (as of the Base Date) of Incoterms, published by the International Chamber of Commerce shall govern.
- 14.5 The price to be quoted in the Letter of Price Bid, in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.
- 14.6 The Bidder shall quote any discounts and the methodology for their application in the Letter of Price Bid, in accordance with ITB 12.1.
- 14.7 **Unless otherwise specified in the BDS** and the Conditions of Contract, the rates and prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the relevant provisions of the Conditions of Contract. In such a case, the Bidder shall furnish the indices and/or weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Employer may require the Bidder to justify its proposed indices and weightings.
- 14.8 **If so specified in BDS 1.1**, Bids are being invited for multiple lots. The Bidders wishing to offer any discounts (including

price reduction) for the award of more than one lot shall specify in their Letter of Price Bid, discounts applicable to such award. Discounts shall be submitted in accordance with ITB 14.6, provided that the Bids for all lots are opened at the same time.

14.9 **Unless otherwise provided in the BDS**, all duties, taxes, and levies payable by the Contractor under the Contract, or for any other cause, as of the date twenty-eight (28) days prior to the deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

14.10 The exact amounts of the Provisional Sums and contingency allowance shall be indicated in the completed Price Schedule in the following manner:

- (a) The exact amounts and currencies of the Specified Provisional Sums and contingency allowance, if any, shall be **as specified in the BDS**.
- (b) The amount of the Provisional Sum, if any, for the Daywork shall be derived by the Bidder (by entering rates and/or prices in the Schedule of Daywork Rates in the Price Schedule) and indicated in the Summary of the completed Price Schedule.

The Bidder shall be aware of the provisions stated in Sub-Clauses 1.1.4.10, 13.5 and 13.6 of the Conditions of Contract.

15. Currencies of Bid and Payment

15.1 The currency(ies) of the Bid shall be **as specified in the BDS**. Payment of the Contract Price shall be made in the currency or currencies in which the Bid Price is expressed in the Bid of the successful Bidder.

15.2 The Bidder may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Schedule of Adjustment Data are reasonable.

16. Technical Proposal and Subcontractors

16.1 The Bidder shall furnish as part of the Technical Bid, a Technical Proposal including design methodology, a statement of work methods, equipment, personnel, schedule, safety plan and any other information as stipulated in Section IV, Bidding Forms in sufficient detail to demonstrate substantial responsiveness of the Bidder's proposal to meet the Employer's Requirements and the completion time.

16.2 The documentary evidence of the conformity of the Works with the Bidding Document may be in the form of literature, drawings and data, and shall include:

- (a) a detailed description of the essential technical and performance characteristics of the Works, including the functional guarantees of the proposed Works, in response to the Employer's Requirements;
- (b) a list giving full particulars, including available sources, of all spare parts (i.e. Mandatory Spare Parts and Recommended Spare Parts, if required), special tools, etc., necessary for the proper and continuing functioning of the Works for the period **specified in the BDS**, after the taking-over of the Works by the Employer in accordance with the provisions of the Contract; and
- (c) adequate evidence demonstrating the substantial responsiveness of the Works to the Employer's Requirements. The Bidder shall note that standards for workmanship, materials and equipment designated by the Employer in the Bidding Document are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalogue numbers in its Technical Proposal, provided that it demonstrates to the Employer's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in the Employer's Requirements.

16.3 **Unless otherwise stated in the BDS**, the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer (nominated Subcontractors).

The Bidder may propose to subcontract any of the key activities for which experience of proposed subcontractors has been evaluated at the Prequalification stage, or otherwise indicated in Section III, Evaluation and Qualification Criteria 2.4.2(b) (specialized subcontractor). In such a case,

- (a) the Bidder may list one or more subcontractor(s) against any of the key activities and summation of the subcontractors' qualifications against each of criteria for key activities is accepted except as provided ITB 16.3(d). Quoted rates and prices will be deemed to apply whichever subcontractor is appointed by the Contractor,

and no adjustment of the rates and prices will be permitted;

- (b) the Bidder shall clearly identify the proposed specialized subcontractor(s) in Form ELI-3, Form EXP-2(b) and Form MAN in Section IV, Bidding Forms and submit the Schedule of Subcontractors, as part of its Technical Proposal, listing out all subcontractors so proposed including information establishing compliance with the requirements specified by the Employer;
- (c) substitution of the proposed subcontractor(s) shall not be allowed after the Bid submission deadline date prescribed by the Employer in accordance with ITB 22.1; and
- (d) If the evaluation of the Price Bid is directly adjusted by the subcontractor's(s') qualifications, services and/or product(s) in Section III. Evaluation and Qualification Criteria (e.g. the Price Bid is adjusted by a performance of subcontractor's Plant), only one subcontractor or combination of subcontractors shall be proposed; and
- (e) If the prequalification process was conducted prior to the bidding process, the Bidder shall name and list out in the Schedule of Subcontractors, the same specialized subcontractor(s) whose experience in the key activities was evaluated in the prequalification, except only for such changes as are explicitly approved by the Employer in accordance with ITB 17.2.

The Bidder may also propose to subcontract major items of the Works as listed by the Employer in Section III, Evaluation and Qualification Criteria 1.1.3. In such a case, sub-clauses (a) and (b) provided above in this ITB 16.3 shall be applied except submission of Form EXP-2(b) in Section IV, Bidding Forms.

17. Documents
Establishing the
Qualifications of
the Bidder

- 17.1 In accordance with Section III, Evaluation and Qualification Criteria,
- (a) if the prequalification process was conducted prior to the bidding process, the Bidder shall provide in the corresponding information sheets included in Section IV, Bidding Forms, updated information on any assessed aspect to establish that the Bidder continues to meet the criteria used at the time of prequalification, and
 - (b) if the prequalification process was not conducted prior to the bidding process, the Bidder shall provide the

information requested in the corresponding information sheets included in Section IV, Bidding Forms.

The aforementioned Evaluation and Qualification Criteria contains, among other things, the requirements as to eligibility specified in ITB 4.

17.2 Any change in the structure or formation of the Bidder after being prequalified and invited to bid (including, in the case of a JV, any change in the structure or formation of any member thereto) shall be subject to the written approval of the Employer prior to the deadline for submission of Bids. Such approval shall be denied if:

- (a) such change has not taken place by the free choice of the firms involved;
- (b) as a consequence of the change, the Bidder no longer substantially meets the qualification criteria set forth in the Prequalification Document; or
- (c) in the opinion of the Employer, the change may result in a substantial reduction in competition.

Any such change should be submitted to the Employer not later than twenty-eight (28) days before the Bid submission deadline.

18. Period of Validity of Bids

18.1 Bids shall remain valid for the period **specified in the BDS** after the Bid submission deadline date prescribed by the Employer in accordance with ITB 22.1. A Bid that is not valid until the date **specified in the BDS**, or any extended date if amended by the Employer in accordance with ITB 8, shall be rejected by the Employer as nonresponsive.

18.2 In exceptional circumstances, prior to the expiration of the Bid validity period, the Employer may request the Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. The Bid Security shall also be extended for twenty-eight (28) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its Bid, except as provided in ITB 18.3.

18.3 If the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial Bid validity period, the Contract Price shall be determined as follows:

- (a) In the case of fixed price contracts, the Contract Price shall be the Bid Price adjusted by the factor **specified in the BDS**.
- (b) In the case of adjustable price contracts, no adjustment shall be made.

In any case, Bid evaluation shall be based on the Bid Price without taking into consideration the effect of the adjustments indicated in the above paragraph.

19. Bid Security

- 19.1 The Bidder shall furnish as part of its Technical Bid, a Bid Security in the amount and currency **specified in the BDS**.
- 19.2 The Bid Security shall be at the Bidder's option, a demand guarantee in any of the following forms at the Bidder's option:
 - (a) an unconditional guarantee issued by a bank or non-bank financial institution (such as an insurance, bonding or surety company);
 - (b) an irrevocable standby letter of credit;
 - (c) a cashier's or certified check; or
 - (d) another security **specified in the BDS**

from a reputable source. If the unconditional guarantee is issued by a non-bank financial institution located outside the Employer's Country, the issuing financial institution shall have a correspondent financial institution located in the Employer's Country to make it enforceable. In the case of a bank guarantee, the Bid Security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms, or in another substantially similar format approved by the Employer prior to Bid submission. In either case, the form must include the complete name of the Bidder. The Bid Security shall be valid for twenty-eight (28) days beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB 18.2.

- 19.3 Any Bid not accompanied by a substantially responsive Bid Security shall be rejected by the Employer as non-responsive.
- 19.4 The Bid Security of all Bidders who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document, shall be returned as promptly as possible upon the Employer's

notification of such rejection pursuant to ITB 25.8.

The Bid Security of all unsuccessful Bidders (other than those referred in the above paragraph) shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the Performance Security pursuant to ITB 41.

19.5 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required Performance Security.

19.6 The Bid Security may be forfeited:

(a) if a Bidder withdraws its Bid during the period of Bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid, or any extension thereto provided by the Bidder; or

(b) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB 40; or

(ii) furnish a Performance Security in accordance with ITB 41.

19.7 The Bid Security of a JV shall be in the name of the JV that submits the Bid. If the JV has not been legally constituted into a legally enforceable JV at the time of bidding, the Bid Security shall be in the names of all future members as named in the letter of intent referred to in ITB 4.1.

20. Format and Signing of Bid

20.1 The Bidder shall prepare one original of the Technical Bid and one original of the Price Bid comprising the documents as described in ITB 11 and clearly mark them "TECHNICAL BID - ORIGINAL" and "PRICE BID - ORIGINAL", as appropriate. Alternative Bids, if permitted in accordance with ITB 13.2, shall be clearly marked "ALTERNATIVE BID - ORIGINAL".

In addition, the Bidder shall submit copies of the Technical and Price Bids, in the number **specified in the BDS** and clearly mark each of them "TECHNICAL BID - COPY", "PRICE BID - COPY" and "ALTERNATIVE BID - COPY", as appropriate.

In the event of any discrepancy between the original and the copies, the original shall prevail.

20.2 The original of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall be in the form of a Power of Attorney included in the Technical Bid. All pages of the Bid

where entries or amendments have been made shall be signed or initialed by the person signing the Bid.

- 20.3 A bid submitted by a JV shall be signed by an authorized representative of the JV accompanied by a Power of Attorney from each member of the JV giving that authorized representative the power to sign on their behalf and legally bind them all. Such power shall also be given by a person duly authorized to do so on behalf of each member evidenced by a Power of Attorney.
- 20.4 Any interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.
- 20.5 The Bidder shall clearly mark "CONFIDENTIAL" any information which they regard as confidential to their business. Such information may include proprietary information, trade secrets, or commercial or financially sensitive information.

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

- 21.1 The Bidder shall enclose:
 - (a) in a sealed envelope, duly marked as "TECHNICAL BID - ORIGINAL", all documents comprising the Technical Bid, as described in ITB 11.2;
 - (b) in a sealed envelope, duly marked as "PRICE BID - ORIGINAL", all documents comprising the Price Bid, as described in ITB 11.3;
 - (c) in sealed envelopes, duly marked as "TECHNICAL BID - COPY", all required copies of the Technical Bid, sequentially numbered;
 - (d) in sealed envelopes, duly marked as "PRICE BID - COPY", all required copies of the Price Bid, sequentially numbered; and
 - (e) if alternative Bids are permitted in accordance with ITB 13.2, and if relevant:
 - (i) in a sealed envelope marked "ALTERNATIVE BID - ORIGINAL", the alternative Bid; and
 - (ii) in a sealed envelope marked "ALTERNATIVE BID - COPY", all required copies of the alternative Bid, sequentially numbered.

These envelopes (inner envelopes) containing the original and the copies shall then be enclosed in one single envelope (outer envelope).

21.2 The inner and outer envelopes shall be:

- (a) clearly marked with the name and address of the Bidder;
- (b) addressed to the Employer in accordance with ITB 22.1; and
- (c) clearly marked with the specific identification of this bidding process **specified in BDS 1.1**.

21.3 The outer envelopes and the inner envelopes containing the Technical Bid shall be clearly marked with a warning “NOT TO BE OPENED BEFORE THE TIME AND DATE FOR THE OPENING OF TECHNICAL BID”, in accordance with ITB 25.1.

21.4 The inner envelopes containing the Price Bid shall be clearly marked with a warning “NOT TO BE OPENED UNTIL ADVISED BY THE EMPLOYER”, in accordance with ITB 25.7.

21.5 The inner envelopes containing the alternative Bids, if any, shall be clearly marked with a warning “NOT TO BE OPENED UNTIL ADVISED BY THE EMPLOYER”, in accordance with ITB 13.2.

21.6 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

22. Deadline for Submission of Bids

22.1 Bids must be received by the Employer at the address and no later than the date and time **specified in the BDS**.

22.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and the Bidders subject to the previous deadline shall thereafter be subject to the deadline as extended.

23. Late Bids

23.1 The Employer shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 22. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

24. Withdrawal, Substitution, and

24.1 A Bidder may withdraw, substitute, or modify its Bid – Technical or Price – after it has been submitted and prior to the

Modification of Bids

deadline for submission of Bids, by sending a written notice, duly signed by an authorized representative, and shall include a copy of the Power of Attorney in accordance with ITB 20.2 and ITB 20.3. The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be:

- (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawals notices do not require copies), and in addition, the respective outer envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION” or “MODIFICATION”; and
- (b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Letters of Technical Bid and Price Bid or any extension thereof.

25. Bid Opening

25.1 Except in the cases specified in ITB 23 and ITB 24, the Employer shall publicly open and read out in accordance with ITB 25.5 all Technical Bids received by the deadline, at the date, time and place **specified in the BDS**, in the presence of the Bidders’ designated representatives and anyone who choose to attend. The Price Bids will remain unopened and will be held in custody of the Employer until the time of their opening to be specified in accordance with ITB 25.7. Alternative Bids, if any, shall remain unopened in accordance with ITB 13.2.

If the Technical Bid and the Price Bid are submitted together in one envelope, the Employer may reject the entire Bid.

25.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No Bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at the opening of Technical Bids.

25.3 Second, outer envelopes marked “SUBSTITUTION” shall be opened. The inner envelopes containing the Substitution Technical Bid and/or the Substitution Price Bid shall be

exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened and read out. Substitution Price Bid will remain unopened in accordance with ITB 25.1. No Bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at the opening of Technical Bids.

25.4 Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened and read out at the opening of Technical Bids. Price Bids, both Original as well as Modification, shall remain unopened in accordance with ITB 25.1.

25.5 Next, all other envelopes holding the Technical Bids shall be opened one at a time, reading out:

- (a) the name of the Bidder;
- (b) whether there is a withdrawal, substitution, or modification;
- (c) whether there is an alternative Bid without opening its envelop;
- (d) the presence or absence of a Bid Security; and
- (e) any other details as the Employer may consider appropriate.

Only Technical Bids read out at the opening of Technical Bids shall be considered for evaluation. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB 23.1).

25.6 The Employer shall prepare a record of the opening of Technical Bids that shall include, as a minimum:

- (a) the name of the Bidder;
- (b) whether there is a withdrawal, substitution, or modification;
- (c) whether there is an alternative Bid; and

(d) the presence or absence of a Bid Security.

The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids in time, and to JICA.

25.7 At the end of the evaluation of the Technical Bids, the Employer will invite the Bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Employer. The opening date should allow the Bidders sufficient time to make arrangements for attending the opening of Price Bids.

25.8 The Employer will notify, in writing, the Bidders who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document and/or who have been determined as being disqualified for award, and return their Price Bids unopened together with the Bid Security.

25.9 The Employer shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids and who have been determined as being qualified for award, in the presence of the Bidders' representatives who choose to attend at the address, date and time specified by the Employer. The Bidders' representatives who are present shall be requested to sign a register evidencing their attendance.

25.10 All envelopes containing Price Bids shall be opened one at a time, reading out:

- (a) the name of the Bidder;
- (b) whether there is a withdrawal, substitution or modification;
- (c) the total Bid Price including any discount and alternative Bids, and in the case of bidding for multiple lots, the total price for each lot together with the sum of the total prices for all lots including any discounts; and
- (d) any other details as the Employer may consider appropriate.

Only Price Bids and discounts read out and recorded at the

opening of Price Bids shall be considered for evaluation. The Employer shall neither discuss the merit of any Price Bid nor reject any Price Bid at the opening of Price Bids.

25.11 The Employer shall prepare a record of the opening of Price Bids that shall include, as a minimum:

- (a) the name of the Bidder; and
- (b) the total Bid Price including any discounts and alternative Bids, and in the case of bidding for multiple lots, the total prices for each lot together with the sum of the total price for all lots including any discounts.

The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted Bids in time, and to JICA.

E. Evaluation and Comparison of Bids

26. Confidentiality

26.1 Information relating to the evaluation of Bids and recommendation of Contract award shall not be disclosed to the Bidders or any other persons not officially concerned with the bidding process until information on Contract award is communicated to all Bidders in accordance with ITB 39.

The use by any Bidder of confidential information related to this bidding process may result in the rejection of its Bid.

26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.

26.3 Notwithstanding ITB 26.2, from the time of Bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it shall do so in writing.

27. Clarification of Bids

27.1 To assist in the examination, evaluation, and comparison of the Technical and Price Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid, giving a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of

the Technical Bid or prices in the Price Bid, including any voluntary increase or decrease in the prices, shall be sought, offered, or permitted, except to confirm the correction of arithmetical errors discovered by the Employer in the evaluation of the Price Bids, in accordance with ITB 33.

27.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.

**28. Deviations,
Reservations, and
Omissions**

28.1 During the evaluation of Bids, the following definitions apply:

- (a) "Deviation" is a departure from the requirements specified in the Bidding Document;
- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
- (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

**29. Preliminary
Examination of
Technical Bids**

29.1 The Employer shall examine Technical Bids to confirm that all documents and information requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted.

29.2 The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the Bid shall be rejected.

- (a) Letter of Technical Bid;
- (b) Power of Attorney to commit the Bidder;
- (c) Bid Security; and
- (d) Technical Proposal in accordance with ITB 16.

**30. Qualification of the
Bidders**

30.1 The Bidder shall substantially meet or exceed the specified qualification requirements. The Employer shall determine to its satisfaction whether the Bidders meet the qualification criteria specified in Section III, Evaluation and Qualification Criteria, during the evaluation of Technical Bids. However, if the prequalification process was carried out prior to the bidding process, the Employer may carry out the assessment of the qualification criteria specified in Section III, Evaluation and Qualification Criteria, only for the Bidder who submitted

the lowest evaluated and substantially responsive Bid.

30.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17. For the purposes of this determination, only the qualification of the legal entity(ies) comprising the Bidder shall be considered. In particular, the qualifications of affiliated entities (such as the parent company(ies), group companies, subsidiaries or other affiliates) shall not be considered unless they are parties to the Bidder under a JV in accordance with ITB 4.1 or as specialized subcontractors to be employed in accordance with ITB 16.3 for the key activities listed in Section III, Evaluation and Qualification Criteria 2.4.2(b).

30.3 The Employer reserves the right to waive minor (nonmaterial) deviations in the qualification criteria if they do not materially affect the technical capability and financial resources of the Bidder to perform the contract.

30.4 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid.

If the assessment of the Bidder's qualification was conducted only for the lowest evaluated Bidder, in accordance with ITB 30.1, and the result of such assessment is negative, the Employer shall proceed to the next lowest evaluated Bid to make a similar determination.

30.5 The subcontractors proposed in its Bid shall meet the eligibility requirements of ITB 4.

Furthermore, if the specialized subcontractor proposed in accordance with ITB 16.3 does not meet the corresponding criteria for the key activities specified in Section III, Evaluation and Qualification Criteria 2.4.2(b), the Bidder who proposed such a specialized subcontractor shall be disqualified.

31. Determination of Responsiveness of Technical Bids

31.1 The Employer's determination of a Technical Bid's responsiveness is to be based on the contents of the Technical Bid itself, as defined in ITB 11.2.

31.2 For the purposes of this determination, a substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or

omission is one that,

(a) if accepted, would

(i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of the other Bidders presenting substantially responsive Bids.

31.3 The Employer shall examine the Technical Bid submitted in accordance with ITB 16 and Section III, Evaluation and Qualification Criteria, in particular, to confirm that all requirements of Section VI, Employer's Requirements have been met without any material deviation, reservation or omission. The Recommended Spare Parts, if any, proposed by the Bidder shall not be subject to evaluation.

Should a manufacturer or subcontractor proposed for Section III, Evaluation and Qualification Criteria 1.1.3 be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to substitute an acceptable manufacturer or subcontractor without any change to the Bid price. Prior to issuing the Letter of Acceptance, the corresponding Schedule to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.

31.4 If a Technical Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and shall not subsequently be made responsive by correction of the material deviation, reservation, or omission.

32. Nonmaterial Nonconformities

32.1 Provided that a Technical Bid is substantially responsive, the Employer may waive any nonconformities (deviation, reservation or omission) in the Technical Bid.

32.2 Provided that a Technical Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of

time, to rectify nonmaterial nonconformities in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

32.3 Provided that a Technical Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component by adding the average price of the item or component quoted by substantially responsive Bidders. If the price of the item or components cannot be derived from the price of other substantially responsive Bidder, the Employer shall use its best estimate.

33. Correction of Arithmetical Errors

33.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:

- (a) where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the total of the amounts given under the column for the price breakdown shall prevail and the amount given under the Total Price will be corrected;
- (b) where there are errors between the total of the amounts of Schedule Nos. 1 to 6 and the amount given in the Grand Summary, the total of the amounts of Schedule Nos. 1 to 6 shall prevail and the amount given in the Grand Summary will be corrected; and
- (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetical error, in which case the amount in figures shall prevail subject to (a) and (b) above.

33.2 The Bidder shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 33.1, shall result in the rejection of the Bid.

34. Conversion to Single Currency

34.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as **specified in the BDS**. The Employer will convert the amounts in various currencies in which the Bid Price, corrected pursuant to ITB 33, is denominated to the single currency identified above at the selling rates established for similar transactions by the authority **specified in the BDS** and on the date **stipulated in the BDS**.

35. Evaluation of Price Bids

35.1 To evaluate a Price Bid, the Employer shall consider the following:

- (a) the Bid Price, excluding the Specified Provisional Sums and contingency allowance, if any in the Grand Summary of the Price Schedule, but including the Provisional Sum for Daywork when priced competitively;
- (b) price adjustment for correction of arithmetical errors in accordance with ITB 33.1;
- (c) price adjustment due to discounts offered in accordance with ITB 14.6;
- (d) the additional evaluation factors specified in Section III, Evaluation and Qualification Criteria;
- (e) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 32.3; and
- (f) converting the amount resulting from applying (a) to (e) above, if relevant, to a single currency in accordance with ITB 34.

The price for the Recommended Spare Parts if any, stated in the Price Schedule shall not be subject to evaluation.

35.2 If price adjustment is allowed in accordance with ITB 14.7, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.

35.3 In the case of bidding for multiple lots, the lowest evaluated price of the lot(s) shall be determined as specified in Section III, Evaluation and Qualification Criteria.

36. Comparison of Bids

36.1 The Employer shall compare the evaluated prices of all substantially responsive Bids established in accordance with

ITB 35.1 to determine the lowest evaluated Bid.

- 36.2 If the Bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Price Schedule, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.
- 36.3 In the event of identification of a potentially abnormally low Bid, the Employer shall seek written clarifications from the Bidder, including detailed price analyses of its Bid Price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Bidding Document.

After evaluation of the price analyses, in the event that the Employer determines that the Bidder has failed to demonstrate its capability to perform the Contract for the offered Bid Price, the Employer shall reject the Bid.

For the purposes of this ITB 36.3, an abnormally low Bid is one where the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the Contract for the offered Bid Price.

37. Employer's Right to Accept Any Bid, and to Reject Any or All Bids

- 37.1 The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to Contract award, without thereby incurring any liability to the Bidders. In case of annulment, all Bids submitted and specifically, Bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

38. Award Criteria

- 38.1 Subject to ITB 37.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to

be qualified to perform the Contract satisfactorily.

39. Notification of Award

- 39.1 Prior to the expiration of the period of Bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the “Letter of Acceptance”) shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works (hereinafter and in the Conditions of Contract and Contract Forms called “the Accepted Contract Amount”).
- 39.2 After a Contract has been determined to be eligible for financing under Japanese ODA Loans, the following information may be made public by JICA:
- (a) name of each Bidder who submitted a Bid;
 - (b) Bid Prices as read out at Bid Opening;
 - (c) name and address of the successful Bidder; and
 - (d) signing date and amount of the Contract.
- 39.3 Until a formal contract is prepared and executed, the Letter of Acceptance shall constitute a binding Contract.

40. Signing of Contract

- 40.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.
- 40.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

41. Performance Security

- 41.1 Within twenty-eight (28) days of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish the Performance Security in accordance with the Conditions of Contract, subject to ITB 36.2 using for that purpose the Performance Security Form included in Section IX, Contract Forms, or another form acceptable to the Employer. If the Performance Security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer’s Country.

41.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose Bid is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

**42. Notification to
Unsuccessful
Bidders and
Debriefing**

42.1 As promptly as possible upon the successful Bidder signing the Contract and furnishing the Performance Security pursuant to ITB 41, the Employer shall notify all unsuccessful Bidders of the results of the bidding.

42.2 After receipt of the Employer's notification pursuant to ITB 42.1 above, the unsuccessful Bidders (including those rejected on the grounds of their Technical Bids not being substantially responsive) may request in writing to the Employer a debriefing seeking an explanation of the grounds on which their Bids were not selected. The Employer shall promptly respond in writing to any unsuccessful Bidder who requests a debriefing in accordance with this Clause.

Section II. Bid Data Sheet

Bid Data Sheet

A. General	
ITB 1.1	The number of the Invitation for Bids is: 18.13.0000.600.14.064.22 The Employer is: Chittagong Port Authority (CPA) located in Bangladesh The Project is: Matarbari Port Development Project The name of the Contract is: Package 2B The multiple lots of the Project for which the Bids are being invited are: <i>not applicable</i>".
ITB 2.1	The Borrower is: Chittagong Port Authority (CPA) The number of the JICA Loan Agreement is: BD-P105 The amount of a Japanese ODA Loan is: 38,866Million JPY The signed date of the Loan Agreement is: 29/05/2019
ITB 2.2	The applicable Guidelines for Procurement under Japanese ODA Loans are those published in <i>April 2012</i> .
ITB 2.3	The other sources of finance are: None
ITB 3.1(b)	The list of ineligible firms and individuals is available at the JICA's website: www.jica.go.jp/english/our_work/compliance
ITB 3.1(c)	The list of debarred firms and individuals is available at the World Bank's website: www.worldbank.org/debarr
ITB 4.5	This bidding <i>is not</i> subject to prequalification.
B. Bidding Document	
ITB 7.1	For <u>clarification purposes</u> only, the Employer's address is: Attention: Project Director Mailing Address: Room No. 528, Bandar Bhaban, Chittagong Port Authority, Chittagong - 4100, Bangladesh. Email: pdmpdp@cpa.gov.bd Responses to any request for clarification, if any, will not be published on the Employer's web page indicated below. Web Page: <i>N/A</i>

ITB 7.4	A pre-bid meeting will take place at the following date, time and place: Date : <u>27 July 2022</u> Time : <u>13:00 PM</u> Place : <u>Room No. 528, Bandar Bhaban, Chittagong Port Authority, Chittagong - 4100, Bangladesh, or Visual Meeting on Zoom (link should be given)</u> A site visit at the time of the pre-bid meeting conducted by the Employer will not be organized.
ITB 8.2	Addenda, if any, will not be published on the Employer's web page.
C. Preparation of Bids	
ITB 10.1	The language of the Bid is: English
ITB 11.2(i)	The Bidder shall submit the following additional documents in its Technical Bid: Bidder's Safety Declaration (Form JSSS/BSD)
ITB 11.3(c)	The Bidder shall submit the following additional documents in its Price Bid: <i>none.</i>
ITB 13.1	Alternative times for completion will not be permitted.
ITB 13.2	Alternative Bids will not be permitted.
ITB 14.7	The prices quoted by the Bidder shall: not to be adjustable; consequently, the Bidder is not required to furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data.
ITB 14.9	In accordance with Sub-Clause 14.1 of the Conditions of Contract, Contractor's Equipment, including essential spare parts therefor, imported by the Contractor for the sole purpose of executing the Contract shall be exempted from the payment of import duties and taxes upon importation. In addition to the above: (a) duties, taxes and levies listed in the table below shall be exempted. Such exempted duties, taxes and levies are fallen into two categories, namely: (i) "No Pay" category: The Contractor shall be entitled to exemption from duties, taxes and levies falling into this category, without having to make any payment arising from or out of or in connection with such liabilities. (ii) "Pay & Reimburse" category: The Contractor shall be entitled to exemption from duties, taxes and levies, falling into this category, provided that the Contractor first makes all payments arising from or out of or in connection with such liabilities and then apply for their reimbursement from the relevant authority, following the procedure prescribed by such authority.

	No.	Duty/ Tax/ Levy	Exemption Category																						
	1	Personal Income Tax of Foreign Staff and Labour working on the Works Under the Contract payable in Bangladesh	No Pay																						
	2	Contractor's Equipment imported on Re-export basis	No Pay																						
	(b) duties, taxes and levies listed below shall be paid by the Employer on behalf of the Contractor: (i) Local taxes and duties on imported Materials and Plant to be incorporated in the Works. (ii) Value Added Tax (VAT) (iii) Advanced Income Tax (AIT)																								
ITB 14.10	The Amounts and Currencies of the Specified Provisional Sums shall be as follows: <table border="1"> <thead> <tr> <th rowspan="2">Item No.</th><th rowspan="2">Description</th><th colspan="2">Amount</th></tr> <tr> <th>Local</th><th>Foreign (USD)</th></tr> </thead> <tbody> <tr> <td>1</td><td>Cost of DB</td><td>-</td><td>441,000</td></tr> <tr> <td>2</td><td>Additional Mitigation Measures against COVID-19 Pandemic</td><td>30,000,000</td><td>-</td></tr> <tr> <td>3</td><td>-</td><td>-</td><td>-</td></tr> <tr> <td colspan="2">Total - Specified Provisional Sums</td><td>30,000,000</td><td>441,000</td></tr> </tbody> </table> Contingency allowance shall be as follows: 5% (five percentage) of the Bid Price in the currency or currencies in which the Bid Price is expressed in the Bid submitted by the Bidder.			Item No.	Description	Amount		Local	Foreign (USD)	1	Cost of DB	-	441,000	2	Additional Mitigation Measures against COVID-19 Pandemic	30,000,000	-	3	-	-	-	Total - Specified Provisional Sums		30,000,000	441,000
Item No.	Description	Amount																							
		Local	Foreign (USD)																						
1	Cost of DB	-	441,000																						
2	Additional Mitigation Measures against COVID-19 Pandemic	30,000,000	-																						
3	-	-	-																						
Total - Specified Provisional Sums		30,000,000	441,000																						
ITB 15.1	The currency(ies) of the Bid shall be as described below: (a) the inputs to the Works that the Bidder expects to supply from within the Employer's country shall be quoted in Bangladesh Taka, referred to as "the local currency", to two decimal places: and (b) the inputs to the Works that the Bidder expects to supply from outside the Employer's country (referred to as "the foreign currency"), shall be quoted in: (i) Japanese Yen (JPY), with no decimal places; and/or (ii) United States Dollars two (2) decimal places.																								

ITB 16.2(b)	The period after the taking-over of the Works by the Employer, for the Bidder to propose spare parts (i.e. Mandatory Spare Parts and Recommended Spare Parts, if required), special tools, etc: two (2) years.
ITB 16.3	At this time the Employer does not intend to execute certain specific parts of the Works by subcontractors (i.e.: nominated Subcontractors) selected in advance.
ITB 18.1	The Bid validity period shall be 180 days.
ITB 18.3(a)	The local and foreign currency portions of the Contract price shall be adjusted by using the following formula: $BP_A = BP_0 \left(1 + \frac{DP \times AF}{365} \right)$ Where: “BP_A” is the local (or foreign) portion of Bid Price as adjusted for the delay in award of the Contract. “BP₀” is the local (or foreign) portion of Bid Price as stated in the Letter of Bid. “DP” is the period of delay, calculated as a number of days between the award date and the date, fifty-six (56) days after the expiry date of the initial bid validity period “AF” is: (a) in the case of local currency, the average annual consumer inflation of the Employer’s country, calculated from the data officially released by the relevant authority of the Employer’s country, responsible for release of such data, considering the period of past three (3) years from the date, one (1) month prior to the award date. (b) in the case of the foreign currency, the average annual consumer inflation of the country of the foreign currency, calculated from the data officially released by the relevant authority of that country, responsible for release of such data, considering the period of past three (3) years from the date, one (1) month prior to the award date.
ITB 19.1	The amount and currency of the Bid Security shall be 750,000 (United States Dollars Seven Hundred Fifty Thousand).
ITB 19.2(d)	Other types of acceptable securities: None.
ITB 20.1	In addition to the original of the Bid, the number of copies is: Six (6) hard copies and two (2) sets of DVDs.
D. Submission and Opening of Bids	
ITB 22.1	For <u>Bid submission purposes</u> only, the Employer’s address is:

	Attention: Project Director Mailing Address: Room No. 528, Bandar Bhaban, Chittagong Port Authority, Chittagong - 4100, Bangladesh. The deadline for Bid submission is: Date: 29 August 2022 Time: 13:00 pm BST.
ITB 25.1	The Technical Bid opening shall take place at: Mailing Address: Room No. 528, Bandar Bhaban, Chittagong Port Authority, Chittagong – 4100, Bangladesh Date: 30 August 2022 Time: 13:00 pm BST
E. Evaluation and Comparison of Bids	
ITB 34.1	The currency that shall be used for Bid evaluation and comparison purposes to convert all Bid Prices expressed in various currencies into a single currency is: United States Dollar. The source of exchange rate shall be: selling rate of Bangladesh Bank, Bangladesh, on the opening date of the Technical Bid. The date for the exchange rate shall be: 29 July 2022

Section III. Evaluation and Qualification Criteria (Option II: Without Prequalification)

Evaluation and Qualification Criteria (Without Prequalification)

1. Evaluation

1.1 Evaluation of Technical Bid

The evaluation of the Technical Bids consists of the following:

- (a) assessment of the qualification of the Bidder to perform the Contract satisfactorily, in accordance with ITB 30. The qualification criteria for the purpose of this assessment have been described in detail under item 2 (*Qualification*) below.
- (b) determination of the substantial responsiveness of the Technical Bid in accordance with ITB 31. The evaluation criteria for the purpose of this determination have been described hereinunder.

Determination of the substantial responsiveness of the Technical Bid includes, among other things, an assessment of the adequacy of the Bidder's Technical Proposal, during which the Bidder's technical capacity to complete the Works will be assessed in terms of the following. Based on such assessment, the Employer will determine whether the Technical Proposal is substantially responsive to the requirements stipulated in Section VI, Employer's Requirements.

- (i) overall completeness and compliance with the Employer's Requirements.
- (ii) conformity of the Works with specified performance criteria, including conformity with the specified minimum (or maximum, as the case may be) acceptable levels corresponding to each functional guarantee, as indicated in the Employer's Requirements and in this Section.
- (iii) suitability of the Works in relation to the environmental and climatic conditions prevailing at the site.
- (iv) quality, function and operation of any process control concept included in the Bid.
- (v) type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services.
- (vi) mobilization of key construction equipment and personnel in execution of the Works.
- (vii) adequately supervising and controlling of the execution of the Works by the Works.
- (viii) planning and scheduling of all work activities in such a manner that the Works will be completed on time and meet with all Contract requirements, mainly the compliance with the Time for Completion, as evidenced by a design and construction schedule provided in the Technical Proposal.
- (ix) execution of the Works fully in accordance with all Contract requirements including but not limited to work methods, material sourcing, etc.
- (x) carrying out all operations for the execution of the Works safely and in an environmental friendly manner.

- (xi) conformity of subcontractors proposed in accordance with the items listed in Sub-Factor 1.1.3 below, if applied.

The Bid that does not meet minimum acceptable standards of completeness, consistency and detail, and the specified minimum (or maximum, as the case may be) acceptable levels for the specified performance guarantees, will be rejected.

1.1.1 Personnel

The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:

No.	Position	Minimum Number of Years	
		Similar Positions	Total Work Experience
1	Project(construction) Manager* (to be Contractor's Representative under GC 4.3)	5	15
2	Manager of Vessel Design and Engineering	5	15
3	Production Manger	5	15
4	Quality Assurance Engineer	5	10
5	Health & Safety (Accident Prevention) Officer	3	10

*Similar Works are:

- (i) in the case of the Project Manager (Construction Manager), project management of manufacturing of similar type of vessels.
- (ii) in the case of Manager of Vessel Design and Engineering, design and engineering for manufacturing of similar type of vessels. (No of vessels worked are required)
- (iii) in the case of Production Manager, Quality Assurance Engineer and Health & Safety (Accident Prevention) Officer, relevant experience in marine works in general. (All relevant educational and professional certificates (such as QA management certificates, Safety Officer's certificate) are required.)

Alternative candidates for key positions shall not be evaluated.

The Bidder shall provide details of the proposed personnel for the Contract together with their experience records in Form PER-1 and Form PER-2 in Section IV, Bidding Forms.

1.1.2 Construction Equipment

The Bidder must demonstrate that it has the key construction equipment listed hereafter:

No.	Equipment Type and Required Performance Characteristics	Minimum Requirement (Number of Units)
1	Key Equipment and Facilities for Shipbuilding	Sufficient for the timely and satisfactory execution Works described in the Bidding Documents.

The Bidder shall certify that such key equipment (key shipbuilding facilities) are:

- (i) owned or leased by them at the time of the Bid;
- (ii) sufficient for the manufacturing of the tug boats, survey boat and pilot boat; and,
- (ii) ready or available for use in the performance of their contractual obligations once the Contract is awarded.

The Bidder shall provide further details of proposed items of equipment using Form EQU in Section IV, Bidding Forms.

1.1.3 Subcontractor for major item of the Works

Subcontractors/manufacturers for the following major item of the Works must meet the following minimum criteria, herein listed for that item. Failure to comply with this requirement will result in rejection of the Subcontractor but not the Bidder.

Item No.	Description of Item	Minimum Criteria to be met	Submission Requirements
1	Ship-building including ASD type tug boat which have minimum 60 tons bollard pull	Manufacturing Experience: at least 40 tug boats or similar vessels between 1 st January 1996 and 31 st December 2021.	N/A
2	Vessel Traffic Management System (installation of system and construction of VTMS tower)	Manufacturing Experience: at least 5 contracts in 10 years since 1st January 2011.	N/A

In the case of a Bidder who offers to supply and install major items of the Works under the contract, which the Bidder does not manufacture or otherwise produce, the Bidder shall provide the Manufacturer's authorization, using the form provided in Section IV, Bidding Forms, showing that the Bidder has been duly authorized by the Manufacturer or producer of the related plant and equipment or component to supply and install that item in the Employer's country.

1.2 Evaluation of Price Bid

In addition to the criteria listed in ITB 35.1 (a) – (c), (e) and (f), the following criteria shall apply:

1.2.1 Other Evaluation Criteria (ITB 35.1(d))

Not Applicable.

1.3 Alternative Times for Completion (ITB 13.1)

Time for Completion of the Works shall be 42 months from the Commencement Date of the Works. No credit will be given for earlier completion.

2. Qualification

(I) Qualification of the Bidder but not of Bidder's Affiliates

It is the legal entity or entities comprising the Bidder (which is/are party to the Bidder under a JV or as specialized subcontractors to be employed for the key activities listed in this Section), and not the Bidder's parent company(ies), group companies, subsidiaries, or other affiliates, that must satisfy the qualification criteria.

(II) Exchange Rate for Qualification Criteria

Wherever a Form in Section IV, Bidding Forms, requires the Bidder to state a monetary amount, the Bidder should indicate the USD equivalent using the rate of exchange determined as follows:

- (a) For turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar or fiscal year, as applicable.
- (b) Value of single contract - Exchange rate prevailing on the date of the Contract.

Exchange rates shall be taken from the publicly available source **identified in BDS 34.1** or, in case such rates are not available in the source identified above, any other publicly available source acceptable to the Employer. Any error in determining the exchange rates may be corrected by the Employer.

(III) Qualification Criteria for Award of Multiple Lots

N/A.

2.1 Eligibility

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.1.1	Nationality	Nationality in accordance with ITB 4.3	Must meet requirement	N/A	Must meet requirement	N/A	Forms ELI –1 and 2 ⁽ⁱ⁾ with attachments
2.1.2	Conflict of Interest	No conflicts of interest in ITB 4.2	Must meet requirement	N/A	Must meet requirement (ii)	N/A	Letter of Technical Bid
2.1.3	JICA Ineligibility	Not having been declared ineligible by JICA, as described in ITB 4.4	Must meet requirement	N/A	Must meet requirement (ii)	N/A	Letter of Technical Bid Form ACK

Notes for the Bidders

(i) ELI -2 is required only if the Bidder is a JV.

(ii) This requirement also applies to subcontractors if proposed by the Bidder under 1.1.3 above and 2.4.2(b) below.

2.2 Historical Contract Non-Performance and Litigation

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.2.1	History of Non-Performing Contracts	Non-performance of a contract ⁽ⁱ⁾ did not occur as a result of contractor's default for five (5) years prior to the Bid submission deadline.	Must meet requirement ⁽ⁱⁱ⁾	N/A	Must meet requirement ⁽ⁱⁱ⁾	N/A	Form CON
2.2.2	Pending Litigation	Bidder's financial position and prospective long-term profitability still sound according to criteria established in 2.3.1 below and assuming that all pending litigation will be resolved against the Bidder.	Must meet requirement ⁽ⁱⁱ⁾	N/A	Must meet requirement ⁽ⁱⁱ⁾	N/A	Form CON
2.2.3	Litigation History	No consistent history of court orders ⁽ⁱⁱⁱ⁾ against the Bidder for five (5) years prior to the Bid submission deadline	Must meet requirement ⁽ⁱⁱ⁾	N/A	Must meet requirement ⁽ⁱⁱ⁾	N/A	Form CON

Notes for the Bidders

(i) Non-performance, as decided by the Employer, shall include all contracts:

- (a) where non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and
- (b) that were so challenged but fully settled against the contractor.

Non-performance shall not include contracts where Employer's decision was overruled by the dispute resolution mechanism. Moreover, non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
been exhausted. (ii) This requirement also applies to contracts executed by the Bidder as a JV member. (iii) The Bidder shall provide accurate information on the related Bidding Form about any litigation resulting from contracts completed or ongoing under its execution over the last five (5) years. A consistent history of court orders against the Bidder or any member of a joint venture may result in failure of the Bid.							

2.3 Financial Situation and Capabilities

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.3.1	Financial Performance	The financial statements for the last five (5) years shall be submitted and must demonstrate the current soundness of the Bidder's financial position and indicate its prospective long-term profitability. As the minimum requirement, the Bidder's net worth calculated as the difference between total assets and total liabilities should be positive.	Must meet requirement	N/A	Must meet requirement	N/A	Form FIN –1 with attachments
2.3.2	Average Annual Turnover	Minimum average annual turnover of USD 30,000,000, calculated as total certified payments received for contracts in progress and/ or completed, within the last five (5) years, divided by five (5) years.	Must meet requirement	Must meet requirement	Must meet twenty-five % percent (25%) of the requirement	Must meet forty percent (40%) of the requirement	Form FIN –2
2.3.3	Financial Resources	The Bidder shall demonstrate, to the satisfaction of the Employer that it currently (as of the Bid submission deadline), it has	Must meet requirement	Must meet requirement	N/A	N/A	Form FIN –3 and FIN –4

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
		access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as USD 6,000,000 for the subject contract(s) net of the Bidder's all other commitments, both current and future.					

2.4 Experience

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.4.1	General Experience	Continuous experience in ship building works, as appropriate, in the role of prime contractor ⁽ⁱ⁾ (single firm or JV member), or subcontractor between 1 st January 1996 and the Bid submission deadline.	Must meet requirement	N/A	N/A	Must meet requirement	Form EXP –1
2.4.2	Specific Experience	(a) A minimum number of one (1) similar contracts, that have been satisfactorily completed⁽ⁱⁱⁱ⁾ as a prime contractor⁽ⁱ⁾ (single entity or JV member)^(iv), between 1st January 2001 and 31st December 2021. The similarity of the contracts shall be based on the following: For purposes of this requirement, a 'similar contract' means a contract for manufacture and delivery of (A) 01 (one) number of ASD Type Tug Boat, (B) Foreign country flag vessel and (C) International Classification Society, which is wholly or substantially funded by JICA, the World Bank or	Must meet requirement	N/A	N/A	Prime contractor must meet requirement ^(v)	Form EXP –2(a) with attachment

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
		the Asian Development Bank.					
		(b) A minimum number of forty (40) similar vessels, that have been satisfactorily completed⁽ⁱⁱⁱ⁾ as a prime contractor⁽ⁱ⁾ (single entity or JV member)^(iv), or subcontractor between 1st January 1996 and 31st December 2021. The similarity of the vessels shall be based on the following: For purposes of this requirement, a 'similar vessel' means a contract for manufacture and delivery of ASD Type Tug Boat with not less than 60 ton bollard pull.	Must meet requirement Following activities can be met through a specialized subcontractor: Manufacture and delivery of tug boats,	Must meet requirement^(v) Following activities can be met through a specialized subcontractor: Manufacture and delivery of tug boats,	N/A	N/A	Form EXP –2(b) with attachment Form ELI –3 Form MAN Schedule of Subcontractors
		(c) A minimum number of forty (40) similar vessels, that have been satisfactorily completed⁽ⁱⁱⁱ⁾ as a prime contractor⁽ⁱ⁾ (single entity or JV member)^(iv), or subcontractor between 1st January 1996 and 31st December 2021. The similarity of the vessels	Must meet requirement Following activities can be met through a specialized subcontractor: Manufacture	Must meet requirement Following activities can be met through a specialized subcontractor: Manufacture	N/A	N/A	Form EXP –2(c) with attachment Form ELI –3 Form MAN Schedule of Subcontractors

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
		shall be based on the following: For purposes of this requirement, a 'similar vessel' means a contract for manufacture and delivery of (A) Pilot Boat, (B) Survey Boat, or (C) Other similar type of boats.	and delivery of pilot boats, survey boats, or similar type of boats	and delivery of pilot boats, survey boats, or similar type of boats			
		(d) A minimum number of five (5) similar contracts, that have been satisfactorily completed⁽ⁱⁱⁱ⁾ as a prime contractor⁽ⁱ⁾ (single entity or JV member)^(iv), or subcontractor between 1st January 2011 and 31st December 2021, The similarity of the contracts shall be based on the following: For purposes of this requirement, a 'similar contract' means a contract for design, manufacture, supply and installation of the Vessel Traffic Management System.	Must meet requirement Following activities can be met through a specialized subcontractor: design, manufacture, supply and installation of the Vessel Traffic Management System.	Must meet requirement^(v) Following activities can be met through a specialized subcontractor: design, manufacture, supply and installation of the Vessel Traffic Management System	N/A	N/A	Form EXP –2(d) with attachment Form ELI –3 Form MAN Schedule of Subcontractors

Notes for the Bidders

(i) For the purposes of this criterion, a 'management contractor' is also considered as a prime contractor. A firm which takes on the role of contractor

Eligibility and Qualification Criteria				Compliance Requirements			Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
		management is referred herein as 'management contractor'. A management contractor does not normally perform directly the work(s) or plant associated with the contract. Rather, it manages the work of other (sub) contractors while bearing full responsibility and risk for price, quality, and timely performance of the contract.					
		(ii) Summation of number of small value contracts (less than the value specified under requirement) to meet the overall requirement will not be accepted.					
		(iii) Completion shall be evidenced by submission of copy of end-user certificates such as Taking-over Certificates and Completion Certificates as required to be submitted as attachment to Form EXP-2(a) or Form EXP-2(b) of Section IV, Bidding Forms.					
		(iv) For contracts under which the Bidder participated as a JV member, only the Bidder's share, by value, shall be considered to meet this requirement.					
		(v) In case of a JV, the value of contracts completed by its members shall not be aggregated to determine whether the requirement of the minimum value of a single contract has been met. Instead, each contract performed by each member shall satisfy the minimum value of a single contract as required for single entity. In determining whether the JV meets the requirement of total number of contracts, only the number of contracts completed by all members, each of value equal or more than the minimum value required, shall be aggregated.					
		(vi) For contracts under which the Bidder participated as a JV member or subcontractor, only the Bidder's share, by value and role, shall be considered to meet this requirement.					

Section IV. Bidding Forms

Section IV. Bidding Forms

The forms included in this section shall be completed by the Bidder in accordance with guidance and instructions provided in this section and other sections of the Bidding Document, and submitted as part of its Technical and Price Bids as indicated in the table below:

The Bid Submitted by Bidder	
Single-Stage Two-Envelope Bidding	
Technical Bid	
(a) Letter of Technical Bid, in accordance with ITB 12.1. (b) Bid Security, in accordance with ITB 19. (c) Power of Attorney, authorizing the signatory of the Bids to commit the Bidder, in accordance with ITB 20.2 and ITB 20.3. (d) Copy of the JV Agreement, or letter of intent to enter into a JV including a draft agreement in the case of a Bid submitted by a JV in accordance with ITB 4.1. (e) Documentary evidence in accordance with ITB 17 establishing the Bidder's eligibility and qualifications to perform the Contract if its Bid is accepted. i. Form ELI -1: Bidder Information Form. ii. Form ELI -2: JV Member Information Form. iii. Form ELI -3: Subcontractor Information Form. iv. Form CON: Historical Contract Non-Performance and Litigation. v. Form FIN -1: Financial Situation. vi. Form FIN -2: Average Annual Turnover. vii. Form FIN -3: Financial Resources. viii. Form FIN -4: Current Contract Commitments. ix. Form EXP -1: General Experience. x. Form EXP -2(a): Specific Experience. xi. Form EXP -2(b): Experience in Key Activities. xii. Form EXP -2(c): Experience in Key Activities. xiii. Form EXP -2(d): Experience in Key Activities. (f) Documentary evidence in accordance with ITB 16.2 establishing that the Works offered by the Bidder conform to the Bidding Document. (g) Technical Proposal in accordance with ITB 16. i. Project Organization. ii. Method Statement. iii. Project Execution Schedule. iv. Quality Assurance Plan. v. Technical Drawings vi. Health and Safety Plan.	

The Bid Submitted by Bidder	
Single-Stage Two-Envelope Bidding	
vii. Environmental Plan. viii. Schedule of Proposed Equipment	
ix. Schedule of Guarantees vii. Schedule of Subcontractors. x. Form MAN: Manufacturer's Authorization. xi. Form PER -1: Proposed Personnel. xii. Form PER -2: Resume of Proposed Personnel. xiii. Form EQU: Construction Equipment. xiv Form SPA: Spare Parts (h) Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans (Form ACK) which shall be signed and dated by the Bidder's authorized representative. (i) Any other document required in BDS 11.2(i).	
<u>Price Bid</u>	
(a) Letter of Price Bid, in accordance with ITB 12.1. (b) Completed Schedules in accordance with ITB 12.1 and 14, including completed Price Schedules, completed Schedule of Payments and completed Schedule of Adjustment Data, (if any required to be submitted under ITB 14.7) but excluding any Schedule(s), required in BDS 11.2(i). (c) Any other document required in BDS 11.3(c).	

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<Option A: Single-Stage Two-Envelope Bidding>

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<Option A: Single-Stage Two-Envelope Bidding>

[prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Letter of Technical Bid

Date	: <i>[insert date of Bid submission]</i>
IFB No.	: <i>[insert Invitation for Bid number]</i>
Project	: Matarbari Port Development Project
Contract	: Package 2B

To: Chittagong Port Authority

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including addenda issued in accordance with Instructions to Bidders (ITB) 8. *[insert the number and issuing date of each addendum]*;
- (b) We, including subcontractors meet the eligibility requirements in accordance with ITB 4 and ITB 5;
- (c) We, including subcontractors have no conflict of interest in accordance with ITB 4;
- (d) We offer to execute in conformity with the Bidding Document the following Works: design, manufacture, fabrication, supply, installation and completion of 03 (three) numbers of Tug Boats, 01 (one) number of Survey Boat, 01 (one) number of Pilot Boat, and Vessel Traffic Management System, and others as per specified in the schedule of supply.
- (e) Our Bid shall be valid for a period of 180 days from the date fixed for the Bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) We are not participating, as a Bidder or as a subcontractor, in more than one Bid in this bidding process in accordance with ITB 4.2(c); and
- (g) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption.

Name of the Bidder¹*[insert name of the Bidder]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder²*[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid [*insert complete title of the person signing the Bid*]

Signature of the person named above [*insert signature of person whose name and capacity are shown above*]

Date signed [*insert date of signing*] day of [*insert month*], [*insert year*]

Notes for the Bidders

1. In the case of the Bid submitted by a Joint Venture, specify the name of the Joint Venture as Bidder.
2. Person signing the Bid shall have the Power of Attorney given by the Bidder to be included in the Technical Bid.

<Option A: Single-Stage Two-Envelope Bidding>

[prepare this Letter of Price Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Letter of Price Bid

Date : *[insert date of Bid submission]*
IFB No. : *[insert Invitation for Bid number]*
Project : Matarbari Port Development Project
Contract : Package 2B

To: Chittagong Port Authority

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Document, including addenda issued in accordance with Instructions to Bidders (ITB) 8. *[insert the number and issuing date of each addendum]*;
- (b) We offer to execute in conformity with the Bidding Document and Technical Bid the following Works: [03 (three) numbers of Tug Boats, 01 (one) number of Survey Boat, 01 (one) number of Pilot Boat, and Vehicle Traffic Management System, and others as per specified in the schedule of supply.
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is:
[in case of only one lot, insert the total Bid Price in words and figures, indicating the amounts in the respective currencies].

[in case of multiple lots, insert:

- (i) *the total price of each lot; and*
- (ii) *the sum of the total price of all lots;*
indicating the amounts in the respective currencies];

- (d) The discounts offered and the methodology for their application are:

The discounts offered are: *[specify in detail each discount offered.]*

The exact method of calculations to determine the net price after application of discounts is shown below: *[specify in detail the method that shall be used to apply the discounts];*

- (e) Our Bid shall be valid for a period of 180 days from the date fixed for the Bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

- (f) If our Bid is accepted, we commit to obtain a Performance Security in accordance with the Bidding Document;
- (g) We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed; and
- (h) We understand that you are not bound to accept the lowest evaluated Bid or any other Bid that you may receive.

Name of the Bidder¹ *[insert name of the Bidder]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder *[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid *[insert complete title of the person signing the Bid]*

Signature of the person named above *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* day of *[insert month]*, *[insert year]*

Notes for the Bidders

1. In the case of the Bid submitted by a Joint Venture, specify the name of the Joint Venture as Bidder.

Price Schedule

A. Preamble

1. The Price Schedule shall be read in conjunction with the General and Particular Conditions of Contract and the Employer's Requirements.
2. Unless otherwise stated in the Particular Conditions of Contract, the Contract is executed on a lump-sum price basis. The Schedules do not generally give a full description of the Works to be executed under each item. Bidders shall be deemed to have read the Employer's Requirements and other sections of the Bidding Document and reviewed the drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The quantities (if any) given in the Price Schedule shall be used in accordance with Sub-Clause 14.1 of the Conditions of Contract.
3. Any parts, consumables or spare parts required for attaining the completion of the Works shall:
 - (a) be included in or deemed to be covered by the rates and/or prices entered in the relevant Schedules of Rates and Prices of the Price Schedule. No separate payment shall be made in respect of any of such parts, consumables or spare parts.
 - (b) become the Employer's property immediately after they are brought to the Site, regardless of whether they will be subsequently used for the completion or will remain unused.
4. The Spare Parts that the Employer considered necessary for the operation and maintenance of the Works shall be included in the Price Schedule entitled "Mandatory Spare Parts", whereas Price Schedule entitled "Recommended Spare Parts" shall include additional spare parts proposed by the Bidder. Both Mandatory and Recommended Spare Parts are to be supplied prior to the completion of the Works.
5. The rates and prices in the completed Price Schedule shall, except insofar as it is otherwise provided under the Contract, include all of design, construction plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.
6. A rate or price shall be entered against each item in the Price Schedule, irrespective of whether quantities are stated or not. Items against which no rate or price is entered in the completed Price Schedule shall be deemed to be covered by the rates or prices entered for other items therein, and will not be paid for separately.
7. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the completed Price Schedule, and where no items are provided, the cost shall be deemed to be included in the rates or prices entered for the related items of work.

8. The payment shall be made in accordance with the Conditions of Contract in the currency or currencies indicated under each respective item in the Price Schedule.

If any composite or lump sum items require price breakdowns (as indicated in B: *Work Items* below), for the purposes of making payments or partial payments, valuation of Variations or evaluation of claims, or for such other purposes as the Engineer considers reasonable, the Engineer may use the breakdown of such items submitted by the Contractor during the bidding stage and included as an attachment to this Price Schedule.

Such breakdowns shall clearly show the items of work activities that the respective composite or lump item consists of, their quantities and unit prices in the manner which can be used for the purposes described above.

9. General requirements, directions and/or descriptions of work and materials are not necessarily repeated or summarized in the Price Schedule. Relevant sections of the Contract documents shall be referred before entering prices against each item in the Price Schedule.
10. Provisional Sums included and so designated in the Price Schedule shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clause 13.5 or Sub-Clause 13.6 of the Conditions of Contract, as applicable. Notwithstanding the above, the Provisional Sum for the cost of the DB shall require no prior instruction of the Engineer.
11. No Contractor's overhead charges or profit shall be included or payable on the Provisional Sum for the cost of the DB.
12. Any unit rates and/or prices quoted in the Price Schedule in:
 - (a) Bangladesh Taka, there shall be two (2) decimal places below zero.
 - (b) Japanese Yen (JPY), there shall be no decimal places below zero, and/or
 - (c) United States Dollars, there shall two (2) decimal places below zero.

Any price(s) resulting from computations (such as unit price multiplied by quantity) shall be rounded down to the nearest decimal place(s) as indicated for each relevant currency above.

13. Where there are any items of work provided in the Price Schedule for complying with requirements of Sub-Clauses 6.1 through 6.24 of the Conditions of Contract, payment for such items is made only by monthly instalments upon the Contractor's compliance with all contract requirement with respect of that item, for each month, to the satisfaction of the Engineer.

B. Work Items

1. The Price Schedule contains the following Schedules of Rates and Prices, Schedules of Specified Provisional Sums and the Grand Summary:
Schedule No. 1 - General Items;
Schedule No. 2 - Design, Manufacture and Delivery of Tug Boats
Schedule No. 3 - Design, Manufacture and Delivery of Survey Boat;
Schedule No. 4 – Design, Manufacture and Delivery of Pilot Boat;
Schedule No. 5 - Design, Manufacture, Supply and Installation of VTMS;
Schedule No. 6 – Mandatory Spare Parts;
Schedule No. 7 – Recommended Spare Parts;
Daywork Schedule;
Schedule of Specified Provisional Sums; and
Grand Summary.
2. The Price Schedule shall include as attachments thereto, price breakdowns for all the lump sum items.

Schedule No. 1: General Items

Item no.	Description	Unit	Quantity	Unit Price			Amount		
				Local	Foreign		Local	Foreign	
				BDT	JPY	USD	BDT	JPY	USD
101	Performance Security	sum							
102	Insurance of the Works	sum							
103	Insurance of the Contractor's Equipment	sum							
104	Third-Party Insurance	sum							
105	Allow for maintenance of Works for 12 months after completion	month	12						
106	Provide safety measures	month	36						
107	Establishment and removal of offices for the Contractor	sum							
108	Maintenance of offices for the Contractor	sum							
109	Provide temporary facilities and works	sum							
110	Provide for cleaning up the Site on completion	sum							
111	Mobilization and demobilization of manpower and equipment	sum							
112	Other cost for General Items	sum							
Total for Schedule No. 1 (carried forward to Summary, p. ____)							—	—	

Schedule No. 2: Design, Manufacture and Delivery of Tug Boats

Item no.	Description	Unit	Quantity	Rate			Amount		
				Local	Foreign		Local	Foreign	
				BDT	JPY	USD	BDT	JPY	USD
201	Design of Permanent Works	sum							
202	Design of Temporary Works	sum							
203	Fabrication and manufacture	sum							
204	Transportation, delivery and testing	sum							
205	Training after Completion	sum							
206	Statutory Fees and Charges	sum							
207	As-built drawings	sum							
208	Operation and Maintenance Manuals	sum							
Total for Schedule No. 2 (carried forward to Summary, p. ____)							—	—	

Country of Origin Declaration Form

Item	Description	Code	Country

Schedule No. 3: Design, Manufacture and Delivery of Survey Boat

Item no.	Description	Unit	Quantity	Rate			Amount		
				Local	Foreign		Local	Foreign	
				BDT	JPY	USD	BDT	JPY	USD
301	Design of Permanent Works	sum							
302	Design of Temporary Works	sum							
303	Fabrication and manufacture	sum							
304	Transportation, delivery and testing	sum							
305	Training after Completion	sum							
306	Statutory Fees and Charges	sum							
307	As-built drawings	sum							
308	Operation and Maintenance Manuals	sum							
Total for Schedule No. 3 (carried forward to Summary, p. ____)							—	—	—

Country of Origin Declaration Form

Item	Description	Code	Country

Schedule No. 4: Design, Manufacture and Delivery of Pilot Boat

Item no.	Description	Unit	Quantity	Rate			Amount		
				Local	Foreign		Local	Foreign	
				BDT	JPY	USD	BDT	JPY	USD
401	Design of Permanent Works	sum							
402	Design of Temporary Works	sum							
403	Fabrication and manufacture	sum							
404	Transportation, delivery and testing	sum							
405	Training after Completion	sum							
406	Statutory Fees and Charges	sum							
407	As-built drawings	sum							
408	Operation and Maintenance Manuals	sum							
Total for Schedule No. 4 (carried forward to Summary, p. ____)							—	—	—

Country of Origin Declaration Form

Item	Description	Code	Country

Schedule No. 5: Design, Manufacture, Supply and Installation of VTMS

Item no.	Description	Unit	Quantity	Rate			Amount		
				Local	Foreign		Local	Foreign	
				BDT	JPY	USD	BDT	JPY	USD
501	Design of Permanent Works	sum							
502	Design of Temporary Works	sum							
503	Statutory Fees and Charges	sum							
504	As-built drawings	sum							
505	Operation and Maintenance Manuals	sum							
506	Supply and construction of VTMS Tower	sum							
507	Fabrication, manufacture and installation of Facilities and system	sum							
508	Field testing	Sum							
509	Training after Completion	Sum							
Total for Schedule No. 5 (carried forward to Summary, p. ____)							_____	_____	

Country of Origin Declaration Form

Item	Description	Code	Country

Schedule No. 6: Mandatory Spare Parts

<i>Item no.</i>	<i>Description</i>	<i>Quantity</i>	<i>Rate</i>			<i>Amount</i>		
			<i>Local</i>	<i>Foreign</i>		<i>Local</i>	<i>Foreign</i>	
			<i>BDT</i>	<i>JPY</i>	<i>USD</i>	<i>BDT</i>	<i>JPY</i>	<i>USD</i>
601	Spare Parts of Tug Boats for two years							
602	Spare Parts of Survey Boat for two years							
603	Spare Parts of Pilot Boat for two years							
604	Spare Parts of VTMS for two years							
Sub-Total for Schedule No. 6 (carried forward to Summary, p. ____)						_____	_____	

Schedule No. 7: Recommended Spare Parts

Item no.	Description	Unit	Quantity	Rate		Amount	
				Local	Foreign	Local	Foreign
701							
702							
703							
704							
705							
706							
707							
708							
709							
710							
Total for Schedule No. 7 (carried forward to Summary, p. ____)						-----	-----

Notes for the Bidders

1. The Bidder shall list out and price in the above schedule, any spare parts which is recommended for the operation and maintenance of the facilities for the period indicated in BDS 16.2(b) (in case of Single-Stage Two-Envelope Bidding) and in BDS 14.2(b) (in case of Two-Stage One-Envelope Bidding) after the completion of the Works, and which are not included in the Schedule entitled "Mandatory Spare Parts".
2. Any spare parts required for attaining completion of the Works shall not be included in this Schedule as they shall be included in the relevant Schedule where regular items of the Plant are described.
3. These spare parts may include, among others, any consumables, not readily available in the Employer's Country.
4. The identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor prior to the completion of the Works. Reference shall be made to Sub-Clauses 1.1.5.10 and 7.9 of the Conditions of Contract.

-
5. The price of such spare parts shall include the purchase price and other costs relating to the supply of spare parts such as transportation, port charge and the Contractor's fees. The Recommended Spare Parts are not subject to evaluation in accordance with ITB 31.3 and ITB 35.1.
 6. The total price of this Schedule shall not be added to the Bid Price. However, the price may have been added to the Contract Price (with modifications agreed during the contract negotiations or the contract execution), if both Parties agree to do so.

C. Daywork Schedule

General

1. Reference should be made to Sub-Clause 13.6 of the General Conditions. Work shall not be executed on a daywork basis except by written order of the Engineer. The Bidders shall enter basic rates for Daywork items in the Schedules, which rates shall apply to any quantity of Daywork ordered by the Engineer. Nominal quantities have been indicated against each item of daywork, and the extended total for Daywork shall be carried forward as a Provisional Sum to the Grand Summary. Unless payment is at current rate or as otherwise adjusted, payments for daywork shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract. The basic rates applied to Daywork items may be quoted and payable in a single currency (either local currency or foreign currency) or multiple currencies (both local and foreign currencies), as appropriate.

Daywork Labour

2. In calculating payments due to the Contractor for the execution of daywork, the hours for labour will be reckoned from the time of arrival of the labour at the work location to execute the particular item of daywork to the time of return to the original place of departure. Only the time of classes of labour directly doing work ordered by the Engineer and for which they are competent to perform will be measured. The time of gangers (charge hands) actually doing work with the gangs will also be measured but the time of foremen or other supervisory personnel supervising the work will not be measured.
3. The Contractor shall be entitled to payment in respect of the total time that labour is employed on Daywork, calculated at the basic rates entered by him in the **Schedule of Daywork Rates: 1. Labour**, together with an additional percentage payment on basic rates representing the Contractor's profit, overheads, etc., as described below:
 - (a) The basic rates for labour shall be deemed to cover all direct costs to the Contractor, including (but not limited to) the amount of wages paid to such labour, transportation time, overtime, subsistence allowances, and any sums paid to or on behalf of such labour for social benefits in accordance with all laws and regulations of [*country of Employer*].
 - (b) The additional percentage to be quoted by the Bidder shall be applied to basic costs incurred under (a) above, and this additional percentage payment shall be deemed to cover the Contractor's profit, overheads, superintendence, liabilities, and insurances and allowances to labour, timekeeping, and clerical and office work, the use of consumable stores, water, lighting, and power; the use and repair of stagings, scaffolding, workshops, and stores, portable power tools, manual plant, and tools; supervision by the Contractor's staff, foremen, and other supervisory personnel; and charges incidental to the foregoing.

Daywork Materials

4. The Contractor shall be entitled to payment in respect of materials used for Daywork (except for materials for which the cost is included in the percentage addition to labour costs as

detailed heretofore), at the basic rates entered by him in the **Schedule of Daywork Rates: 2. Materials**, together with an additional percentage payment on the basic rates representing the Contractor's profit, overhead charges, etc., as described below:

- (a) the basic rates for materials shall be calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc., and shall provide for delivery to store for stockpiling at the Site.
- (b) the additional percentage shall be quoted by the Bidder and applied to the basic cost incurred under (a) above, and this additional percentage payment shall be deemed to cover the Contractor's profit, overheads, administrative costs and all other charges related to the procurement and supply of such material.
- (c) the cost of hauling materials for use on work ordered to be carried out as daywork from the store or stockpile on the Site to the place where it is to be used:
 - (i) shall not be included in the basic rate or percentage above; and
 - (ii) shall be paid separately under Schedule of Daywork Rates 1. Labour and/or Schedule of Daywork Rates 3. Contractor's Equipment, as appropriate.

Daywork Contractor's Equipment

- 5. The Contractor shall be entitled to payments in respect of Contractor's Equipment (including those already on Site) employed on Daywork at the basic rates entered by him in the **Schedule of Daywork Rates: 3. Contractor's Equipment**, together with an additional percentage payment on basic rates representing the Contractor's profit, overheads, etc., as described below:
 - (a) The basic rates for equipment shall be deemed to cover all direct cost to the Contractor including (but not limited to) the depreciation, interest, indemnity, and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables directly related to the use of such equipment.
 - (b) The additional percentage shall be quoted by the Bidder and applied to the basic cost incurred under (a) above and this additional percentage payment shall be deemed to cover the Contractor's profit, overheads, administrative costs and all other charges related to the use of such equipment.
 - (c) The cost of drivers, operators, and assistants
 - (i) shall not be included in the basic rate or percentage above; and
 - (ii) shall be paid for separately under Schedule of Daywork Rates 1. Labour.
- 6. In calculating the payment due to the Contractor for Contractor's Equipment employed on Daywork, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the travelling time from the part of the Site where the Contractor's Equipment was located when ordered by the Engineer to be employed on Daywork and the time for return journey thereto shall be included for payment.

Schedule of Daywork Rates: 1. Labour

Item No.	Description	Unit	Nominal Quantity	Rate		Extended Amount	
				Local BDT	Foreign	Local BDT	Foreign
D101	Rigger	hour	100				
D102	Welder	hour	100				
D103	Carpenter	hour	100				
D104	Mason	hour	100				
D105	Rebar fixer	hour	100				
D106	Concreter	hour	100				
D107	Mechanic	hour	100				
D108	Electrician	hour	100				
D109	Skilled worker	hour	100				
D110	Unskilled worker	hour	100				
D111	Traffic signal man	hour	100				
D112	Security guard	hour	100				
				Subtotal			
Allow ____ percent ¹ of Subtotal for Contractor's profit, overheads, etc.							
Total Daywork for Labour (carried forward to Daywork summary, p.____)						----	----

Notes for the Bidders

1. The Bidder shall indicate the percentage for Contractor's profit, overheads, etc. in accordance with paragraph 3(b) above.

Schedule of Daywork Rates: 2. Materials

Item No.	Description	Unit	Nominal Quantity	Rate		Extended Amount	
				Local BDT	Foreign	Local BDT	Foreign
D201	Deformed bar Grade 500	ton	10				
D202	Concrete - Grade 35	cum	100				
D203	Concrete - Grade 40/45	cum	100				
D204	Timber, plank	cum	10				
D205	Asphalt mixture	ton	100				
D206	Geotextile	sqm	100				
D207	PVC pipe, Dia = 50mm,t=4.5mm	lm	100				
D208	steel	ton	10				
Subtotal							
Allow ____ percent ¹ of Subtotal for Contractor's profit, overheads, etc.							
Total Daywork for Materials (carried forward to Daywork summary, p.____)						-----	-----

Notes for the Bidders

1. The Bidder shall indicate the percentage for Contractor's profit, overheads, etc. in accordance with paragraph 4(b) above.

Schedule of Daywork Rates: 3. Contractor's Equipment

Item No.	Description	Unit	Nominal Quantity	Rate		Extended Amount	
				Local	Foreign	Local	Foreign
				BDT		BDT	
D301	Bulldozer, 21 t	hours	100				
D302	Backhoe, 0.7 m ³	hours	100				
D303	Dump truck, 10 t	hours	100				
D304	Crawler crane, hyd., 30 t	hours	100				
D305	Wheel crane, 25 t	hours	100				
D306	Tire roller, 8-20t	hours	100				
D307	Vibrating roller, Tandem 8-10t	hours	100				
D308	Air compressor, screw, 5.0m ³ /min	hours	100				
D309	Diesel generator, 100/150 kVA	hours	100				
D310	Concrete vibrator Ø 60 mm	hours	100				
Subtotal							
Allow ____ percent ¹ of Subtotal for Contractor's profit, overheads, etc.							
Total Daywork for Contractor's Equipment (carried forward to Daywork summary, p.____)						-----	-----

Notes for the Bidders

- The Bidder shall indicate the percentage for Contractor's profit, overheads, etc. in accordance with paragraph 5(b) above.

Daywork Summary

Description	<i>Amount</i>	
	<i>Local</i>	<i>Foreign</i>
1. Total for Daywork: Labour		
2. Total for Daywork: Materials		
3. Total for Daywork: Contractor's Equipment		
Total for Daywork (Provisional Sum) (carried forward to Grand Summary, p. _)	-----	-----

Schedule of Specified Provisional Sums

Item No.	Description	Amount	
		Local	Foreign
		BDT	USD
1	Cost of Dispute Board (DB)	0	441,000
2	Additional Mitigation Measures against COVID-19 Pandemic	30,000,000	0
	Total (carried forward to Grand Summary (C), p. ____)	30,000,000	441,000

Notes for the Bidders

- Provisional Sums included and designated above shall be expended in whole or in part at the direction of the Engineer and in accordance with Sub-Clause 13.5 of the Conditions of Contract. Notwithstanding the above, the Provisional Sum for the cost of the DB shall require no prior instruction of the Engineer
- No Contractor's overhead charges or profit shall be included or payable on the Provisional Sum for the Cost of the DB.

Grand Summary

Description	Page	Amount		
		Local	Foreign	
		BDT	JPY	USD
Schedule No. 1 : General Items				
Schedule No. 2 : Design, Manufacture and Delivery of Tug Boats				
Schedule No. 3 : Design, Manufacture and Delivery of Survey Boat				
Schedule No. 4 : Design, Manufacture and Delivery of Pilot Boat				
Schedule No. 5 : Design, Manufacture, Supply and Installation of VTMS				
Schedule No. 6 : Mandatory Spare Parts				
(A) Total of Schedules				
(B) Total for Daywork (Provisional Sum)				
(C) Specified Provisional Sums		30,000,000		441,000
(D) Total of Schedules Plus Provisional Sums (A + B + C)				
(E) Add contingency allowance (5%)		[sum] ¹	[sum] ¹	[sum] ¹
(F) Bid Price (D + E)				
(G) Value Added Tax (VAT)				
(H) Advance Income Tax (AIT)				
(I) Total Bid Price with AIT and VAT [Carried forward to Letter of Price Bid]				
Schedule No. 7: Recommended Spare Parts		[sum]	[sum]	[sum]

Notes for the Bidders

1. The Bidder shall derive the local and foreign currency portion of this Amount, applying the relevant percentage indicated in BDS 14.10 (in the case of Single-Stage Two-Envelope Bidding) or BDS 30.10 (in the case of Two-Stage One-Envelope Bidding), as appropriate.

Technical Proposal

- Project Organization (including Organization Chart)

- Method Statement

Project Execution Schedule (Time Schedule showing the timing for manufacture, delivery, testing etc. for major items)

- Quality Assurance Plan
- Technical Drawings
- Health and Safety Plan
- Environmental Plan
- Schedule of Proposed Equipment
- Schedule of Guarantees
- Subcontractors/ Manufacturers
 - o Schedule of Subcontractors
 - o Form MAN: Manufacturer's Authorization
- Personnel:
 - o Form PER-1: Proposed Personnel
 - o Form PER -2: Resume of Proposed Personnel
- Construction Equipment
 - o Form EQU: Construction Equipment
- Form SPA: Spare Parts

Project Organization

[The Bidder shall insert the organization information.]

The Bidder shall submit the organization chart showing his project organizational structure proposed for the fulfilment of this contract. The chart shall show the relationship among joint-operation (if any) with the associated companies and sub-contractors. The assignments and responsibilities of the key personnel for the respective fields of work shall be described for engagement identifying the part of works for which they will participate.

The proposed Project Organization shall include but not be limited to the following:

- Name and age
- Name of Company and Title
- Responsibility
- Location of the activities

Method Statement

[The Bidder shall insert the Method of Statement.]

The proposed Method statement shall include but not be limited to the following:

Shipbuilding

- Detailed schedule for engineering, procurement, fabrication, shipment, commissioning and training.
- Project organization chart.
- Quality control system at the factory including detailed procedure and copy of ISO certificate.
- Method of quality control system.
- Proposed after-sales technical services (after guarantee period) in Bangladesh.
- Method and detailed description of the items for commissioning and inspection at the factory and at the Site.
- Method for training at the Site including the schedule.
- Method of before-shipment inspection including location and items to be inspected.
- List of subcontractors or vendors of the major components.
- Detailed procedure for inspection and test during manufacturing.
- Conceptual Image of proposed vessels.

VTMS Tower

- Method of construction.
- List of subcontractors or vendors of the major components.
- Method of inspection at the Site.

VTMS

- Detailed schedule for engineering, procurement, fabrication, shipment, erection at site, commissioning and training.
- Project organization chart for VTMS.
- Method of transportation and installation with the schedule.
- Proposed after-sales technical services (after guarantee period) in Bangladesh.
- Method and detailed description of the items for commissioning and inspection at the Site.
- Method for training at the Site including the schedule.
- Method of before-shipment inspection including location and items to be inspected.
- List of subcontractors or vendors of the major components.
- Method for training at the Site including the schedule.
- Method of before-shipment inspection including location and items to be inspected.
- List of subcontractors or vendors of the major components.
- Conceptual image of proposed VTMS

Project Execution Schedule

[The Bidder shall insert the Project Execution Schedule.]

The Bidder shall submit the time schedule for the execution of design, manufacture, testing and delivery of the Tug Boats, Survey boat, Pilot boat and VTMS respectively in the form of a Bar Chart showing the sequence and duration of the various items of work to be executed on a monthly basis.

The Bidder shall also submit a detailed construction schedule in the form of a Network Diagram showing the interaction of all activities, including the critical activities/path of the total works. The diagram will also show floating periods of non-critical items.]

The schedule shall show the item of major work required in the Contract but not limited to the following;

- Design
- Fabrication
- Keel Laying
- Construction
- Launching
- Outfitting
- Sea Trials
- Delivery at shipyard
- Personnel Training
- Delivery Voyage
- Taking Over and Acceptance at Site
- Training at Site.

Quality Assurance Plan

[The Bidder shall insert the proposal for Quality Assurance Plan.]

The Preliminary Design shall include but not be limited to the following:

The Bidder shall submit the Quality Assurance Plan which demonstrates implementing of a quality assurance system and drawing up of the quality assurance plan specifically for the Works, meeting with the requirement of planning, documenting and implementing of the Works thoroughly so as to ensure full compliance with all contractual requirements and obligations.

The Bidder shall develop the Quality Plan in line with the guidelines established for ISO 9000 or a similar internationally recognized quality assurance system.

The above Quality Assurance Plan shall contain a valid Quality Statement (signed by the Project Manager) and set out the Shipbuilder organizational structure for the Contract, including the quality assurance and quality control organizational structures. Moreover, it shall also contain a specific quality procedure for all activities to be carried out during the execution of the Contract, together with specific work procedures that are necessary to fulfil the requirements of the Contract.

Technical Drawings

[The Bidder shall insert the proposed Technical Drawings including the following items, but not limited to.]

- Proposed preliminary design of the Boats
- Proposed preliminary design of the VTMS Tower and diagram of systems

Health and Safety Plan

Notes for the Bidder

The Bidder should submit “The Bid Stage Safety Plan” which complies with requirements described in Annex 1.2, Content of Bid Stage Safety Plan, Chapter 1, JICA Standard Safety Specification (JSSS), covering the items below.

[The Bidder shall insert the Health and Safety Plan.]

- (1) Description of the Works
- (2) Health and Safety Management System, Responsibility and Authority of Bidder's Personnel
- (3) Health and Safety Laws
- (4) Bidder's Safety Management System
- (5) Temporary Works
- (6) Temporary Facilities on Site
- (7) Safety Measures for Contractor's Design of the Permanent Works
- (8) COVID-19 Mitigation Plan with Countermeasures during Pandemic (PC Sub-Clause 6.7) in which any requirements in accordance with the guidelines, regulations and laws of Bangladesh Government and JICA shall be applied
- (9) Safety Plan for the Works
- (10) Safety Plan for Dangerous Work.
- (11) Permit to Work System
- (12) Safety Measures for Contractor's Equipment
- (13) Proposed Health and Safety Incentive Scheme
- (14) Safety Information Sharing and Communications Policy
- (15) Health and Safety Equipment, Facilities and Personal Protective Equipment (PPE)
- (16) Site Inspection Plan
- (17) Site Security
- (18) Policy for Preventing Traffic Accidents
- (19) Reporting Procedure for Unsafe Conditions and Behaviour
- (20) Accident Response Plan
- (21) Health Care Plan
- (22) Environmental, Temporary Works and Structural Monitoring Plans
- (23) Fire Response Plan
- (24) Emergency Response Plan
- (25) Monitoring and Review of Health and Safety Management Activities
- (26) Safety Induction Training
- (27) Skill Training
- (28) Legal Requirements

Environmental Plan

[The Bidder shall insert the proposed preliminary Environmental Plan including the following items, but not limited to.]

- Monitoring items
- Frequency of the monitoring
- Baseline survey plan
- Proposed countermeasures if necessary

Schedule of Proposed Equipment

[The Bidder shall insert the Proposed Equipment.]

[The Bidder shall fill in the proposed equipment (manufacture and model) to be used/ installed and/or mounted for the Tug Boats, Survey Boat and Pilot Boat to be procured under this Contract and submit as part of the Technical Proposal. The Bidder shall provide at least two options for each list of proposed equipment. Final list of Proposed Equipment will be discussed and agreed during contract negotiation.]

1. Tug Boat

No.	Item/Description Equipment	of	Manufacture	Model	Country Origin	of

2. Survey Boat

No.	Item/Description Equipment	of	Manufacture	Model	Country Origin	of

3. Pilot Boat

No.	Item/Description Equipment	of	Manufacture	Model	Country Origin	of

Schedule of Guarantees

[The Bidder shall provide, in the right column, the corresponding value for each functional guarantee of the proposed plant, as required in the Employer's Requirements and stated by the Employer in para. 1.2.2 (b) of Section III. Evaluation and Qualification Criteria, and in the right column, provide the corresponding value for each functional guarantee of the Tugboat. The Bidder shall submit the completed form as part of the Technical Proposal]

Required Performance Guarantee	Value of Performance Guarantee of the Proposed Works
1. Tug Boats	
1.1 Bollard Pull at 100% torque	
1.2 Maximum speed	
1.3 Cruising speed	
1.4 Cruising range	
1.5 Capacity of Fuel Oil Tank	
2. Survey Boat	
2.1. Cruising speed	
2.2 Cruising range	
2.3. Operability of sea weather up to Beaufort scale 4/5	
3. Pilot Boat	
3.1. Cruising speed	
3.2 Cruising range	
3.3. Operability of sea weather up to Beaufort scale 4/5	

Schedule of Subcontractors

[The Bidder shall list below specialized subcontractors (if any) proposed by the Bidder for the execution of the key activities listed in Section III, Evaluation and Qualification, Sub-Factor 2.4.2(b) as appropriate, in accordance with Section I, Instruction to Bidders, ITB 16.3.]

Also, the Bidder shall list below subcontractors for major item of the Works as listed by the Employer in Section III, Evaluation and Qualification Criteria 1.1.3. if applied, in accordance with Section I, Instruction to Bidders, ITB 16.3,

The completed Schedule, once accepted by the Employer will be a contract document in accordance with the Contract Agreement. Nominated Subcontractors shall not be listed in this Schedule.]

The Schedule of Subcontractor becomes part of the contract document in accordance with Sub-Clause 4.4 (a) of General Conditions.

No.	Key Activity	Specialized Subcontractor	
		Name	Nationality

No.	Major Item of the Works	Subcontractor	
		Name	Nationality

Form MAN: Manufacturer's Authorization

[In accordance with ITB 16.3 if the Bidder proposes, for the execution of the key activities or major items above, to supply and install any goods which the Bidder do not manufacture or otherwise produce, the Bidder shall require the manufacturers of the goods to be supplied and installed under the Contract to fill in this Form in accordance with the instructions indicated.]

This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the manufacturer.

When the Bidder proposes subcontractors other than manufacturers in accordance with EQC 1.1.3 or 2.4.2(b), Form MAN is still required. Accordingly the first paragraph of the main text should be revised as follows:

“We [insert complete name of subcontractor] do hereby authorize [insert complete name of Bidder] to submit a Bid, the purpose of which is to provide the following part of the Contract performed by us [insert name and/or brief description of the services], and to subsequently negotiate and sign the Contract.”]

Date: [insert date (as day, month and year) of Bid Submission]

IFB No.: [insert number of bidding process]

To: [insert complete name of Employer]

WHEREAS

We [insert complete name of manufacturer or manufacturer's authorized agent], who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of manufacturer's factories],], having ISO9001 and ISO14001 certification, do hereby authorize [insert complete name of Bidder] to submit a Bid the purpose of which is to provide the following goods, manufactured by us [insert name and/or brief description of the goods], and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with the Contract, with respect to the goods offered by the above firm.

Name: [insert complete name of person signing the Bid]

In the capacity of [insert legal capacity of person signing the bid]

Signed: [insert signature of person whose name and capacity are shown above]

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

Dated on _____ day of _____, _____ [insert date of signing]

Form PER -1: Proposed PersonnelDate: *[insert day, month, year]*Bidder's Legal Name: *[insert full name]*JV Member Legal Name: *[insert full name]*IFB No: *[insert number]*Page *[insert page number]* of *[insert total number]* pages

[The Bidder shall provide the names of suitably qualified personnel to meet the specified requirements stated in Section III, Evaluation and Qualification Criteria, Clause 1.1.1. 'Title of Position' shall be filled in with key positions as listed in the above Clause.]

1.	Title of position:
	Name:
2.	Title of position:
	Name:
3.	Title of position:
	Name:
4.	Title of position:
	Name:

Form PER -2: Resume of Proposed Personnel*Date: [insert day, month, year]**Bidder's Legal Name: [insert full name]**JV Member Legal Name: [insert full name]**IFB No: [insert number]**Page [insert page number] of [insert total number] pages*

[The Bidder shall provide the data on the experience of the personnel indicated in Form PER-1, in the form below:]

Name of Bidder:**Position:****Personnel
information****Name:****Date of birth:****Professional qualifications:****Present
employment****Name of employer:****Address of employer:****Telephone:****Contact (manager / personnel
officer):****Fax:****E-mail:****Job title:****Years with present employer:**

[The Bidder shall summarize professional experience over the last 20 years, in a reverse chronological order. Indicate particular technical and managerial experience relevant to the position of the proposed personnel.]

From	To	Relevant Technical and Management Experience
		Company :
		Project :
		Position :
		Experience:
		Company :
		Project :
		Position :
		Experience:
		Company :
		Project :
		Position :
		Experience:
		Company :
		Project :
		Position :
		Experience:

Form EQU: Construction Equipment

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

JV Member Legal Name: [insert full name]

IFB No: [insert number]

Page [insert page number] of [insert total number] pages

[The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria, Clause 1.1.2. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.]

Item of equipment:		
Equipment information	Name of manufacturer:	Model and power rating:
	Capacity:	Year of manufacture:
Current status	Current location:	
	Details of current commitments:	
Source	Indicate source of the equipment: ☐ Owned ☐ Rented ☐ Leased ☐ Specially manufactured	

Omit the following information for equipment owned by the Bidder.

Owner	Name of owner:	
	Address of owner:	
	Telephone:	Contact name and title:
	Fax:	Telex:
Agreements	Details of rental / lease / manufacture agreements specific to the project:	

Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section III, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in the corresponding Forms included hereunder:

Form ELI -1	: Bidder Information Form
Form ELI -2	: JV Member Information Form
Form ELI -3	: Subcontractor Information Form
Form CON	: Historical Contract Non-Performance and Litigation
Form FIN -1	: Financial Situation
Form FIN -2	: Average Annual Turnover
Form FIN -3	: Financial Resources
Form FIN -4	: Current Contract Commitments
Form EXP -1	: General Experience
Form EXP -2(a)	: Specific Experience
Form EXP -2(b)	: Experience in Key Activities
Form EXP -2(c)	: Experience in Key Activities
Form EXP -2(d)	: Experience in Key Activities

Form ELI -1: Bidder Information Form

Date: *[insert day, month, year]*IFB No.: *[insert number]*Page *[insert page number]* of *[insert total number]* pages

[Bidders shall provide the following information. The documents listed/ stated as required shall be submitted as attachments hereto.]

Bidder's legal name: <i>[insert full name]</i>
In case of a JV, legal name of the representative member and of each member: <i>[insert full name of each member in the JV and specify the representative member.]</i>
Bidder's actual or intended country of registration: <i>[insert country of registration]</i>
Bidder's actual or intended year of incorporation: <i>[insert year of incorporation]</i>
Bidder's legal address in country of registration: <i>[insert mailing address]</i>
Bidder's authorized representative information Name: <i>[insert full name]</i> Address: <i>[insert mailing address]</i> Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> E-mail address: <i>[insert e-mail address]</i>
1. Attached are copies of original documents of Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form ELI -2: JV Member Information Form

Date: *[insert day, month, year]*IFB No.: *[insert number]*Page *[insert page number]* of *[insert total number]* pages

[The following form is additional to Form ELI-1, and shall be completed to provide information relating to each JV member, in case if the Bidder is a JV. The documents listed/stated as required shall be submitted as attachments hereto.]

Bidder's legal name: <i>[insert full name]</i>
JV Member's legal name: <i>[insert full name of Bidder's party]</i>
JV Member's country of registration: <i>[insert country of registration]</i>
JV Member's year of incorporation: <i>[insert year of incorporation]</i>
JV Member's legal address in country of registration: <i>[insert mailing address]</i>
JV Member's authorized representative information Name: <i>[insert full name]</i> Address: <i>[insert mailing address]</i> Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> E-mail address: <i>[insert e-mail address]</i>
1. Attached are copies of original documents of Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form ELI -3: Subcontractor Information Form

Date: *[insert day, month, year]*IFB No.: *[insert number]*Page *[insert page number]* of *[insert total number]* pages

[The following form is additional to Form ELI-1 and ELI-2 (if applicable), and shall be completed to provide information relating to the specialized subcontractor (if any) proposed by the Bidder for the execution of the key activities listed in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(b) or the subcontractors for major items of the Works as listed by the Employer in Section III, Evaluation and Qualification Criteria 1.1.3. The documents listed/ stated as required shall be submitted as attachments hereto.]

Bidder's legal name: <i>[insert full name]</i>
Subcontractor's legal name: <i>[insert full name of Bidder's party]</i>
Subcontractor's country of registration: <i>[insert country of registration]</i>
Subcontractor's year of incorporation: <i>[insert year of incorporation]</i>
Subcontractor's legal address in country of registration: <i>[insert mailing address]</i>
Subcontractor's authorized representative information Name: <i>[insert full name]</i> Address: <i>[insert mailing address]</i> Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> E-mail address: <i>[insert e-mail address]</i>
1. Attached are copies of original documents of Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Form CON: Historical Contract Non-Performance and Litigation

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV.]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

JV Member's Legal Name: *[insert full name]*

IFB No.: *[insert number]*

Page *[insert page number]* of *[insert total number]* pages

1. History of Non-Performing Contracts

Non-Performing Contracts			
In accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate, for five (5) years prior to the Bid submission deadline: <i>[The Bidder shall indicate the applicable wording below by checking the appropriate box.]</i> ☐ contract non-performance did not occur. ☐ contract non-performance occurred as indicated below:			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	- Contract Identification: <i>[insert complete contract name, number, and any other identification]</i> - Name of Employer: <i>[insert full name]</i> - Address of Employer: <i>[insert mailing address]</i> - Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> - E-mail address: <i>[insert e-mail address]</i> - Reason(s) for non-performance: <i>[indicate main reason(s)]</i>	<i>[insert current value, currency, exchange rate and USD equivalent]</i>

2. Pending Litigation

Pending Litigation				
In accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate: <i>[The Bidder shall choose the relevant wording below by checking the appropriate box.]</i> ☐ there is no pending litigation involving the Bidder. ☐ there is pending litigation involving the Bidder as indicated below:				
Year of dispute	Amount in dispute (currency)	Outcome as Percentage of Net Worth	Contract Identification	Total Contract Amount
<i>[insert year]</i>	<i>[insert amount]</i>	<i>[insert percentage]</i>	- Contract Identification: <i>[indicate complete contract name, number, and any other identification]</i> - Name of Employer: <i>[insert full name]</i> - Address of Employer: <i>[insert mailing address]</i> - Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> - E-mail address: <i>[insert e-mail address]</i> - Party who initiated Litigation: <i>[indicate "Employer" or "Contractor"]</i> - Matter in dispute: <i>[indicate main issues in dispute]</i>	<i>[insert current value, currency, exchange rate and USD equivalent]</i>

3. Litigation History

Litigation History		
In accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate, for five (5) years prior to the Bid submission deadline. <i>[The Bidder shall choose the relevant wording below by checking the appropriate box.]</i> ☐ there are no court orders against the Bidder. ☐ there are court orders against the Bidder as indicated below:		
Year of award	Contract Identification	Total Contract Amount
[insert year]	- Contract Identification: <i>[indicate complete contract name, number, and any other identification]</i> - Name of Employer: <i>[insert full name]</i> - Address of Employer: <i>[insert mailing address]</i> - Telephone/Fax numbers: <i>[insert telephone/fax numbers, including country and city codes]</i> - E-mail address: <i>[insert E-mail address]</i> - Matter in dispute: <i>[indicate main issues in dispute]</i> - Party who initiated litigation: <i>[indicate "Employer" or "Contractor"]</i> - Abstract of the Court Order: <i>[state concisely the court order concerning main issues in dispute]</i>	<i>[insert current value, currency, exchange rate and USD equivalent]</i>

Form FIN -1: Financial Situation

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV. The documents listed/ stated as required shall be submitted as attachments hereto.]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

JV Member's Legal Name: *[insert full name]*

IFB No.: *[insert number]*

Page *[insert page number]* of *[insert total number]* page

1. Financial data

Type of Financial information in (currency)	Historic information for previous <i>[insert number]</i> years (amount in currency, currency, exchange rate, USD equivalent)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Information from Balance Sheet					
Total Assets (TA)					
Total Liabilities (TL)					
Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Profits After Taxes (PAT)					
Information from Cash Flow Statement					
Cash Flow from Operating Activities					

2. Financial documents

The Bidder and its parties shall provide copies of the financial statements¹ for the number of years indicated in the relevant Prequalification criteria or Section III, Evaluation and Qualification Criteria Sub-Factor 2.3.1, as appropriate. The financial statements shall:

- (a) reflect the financial situation of the legal entity(ies) comprising the Bidder, and not of the affiliated entities (such as parent company(ies), group companies or subsidiaries) of the Bidder unless they are parties to the Bidder under a JV in accordance with ITB 4.1.
- (b) be independently audited or certified in accordance with local legislation.
- (c) be complete, including all notes to the financial statements.
- (d) correspond to accounting periods already completed and audited.

Attached herewith are copies of financial statements for the number of years required above, and complying with the requirements.

Notes for the Bidders

1. If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.

Form FIN -2: Average Annual Turnover

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

JV Member's Legal Name: [insert full name]

IFB No.: [insert number]

Page [insert page number] of [insert total number] pages

Annual Turnover Data			
Year	Amount and Currency	Exchange Rate	USD equivalent
[indicate year]	[insert amount and indicate currency]	[insert applicable exchange rate]	[insert amount in USD equivalent]
Average Annual Turnover ¹			

Notes for the Bidders

1. Total USD equivalent for all years divided by the total number of years, in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.2, as appropriate.

Form FIN -3: Financial Resources

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV.]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

JV Member's Legal Name: *[insert full name]*

IFB No.: *[insert number]*

Page *[insert page number]* of *[insert total number]* pages

[specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.3, as appropriate.]

Financial Resources		
No.	Source of financing ¹	Amount (USD equivalent)
1		
2		
3		

Notes for the Bidders

1. Sources of financing may include working capital (to be taken from FIN-1), Credit Line (to be substantiated by a letter from the bank issuing the line of credit), etc.

Form FIN -4: Current Contract Commitments

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV.]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

JV Member's Legal Name: *[insert full name]*

IFB No. *[insert number]*

Page *[insert page number]* of *[insert total number]* page

[The Bidder and each member should provide information on their current commitments on all contracts that have been awarded, or for which a Letter of Intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full Taking-over Certificate/ Completion Certificate has yet to be issued, in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.3, as appropriate.]

Current Contract Commitments						
No.	Name of Contract	Employer's Mailing Address, Tel, Fax.	Value of Outstanding Work [Current USD Equivalent]	Commencement Date	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [USD/month]
1						
2						
3						
4						
5						

Form EXP -1: General Experience

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV.]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

JV Member's Legal Name: *[insert full name]*

IFB No.: *[insert number]*

Page *[insert page number]* of *[insert total number]* pages

[The Bidder shall identify contracts that demonstrate continuous experience pursuant to Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.1 and list contracts chronologically, according to their commencement (starting) dates.]

General Construction Experience			
Starting Year	Ending Year	Contract Identification	Role of Bidder
<i>[indicate year]</i>	<i>[indicate year]</i>	- Contract name: <i>[insert full name]</i> - Brief description of the contract performed by the Bidder: <i>[describe contract performed briefly]</i> - Amount of contract: <i>[insert amount in currency, mention currency used, exchange rate and USD equivalent]</i> - Name of Employer: <i>[indicate full name]</i> - Address: <i>[indicate mailing address]</i>	<i>[insert "Prime Contractor (single entity or JV member)" or "Subcontractor"]</i>

Form EXP -2(a): Specific Experience

[The following table shall be filled in for the Bidder, and for each JV member if the Bidder is a JV. The documents listed/ stated as required shall be submitted as attachments hereto.]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

JV Member's Legal Name: *[insert full name]*

IFB No.: *[insert number]*

Page *[insert page number]* of *[insert total number]* pages

[The Bidder shall fill out one (1) form per contract, in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(a).]

Contract of Similar Size and Nature			
Similar Contract No.	Information		
<i>[insert number] of [insert number of similar contracts required]</i>			
Contract Identification	<i>[insert contract name and reference identification number, if applicable]</i>		
Award Date	<i>[insert day, month, year, e.g., 15 June 2015]</i>		
Completion Date	<i>[insert day, month, year, e.g., 03 October 2017]</i>		
Role in Contract <i>[check the appropriate box]</i>	Prime Contractor		
	Single entity ☐	JV member ☐	
Total Contract Amount	<i>[insert total contract amount and currency(ies)]</i>	USD <i>[insert exchange rate and total contract amount in USD equivalent]</i>	
If member in a JV, specify participation in total Contract amount	<i>[insert percentage participation]</i>	<i>[insert total contract amount and currency(ies)]</i>	USD <i>[insert exchange rate and total contract amount in USD equivalent]</i>
	<i>[describe participation in JV and work performed]</i>		
Employer's Name:	<i>[insert full name]</i>		
Address:	<i>[insert mailing address]</i>		

Contract of Similar Size and Nature	
Similar Contract No.	Information
[insert number] of [insert number of similar contracts required]	
Telephone/fax number	[insert telephone/fax numbers, including country and city area codes]
E-mail:	[insert e-mail address, if available]
Description of the similarity in accordance with Sub-Factor 2.4.2(a) of Section III:	
1. Type of Contract	[insert Type of Contract]
2. Number of Tug Boats	[insert number of Tug Boats]
3. Number of foreign Country Flag Vessel	[insert number foreign Country Flag Vessel]
4. International Classification Society	[insert International Classification Society]
5. Contract Value	[insert contract value in Japanese Yen]
6. Physical Size	[insert physical size of major activities]
Attached herewith are the copies of originals of: (a) abstracts of contract documents, JV Agreements, etc. evidencing that the size and nature of the above-mentioned contract meets the requirements specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(a). (b) the end-user certificate(s) (i.e. Taking-over Certificate(s)/ Completion Certificate(s)), evidencing that the contract above-mentioned contract has been successfully completed.	

Form EXP -2(b): Experience in Key Activities

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

JV Member's Legal Name: [insert full name]

Subcontractor's Legal Name: [insert full name]

IFB No.: [insert number]

Page [insert page number] of [insert total number] pages

1. Summary of Key Activities

[Fill out if the Bidder is a Single Firm/JV or proposes specialized subcontractors for the execution of any of the key activities]

Summary of Single Firm/JV Member/ Subcontractor for Key Activities		
Key Activity		Single Firm/JV Member/ Subcontractor
No	Description	
1	Manufacture and deliver of Tug boat	[insert full name(s) of Single Firm/JV Member(s)/ Subcontractor(s)] (i) (ii) (iii)

2. Contract Information

Key Activity No (1): Manufacture and deliver of Tug boat

[Fill out one (1) form per contracts performed by the Bidder (Single Firm/ JV member/ specialized subcontractor) as listed in the Summary of Key Activities above in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(b). The documents listed/ stated as required shall be submitted as attachments hereto.]

(i) [insert full name of Single Firm, JV Member's/ Subcontractor's Legal Name]

Contract with Similar Key Activities	
Item	Information
Contract Identification	[insert contract name and number, if applicable]
Award Date	[insert day, month, year, e.g., 15 June 2015]
Completion Date	[insert day, month, year, e.g., 03 October 2017]

Contract with Similar Key Activities			
Role in Contract [check the appropriate box]	Prime Contractor Single entity ☐ JV member ☐		Subcontractor ☐
Total Contract Amount	[insert total contract amount and currency(ies)]	USD [insert Exchange rate and total contract amount in USD equivalent]	
[insert brief description of the Activity No. (1)]	[describe briefly how the corresponding minimum requirement is met]		
Employer's Name:	[insert full name]		
Address:	[indicate mailing address]		
Telephone/fax number	[insert telephone/fax numbers, including country and city area codes]		
E-mail:	[insert e-mail address, if available]		
Attached herewith are the copies of originals of: (a) abstracts of contract documents, sub-contract agreements, JV Agreements, etc. evidencing that the above activity meets the criteria specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(b). (b) the end-user certificate(s) (i.e. Taking-over Certificate(s)/ Completion Certificate(s)) for the above-mentioned contract, evidencing that the above activity has been successfully carried out.			

Form EXP -2(c): Experience in Key Activities

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

JV Member's Legal Name: [insert full name]

Subcontractor's Legal Name: [insert full name]

IFB No.: [insert number]

Page [insert page number] of [insert total number] pages

1. Summary of Key Activities

[Fill out if the Bidder is a Single Firm/JV or proposes specialized subcontractors for the execution of any of the key activities]

Summary of Single Firm/JV Member/ Subcontractor for Key Activities		
Key Activity		Single Firm/JV Member/ Subcontractor
No	Description	
1	Manufacture and deliver of Pilot Boat, Survey Boat, or Other similar type of boats.	[insert full name(s) of Single Firm/JV Member(s)/ Subcontractor(s)] (i) (ii) (iii)

2. Contract Information

Key Activity No (1): Manufacture and deliver of Pilot Boat, Survey Boat, or Other similar type of boats.

[Fill out one (1) form per contracts performed by the Bidder (Single Firm/ JV member/ specialized subcontractor) as listed in the Summary of Key Activities above in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(c). The documents listed/ stated as required shall be submitted as attachments hereto.]

(i) [insert full name of Single Firm, JV Member's/ Subcontractor's Legal Name]

Contract with Similar Key Activities	
Item	Information
Contract Identification	[insert contract name and number, if applicable]
Award Date	[insert day, month, year, e.g., 15 June 2015]
Completion Date	[insert day, month, year, e.g., 03 October 2017]

Contract with Similar Key Activities			
Role in Contract [check the appropriate box]	Prime Contractor Single entity ☐ JV member ☐		Subcontractor ☐
Total Contract Amount	[insert total contract amount and currency(ies)]	USD [insert Exchange rate and total contract amount in USD equivalent]	
[insert brief description of the Activity No. (1)]	[describe briefly how the corresponding minimum requirement is met]		
Employer's Name:	[insert full name]		
Address:	[indicate mailing address]		
Telephone/fax number	[insert telephone/fax numbers, including country and city area codes]		
E-mail:	[insert e-mail address, if available]		
Attached herewith are the copies of originals of: (a) abstracts of contract documents, sub-contract agreements, JV Agreements, etc. evidencing that the above activity meets the criteria specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(c). (b) the end-user certificate(s) (i.e. Taking-over Certificate(s)/ Completion Certificate(s)) for the above-mentioned contract, evidencing that the above activity has been successfully carried out.			

Form EXP -2(d): Experience in Key Activities

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

JV Member's Legal Name: [insert full name]

Subcontractor's Legal Name: [insert full name]

IFB No.: [insert number]

Page [insert page number] of [insert total number] pages

1. Summary of Key Activities

[Fill out if the Bidder is a Single Firm/JV or proposes specialized subcontractors for the execution of any of the key activities]

Summary of Single Firm/JV Member/ Subcontractor for Key Activities		
Key Activity		Single Firm/JV Member/ Subcontractor
No	Description	
1	Design, manufacture, supply and installation of Vessel Traffic Management System	[insert full name(s) of Single Firm/JV Member(s)/ Subcontractor(s)] (i) (ii) (iii)

2. Contract Information

Key Activity No (1): Design, manufacture, supply and installation of Vessel Traffic

Management System

[Fill out one (1) form per contracts performed by the Bidder (Single Firm/ JV member/ specialized subcontractor) as listed in the Summary of Key Activities above in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(d). The documents listed/ stated as required shall be submitted as attachments hereto.]

(i) [insert full name of Single Firm, JV Member's/ Subcontractor's Legal Name]

Contract with Similar Key Activities	
Item	Information
Contract Identification	[insert contract name and number, if applicable]
Award Date	[insert day, month, year, e.g., 15 June 2015]
Completion Date	[insert day, month, year, e.g., 03 October 2017]

Contract with Similar Key Activities			
Role in Contract [check the appropriate box]	Prime Contractor Single entity ☐ JV member ☐		Subcontractor ☐
Total Contract Amount	[insert total contract amount and currency(ies)]	USD [insert Exchange rate and total contract amount in USD equivalent]	
[insert brief description of the Activity No. (1)]	[describe briefly how the corresponding minimum requirement is met]		
Employer's Name:	[insert full name]		
Address:	[indicate mailing address]		
Telephone/fax number	[insert telephone/fax numbers, including country and city area codes]		
E-mail:	[insert e-mail address, if available]		
Attached herewith are the copies of originals of: (a) abstracts of contract documents, sub-contract agreements, JV Agreements, etc. evidencing that the above activity meets the criteria specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.2(d). (b) the end-user certificate(s) (i.e. Taking-over Certificate(s)/ Completion Certificate(s)) for the above-mentioned contract, evidencing that the above activity has been successfully carried out.			

Form ACK

Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans

A) I, *[insert name and position of authorized signatory]*, being duly authorized by *[insert name of Bidder/members of joint venture (“JV”)]* (hereinafter referred to as the “Bidder”) to execute this Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans, hereby certify on behalf of the Bidder and myself that:

- (i) all information provided in the Bid submitted by the Bidder and its subcontractors for *[insert name of the Project, and name, number and identification of lot(s) (contract(s)) as stated in BDS 1.1]* is true, correct and accurate to the best of the Bidder’s and my knowledge and belief; and
- (ii) the Bidder or any of its subcontractors has not, directly or indirectly, taken any action which is or constitutes a corrupt or fraudulent practice and is not subject to any conflict of interest as stipulated in the relevant section of the Guidelines and the Bidding Document.

<If debarment for more than one year by the World Bank Group is NOT imposed, use the following sentence B).>

B) I certify that the Bidder has NOT been debarred by the World Bank Group for more than one year since the date of issuance of Invitation for Bids.

<If debarment for more than one year by the World Bank Group has been imposed BUT three (3) years have passed since the date of such debarment decision, use the following sentence B’).>

B’) I certify that the Bidder has been debarred by the World Bank Group for a period more than one year BUT that on the date of issuance of Invitation for Bids at least three (3) years had passed since the date of such debarment decision. Details of the debarment are as follows:

name of the debarred firm	starting date of debarment	ending date of debarment	reason for debarment

C) I certify that the Bidder will not enter into a subcontract with a firm which has been debarred by the World Bank Group for a period more than one year, unless on the date of the subcontract at least three (3) years have passed since the date of such debarment decision.

D) I certify, on behalf of the Bidder and its subcontractors, that if selected to undertake works and services in connection with the Contract, the Bidder and its subcontractors shall carry out such works and services in continuing compliance with the terms and conditions of the Contract.

- E) I further certify, on behalf of the Bidder and its subcontractors, that if the Bidder and any of its subcontractors is requested, directly or indirectly, to engage in any corrupt or fraudulent act or practise under any applicable law, such as the payment of a rebate, at any time or any stage of a process of procurement such as negotiations, execution or implementation of contract (including amendment thereof), the Bidder shall report all relevant facts regarding such request to the relevant section in JICA (details of which are specified below) in a timely manner.

JICA's information desk on fraud and corruption (A report can be made to either of the offices identified below.)

- (1) JICA Headquarters: Legal Affairs Division, General Affairs Department

URL: <https://www2.jica.go.jp/en/odainfo/index.php>

Tel: +81 (0)3 5226 8850

- (2) JICA Bangladesh Office

Tel: +880-2 22229 1897

Email: bd_oso_rep@jica.go.jp

The Bidder acknowledges and agrees that the reporting obligation stated above shall NOT in any way affect the Bidder's responsibilities, obligations or rights, under relevant laws, regulations, contracts, guidelines or otherwise, to disclose or report such request or other information to any other person(s) including the Employer or to take any other action, required to or allowed to, be taken by the Bidder. The Bidder further acknowledges and agrees that JICA is not involved in or responsible for the procurement process in any way.

- F) If any of the statements made herein is subsequently proven to be untrue or incorrect based on facts subsequently determined, or if any of the warranties or covenants made herein is not complied with, the Bidder will accept, comply with, and not object to any remedies taken by the Employer and any sanctions imposed by or actions taken by JICA.

Authorized Signatory

[insert name of signatory; title]

For and on behalf of

[insert name of the Bidder]

Date: *[insert date]*

Form JSSS/BSD Bidder's Safety Declaration

I, *[insert name and position of authorised signatory]*, being duly authorised by *[insert name of Bidder/members of joint venture ("JV")]* (hereinafter referred to as the "Bidder") to execute this Form JSSS/BSD, hereby declare our commitment to comply with the health and safety requirements of the Contract.

The Bidder declares, that if selected to undertake the Works, he will ensure that the Site is established and maintained as a healthy and safe workplace for the Contractor's Personnel, the Employer's Personnel and all other persons entitled to be thereon or that may be affected by operations thereby.

The Bidder hereby declares that after investigation and research of resources within the Country, he has given full and careful consideration and fully accepts the need and has made full allowance for the importation, the use upon the Works and subsequent re-export in accordance with the Contract of all required Contractor's Equipment, Temporary Works, PPE and all other safety resources necessary to maintain the international level of health and safety upon the Works.

The Bidder declares that he will mobilise for use upon the Works:

1. New (or recent) or duly maintained PPE and other safety equipment of an international standard, suitable and fit for the purpose for which it is intended, in full working order, complete with all necessary spare parts and consumables, suitable and safe for use on the Works, all to meet with the consent of the Engineer and in sufficient quantities to allow for replacement in the case of being worn-out, lost or damaged, and
2. New (or recent) or duly maintained Contractor's Equipment and Temporary Works, all suitable and fit for the purpose for which it is intended, in full working order, clean, non-polluting, complete with all necessary spare parts and consumables, suitable and safe for use on the Works.

The Bidder further declares that he shall:

1. Carry out regular and thorough safety inspections, find and correct any health and safety problems on the Works, primarily by trying to eliminate or reduce hazards through making feasible changes in working conditions rather than relying on PPE to reduce risks.
2. Employ workers with appropriate skill, educational or vocational qualification, experience and capability.
3. Fully inform workers about hazards.
4. Provide health and safety training to all Contractor's Personnel, any Subcontractors, suppliers and others for whom the Contractor is responsible, the Employer's Personnel and all other persons who are entitled to be on the Site, in a language and vocabulary they can understand.
5. Keep accurate records of work-related injuries and illnesses.
6. Perform tests in the workplace, such as air sampling as required by the Safety Specification.

7. Provide required new PPE at no cost to workers and ensure that this is used properly, kept in good condition and replaced in the case of being worn-out, lost or damaged.
8. Assign only workers who, in consideration of health, physical condition and age are suited to the operations to which they are assigned.
9. Provide eyesight, hearing and mobility examinations and other medical tests required by the Contract.
10. Post injury and illness information and data where workers can see them.
11. At occurrence of any accident, promptly inform the Engineer and thereafter submit details of the accident within twenty-four (24) hours after its occurrence.
12. Not retaliate against workers for using their rights under the Laws of the Country.

The requirements of this declaration shall apply fully to all of the Bidder's proposed Subcontractors, suppliers and specialists engaged by the Bidder on the Works, for whom the Bidder shall remain fully responsible.

The Bidder also affirms that if the Bid is successful, the Health and Safety Officer, named below and also included in Bidding Form, Form PER -1: Proposed Personnel, unless otherwise required by the Bidding Documents, shall be assigned from the Commencement Date, full-time upon the Site and shall not be replaced or substituted at any time except with the consent of the Engineer.

If the Bid is accepted the Bidder agrees that this Declaration shall form a part of the Contract, at and from which time all references to "Bidder" shall be construed as references to "Contractor".

Signed:

(Bidder's Official Representative)

Name:

 —

Date: _____

*(*Delete as applicable)*

Signed:

(Bidder's Proposed Health and Safety Officer at Site)*

Or

(Bidder's Head Office Health and Safety Manager)*

Name:

 —

Date: _____

Form of Bid Security

(Bank Guarantee)

[*Guarantor letterhead or SWIFT identifier code*]

Beneficiary:

Chittagong Port Authority:.
Room No. 528, Bandar Bhaban,
Chittagong Port Authority,
Chittagong - 4100,
Bangladesh.

IFB No.: [*insert number of Invitation for Bids*]

Date: [*insert date of issue*]

BID GUARANTEE No.: [*insert guarantee reference number*]

Guarantor: [*insert name and address of place of issue, unless indicated in the letterhead*]

We have been informed that [*insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof*] (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Bid (hereinafter called "the Bid") for the execution of [*insert description of contract*].

Furthermore, we understand that, according to the Beneficiary's conditions, Bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of [*insert amount in words*] ([*insert amount in figures*]) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Bid during the period of bid validity set forth in the Applicant's Letters of Technical Bid and Price Bid ("the Bid Validity Period"), or any extension thereto provided by the Applicant; or
- (b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the

contract agreement, or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary's bidding document.

This guarantee shall expire and be returned to us: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) twenty-eight days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

[signature(s)]

[Note: All italicized text is for use in preparing this form and shall be deleted from the final product.]

Section V. Eligible Source Countries of Japanese ODA Loans

All the countries and areas of the World.

PART 2 –EMPLOYER’S REQUIREMENTS

Section VI. Employer's Requirements

SECTION VI-1 GENERAL

SECTION VI-1: GENERAL

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Attachment-1 Site Data

SECTION VI-1: GENERAL

4001 PREAMBLE AND GENERAL PROVISIONS

4001.01 Preamble

- (a) The Employer's Requirements shall be read in conjunction with the General and Particular Conditions of Contract, and any other document forming part of the Contract.
- (b) Words and expressions in the Employer's Requirements shall have the same meanings as are respectively assigned to them in the Conditions of Contract.

4001.02 Abbreviations

The following abbreviations are used in this Specification:

CDL	:	Chart Datum Level
CPA	:	Chittagong Port Authority
CPM	:	Critical Path Method
HHWL	:	Highest High-Water Level
ITP	:	Inspection and Testing Plan
MSL	:	Mean Sea Level
PBM	:	Permanent Benchmark
PPG	:	Personnel Protection Gear
SOB	:	Survey of Bangladesh
UTM	:	Universal Traverse Mercator

4001.03 Definitions

Words and expressions in this Employer's Requirements shall have the same meanings as are respectively assigned to them in the Conditions of Contract.

4001.04 Discrepancies and Interpretations

During the execution of any item of work, if the Contractor discovers/finds any ambiguity or discrepancy in the Employer's Requirements, or between the Employer's Requirements and any other document forming part of the Contract:

- (a) the Contractor shall give prompt notice to the Engineer.
- (b) the Engineer shall, within a reasonable time upon receipt of the above notice, issue any necessary clarifications and/or instructions.

The Engineer's technical interpretation shall be final, and the Contractor shall execute such item of work, strictly in accordance with the instructions issued by the Engineer pursuant to GC Sub-Clause 1.5 [*Priority of Documents*].

4002 SCOPE OF WORK

The Scope of Work shall be as described in or as reasonably interfered from other sections of the Employer's Requirements, and any other document forming part of the Contract.

The Contractor shall study carefully all documents forming part of the Contract, and satisfy himself as to the full extent, character and nature of the Works to be executed under the Contract.

The Works comprise the design, manufacture/ fabrication, supply, installation, completion, and remedying of any defects of the Works, which shall include generally but without limitation the following:

- (a) Tug boats, survey boat and pilot boat.
- (b) Vessel Traffic Management System (VTMS).
- (c) VTMS Tower.
- (d) Operation/Maintenance Manuals and as-build documents for the above boats and system.
- (e) All Spare Parts for the two years after the taking-over for the above boats and system;
- (f) Training of the Employer's Personnel of the operation of the above boats and system;
- (g) any other work, as described in the Employer's Requirements or which are contingent or necessary for the satisfactory completion of the Works.
- (h) all Temporary Works including but not limited to those described in the Employer's Requirements and/or in the approved method statements of the above works, and any other work, which is incidental thereto and connected therewith.
- (i) all preparatory works including but not limited to document control, safety control, environmental control, progress control, quality control and meetings related with the Works shown above, and any other work, which is incidental thereto and connected therewith.

4003 PROJECT AREA AND WORKING AREA

4003.01 Definition of Working Area and Project Area

The Working Area and the Project Area are defined as follows.

- (a) The Work Area - On-shore; shall be the area, immediately within the property boundary line, as verified under Sub-Clause 4009.02 [Benchmarks and Project Boundary] of this Employer's Requirements.
- (b) The Work Area - Off - Shore; shall be the area within 150m to the seaside from the face line of the berth and/or revetment, or within 150m from the edge line of the dredging area as shown on the Drawings.
- (c) The Project Area (Site) - shall be all related areas of the Project which includes the Working Area, temporary yard, fabrication yard, accommodation camp, disposal area in both on-shore and off-shore.

The use of an area other than those described above, by the Contractor, shall solely be at his own risk and responsibility.

4003.02 Access

The Employer shall provide access to the Contractor to the Site, which is via the Bay of Bengal and via the existing road under GC Clause 2.1.

The Contractor shall abide by all limitations, laws and regulations relating to the use of public access and shall be responsible for any damage or disruption caused by his use of them. The Contractor may improve and/or widen existing roads, repair; or strengthen existing bridges or culverts, and widen and/or deepen existing waterway routes to meet his haulage requirements, provided that such work will be so scheduled and conducted as to minimize disturbance to other users, and subject to the approval of the Engineer and any relevant authorities having jurisdiction over such matters.

The Contractor may use the existing navigation channel (which is approximately 18.5m deep from MSL, 250m wide at the bottom and 14,300m long, as shown on the drawing) for the purpose of temporary transportation route to the Site.

Should the Contractor require any other form or route of access not specified in the Contract, he shall make his own arrangements, obtain any necessary permission, and be solely responsible for payment of any costs, charges or compensation, in connection therewith and/or incidental thereto.

4003.03 Transportation Route

The Contractor shall be entirely responsible for providing all routes of transportation to the Site for his personnel, materials, vehicles, plant and equipment and for meeting all other requirements of the Works, whether such transportation route is via the Bay of Bengal or Kohelia river or via the existing road after the access to the Site is provided by the Employer under GC Clause 2.1.

4003.04 Security

The Contractor shall be responsible for the security and safe working environment of the Site within the project area, twenty-four (24) hours per day, seven (7) days per week which can ensure the safety and security of persons and properties on the Site, commencing from the time when the possession of Site is given to the Contractor by the Employer.

However, the contractor may discuss and agree with the corporation of security system at the Site with the contractor of Package-1.

The Contractor's Security measures, against Force Majeure events defined in Sub-Clause 19.1 of the General Condition, if necessary, shall not be included in this Section and shall be discussed and agreed between the Employer and the Contractor.

4003.05 Cleanliness and Reinstatement

The Contractor shall, throughout the construction period, maintain the whole area of his operations in a clean, tidy and safe condition by arranging the materials and construction equipment in an orderly manner. All rubbish, waste material, debris and the like shall be systematically cleared and removed directly off the Site for disposal in a designated area or other proper disposal facilities.

The Contractor shall immediately, upon completion of any work and the approval of the Engineer for such work, fill up all holes and trenches which may have been made or dug, level any mounds made and clear away all rubbish which may have been occasioned or made in the course of the execution of the Works.

4003.06 Disposal and Pollution

The Contractor shall, at all times, abide by the rules and regulations set by the environmental authority (i.e. Department of Environment – Government of the Peoples Republic of Bangladesh).

The Contractor shall not dispose of any waste, rubbish or offensive material in any place not approved by the Engineer or the relevant authorities having jurisdiction over such matters.

The Contractor shall not discharge, oil, solids, noxious floating materials or any untreated waterborne effluent into any watercourse, and take reasonable precautions to prevent their accidental spillage and contact with soil or discharge into the watercourse.

The Contractor shall take all reasonable precautions to keep public or private roads clear of any spillage or droppings from his vehicles. Any spillage or droppings which may occur shall be cleared without delay, to the satisfaction of the Engineer.

4004 PREPARATORY WORKS

The Contractor shall carry out all preparatory works such as the Temporary Works, security facilities, establishing access roads/ routes to the Site and obtaining all necessary permissions, all of which shall be completed prior to commencement of the relevant Permanent Works.

4004.01 Possession

The Contractor will be given possession of the Site allocated for his temporary use and for the execution of the Works in accordance with the Conditions of Contract.

4004.02 Notice to Mariners

The Contractor shall arrange for the publication of all "Notices to Mariners" which may be required in respect of the Works. The arrangement for publication of Notice to Mariners shall be the responsibility of the Contractor; necessary assistance will be provided by the Employer and the Engineer.

4004.03 Permissions

The Contractor shall be responsible for obtaining all necessary permissions from the relevant authorities necessary for the commencement and carrying out of any construction work, prior to its commencement.

4005 THE CONTRACTOR'S REVIEW AND CLARIFICATION OF THE DESIGN

Prior to commencement of the Works, the Contractor shall review all the Employer's Requirements and the other documents forming part of the Contract and satisfy himself that the Employer's Requirements are technically realistic and reasonable.

4006 TEMPORARY FACILITIES

4006.01 General

The Contractor shall be responsible for the design, specification, execution and subsequent removal of all the Temporary Works necessary and incidental to the completion of the Works such as temporary roads, temporary jetties, fabrication yards, accommodation camps, working platforms, etc. The Temporary Works shall be designed by the Contractor in accordance with the standards if any described elsewhere in the Employer's Requirements or as proposed by the Contractor and reviewed by the Engineer.

4006.02 Temporary Works

Before the Contractor starts construction on any part of the Temporary Works, he shall furnish to the Engineer, a work plan (the Temporary Works Plan) including but not limited to a complete set of drawings, and if so required, the execution plan, the equipment to be used, the expected schedule, calculations relating to stability, strength and deflections of that part of the Temporary Works. Where the Temporary Works have direct contact with any part of the Permanent Works, the drawings and calculations shall clearly indicate the relationship, illustrate erection sequences and show any loadings or stresses applied to or from the Permanent Works.

The Temporary Works Plan shall be submitted in the forms as directed by the Engineer, for the Engineer's approval.

All necessary drawings and/or calculations shall be made to the Engineer for his review, within a reasonable period in advance of the commencement of any fabrication or installation of the Temporary Works. The Contractor shall make allowance in his program for submission of the Temporary Works Plans, the review by the Engineer and all necessary amendments, resubmission and further review by the Engineer as may be necessary until the Engineer's final consent is obtained.

The approval of any drawings, method statement and calculations of the Temporary Works by the Engineer shall not relieve the Contractor of any liability or obligation under the Contract in respect of such Temporary Works and the related Permanent Works.

4006.03 Contractor's Accommodation and Camp

The necessary authorization for the occupancy by the Contractor of any areas for the use for the camps inside the construction area within the boundary of any CPA property shall be approved by the Employer, and concurred by the Engineer. Otherwise, the Contractor shall locate his camp facilities or part thereof outside the boundary area.

Any temporary field camp or services provided by the Contractor shall be established and operated in accordance with the local regulations of the temporary field camps, and/or as approved by the Engineer.

The Contractor, in addition to the above, shall obtain the necessary permits from the relevant authorities, prior to the establishment of any camp outside the boundary area.

The Engineer may instruct the Contractor to shift the location of the accommodation camp due to the progress of the Works, a safety reason, an environmental reason or any other reason. The Contractor shall shift it at his own cost.

After the completion of the Works, the Contractor shall dismantle and remove such temporary camp and the area shall be cleaned and reinstated.

4006.04 Temporary Utilities and Services

It shall be the Contractor's responsibility to make all necessary arrangements for temporary utility services and obtain all necessary permits for the connections of the existing power supply, water supply, telephone line, and permits of construction for the Works as specified in the Employer's Requirements. These responsibilities shall include but not be limited to obtaining all necessary permits, approvals, payment of supervision expenses and compliance with all regulations etc. required by the relevant authorities concerned.

(a) Water

The Contractor shall make all necessary arrangements for adequate water supply for safe drinking and other water requirements on the Site, including the provision of any storage tanks so that sufficient fresh water shall always be available during the execution of the Works. The quality, number, capacity and location of all installations shall be to the satisfaction of the Engineer and in addition, shall conform to the requirements of the relevant authorities.

(b) Electricity

The Contractor shall make all necessary arrangements for the supply of all electricity requirements for the execution of the Works.

(c) Lighting

The Contractor shall install and maintain at his own expense a system of lighting to provide a sufficient degree of illumination over the area of the Works, offices and camp. Details of the scheme shall be submitted to the Engineer for his approval before any work commences.

(d) Drains, Watercourses and Sanitary Facilities

All drains, pipes, channels, watercourses or streams and drainage structures temporarily cut through or disturbed by the execution of the Contractor's Temporary Works are to be restored so that the water flowing in them will continue to flow in as full and free a manner as it did before the disturbance.

All necessary precautions and measures shall be taken by the Contractor at his own cost in order to prevent the Site from any flooding, forming ponds or the like by providing and maintaining appropriate temporary drainage, watercourses, channels, etc. for smooth

discharge of water flowing in or caused within the Site throughout the execution of the Works or until such time that the permanent drains or channel required to be constructed under the Contract have been completed and approved by the Engineer.

The Contractor shall provide proper sanitary facilities for the use of his personnel, and shall keep them in a good condition, throughout the project execution period under the Contract.

(e) Rainfall water and discharged water

Rainfall water in the Working Area shall not be discharged into any residential area near the Project Area. The Contractor shall install necessary temporary drainage which makes the rainfall water discharged into the sea or river directly.

(f) Waste and Rubbish

The Contractor shall carry out a regular daily clean-up and removal of trash, solid waste, construction debris, etc. in the Project Area. Disposal of such waste, rubbish and wastewater from the Project Area shall be arranged and carried out by the Contractor in accordance with rules and regulations set by the environmental authority (i.e. Department of Environment – Government of the Peoples Republic of Bangladesh).

(g) Parking

The Contractor shall provide parking spaces for his mobile equipment and vehicles.

(h) Storage

The Contractor shall provide and maintain roofed/unroofed, open and/or closed temporary storage areas as necessary.

4006.05 Contractor's Site Office

Within twenty-eight (28) days prior to the commencement date of the activity at Site, the Contractor shall submit to the Engineer for his approval, the plan of the Contractor's proposed site office.

The site office shall be located within or near the Project Area. The precise location shall be proposed by the Contractor for the Engineer's approval or may be designated by the Engineer.

The Contractor shall construct the site office and maintain to the satisfaction of the Engineer, until the completion of the Works unless otherwise instructed by the Engineer. Such site office shall include, in addition to the basic facilities and amenities, the first aid facilities, meeting rooms, toilets, etc. The construction of the site office shall conform to all related local laws and regulations.

The Engineer may instruct the Contractor to shift the location of the site office due to a reason concerning the progress of the Works, safety, an environmental or some other matter, and the Contractor, upon receipt of such a request, shall shift at his own expense.

The Contractor shall be responsible for the removal of the site office unless otherwise instructed by the Engineer.

4006.06 Safety of Temporary Facilities for Construction

At least fourteen (14) days in advance of the commencement of any Temporary Works requiring design calculation of stability such as supporting, piling, excavating, the Contractor shall submit, to the Engineer for his approval, his (the Contractor's) proposals for all such Temporary Works including design, drawings, relevant catalogues of materials and calculations.

Notwithstanding the approval by the Engineer of any submitted design for any of the Temporary Works, the Contractor shall remain entirely responsible for such work in all aspects. The Engineer may require modifications to the Temporary Works in accordance with the Conditions of Contract. Unless otherwise specified, the Contractor shall carry out such modifications at his own expense.

The Contractor shall take full responsibility for the stability of any interim sections or the partially completed temporary facilities.

All the Temporary Works shall be adequate for their intended uses and for all loads imposed without excessive settlement, deflection or deformation or sliding. All parts shall be properly supported, wedged, braced and secured to prevent any displacement or failure.

4006.07 Use of existing sand material

The existing sand material which can be obtained from the existing shoreline in the Working Area may be used for the temporary filling to prepare the working stage and reclamation work if approved by the Engineer.

When the Contractor intends to use the existing sand/soil for the Temporary Works, a detailed method including the quantity, purpose and sampling location shall be submitted to the Engineer for his approval prior to commencement of such work.

4007 FACILITIES FOR THE EMPLOYER AND THE ENGINEER

4007.01 Protective Items and other Consumables

The Contractor shall provide to the Engineer and his staff such waterproof and other protective clothing, safety helmets and other safety equipment, safety boots, lifejacket, and the like as may reasonably be required by them.

All such items shall be new when issued and shall be repaired or replaced by the Contractor as necessary.

4008 MOBILIZATION AND DEMOBILIZATION

4008.01 Mobilization and Demobilization

Within a period of fourteen (14) days of the Commencement of Date, the Contractor shall submit "Mobilization / Demobilization Plan" to the Engineer for his approval giving full details of his intended mobilization and demobilization plan of manpower and major equipment.

In the Mobilization and Demobilization Plan, mobilization / demobilization timing and the stay period of each major equipment shall be described clearly and the stay period of equipment should be consistent with the Contractor's cost breakdowns if any.

4009 SURVEY

The Contractor shall be responsible for carrying out all survey work related to the Works. The execution of the said work shall be subject to the Engineer's approval. However, such approval shall no way relieve the Contractor from any of his duties and responsibilities under the Contract.

4009.01 Coordinate System

All measurements shall be provided in meters unless otherwise indicated. The UTM (Universal Transverse Mercator) coordinate system using the WGS 84 datum shall be used to establish horizontal positioning unless otherwise instructed by or agreed with the Engineer. Elevations, unless otherwise indicated, are referenced to the CDL (Chart Datum Level).

4009.02 Bench Marks and Project Boundary

Survey reference points have been established on the Site and the positions, coordinates and levels are shown on the Attachment-1 Site Data (drawing No. GE-001).

The Vertical Datum is the MSL established by the Survey of Bangladesh (SOB), the National Mapping Organization of Bangladesh. For verification control, the benchmark named GPS 322 which was established by SOB and the permanent benchmark PBM-1 which was established by the JICA Study Team during the stage of Feasibility Study shall be used. The latter was

installed on the top of steel pipe with 90 mm diameter and 44.2 m long penetrated into the bearing layer. The elevations on MSL for these two benchmarks are +4.6373m MSL, +3.845m MSL, correspondingly.

For horizontal control, two SOB benchmarks named BM 8508 and BM 6010, and the above-mentioned PBM-1 shall be used. The coordinates and elevations of control points are as shown as follows:

Table 4000-1: Bench Mark of Vertical and Horizontal Control

Point name	Coordinates in UTM System		Elevation (MSL)
	North (m)	East (m)	
PBM-1	2399433.796	384612.764	3.845
BM 8508	2398788.388	383295.616	2.1853
BM 6010	2402479.557	384669.838	2.4344
GPS 322	2395895.991	404305.717	4.6373

It is the responsibility of the Contractor to verify the coordinates of PBM-1 or any other temporary benchmarks to be used in the setting out and monitoring of the construction. The traverse and level surveys on these given points are required for the purpose of verifying the accuracy and integrity of these benchmarks prior to setting out of the Works.

Prior to performing verification survey of benchmarks and reference points, the Contractor shall install tidal gauges with instruments, of which, the type, model, accuracy of observation system and data transfer system shall be as approved by the Engineer. The results of the verification survey with proposed adjustments of the accuracy of coordinates and elevation shall be compiled into a report named "Survey Control Point Verification Report" and submit to the Engineer for his approval.

Project Boundary line is shown on the Attachment-1 Site Data (drawing No. GE-001).

4009.03 Datum and Levels

Datum levels for the Works are to be related to MSL as follows:

	Datum Level (MSL)
HHWL (Highest High Water Level)	: +2.2 m
MSL (Mean Sea Level)	: +0.0 m
LAT (Lowest Astronomical Tide)	: -2.68 m

4009.04 Assistance to the Engineer

Whenever instructed by the Engineer, the Contractor shall carry out any surveys, which are deemed to be necessary in the opinion of the Engineer, to investigate, inspect, examine, or measure the items directly or indirectly connected to the Works.

The Contractor shall render assistance to the Engineer's survey by providing equipment, facilities, helpers, and materials at any time as may be required by the Engineer.

4010 PLANNING AND METHOD STATEMENT

4010.01 General

Within a period of twenty-eight (28) days of the Commencement Date, the Contractor shall submit a method statement to the Engineer for his approval, giving full details of his intended implementation procedure.

A method statement shall include but not be limited to:

- work area of each work

- detailed work procedure of each work
- explanation and plan of used equipment and materials for each work
- the Master Program made by Bar-chart CPM type which indicates clearly at least work quantity, expected daily progress, team number, assumed activity ratio, commencement date and completion date of each work item and critical path of the Works.
- survey control plan and used control points/temporary bench marks, if necessary
- quality plan including Inspection and Testing Plan (ITP) and counter-measures for defection
- details of necessary temporary works and preparatory works
- organization and responsible person of each work
- Safety Control Plan
- Environmental Control Plan

The Contractor is not allowed to commence any Permanent Works without the approval of the Method Statement by the Engineer unless otherwise instructed by the Engineer.

Basically, any Permanent Works and all related Temporary Works shall be carried out in accordance with the approved Method Statement unless otherwise instructed by the Engineer. When the Contractor intends to revise work procedure(s) and/or any conditions therein, he shall prepare and submit the revised work procedure to the Engineer for his approval prior to commencement of any related work.

However, any approval by the Engineer shall not relieve the Contractor from any of his contractual obligations.

4010.02 Work Procedure

The Contractor shall prepare and submit the work procedure to the Engineer for his approval whenever the Contractor intends to revise any work procedure mentioned in the approved method statement or to add more explanation, or as instructed by the Engineer.

The work procedure shall include at least each work item and its area, detailed explanation of the work procedure, detailed work schedule and any revised point from the approved method statement.

4010.03 Master Program

The Construction Schedule for the Works indicated in the approved Method Statement will be used as the "Master Program" of the Works. The Master Program will be used to monitor the actual progress of the Works.

The Master Program shall be revised only when the Engineer instructs or the Contractor requests and accepted by the Engineer. At that case, the Contractor shall revise the approved Master Program in accordance with the actual site condition and/or his revised work plan. The revised Master Program shall be submitted to the Engineer for his approval.

The completion date of the Works shown in the Master Program shall not exceed the Time for Completion shown in the Conditions of Contract.

4011 PROGRAMME AND PROGRESS

4011.01 General

On a regular basis, the Contractor must prepare a progress report quantifying the activities performed during the period comparing with the approved Master Program, outlining any constraints to the progress and possible remedial actions to be taken.

4011.02 Master Program and Detailed Work Schedule

The Contractor shall prepare detailed schedules of each work such as weekly schedules and monthly schedules in accordance with the approved Master Program, actual progress and expected work plan of the Contractor to examine the actual progress for weekly meetings and monthly meetings.

The detailed work schedule shall not require approval of the Engineer. However, when the detailed work schedule is behind the approved Master Program, the Contractor shall explain to the Engineer the reasons of delay and the countermeasures to be taken to catch up the schedule to the satisfaction of the Engineer.

4011.03 Daily Records

The Contractor shall record daily work progress including information of labour, equipment and material on site, work undertaken for each item of the Works, record of inspection performed on the day and on site.

Daily Records of the previous week shall be submitted to the Engineer for his information at the weekly progress meetings.

4011.04 Weekly and Monthly Returns

At weekly/monthly intervals, the Contractor shall, in accordance with the relevant provisions of the Contract, supply to the Engineer, returns of labour, materials and equipment used. In addition, a schedule of the main work items in each section of the Works showing quantitative progress during the previous week/month and cumulative progress to date shall also be supplied.

The Contractor shall submit to the Engineer, the Monthly Progress Report for the previous month which shall include, but not be limited to the following:

- a program marked up with any agreed amendments and showing the actual percentage completion of each of the main items of the Works in such a way, that a comparison can be made with the scheduled percentage completion of each item.
- actual schedule which shows at least the commencement date and completion date of each work.
- weather and other conditions, including daily temperature range, humidity, rainfall, wind speed and direction, wave height and direction, tide elevations etc.
- summary of staff and labour employed on the Site.
- schedule of the Contractor's Equipment on the Site with dates of arrival and departure as appropriate.
- schedule of principal material items with dates of placing orders, progress of manufacture, dates of delivery to Site etc.
- Safety Monitoring Report.
- a list of any constraints to progress, and suggestions on possible remedial actions
- progress photographs record of each work item, quality control and site overview.

4011.05 Countermeasures

The Contractor shall be responsible for rate of progress of the Works compared with the approved Master Program and should take necessary countermeasures to catch up unless otherwise instructed by the Engineer in accordance with the relevant provisions of the Contract.

Whenever the actual construction progress is lagging behind the approved Master Program, longer than half a month, the Contractor shall prepare and submit the proposed countermeasures to catch it up to the Engineer for his acceptance.

These measures shall be practicable and reasonable. The Contractor shall identify the reason for the delay and establish a catch-up schedule in the proposal.

No additional cost for the preparation or implementation of catching up schedule is permitted. Overtime work of the Engineer and his staff for the proposed counter measurement is not allowed unless otherwise agreed by the Engineer or duly compensated by the Contractor.

4011.06 Progress Photograph

The Contractor shall supply to the Engineer a soft copy of a photographic records before the start of the Works and monthly thereafter, showing the progress of the Works and also such

particular sections of the Works, Site, Plant and Materials as the Engineer may direct. Each photograph shall be referenced with the date of exposure and identification or reference number to be cross-referenced to a spreadsheet/database providing a brief description of the view and any other details that the Engineer deems necessary. This information shall be submitted to the Engineer within seven (7) days after the end of each month.

4012 QUALITY AND STANDARDS

4012.01 General

The Contractor shall solely be responsible for ensuring the quality and standard of the design, material and workmanship of the Works, fully in accordance with the relevant provisions of the Contract.

Any inspection/testing or approval by the Engineer shall not relieve the Contractor of any of his duties and obligations under the Contract.

4012.02 Quality Plan

The Contractor shall establish and operate a quality control system for the Works, generally complying with the ISO 9001:2008 or an equivalent guideline. The Contractor shall prepare a 'Quality Plan' for the Works. The plan shall be submitted as part of the Method Statement for the approval of the Engineer.

The Quality Plan shall present quality system procedures to be undertaken by the Contractor and it shall include the following items as a minimum:

- material inspection procedure
- document form and report submission plan
- Inspection and Testing Plan (ITP).
- organization of quality control and responsible persons
- corrective and preventive action.
- record and photograph plan

The Quality Plan shall be reviewed, updated and resubmitted to the Engineer for his approval as necessary throughout the construction period.

4012.03 Inspection and Testing Plan (ITP)

The Inspection and Testing Plan (ITP), showing the details of necessary inspection and testing shall be prepared in accordance with the relevant provisions in the Contract, in a tabular form (format of a table) and submitted as part of the Quality Plan.

The Inspection and Testing Plan shall include, among other things, the information of:

- inspection and testing item
- exact location of inspection
- timing and/or frequency
- applied standard and/or allowable tolerance
- responsible person and the attendance plan (requirement of the Engineer's attendance)

ITP shall be reviewed, updated and resubmitted to the Engineer for his approval as necessary throughout the construction period.

4012.04 Document Procedure (Requests and Records)

The Contractor shall prepare and submit the inspection and testing request at least twenty-four (24) hours before the inspection or testing, to the Engineer so that the Engineer can be prepared himself to attend the inspection or testing.

Inspection or testing shall be scheduled at a regular working time of a working day of the Engineer unless otherwise agreed by the Engineer. The Contractor shall arrange inspection and testing in such a way that would avoid several inspections conducted at the same time.

The Engineer has a right to reject the attendance of the inspection or testing if a request for an inspection at a proposed time and/or on a proposed date could not be accommodated within his schedule.

The inspection/testing record shall identify the Contractor's and Engineer's staff attended, the location, the date and time when the inspection was completed, the section of the Works and the materials tested or inspected and its state of completion. Reference shall be made to the relevant working/shop drawings and the specific aspects or properties which were checked or measured shall be recorded. The detailed form and required information of the record shall be instructed or approved by the Engineer.

One copy of each record of inspection/testing shall be submitted to the Engineer. The records of inspections and tests shall be stored in an orderly manner on the Site by the Contractor until the issue of the Performance Certificate for the whole of the Works, or such earlier time as the Engineer may instruct; the Engineer shall have the right to access to such records at all times.

4012.05 Standards

The Contractor shall apply the quality standards mentioned in the Employer's Requirements or an equivalent guideline approved by the Engineer. In case the approved standard is updated during the contract period, the Contractor should apply the latest one and any extension of the Time for Completion and/or additional cost will not be accepted due to the update of the standards.

4013 MEETINGS AND COMMUNICATIONS

4013.01 Meetings

(a) Daily Meeting

In order of disseminating of the information/details of the daily progress, mobilization plan, daily safety issues and daily activities, the Contractor shall schedule and conduct daily brief meetings among the Engineer's staff and the Contractor's staff every working day at the Site unless otherwise agreed with the Engineer. The Contractor shall assign suitable persons of his staff to attend these daily meetings.

When instructed by the Engineer or his staff, the Contractor shall prepare the minutes of the meeting and submit to the Engineer for his information.

(b) Weekly Progress Meetings

In order of disseminating the information/details of the actual progress of construction work at the Site, the Contractor shall schedule and conduct progress meetings weekly (so, weekly progress meetings) among the Contractor's staff and the Engineer's staff. Among others, the section managers and safety officer shall attend the meetings to inform the progress unless otherwise agreed with the Engineer.

The following subjects shall be reported by the Contractor in writing at the meeting:

- actual progress of the last week in comparison with the master program
- reasons of delay or proceed of the progress from the master program
- proposed countermeasures to catch up schedule, if necessary
- Works expected to be carried out next week
- significant safety, environmental and quality issues

All the discussion subjects including the instruction given by the Engineer shall be reported to the Engineer as the minutes of meeting by the Contractor for the Engineer's acceptance within three (3) days.

(c) Monthly Progress Meetings

For the purpose of disseminating of the information/details of the work progress, problems, and other information, the Contractor shall schedule and conduct monthly, the monthly progress meeting, among the Employer, the Engineer and the Contractor. The project manager, site manager, and the safety officer shall attend the meetings to inform the progress unless otherwise agreed with the Engineer. The venues of the meetings will be instructed by the Engineer.

The following subjects shall be reported to the Employer and the Engineer by the Contractor in writing at the meeting.

- Actual progress of physical and disbursement basis of the last month in comparison with the master program
- reasons of delay or proceed of the progress from the master program
- proposed countermeasures for catch up schedule, if necessary
- expected works to be carried out in the next month
- significant safety, environmental, quality and administrative issues

All the discussion subjects including information from the Employer and instruction from the Employer and the Engineer shall be reported to the Engineer as the minutes of meeting by the Contractor for the Employer's/Engineer's agreement within three (3) days.

Whenever necessary, in addition to the above parties/persons, other related parties shall also be invited to attend the meeting.

(d) Other Meetings

When instructed by the Engineer and Employer, the Contractor shall schedule and conduct meetings and invite related parties to attend such other meetings, which have not been listed above.

4013.02 Communications

Unless otherwise stated in the Employer's Requirements or agreed with the Engineer, whenever this Employer's Requirements provides that the Contractor gives or makes any notices, requests, etc., all these communications shall be:

- (a) in writing; and
- (b) delivered by hand (against receipt), sent by mail or courier, or transmitted by using any of the agreed systems of electronic communications in the Conditions of Contract.

4014 ENVIRONMENTAL MANAGEMENT AND MONITORING

The Contractor shall comply with all requirements relating to environmental management and monitoring as described in EIA Report, Laws and Regulation, and JICA Guidelines. The *Specification for Environmental Requirements of the Works* to be provided by the Engineer can be used for the Contractor's environmental management.

The Contractor shall comply with the environmental Laws of the Country and the requirements of the Specification to ensure environmental disturbance or damage is minimised and any damage is rectified promptly.

The Contractor shall also comply with all reasonable requests of the national and local authorities responsible for enforcing environmental controls.

The Contractor shall confine his work within the limits of the Site as much as possible and avoid undue interference with existing lands adjacent to the Site.

Within 28 days of the commencement date, the Contractor shall submit a detailed Construction Environmental Management Plan for the Engineer's approval showing how he intends to comply with environmental laws and regulations and other specific environmental requirements prescribed in the Contract. Such approval by the Engineer shall not relieve the Contractor of any of his obligations or responsibilities under the laws or under the Contract."

4015 HEALTH & SAFETY MANAGEMENT AND MONITORING

4015.01 General

The Contractor shall be responsible for all aspects of the health and safety at the Site throughout the period starting from the Commencement Date until issuance of the Defects Notification Period.

The Contractor shall provide necessary health and safety facilities at the Site, maintaining them and supervising all the work at the Site and related activities as mobilization of the personnel and equipment to avoid any incident or accident, to which he is responsible for.

The Contractor shall also refer to the relevant rules, laws and regulations of the locality where the Site is located and comply with all requirements stipulated therein, with regard to the health and safety management and monitoring.

Any additional time and/or cost incurred by the Contractor to carry out any health and safety activity or instruction shall be borne solely by the Contractor. The Contractor shall not be entitled to any compensation or reimbursement in respect of the above times or costs.

4015.02 JSSS

The Contractor shall comply with all health and safety requirement as described in JICA Standard Safety Specification (JSSS).

4015.03 Particular Safety Specification (PSS)

Other requirement is as described 4015.04 through 07 as Particular Safety Specification.

In case the requirement by PSS is duplicated or inconsistent with JSSS, the requirement by PSS shall be prioritised.

4015.04 Health and Safety Control Plan

The Contractor shall prepare the "Health and Safety Control Plan" and submit it within twenty-eight (28) days from the Commencement Date to the Engineer for his comments or approval.

The Health and Safety Control Plan shall include but not be limited to the following:

- health and safety personnel plan, organization and responsible person of each work
- health and safety risk assessment of major works
- health and safety facilities plan
- health and safety meeting plan, health and safety patrol plan, and health and safety training plan
- emergency communication network
- special care for major works
- monitoring and reporting plan

Health and safety control plan shall include all requirements of the local laws and regulations applicable for health and safety control.

The Engineer may request or instruct the Contractor to revise the health and safety control plan during the construction period in accordance with the site condition or work progress for his approval.

During the entire contract period, the Contractor shall conduct health and safety control and take necessary action according to the approved health and safety control plan to prevent any incident or accident.

4015.05 Health and Safety Control at Site

(a) Health and Safety personnel, and Health and Safety Officer

The Contractor shall establish and operate the health and safety personnel organization. Health and safety personnel plan which is included in the Health and Safety Control Plan shall clearly indicate;

- a health and safety responsible person of the whole project (Health and Safety Officer);
- a health and safety responsible person of each work;
- duties and authorities of each person, health and safety responsible persons.

The health and safety responsible persons shall check work procedures, safety facilities, daily activities and any safety aspect to prevent incidents or accidents.

The Contractor shall appoint a health and safety officer who is responsible for maintaining health, safety and protection against all sorts of accidents, hazards, diseases etc. This person shall be qualified to charge with this responsibility and shall have the authority to issue instructions and take protective measures to prevent accidents.

Throughout the execution of the Works, the Contractor shall provide all that is required by this person in order for him to meet with/ exercise this responsibility and authority.

(b) Health and Safety Facility

The Contractor shall provide and maintain necessary health and safety facilities at the Site to avoid health and safety risks. Necessary health and safety facilities include but not be limited to the following:

Table 4000-2: Equipment List – Health and Safety Facilities Requirements

No.	Health and Safety Facility	Object works or location
1	Personnel Protection Gear (PPG)	All works
2	Security Boat	Marine works
3	Security Fence and Gate	Whole Site
4	Safety barricade and signboard	All works
5	Safety working stage	High location works
6	Handrail, safety rope and safety net	High location works
7	Emergency road in the Site and safety path	Whole Site
8	Worker's rest house	Whole Site

The Contractor shall establish the health and safety facilities plan with detailed explanations and mention it in the Health and Safety Control Plan.

(c) Health and Safety Meeting and Patrol

The Contractor shall conduct health and safety meetings and safety patrol at least once a month.

Safety meetings shall be held in order to raise the health and safety consciousness of all staff and workers, and safety patrol shall be conducted in order to check the Project areas from the safety viewpoint.

Requirements/ matters pointed out in the safety patrol shall be immediately met with/improved by the Contractor on his own responsibility. All the records of the safety meeting and safety patrol shall be submitted to the Engineer.

(d) Emergency Communication Network

The Contractor shall be responsible for establishing an emergency communication network (Hotline) for the purpose of communication in case of any accident or incident and inform/submit a proposal of the network to the Engineer for his approval.

This network shall include at least the Employer, the Engineer, related authorities, hospital, and a fire station. The emergency communication network shall be included in the Health and Safety Control Plan. The efficiency of this network shall be confirmed at the safety training.

(e) Safety Training

The Contractor shall be responsible for carrying out the safety training to his staff including all the workers in accordance with the Health and Safety Control Plan, in order to enhance their knowledge and awareness on the health and safety and thereby to prevent any incident or accident.

Evidence of the health and safety training such as photograph records, attendance sheet, or training materials shall be submitted to the Engineer for his information.

(f) Personnel Protection Gear (PPG)

All staff and workers who are at the Site shall be protected by the PPG such as helmet, safety shoes, safety gloves, safety jackets unless otherwise agreed by the Engineer. Any staff or worker who involves in the marine works should wear a life jacket.

The Contractor shall provide all necessary PPG to all staff and workers to protect them from any accident in accordance with the approved Health and Safety Control Plan.

Any staff or workers who are not protected by the necessary PPG may not be allowed to enter into the Working Area.

(g) Health and Safety Monitoring at Site

The Contractor shall supervise all the activities related to the Works during the contract period to avoid any incident or accident.

Any work or/and facilities at the site which has a potential risk of accident shall be improved by the Contractor on his own responsibility.

The Employer and the Engineer may carry out safety patrols at the Site and give safety instruction to the Contractor, verbally or in writing, and the Contractor shall improve work conditions and/or facilities immediately at that time.

(h) Accident Report

The Contractor shall over the telephone, report to the Engineer and all related parties immediately if any accidents or unusual or unforeseen occurrences related to the Works occurs at any time and at any location. Details of the accident/incident shall be reported to the Engineer, the Employer and JICA in writing within twenty-four (24) hours from its occurrence. For the purpose of reporting of the accident to the Engineer, Employer and JICA, a designated form of JICA shall be used; and updates (if any) shall also be reported in the form designated by JICA, until the issues are settled.

Accident/incident report shall include all information instructed by the Engineer.

4015.06 Health and Safety Monitoring Report

The Contractor shall report all activities on the health and safety issues to the Engineer for his approval as a Health and Safety Monitoring Report in every month as part of the monthly progress report.

Health and Safety Monitoring Report shall include but not be limited to:

- incident and accident record
- health and safety instructions and improvement record
- health and safety training, safety patrol, and safety meeting record
- special issues of safety to be taken care of in next month
- Photograph record

The approved health and safety monitoring report might be submitted to the Employer and the relevant authorities, if necessary, by the Contractor.

4015.07 Safety Mitigation Plan for COVID-19 and other infection

To prevent the spreading of infections such as COVID-19 at the site, the Contractor shall establish the Safety Mitigation Plan for COVID-19 and other infections.

Safety Mitigation Plan shall be submitted to the Engineer for his approval within 14 days from commencement of the Works.

Safety Mitigation Plan shall include, but not limited;

- Limitation of entering the site
- Applied hospital
- Necessary countermeasures and rules at site, such as hand wash, face mask and social distance
- Emergency procedure in case the infected staff is found in the site
- Rules and procedure of quarantine
- Any other requirements in accordance with the guidelines, regulations and laws of Bangladesh Government
- Any other requirements in accordance with the guideline of JICA

In the case a pandemic of any infection is occurred in the world or in Bangladesh, additional safety measures will be required by the Engineer. And the Contractor should construct necessary facilities and/or should take the instructed mitigation measure. In such case, Clause-13 or Clause-20 of the General Condition of the Contract shall be applied.

4016 SPARE PARTS

The Contractor shall provide spare parts and store them in the location instructed by the Engineer. The detailed list of the Spare Parts shall be submitted to the Engineer for his approval together with the detailed design report.

4017 INSPECTION

Any stage of works shown in the Contract Condition should be inspected and approved by the Engineer step by step of the process of the Works unless otherwise instructed or described in the Contract Condition.

The inspection shall be conducted at least the following work item for the Engineer's approval unless otherwise described in the other Section of the Employer's Requirements.

- Submission of the Detailed Design including drawings
- Used materials and parts
- Completion of the fabrication
- Installation at Site
- Operation Test at Site

- Submission of the Operation/Maintenance manuals
- Training

The Contractor's self-inspection for materials and/or works shall be accepted only when the Engineer agreed. The Contractor's self-inspection should be conducted strictly in accordance with the Employer's Requirements and the approved method statement. Inspection results including necessary pictures and records shall be submitted to the Engineer without delay for his approval.

Any inspection shall be conducted on a date and at the time within the Engineer's normal working days and hours unless otherwise agreed by the Engineer. If an inspection on a holiday or outside the Engineer's normal working hours is requested and agreed upon by the Engineer, necessary transportation and meal (if necessary) shall be provided by the Contractor.

Off-site and/or overseas inspection/testing may be necessary in accordance with the Condition of the Contract, in any cases the costs of such inspections/tests are to be borne solely by the Contractor. The Contractor shall provide means of access, transportation, lodging, meals, overseas allowance and all assistance as may reasonably be required by the Employer/Engineer for such off-site and/or overseas inspection/testing.

The Contractor shall obtain and submit the third party's certification of the detailed design and/or completion of each work item if required by the Employer.

4018 APPROVAL BY THE ENGINEER

Documents, materials, works and other activities of the Contractor should be approved by the Engineer if the Contract requires him to do so.

However, any approval by the Engineer shall not relieve the Contractor from any of his contractual obligations.

In case the Engineer considers that an approved document, material or activity is not suitable for the requirement of the Contract, he will withdraw the previous approval immediately. In such case, the Contractor shall be fully responsible for the cost and time of any rectification work.

4019 FINAL INSPECTION, REPORTS AND SUBMISSION

4019.01 Final Inspection

The final inspection shall be conducted and approved by the Employer, with the assistance of the Engineer prior to the preparation of the project completion report.

The Contractor shall prepare items to be inspected and procedure of inspection for the Engineer's approval. All results of the final inspection shall be reported by the Contractor to the Employer and the Engineer.

When any defect is found or any item of the Works is commented by the Employer/Engineer, the Contractor shall prepare a punch list and take remedial actions until every item in the list is cleared.

4019.02 Operation/Maintenance Manual

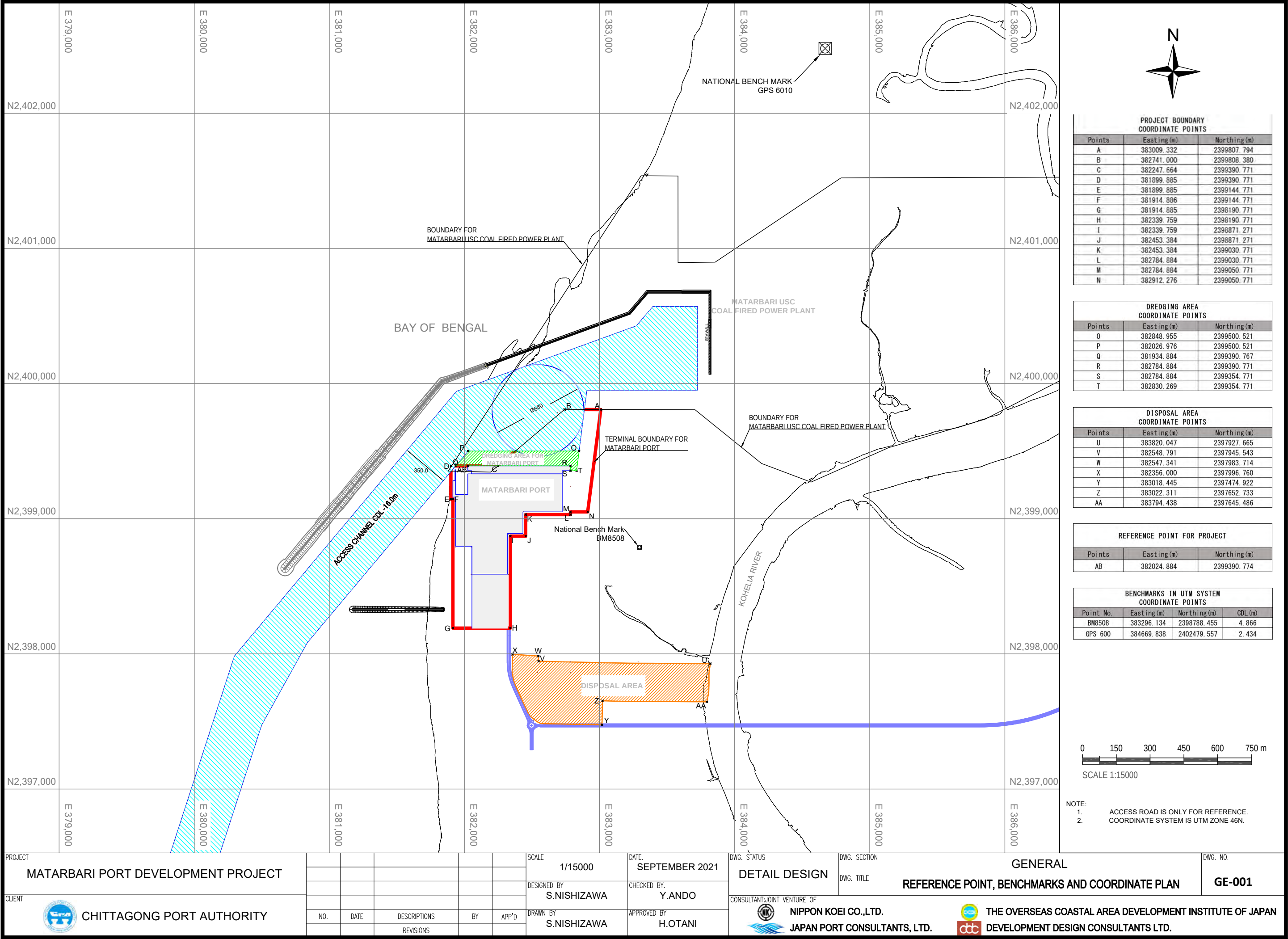
In accordance with GC Sub-Clause 5.7, the Contractor shall prepare and submit the As-build drawings and Operation/Maintenance Manuals for the whole of the Work to the Engineer for his review and approval. The number of manuals and the format of the submission shall be subject to the approval of the Engineer.

4019.03 Project Completion Report

The Contractor shall submit the project completion report and it shall be approved by the Engineer, prior to the issue of the Performance Certificate. The report, after the Engineer's comments, the Contractor's correction, and the Engineer's approval shall be submitted to the Employer in both the hard copy and the electronic file. The number of hard copies of the project completion report to be submitted is twelve (12) copies; five (5) copies for the Employer and seven (7) copies for the Engineer.

The completion report shall at a minimum contain the following:

- bidding process and other activity records during the pre-construction stage.
- actual method of the whole of the Works.
- summaries of the items reported in the monthly reports.
- Works executed.
- actual work schedule performed.
- record of the activities for each work item.
- financial status of disbursed payment from the commencement to the final payment.
- interim and final inspection record.
- safety monitoring results and environmental monitoring results.
- As-build drawings and maintenance and operation manual including information for further procurement of required parts as well as contacts of factories, address, person in charge written in English and Bengali.
- progress photographs including aerial photographs.



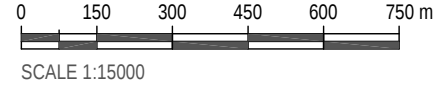
PROJECT BOUNDARY COORDINATE POINTS		
Points	Easting (m)	Northing (m)
A	383009.332	2399807.794
B	382741.000	2399808.380
C	382247.664	2399390.771
D	381899.885	2399390.771
E	381899.885	2399144.771
F	381914.886	2399144.771
G	381914.885	2398190.771
H	382339.759	2398190.771
I	382339.759	2398871.271
J	382453.384	2398871.271
K	382453.384	2399030.771
L	382784.884	2399030.771
M	382784.884	2399050.771
N	382912.276	2399050.771

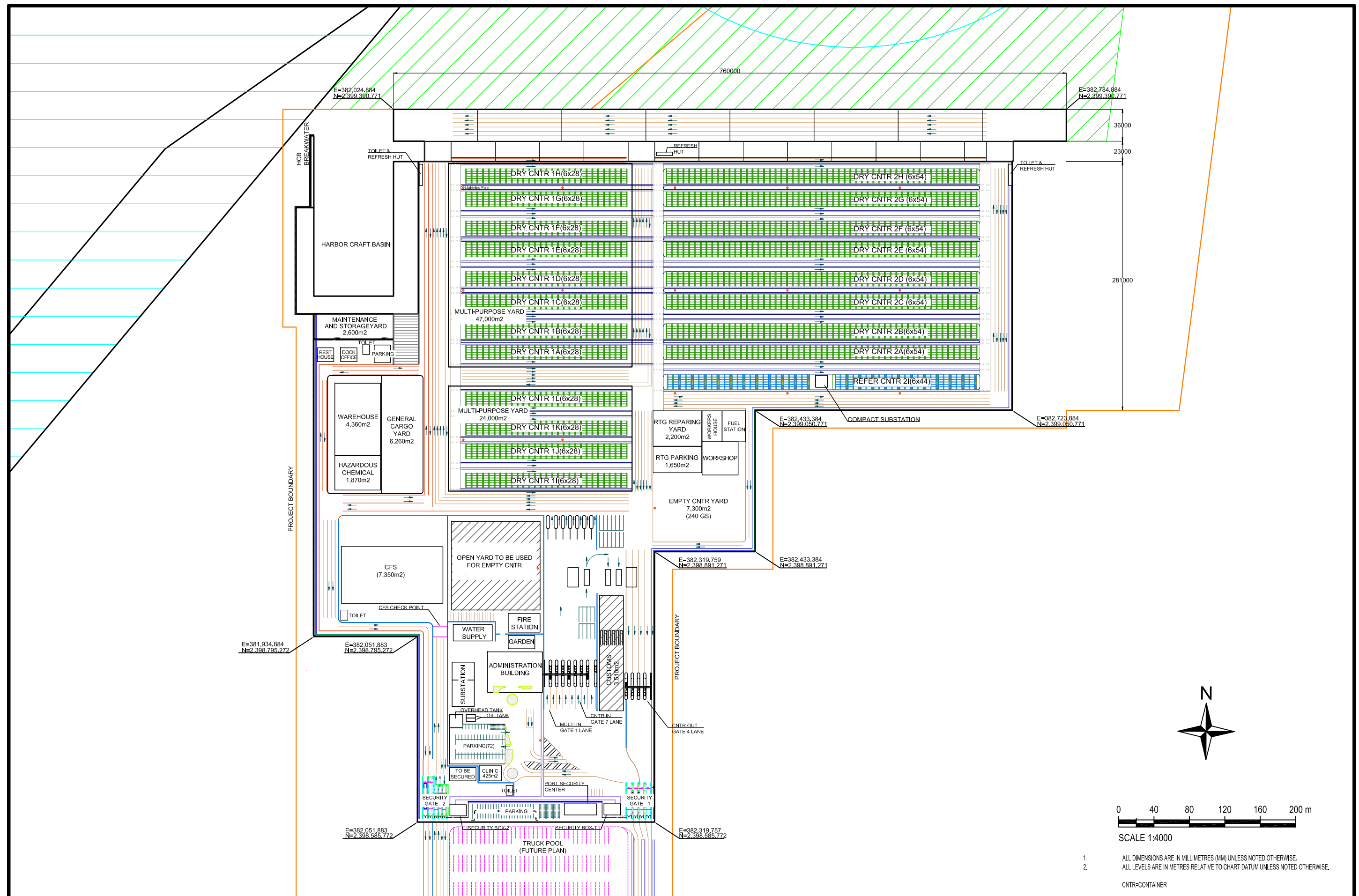
DREDGING AREA COORDINATE POINTS		
Points	Easting (m)	Northing (m)
O	382848.955	2399500.521
P	382026.976	2399500.521
Q	381934.884	2399390.767
R	382784.884	2399390.771
S	382784.884	2399354.771
T	382830.269	2399354.771

DISPOSAL AREA COORDINATE POINTS		
Points	Easting (m)	Northing (m)
U	383820.047	2397927.665
V	382548.791	2397945.543
W	382547.341	2397983.714
X	382356.000	2397996.760
Y	383018.445	2397474.922
Z	383022.311	2397652.733
AA	383794.438	2397645.486

REFERENCE POINT FOR PROJECT		
Points	Easting (m)	Northing (m)
AB	382024.884	2399390.774

BENCHMARKS IN UTM SYSTEM COORDINATE POINTS			
Point No.	Easting (m)	Northing (m)	CDL (m)
BM8508	383296.134	2398788.455	4.866
GPS 600	384669.838	2402479.557	2.434





1. ALL DIMENSIONS ARE IN MILLIMETRES (MM) UNLESS NOTED OTHERWISE.
 2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
- CNTR=CONTAINER

PROJECT	MATARBARI PORT DEVELOPMENT PROJECT					SCALE	1/4000	DATE	SEPTEMBER 2021	DWG. STATUS	DETAIL DESIGN	DWG. SECTION	GENERAL TERMINAL LAYOUT PLAN		DWG. NO.	GNR-003
CLIENT	 CHITTAGONG PORT AUTHORITY					DESIGNED BY	S.NISHIZAWA	CHECKED BY	Y.ANDO	CONSULTANT: JOINT VENTURE OF  NIPPON KOEI CO.,LTD.  JAPAN PORT CONSULTANTS, LTD.  THE OVERSEAS COASTAL AREA DEVELOPMENT INSTITUTE OF JAPAN  DEVELOPMENT DESIGN CONSULTANTS LTD.						
						DRAWN BY	S.NISHIZAWA	APPROVED BY	H. OTANI							
						NO.	DATE	DESCRIPTIONS	BY	APP'D						
						REVISIONS										

SECTION VI-2

TUG BOAT

SECTION VI-2: TUG BOAT

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SECTION VI-2: TUG BOAT

1 GENERAL PROVISION

1.1 Intent

It is the intent of this Employer's Requirements to describe the guidance and minimum requirement for the design, materials, equipping, inspection, testing, training and documenting of "Harbour Tugboat with 60 tons bollard pull by Azimuth Stern Drive (ASD)" (hereinafter referred to as "the Boat") for Matarbari Port Development Project in People's Republic of Bangladesh.

This Requirement is descriptive and general in nature. It does not specify the Boat in details, or the details of the equipment to be included in the scope of supply. The Contractor shall recognize that the Employer requires the design of the Boat and of the equipment they contain to be up-to-date and proven and in service and similar to that in use for tugboats. The Boat shall be capable of being safely operated while performing its required duties in both benign and adverse weather and sea conditions.

1.2 Scope of Works

- 1) Design, supply of materials, fabrication including inspection and testing, and delivery of the herein under listed Equipment including associated equipment, spare parts, tools and documents to the Matarbari Port in Bangladesh.
- 2) Arrangement and assistance for the Employer's/Engineer's inspection and test for fabrication of tugboats at the manufacturer's workshop.
- 3) Arrangement and assistance for the Employer's/Engineer's witness inspection and test at the site.
- 5) Training of the Employer's personnel or other personnel so directed by the Employer on the operation and maintenance of the supplied tugboats at the Site.

1.3 General Description and Arrangement

The Boat shall be designed and built as a steel-hulled tugboat equipped with two marine diesel engines.

The Boat must therefore have excellent capabilities by Azimuth Stern Drive system. Optimum manoeuvring capabilities are required in any expected weather condition.

The Boat will also act firefighting Boat. The Boat must therefore be suitable for operations in hazardous areas.

The equipment and installation must therefore make possible the safe operation of the Boat while performing these functions.

The Boat shall have suitable towing force, stability and manoeuvrability for the purpose intended, and shall have suitable strength and arrangement.

The described detailed dimensions and specifications in the following section are the reference standard values, and shall be proposed by the Contractor for the Employer's approval.

1.4 Design Guideline

Safety, reliability and ease of operation, minimum maintenance and good accessibility to all areas for repair and maintenance shall be the principal consideration in the detailed design of the Boat.

Modern and practical living comfort to the latest standards is to be practiced in the outfit, lighting and furniture of all cabins and other interior spaces.

The design shall provide the maximum possible all around visibility from the wheelhouse bridge. A clear sight onto all working decks and the main deck equipment is required. Utmost attention is to be paid with respect to the view on essential machinery and to the documents of functions in the engine room.

The layout of control and alarm panels or desks within such locations as the wheelhouse and engine room shall conform to the latest ergonomic design criteria.

Crew's cabin, mess room, galley, wash and lavatory, air conditioning space and deck store shall be arranged in the accommodation space.

The exposed upper deck shall be equipped with mooring gears, crane, towing gears, ventilation and escape hatches. Ventilator and inflatable life raft shall be provided on the bridge deck, forward towing winch on the upper deck and towing bits on the upper deck aft of deck house.

Wheelhouse shall be arranged on the bridge deck, and radar mast, speaker, etc. to be provided on the wheelhouse top.

All equipment and machineries which are part of the Boat shall be brand new and shall be made by original manufacturers as stipulated in this Requirements.

Any same article or work mentioned twice or more in the Requirements shall be supplied and/or executed only once.

1.5 Definition

1. The word "the Employer" shall be understood to mean Chittagong Port Authority.
2. The words "the Contractor" shall be understood to mean the Contractor who shall be responsible for the supply and construction of the Boat, including the work by all sub-contractors who may be engaged by the Contractor.
3. The terms "best marine practice" or "good shipbuilding practice" or their equivalent shall be understood to mean construction to soundly conceived and engineered plans and data incorporating the specified components so as to meet the intent of this specifications, utilizing the best construction and testing methods.
4. The terms "the Classification Society" shall be understood to mean Nippon Kaiji kyokai (NK) or International Association of Classification Societies (IACS).
5. The word "Surveyor(s)" shall be understood to mean the person or persons duly authorized by Classification Society.
6. The term "Employer's or Engineer's Representative" shall be understood to mean the Employer's or/and Engineer's Representative attending the Contractor's activities and inspections during the period of construction.
7. The term "Contractor's standard" shall be understood to mean the standard established by the Contractor based on the international standard.

1.6 Language and Unit

Prepare all drawings, documents, and equipment manuals shall be prepared in English language and in metric (SI) units.

1. Equipment nameplates and labels shall be in English.
2. JIS or equivalent system units or equivalent shall be used for all instrumentation, notices and labels, machinery and fittings, identification and data.
3. All piping, valves and fittings shall be of JIS standards or equivalent.
4. Mark all tank volumes, gauges, etc., shall be in liters.

1.7 Principal Particulars

The Contractor shall propose optimal dimensions to meet the Requirements.

1. Principal Dimensions

Length Overall (except fender)	Approx.	35 m
Length between perpendiculars (Lpp)	Approx.	30 m
Breadth, moulded	Approx.	10 m
Depth, moulded	Approx.	4 m
Designed loaded draft, moulded	Approx.	3 m
2. Capacity

Fuel Oil Tank	Approx.	70,000 liters
Fresh water tank	Approx.	15,000 liters
Lubricating oil tank	Approx.	5,000 liters
Foam tank	Approx.	7,000 liters
3. Propelling Machinery, Speed, Bollard Pull and Entrance
 - a) Main Engine

Type	Vertical, 4-cycle, single-acting, water cooled diesel engine with turbocharger and air cooler.
KW (PS) x RPM	Maximum Continuous Rating Capable of performing 60 tons equivalent safe bollard pull
No. of set	Two (2) sets
 - b) Propulsion Equipment

Type	Azimuth Stern Drive System Fixed pitch, Skewed Kaplan type in Kort nozzle, or instructed by the Employer.
No. of set	Two (2) sets
 - c) Speed

Maximum speed at light loaded conditions	Not less than 14 knots
--	------------------------

- | | | |
|----|--|--|
| d) | Bollard Pull | |
| | Mean maximum bollard pull at 100% torque | Not less than 60 tons ahead
Approx. 64 tons at 110% ahead |
| e) | Endurance | |
| | Endurance based on total fuel oil tank capacity and sea speed of 13 knots. | Not less than 1,700 nautical miles |
| 4. | Complement | |
| | Crew | 6 persons |
| | (Capt, C/E, 4 crews) | |
| | Others | 9 persons |
| | Total | 15 persons |

1.8 Materials and Workmanship

Materials, machinery, equipment and outfits shall be in accordance with Japanese Industrial Standard (JIS) or equivalent as far as practicable, and complies with the requirements of the Classification Society.

All materials and equipment used for the construction shall be new. The Boat shall be constructed throughout of mild steel plates and sections tested and approved as required by the Classification Society. Test Certificates shall be supplied as required.

All steel plates and profiles shall be shot-blasted to SA 2 1/2 and primed with an approved composition before fabrication.

All wood used in the Boat shall be well-seasoned, free from sap shakes, warps and other defects, and to be reasonably free from knots. All wood shall be impregnated with anti-pest and anti-rot composition. All smith work or fabricated fittings shall be of neat design, strong, smooth and free from defects, and shall be manufactured to the Classification Requirements and approval.

All cables, fastening, shackles, rigging, sheave blocks and light fittings shall be made of materials which have been tested, approved and certificates supplied.

ISO metric threads shall be used for screw threads as a rule. Materials, parts or products equivalent to the requirement of these Specifications may be substituted for those specified in these Specifications with prior consent by the Employer/Engineer and the Classification Society.

1.9 Rules, Regulations and Certificates

The Boat, including its hull, machinery and equipment shall be commissioned, designed and built under special survey to the Classification Society, and shall be registered as the Tug Boat.

The Boat shall not be engaged in international voyage and the navigation area shall be coasting.

1.9.1 Rules and Regulations

The following rules and regulations in force at the date of the contract shall be applied.

- 1) Rules and Regulation of the Classification Society

- 2) Japanese Maritime Regulation as Design Criteria
- 3) International Convention on Tonnage Measurement, 1969.
- 4) International Convention for the Prevention Collision at Sea, 1972 Annex revision, 1981-1993.
- 5) International Convention for the Prevention of Pollution from ship 1973 and the Protocol of 1978, ANNEX VI and its latest amendments.
- 6) International Convention for the Prevention of Pollution from Ships (MARPOL) as applicable to the tugs.
- 7) Ship Safety Law and related regulations.
- 8) Marine Traffic Law and related regulations.
- 9) International Convention on the Control of Harmful Anti-Fouling systems on Ships, 2001(AFS)
- 10) For fire protection, detection and extinction, Classification requirement shall be applied
- 11) For life saving appliances, Japanese Regulations for Life-saving Appliance of Ships (non-international voyage, category four (4) vessel) shall be applied

All Classification and statutory surveys, certificates and fees shall be paid by the Contractor. All necessary certificates, issued by the Classification Society, regulatory bodies and the Contractor shall be handed over to the Employer at the time of delivery of the Boat.

1.9.2 Certificates

The following certificates shall be furnished with the Employer/Engineer at the time of the delivery of the Boat.

Certificates	Issued by
1. Provisional Certificate of Bangladesh Registry	Bangladesh Government
2. Classification Certificate	Classification Society
3. Tonnage certificate (Non-convention)	Classification Society
4. Statement of Compliance for Engine Air Pollution Prevention	Classification Society
5. Certificates for anchors, chains, navigation lights, sound signals, life saving apparatus, etc.	Classification Society
6. Builder's certificate	Contractor (Shipbuilder)
7. Compass Adjustment Certificate	Contractor (Shipbuilder)
8. Deratization Exemption Certificate	Gov. of Contractor's Country
9. Other appropriate certificates of equipment and outfitting materials	Classification Society
10. Certificates as per The Inland Shipping Ordinance (1976)	Bangladesh Government

1.10 Inspection, Tests and Trials

1.10.1 General

The Boat construction, machinery, outfits and equipment shall be inspected and tested at the premises of the Contractor or subcontractors under the presence of the Employer/Engineer and/or the surveyor(s) representing the Classification Society in accordance with their respective rule requirements at the time of signing the contract.

Inspections, tests and trials shall be carried out in accordance with Contractor's standards and Class protocols for inspections, tests and trials, details of which shall be submitted to the Employer/Engineer for approval. Contractor's standards for performance of inspections, tests and trials shall subject to approval of the Classification Society and the Employer/Engineer.

The Contractor shall deliver to the Employer/Engineer in duplicate a key schedule of inspections, tests and trials to be performed up to the delivery of the Boat and submit update if necessary. The Contractor shall deliver to the Employer/Engineer details schedules of inspections, tests and trials during the construction periods of the Boat.

The Contractor shall bear all costs, including International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance etc. for the Employer/ Engineer to attend the inspections, tests and trials at the premises of the Contractor.

This schedule shall be prepared in consultation with the Employer/Engineer and shall be timely informed no later than 28 working days in advance to make arrangement for attending the inspections, tests and trials.

All tests, trials and re-trials will be at the expense of the Contractor. The tests and trials expense shall include fuel oil, lubrication oil, system oil, fresh water, food, crew, equipment, stand-by vessel and any other expense connected with the trials.

Any unsatisfactory test or part of it shall be repeated, after correction of defects, to the satisfaction of the Employer/Engineer and/or the Classification Society.

The Contractor shall submit in triplicate copies of all inspection, test and trials reports carried in accordance with the requirement of specification, Class etc.

Qualified personnel of the main engine, gearing, electrical/control & instrumentation, which and propulsion system manufacturers shall be in attendance during commissioning, dock trials and sea trials at the Contractor's expense.

Confirmation of accepted tests and trials shall be by signature of the Employer/ Engineer, the Classification Society, and representative of the Authority concerned. On completion of the trials a general survey is to be made and defects which may have developed or any work found incomplete is to be corrected and made good by the Contractor before delivery.

Prior to sea trials, the Boat shall be dry docked for final inspection and bottom painting. The Boat shall be dry docked after the sea trials in case serious underwater defects are expected, in order to allow for a complete inspection of the underwater hull, propellers, anodes and paint.

Before the sea trials all underwater painting work shall be finished, propeller, and kort nozzle shall be inspected and polished. After the sea trials the Contractor shall submit a sea trial record book in which all data and records are to be carefully analysed and compiled.

All installations including main engines, auxiliary machinery, electric generators, electric equipment, instrumentation and controls commissary equipment, weather tight doors, any key equipment, winch, etc. shall be thoroughly tested on board by the Contractor or manufacturers to demonstrate their suitability for the purpose intended and that the Requirements have been fulfilled.

Prior to the commencement of the sea trials the main engines shall run at least for two (2) hours.

The sea trials shall be performed at light loading condition under deep sea conditions with a wind speed not exceeding Beaufort 2. Trial loading condition shall be submitted to the Employer/Engineer for approval not later than 14 working days in advance of the sea trials. Upon completion of sea trials, any machinery considered necessary by the Employer/Engineer and/or the Classification Society shall be opened up for inspection.

The result of these tests shall be submitted to the Employer/Engineer within seven (7) working days of the tests being completed.

1.10.2 Shop Tests

The shop tests program shall be submitted to the Employer/Engineer no later than 30 working days in advance.

Main engines, propulsion machinery, winches and other equipment shall be shop tested in accordance with requirements of the Classification Society and/or the standard protocols of the manufacturers and to the satisfaction of the Employer/ Engineer.

The shop test of the main engine and generator set will be conducted with the attendance of the Employer/Engineer and Contractor. All documents and data of the inspections, tests and trials performed shall be submitted to the Employer/Engineer for approval.

1.10.3 Shipyard Testing

All tanks and main hull compartments shall be tested for oil and water tightness according to the Classification Society requirements prior to any paint application except shop primer. Before testing, all tanks shall be structurally complete, with all external pipe fittings, connections fitted and cleaned. Subject to the specific requirements of the Classification Society and the Employer/Engineer, no tank or compartment boundary welded connections shall be coated or painted until testing has completed and the tank or compartment has been passed by the Employer/ Engineer. Spaces with steel bulkheads permanently exposed to drip and splash water and floors which are covered with cement or tiles, before painting and before floor coverings are laid, will be tested according to the Classification Society requirements.

Weather tightness of exterior doors, windows and hatch covers shall be tested by means of hose testing as required by relevant regulations.

Water tight door shall be tested by means of hose testing as required by relevant regulations.

1.10.4 Launching

The Contractor shall be responsible for satisfactory launching of the Boat. The Contractor shall make all necessary arrangement and inform the Employer/Engineer and the Classification Society in writing fourteen (28) days in advance of the date of launching. The launching shall be carried out in daylight.

1.10.5 Dock Trial

Dock trial shall be carried out at the Contractor's expense prior to the official sea trial in accordance with the completion program agreed with the Employer/Engineer, to ensure correct performance of all machinery.

Engine room, machinery and systems shall be cleaned and free from loose building materials before testing will take place.

The trial shall include the testing of at least the following machinery, installations and systems but not limited to the following:

- Main engines and propulsion systems
- Auxiliary machinery
- Load tests of alternator sets and paralleling and switchboard tests
- All deck machinery
- All piping systems including pumps, valves, cocks
- All electrical systems including alarms and control systems, navigation equipment
- Hydraulic systems
- Ventilation supplies and exhaust systems
- Air conditioning systems
- Lifting appliances

Before trials of main machinery are commenced, test for entire auxiliary machinery shall have been completed and proven to be in good working order.

The main propulsion system will be tested for a minimum continuous duration of two (2) hours under the supervision of the main engine manufacturer after ensuring satisfactory alignment of the main engine, propulsion units and shafting in accordance with manufacturer requirements and within their specified limits.

The bilge, ballast and general services pumps shall be operated on the respective systems and the ballast tanks must be tested before filling.

The necessary water and sanitary systems shall be in continuous operation during trials, and each tap, water closet, shower, etc., together with all fittings are to be operated and the specified pressures maintained on the system.

All defects shall be remedied by the Contractor and re-tested to the satisfaction of the Employer/Engineer before sea trials.

Lifesaving equipment shall be tested and demonstrated to the satisfaction of the Employer/Engineer, Classification Society and Authority concerned.

1.10.6 Official Sea Trial

Official Sea Trial shall be carried out in accordance with the Contractor's program approved by the Employer/Engineer, the Classification Society and Authority. During the official sea trials, the Boat shall be under the command of an experienced captain nominated by the Contractor.

The Contractor shall prepare and submit a detailed trial program 28 days working days prior to commencement of the official sea trial showing the method, order and time schedule of the trials to the Employer/Engineer for approval.

The Contractor shall perform the following tests and trials, but not limited to, under the attendance of the Employer/Engineer and the Classification Society.

- Progressive speed trial
- Crash stop astern and crash stop ahead test
- Steering gear test
- Turning test
- Endurance test including measurement of fuel oil consumption
- Anchoring test
- Starting test of main engines
- Dead slow test of main engines
- Torsion vibration measurement
- Test and/or adjustment of nautical equipment
- Noise & Vibration measurement
- Firefighting test
- Air conditioning system test
- Bollard pull test

(1) Progressive Speed Trial

Progressive speed trial shall consist of the following runs over officially measured mile course and the speed in each case shall be determined as an average of one (1) double runs in opposite directions.

Main Engine Revolution at	round trip
1/4 of maximum continuous revolution	1
2/4 of maximum continuous revolution	1
3/4 of maximum continuous revolution	1
4/4 of maximum continuous revolution	1
Maximum Continuous Output (MCO) or corresponding to maximum allowable shaft revolution	1

On completion of the official sea trials, the Contractor shall present immediately the report including speed-power curves to the Employer/Engineer.

Main engine output shall be estimated from the measured engine data during the speed trial using the results of the shop test of main engines.

(2) Endurance Trial

Engine room temperature To consist of 30 minutes approx. 10% over speed and two (2) hours with the engine running at maximum continuous rated rpm.

The following data shall be recorded at 30 minutes intervals:

- Main engine jacket water temperature & pressure
- Main engine lubricating oil pressure & temperature
- Main engine exhaust temperature
- Fuel rack setting
- RPM of main engine
- Charge air pressure & temperature
- Other data to be advised by Engine Maker and the Employer/Engineer
- Main engine cooling sea water inlet temperature

(3) Bollard Pull Test

Bollard pull test shall be carried out to demonstrate the achievement of bollard pull. This test shall be carried out in the ahead and astern mode. The test shall be conducted in waters having adequate depth and relatively free from currents.

The following documents, but not limited to, shall be recorded and submitted for the Consultant upon completion of the test:

- Towing wire tension
- Shaft power
- Propeller revolution (RPM)
- Fuel rack setting
- Water depth
- Towline length
- Exhaust gas temperatures
- Ambient condition
- Boat loading condition and drafts

The dynamometer shall be calibrated prior to test with certificate of calibration provided.

1.11 Stability and Trim

The Boat shall have enough stability as a tugboat. The calculation sheets of each condition based on the inclining experiment shall be submitted to the Employer/Engineer, the Classification Society and the Authority Concerned.

The stability of the Boat for any reasonable condition of loading shall conform to the criteria by Classification Society.

1.12 Inclining Experiments

When the Boat has reached a sufficiently advanced stage of construction, and only minor work remains to be completed, the lightweight, vertical and longitudinal centres of gravity of the Boat shall be determined by means of an inclining experiment.

The inclining experiment shall be attended by the Employer/Engineer and/or his Representative and Classification Society who shall be given notice for this purpose at least 28 days before. During the inclining experiment, the Boat shall be in a suitable condition approved by the Classification Society. No loose water or oil on board, and all shipyard equipment, rubbish etc., shall be removed.

A "Trim and Stability" booklet shall be prepared by the Contractor after the light Boat data has been calculated from the inclining experiment. Each condition listed in the booklet to state the correction made to the metacentric height for the free surface effects and the tanks included in the free surface correction. Sufficient number of conditions to satisfy the Classification Society shall be provided.

1.13 Basic Numerical Value

Specific gravity used for design of the Boat to be as follows:

Sea Water	1.025
Fresh Water	1.000
Fuel Oil	0.850
Lubricating Oil	0.900

1.14 Vibration

The Contractor shall take all practical steps to minimize vibration particularly in the accommodation, main mast and wheelhouse to the satisfaction of the Employer/Engineer and the Classification Society. Any excessive vibration abnormal for this type of the Boat discovered during trials shall be rectified by the Contractor at his own expense.

1.15 Drawings and Plans

1.15.1 Approval Drawing

The Contractor shall prepare and submit to the Employer/Engineer, the Classification Society for approval of drawings, calculations, documentations and other technical details required for the constructions and fitting out of the Boat.

The Contractor shall be responsible for the approval procedure with the Classification Society and shall submit to the Employer/Engineer copies of all correspondence concerning technical matters between the Contractor and Classification Society and the Authority.

Prior to commencing the design of the Boat, the Contractor shall submit a list of drawings including manufacturer's drawings to the Employer/Engineer for approval. Before starting prospective works, the Contractor shall submit each one (1) copy in electric format and three (3) print copies of the drawings and plans specified in the lists of the drawings and plans for approval to the Employer/ Engineer, and one (1) copy each to be returned to the Contractor with approval or comments, if any, by the Employer/Engineer. List of drawings for approval shall include the following contents, but not limited to:

(1) General

- 1) Technical Specifications
- 2) General Arrangement
- 3) Lines
- 4) Hydrostatic table
- 5) Lighting lever table
- 6) Initial calculation of weight, trim and stability
- 7) Tonnage Calculation
- 8) Tank capacity plan
- 9) Speed and bollard pull calculation including propeller calculation
- 10) Test method of official sea trial and bollard pull test

(2) Hull Construction

- 1) Midship section
- 2) Construction profile and deck plan
- 3) Shell expansion
- 4) Scantling calculation
- 5) Frame lines
- 6) Fore construction
- 7) Engine room construction including main engine bed
- 8) Aft construction

- 9) Bridge deck construction
- 10) Wheelhouse construction
- 11) Skeg construction
- 12) Winch seats and under deck stiffening
- 13) Towing fittings and under deck stiffening
- 14) Kort Nozzle
- 15) Anodes
- 16) Docking plan
- 17) Welding procedures

(3) Hull Fitting

- 1) Wheelhouse arrangement
- 2) Deckhouse arrangement
- 3) Mooring arrangement
- 4) Accommodation arrangement
- 5) Arrangement of outfitting
- 6) Chain pipe and hawse pipe
- 7) Mast construction
- 8) Fender arrangement
- 9) Arrangement of life saving equipment and firefighting appliance
- 10) Towing bitt
- 11) Painting scheme
- 12) Insulation of deck covering
- 13) Arrangement of hull piping
- 14) Duct for air conditioning and ventilations
- 15) Windows and sidelights
- 16) Internal and external doors
- 17) Hull inventory list
- 18) Equipment list for accommodation

(4) Machinery

- 1) Engine room arrangement
- 2) Shaft arrangement
- 3) Piping diagrams
- 4) Arrangement of exhaust gas piping in engine room and thruster room
- 5) Insulation of exhaust gas pipe
- 6) Details of tanks in engine room
- 7) Sea inlet details
- 8) Arrangement of hull fitting valves
- 9) Arrangement of ventilation duct in engine room

- 10) Torsional vibration calculation
- 11) Arrangement of floor, ladder and grating in engine room
- 12) Machinery inventory list

(5) Electric

- 1) Wiring diagram of power circuit
- 2) Wiring diagram of lighting circuit
- 3) Wiring diagram of nautical and communication equipment
- 4) Electric power balance calculation
- 5) General arrangement of electric installation
- 6) Remote control system drawing for main engine and propeller
- 7) Navigation lights
- 8) Electric Inventory list

1.15.2 Finished Drawing

Upon delivery of the Boat, four (4) sets of the finished drawings and plans specified in the lists of the finished drawings and plans generally to include but not limited to, results of various tests and inspections and a detailed list of spare parts, inventories and tools provided, and shall also submit four (4) sets of the instruction manuals for all items of machinery, electrical, and electronic equipment written in English shall be handed over to the Employer/Engineer, and one (1) copy each to be placed on board the Boat. One (1) copy shall be provided in electronic format.

One (1) set of the following finished plans shall be mounted in frames and displayed on board.

- General Arrangement
- Capacity plan
- Pumping diagram
- Arrangement of life saving and firefighting appliances
- Other plans as required by the regulations

1.16 Identification

Draft mark, freeboard mark, ship's name, port of registry and Employer's stack insignia of steel plate make shall be welded to the hull.

Each room, valve, pipe head and manhole, etc. shall be fitted with name plates where necessary as per requirements of the Employer/Engineer and the Classification Society.

Furthermore, all switchboard controls shall be identified by English labelling.

1.17 Site Conditions

The Boat, machinery and all equipment shall be suitable for operation under climatic conditions in the waters of Bay of Bengal.

Allowance shall be made for ambient air temperature of 45 degrees C. sea water temperature of 35 degrees C and seasonal high relative humidity.

1.18 Building Berth, Launching and Docking

During building and in the assembling of pre-fabricated sections at the berth, the utmost care shall be taken to ensure good alignment and fairness. Keel sightings and measurements shall be recorded at regular intervals.

Careful allowances shall be made before final welding to avoid permanent distortion. At all times during building, the hull shall be earthed.

1.19 Supervision and Inspection

During the entire period of construction, the Contractor shall permit the Employer's/Engineer's Representatives to enter the Shipyard for supervision of the works. This supervision does not include Inspection, Tests and Trials as described in Section 1.10 above. The required number of the Representatives and supervision period is shown below.

No. of Supervision	Purpose	Schedule	No. of Inspector		Days
			Employer	Engineer	
1	Survey of Manufacturing capacity of Factory	After Contract signing	4	2	4 (3 nights)
2	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
3	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
4	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
5	Inspection during sea trial	During sea trial	4	2	As required

To enable the Employer/Engineer to execute their duties and attend trials of any of the larger units shall be conducted at the Contractor's yard or at their sub-contractor's premises; the Contractor shall notify the Employer/Engineer at least fourteen (28) days in advance of the time and location of any trials.

The Contractor shall be advised by the Employer/Engineer of the names of the person authorized to give decisions on the Employer's/Engineer's behalf and also the extent of the authority vested in such persons. The decision of such persons shall be final and binding upon the Employer/Engineer.

The expense of the Employer's/Engineer's Representatives required for supervision at the manufacturing factory of the Contractor such as International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance, shall be borne by the Contractor.

Drawings, specifications, lists of materials and other relevant information as required by the Employer/Engineer shall be furnished and made available to them. Copies of the technical correspondence as well as of all minutes taken down at meetings by the Contractor shall be made available to the Employer's/ Engineer's Representatives, all in English.

Any inspection carried out by the Employer's/Engineer's Representatives shall be for the purpose of verifying the quality control function of the Contractor and shall not be used to relieve the Contractor of his responsibility to maintain a high standard of workmanship thorough competent and thorough supervision.

1.20 Quality Control

The Contractor, using its Quality Control Team, shall ensure that the labour standard and material quality during construction is in accordance with the Contractor's Standard Shipbuilding practice, the Rules of the Classification Society and Statutory Regulations.

One members of the Contractor's Quality Control Team shall be assigned to and shall maintain close liaison with the Employer's/Engineer's supervisors. The Contractor shall provide the Employer's/Engineer's supervisors with complete access and availability to tests, test reports, X-rays, samples and unpriced purchase orders etc., involved in the construction.

A quality plan shall be submitted by the Contractor and agreed between the Employer/Engineer and the Contractor. The requirements in the Quality plan to include quality assurance system of sub-contractors. A list of major sub-contractors should be provided to the Employer/Engineer for their approval.

1.21 Construction Progress

Construction progress report shall be issued by the Contractor for Employer's/ Engineer's guidance. The Contractor shall submit monthly progress report to the Employer/Engineer.

1.22 Delivery and Taking-Over

Upon satisfactory completion of the trial program, the Boat, all compartments, tanks, machinery, accommodation spaces, bilges, and tank top shall be thoroughly cleaned and prepared for delivery to the Employer. All deteriorated paint-works shall be restored and rusted areas shall be power brushed, primed and painted.

In accordance with the contract, the Boat shall be transported to by the Contractor at Contractor's responsibility and cost. Employer's Representative will attend during the delivery. The Boat shall be taken over afloat to the Employer at after acceptance inspection by the Employer/Engineer.

1.23 Provisional Registry

The Boat shall be registered under the laws and regulations. The Employer shall apply for the provisional registry of the Boat after receipt of the following certificate.

- 1) Classification (Hull & Machinery)
- 2) Tonnage
- 3) Safety Construction
- 4) Safety Equipment
- 5) International Load line
- 6) Safety Radiotelephony
- 7) Contractor's Certificate
- 8) Bill of Sale

The Employer is responsible for registration of the Boat and all costs incurred in relation to registration of the Boat.

The Contractor shall apply the custom and de-ratting certificate from the local authorities after the Employer has submitted the provisional registry to the Contractor.

1.24 Defect Liability

The Contractor shall guarantee for a period of not less than twelve (12) months the workmanship, materials including paint work and equipment of the Boat against defects.

Not later than twelve (12) months after delivery, the Boat shall be dry- docked at a shipyard designated by the Employer for final inspection of hull, shafting, propellers, kort nozzles, gearing, etc.

Defects found during dry docking shall be made good at the Contractor's account and to Employer's/Engineer's satisfaction. The Contractor shall bear all the cost of the final inspection. If any defects are found, any necessary expenses within the scope of guarantee shall be to the Contractor's account.

1.25 Spare Parts, Inventories and Tools

Mandatory (standard) spare parts, inventories, and tools for two years operation shall be provided in accordance with the requirements by the Rules and Regulations of the Classification Society, and those items not specified in the Rules and Regulations shall be provided in accordance with the Contractor's/manufacture's standards. Special tools for maintenance purpose shall be provided.

If the Contractor recommends additional spare parts, he shall submit the Recommended Spare Parts List to the Employer/Engineer which includes details of the items and unit costs.

1.26 Delivery Period

Boats shall be delivered to the Employer within 18 months from the commencement of the Works.

1.27 Training

The Contractor shall provide training for the Employer's Personnel for the whole Boat at the Site during shipment period. The Contractor shall provide experienced engineer(s) to execute the training at his own expense. All training texts and lecture materials shall be prepared by the Contractor free of charge, whilst a lecture room shall be arranged by the Employer. The instruction and training shall be in English. The detailed training programme shall be submitted to the Employer/Engineer for approval at least three (3) months before the training. The Contractor shall, at his own expense, provide all necessary tools, materials, equipment and manpower for the training.

The number of trainees and duration of the training of the maintenance and operation personnel shall be at least as shown in Table below:

Item	Trainee		Min. duration of training
Tug Boat At the Site	Maintenance	Seven (7) mechanical engineers Seven (7) electrical engineers	14 days
	Operator	Nine (9) persons	14 days (4 h/day)
Tug Boat During Shipment	Operator	Four (4) persons	As required

2 HULL PART

2.1 Hull Construction

2.1.1 General

Scantlings of structural members shall be in conformity with the requirement of the Classification Society and shall have adequate strength for the purpose intended. Careful consideration shall be paid to maintain continuity of structural strength. Where structural continuity is insufficient, necessary compensation shall be provided by taper, overlap and brackets.

Steel of hull construction shall be of mild steel approved by the Classification Society.

All works for hull construction shall be carried out in accordance with the Contractor's practice and under the survey of the Classification Society. Temporary access and ventilation openings may be provided on deck, tank top etc., where necessary, for the convenience of work, and shall be recovered in place by welding subject to the approval of the Classification Society.

Prefabrication shall be used wherever possible for the maximum use of down hand welding. Structures contributing to the longitudinal strength of the Boat shall be generally continuous. Abrupt changes of strength shall be prevented and the scantling of longitudinal strength members shall be changed gradually where necessary. The termination of strength members shall be arranged in a manner to minimize a concentration of stresses.

The bottom structure at stern shall be strengthened so the Kort nozzles withstand the force imposed. The main and auxiliary engine girders shall be efficiently integrated with the main hull structure. In way of hawse pipes, deck machinery, mooring fittings and elsewhere as required, welded deck plates of increased thickness shall be inserted and the structure in way it shall be strengthened. Main and auxiliary engines shall be seated on resin chock. Deck machinery shall be seated on steel machined foundation.

2.1.2 Welding

The Boat shall be constructed by the block construction method

The Boat shall be of all welded construction. The welding shall be conducted in the best practice, approved sequences and every endeavour shall be made to avoid locked-in stresses.

Fully or semi-automatic cutting of steel shall be utilized to ensure smooth edges and good welding.

All slag shall be removed and backing runs made on all shells and deck welding.

All furnished welds shall be sound, uniform and substantially free from slag enclosures, porosity, undercutting gas enclosures and other defects. In general, double continuous welding shall be adopted throughout the construction as possible as practicable.

Where plate edge gaps are excessive, filling in pieces, liners or packing places shall not be used except with the permission of the Employer/Engineer.

X-rays of area as required by the Classification Society shall be taken and to be for the Contractor's account including re-examination for defects.

2.1.3 Scantling

All scantlings shall be in accordance with the Classification Society's requirements for thickness of plating and modules of sections, except where specifically strengthened for the loadings specified.

2.1.4 Stem

Stem of the Boat shall be of built-up steel plate, and shall be stiffened to obtain strength for pushing work.

Lower part of stem shall be welded to keel plate, and upper part shall be fashion plate.

2.1.5 Keel, Shell Plate and Bilge Keel

Keel shall be of flat plating system.

Shell plating of bow parts, around Kurt nozzles, hawse pipes and sea chest shall be suitably increased, and/or be stiffened by doubling.

Bilge keel shall be fitted amidships on each side for approximately one third of the Boat's length.

2.1.6 Frame and Floor

Transverse framing system shall be adopted throughout the Boat. Angle steel with sufficient strength shall be applied.

Web frame shall be adapted to engine room, steering gear room and other space where necessary.

Floor shall be arranged horizontally in every frame space.

2.1.7 Bottom Construction

Bottom shall be of single construction except partial double bottom, and shall be reinforced with centre keel, side keel and frame bar.

Double bottom shall be constructed and allocated as fresh water tank, lubricating oil sump tank and fuel oil tank.

The part of the hull around Kort nozzles and Plummer block foundation for intermediate shaft shall be reinforced with frame bar and longitudinal girder to bear weight of vibration by the propellers.

2.1.8 Deck

Upper deck, bridge deck, and wheelhouse top shall be of steel welded construction.

Deck plating under deck machinery foundation and bollards, etc., shall be suitably increased or stiffened, and the edge part of deck opening shall be also stiffened. Curling shall be fitted under windlass, bollard, bitt, etc.

Operating stand of windlass and stage in way of the bow bitt shall be plated with checkered plate.

2.1.9 Deck Beam and Pillar

Beams shall have camber required, and shaped steels or steel flat bars of specified dimensions shall be arranged at each frame.

Pillars shall be provided where necessary.

2.1.10 Under Deck Girder and Bulkhead

Under deck girders shall be provided where necessary, and connected with beams, and girders shall be supported with pillars.

Special reinforcement for engine room and steering gear room shall be taken for prevention of vibration.

Bulkheads shall be arranged with reinforcement of angle plate.

2.1.11 Deckhouse and Engine Casing

Deckhouse and engine casing shall be of steel construction, and stiffeners shall be arranged. Corrugate plate, flat plate and angled plate shall be adopted for prevention of stresses.

Partitions forming bathroom, galley and toilet shall be of steel.

2.1.12 Main Engine Foundation

Main engines and reduction/reverse gearboxes beds shall be of rigid welded construction and situated on the double bottom, and to bear weight and vibration of main engines. Construction under their beds shall be reinforced with string girder plates.

Intermediate shaft bearing bed and auxiliary machine bed shall be of all welded construction. Construction under generator bed shall be reinforced with girder plates, etc.

2.1.13 FOT, FWT, LOT, WBT and Foam Tank

Each tank shall be arranged in double bottom and fitted with sounding pipe, air escape pipe, filling pipe, manhole, etc. Foam tank shall be suitably painted.

2.1.14 Hatch and Entrance

Hatches and entrances shall be provided with steel coaming and covers.

2.1.15 Chain Locker

Steel chain lockers shall be provided forward of bulkhead. Manhole shall be fitted.

Hawse pipe shall be of galvanized pipe with bell mouth. Wood sheathing shall be provided on the floor of chain locker.

2.1.16 Bulwark

Steel bulwarks shall be provided on the upper deck. Top of bulwark shall be fitted with bulb plate and half round bar shall be fitted at top of outer side. Steel plate shall be fitted at inner side face inclined. Side of bulwark shall be provided with mooring pipes and freeing ports.

2.1.17 Skeg

Skeg shall be provided at the centre line of the stern for taking course stability and docking into consideration.

2.1.18 Fender

Steel fender of half-cut pipe shall be fitted at both sides and stern of the Boat.

2.2 Hull Fittings

2.2.1 Hatches, Manholes and Doors

Hatches and manholes shall be constructed according to the Classification Society concerning water tightness and coaming height.

Hatches shall be fitted with a hinged steel weather tight cover, synthetic rubber gasket and clamping.

Oil tight and/or water tight manholes shall be provided to the double bottom tanks and deep tanks for inspection and maintenance. Manholes on double bottom shall be bolted raised type.

Weather tight steel hinged doors shall be fitted for the entrance of the deckhouse and deck store. A non-tight hinged type aluminium alloy sliding door with a square window shall be fitted to the wheelhouse on each side. Wooden doors shall be fitted for cabins, mess room, etc.

2.2.2 Side Scuttles, Windows and Ventilations

(1) Lighting (Square Windows and Scuttles)

Hinged steel welded side scuttles shall be fitted. A fixed steel welded scuttle shall be fitted to doors for the entrances of the deckhouse. Eyebrows shall be fitted over all side scuttle where there is no deck overhang. Wheelhouse shall be given panoramic view by means of large windows all way round, with window wipers cleaning system by fresh water.

Front and rear windows shall be of steel fixed type. Thickness of window panes at the front wall of wheelhouse, cabins and mess room shall be increased.

(2) Natural Ventilation

All spaces which are not connected to the air conditioning system and/or the mechanical ventilation system shall be provided with natural supply and exhaust ventilation via supply and discharge louvers, gratings and ducts.

(3) Filters for Air intakes and outlets

Air intakes and outlets shall be provided with a good quality filter.

(4) Mechanical Ventilation

Mechanical ventilation shall be provided for engine room, steering gear room, galley and lavatory as appropriate.

(5) Air-conditioning System

Air conditioning plant shall be installed to serve all cabins, galley, mess room and wheelhouse.

Ventilation blower unit shall be motor driven fan and of a capacity of suit service intended, and to be designed and installed to give minimum noise level.

The ventilation trunk shall be of galvanized steel and insulated with light weight fibrous material. All vent outlets are to be fitted low noise type diffusers and adjustable dampers capable of closing completely.

Engine control room shall be provided with one single air conditioning unit for spot cooling.

(6) Electrical Fresh Water Heating System

Electrical heating system shall be provided for supply hot water to galley and shower room.

2.2.3 Ladders and Steps

Ladders shall be of steel and fitted where required.

Steps and / or grips shall be fitted for access to the masts, the exhaust stacks and where necessary.

2.2.4 Grating

Checkered steel plate shall be laid in engine room, steering gear room and engine control room.

Batten grating of soft wood shall be laid on the floor of stores.

2.2.5 Storm Rails & Foot Steps

Handrails of galvanized steel shall be fitted on navigation bridge deck and wheelhouse top

The stanchions shall be of steel flat bar 50 mm× 16 mm, the top rail of 42 mm dia. galvanized steel pipe and the intermediate rails of 16 mm dia. solid rod. Additional stiffeners shall be fitted as required. Storm rails shall be of 42 mm dia. painted galvanized pipe and be provided as necessary. Hand grips shall be fitted in way of lavatories and showers.

2.2.6 Mooring and Fittings

Item	Location	Material	Remarks
Double pole towing bitt	Upper deck aft and fore	Steel pipe	With closed chock (SUS) at fore bits.
Mooring pipe	Bulwark	Cast steel	
Bollard	Upper deck	Steel pipe	Vertical barred type
Closed chock	Upper deck	Cast steel	
Chain compressor	Upper deck	Cast steel	

2.2.7 Rubber Fenders

Rubber fenders shall be designed and proposed by the Contracrot for the Engineer's and Employer's approval

2.2.8 Mast

Steel constructed mast equipped with radar scanner, masthead lights, towing light, anchor light, fire monitor, step, air horn, antenna, etc., shall be provided.

2.2.9 Windlass/Towing Winch

Hydraulic windlass/towing winch shall be installed on the upper deck fore.

Windlass shall be equipped with two (2) cable lifter suitable for chain cable and one (1) warping end.

One (1) electric motor driven hydraulic unit installed in the engine room. Starting/stopping of electric motor for hydraulic unit shall be performed at control stand in the wheelhouse and in the engine room. Running indicator lamp of electric motor shall be provided at machinery side and control stand in the wheelhouse.

The windlass shall be controlled automatically from the wheelhouse.

The breaking capacity off towing winch shall be not less than 180tfkN and the winding speed shall be not less than 10m/min. Hauser Drum shall be designed for 200m towline of ϕ 50mm HMPE rope.

2.2.10 Rope Winch

One set of hydraulic rope winch shall be installed on the bridge deck.

2.2.11 Deck Crane

One set of electro-hydraulic driven (2,000 kg winch with remote control) shall be installed on the housing top aft. The detailed capacity shall be proposed by the Contractor for the Employer/Engineer's satisfaction.

Reference capacity of the deck crane

Type Multi-folding type / Telescopic type 4-stage boom

Lifting capacity 11.6 ton-m

Drive system Electro-hydraulic

Maximum load 6.79 ton (with 1.8 m reach)

Working radius 1.8 m to 8.1 m Max.

2.2.12 Insulation

Heat insulation of accommodation quarter shall be of 50 mm glass wool and shall be applied to the following space, unless otherwise proposed by the Contractor and approved by the Employer.

- Deck head and side walls in accommodation quarters where shall be exposed to weather.
 - Deck head and side wall in wheel house and side wall in void space under wheelhouse.
- 50 mm rock wool shall be installed in accommodation area under upper deck and boundary wall between engine room and accommodation.

2.2.13 Painting

Paint shall be International Paint, Make suitable for marine use unless otherwise proposed by the Contractor and approved by the Employer.

All the painting work shall be executed in accordance with the Contractor's standard and the manufacturer's recommendation.

Shell plates and deck plates shall be shot-blasted to SA 2 1/2 and wash-primed at the steel mill. Prior to painting, after erection, all the steel shall be wire-brushed or disc-sandered to remove rust or burn by welding where necessary.

Paint colour shall be proposed by the Contractor and approved by the Employer.

Painting schedule shall be as per paint maker's recommendation.

2.2.14 Cathodic Protection and Galvanizing

(1) Cathodic Protection

Cathodic protection of aluminium anode shall be provided around propeller, under sides of bilge keels and outer edges and inside of sea chests. The lifetime of the anode and necessary amounts of spare parts shall be proposed by the Contractor and approved by the Employer.

(2) Galvanizing

Galvanizing shall be processed for anti-corrosion to hawse pipes, steel stairways except tanks in hull construction, hand rails, stanchions, gratings and other parts where necessary. JIS or equivalent standard shall be applied to the quality of galvanizing.

2.2.15 Name, Draft Mark and Nameplate

(1) Name & Draft Marks

The name of the Boat shall be welded on and painted on the bow, port and starboard. The name and port of registry of the Boat shall be welded to the transom of the Boat and painted. All letters of the Boat's name shall be not less than 300 mm in height.

Port of registry shall be 200 mm in height.

The draft marks measured above the bottom of the keel shall be welded on and painted on the stem and at the stern, port and starboard.

The draft marks in Arabic numerals shall be marked in meter. The figures shall be 100 mm height, spaced 200 mm apart and the bottom edge of each number is to correspond to the exact draft indicated by that number.

(2) Name Plate

Each room, store, entrance shall be provided with lock, nameplate and certify the number of persons.

2.2.16 Accommodation

(1) General

All fixed and loose furniture, mattress, chairs, etc. shall be supplied and fitted by the Contractor. All materials shall be good quality of substantial construction and well finished, timber being well seasoned and free from defects. Internal doors shall be generally plastics laminate faced, hung on brass or stainless steel hinges and fitted with satin chromed door fittings.

(2) Joiner Bulkhead, Insulation and Lining

All steel bulkheads in the accommodation to be lined. In way of pipelines and ducts the deck head and bulkhead linings are to be removable where required.

Where ceilings and bulkheads form an outside boundary they are to be suitably insulated and lined with non-combustible plastic laminated material of marine quality.

(3) Deck covering

All exposed deck shall be painted with non-slip paint.

Floor in galley and lavatories shall be tiled.

Floor in store, CO2 bottle room and air conditioning machine room shall be painted with deck paint.

(4) Furniture

Accommodation spaces shall be furnished with as follows but other small fittings including curtains than described hereto shall be provided as appropriate.

Single berth cabins

- 1 - Single berth
- 1 - Desk and revolving arm chair
- 1 - Book case
- 1 - Locker

Mess room

- 1 - Dining table and chairs/sofas
- 1 - Side board with a TV/VCR set
- 1 - Clock

Galley

- 1 - Sink
- 1 - Dressing table
- 1 - Electric range
- 1 - Microwave oven
- 1 - Refrigerator
- 1 - Hot water heater

Lavatory

- 1 - Toilet bowl

Shower space

- 1 - Shower heads and towel hooks-
- 1 - Wash basin

(5) Wheelhouse

The wheel house shall be furnished with the following instrumentation and furniture:

- 1 - Steering and engine manoeuvring console
- 1 - Windlass/towing winch control panel
- 1 - Chart table
- 1 - Radio table
- 1 - Flag locker for one complete set of international signal flags
- 1 - Binocular box

2.2.17 Life Saving Apparatus

Lifesaving appliances to comply with the Rules and the Regulations of the Classification Society shall be furnished.

2.2.18 Firefighting Equipment

(1) Internal Fire Fighting Equipment

Firefighting equipment shall be provided in accordance with the Rules and the Regulations of the Classification Society.

(2) External Fire Fighting System

External firefighting equipment capable of extinguishing fire of the target calling vessel shall be provided. The system shall be capable of providing self-protection from fire of the Boat. Monitor shall be 2.700L/min and suitable for water application and for foam application

One (1) fire pump shall be installed.

A foam tank of an approximately 7 cubic meters volume shall be built into hull construction.

2.2.19 Piping System

In General, all pipes, valves and flanges shall be of Japanese Industrial Standard (JIS) or equivalent. As to pipe joints, welding butt or sleeve joints shall be used generally, and flanges may be used where required for convenience of work or easiness or replacement.

All piping shall be protected against mechanical injury and vibrations and identified by color-coding according to usual practice.

(1) Fresh Water Piping System

Fresh water piping system shall be installed for drinking, washing and sanitary purposes. Water shall be supplied to accommodation through a hydrophone system.

The system shall supply to all wash basins, showers, water closets, galley and etc.

(2) Sea Water Piping System

The following piping system shall be applied for galvanized steel pipes.

Seawater to be filled at sea chest by bilge/G.S Pump. Bilge/G.S Pump to be connected to F.W Tank to draw fresh water.

Sea water piping system shall be installed to provide sea water and fresh water supply to as follows;

- Hydrant on upper deck
- Spray for exhaust outlet
- Stand-by Cooling for Main engine, Generator engine
- Outboard

(3) Hot water system

Stainless steel pipe shall be applied.

Hot water shall be supplied to galley, shower room and basin through electric fresh water heater.

(4) Water discharge system

Exposed drainage water shall be led through discharging pipes on upper deck and bridge deck to lower deck, then to outboard.

Drainage water in deck house shall be led to outboard through storm valves.

(5) Bilge Piping System

Bilge suction pipes shall be fitted in front store, Crew's room, azimuth thruster room and bilge wells in engine room shall be led to bilge pump in engine room.

(6) Sanitary drain water

The drainage of washbasins, showers, toilets etc., shall be via galvanized steel pipes to the sewage treatment plant of approved type to comply with MARPOL Regulation shall be installed.

Sanitary drainage from above the upper deck has as stand-by a direct overboard valve.

Soil water from lavatory shall be also led to outboard through storm valves in case of open water.

(7) Sounding and Air Escape Piping System

Sounding and air escape pipes shall be fitted on each tank. Those pipes in fuel tank shall not be galvanized.

Sounding pipes in engine room shall be provided with self-closing cocks with safety check signal.

Air escape pipes shall be gooseneck type.

(8) Filling Port

Filling ports of fresh water and fuel oil shall be fitted with pipe head caps.

Filling ports of lubricating shall be fitted with blank flange.

2.2.20 Canvas Covers

Canvas covers shall be furnished as follows.

- | | | |
|--------|---|---|
| 1 | - | For Windlass/towing winch control stand |
| Each 1 | - | For Chain pipe |
| Each 1 | - | Exposed electrical lighting equipment |
| 1 | - | For Fire monitor |

2.2.21 Deck Outfits

All deck outfits shall be in accordance with the Requirement of the Classification Society.

(1) Outfits to be supplied.

- | | | |
|--------|---|--|
| 2 | - | Anchors |
| 2 | - | Anchor cable, Galvanized, grade 2 stud |
| Each 1 | - | Towing hawser line (150m, 600m) |
| 4 | - | Mooring line |
| 3 | - | Towing line |
| 2 | - | Anchor swivel |
| 2 | - | Anchor shackle |
| 2 | - | Anchor shackle (Spare) |
| 16 | - | Joining shackle |
| 1 | - | Shackle punch |
| 1 | - | Pin punch |
| 2 | - | Chain hook |
| 2 | - | Nylon rope for hawser 40 mmφ x 30 m |

(2) Navigation Outfits

- | | | |
|---|---|--|
| 1 | - | Magnetic Compass (150mm, reflector type) |
|---|---|--|

1	-	Spare bowl for the above (with box)
1	-	Bell (300 mmφ)
1	-	Clock
1	-	Binoculars (7 x 50mm)
1	-	Barometer (Aneroid)
1	-	Black ball (net type)
3	-	Black diamond shape (net type)
2	-	National flag (900mm x 1200mm)
1	-	International signal flag
1 set	-	International code book
1	-	Call sign flag
1	-	Air whistles (solenoid)

(3) Navigation Lights

1	-	Mast light
1 pair	-	Side light
1	-	Stern light
1	-	Anchor light
1	-	Towing light
1	-	Not under command light

(4) Deck Inventory

1	-	Clinometer (6 inch pendulum type)
1	-	Thermometer
Each 1	-	Painting tools (Paint scraper, paint pot)
Each 3	-	Painting tools (Brush (big, small)
1 set	-	Carpenter's tools
1	-	Aluminium step
Each 1 -	-	Frame for certificate (certificate of ship's nationality, Certificate of ship's survey)
Each 1 set-	-	Room nameplates and lock sets
1	-	Key box
Each 1	-	Crew's name plates rack
2	-	White board
Each 1	-	Room name plates and locks
1	-	Ship's number plate
1	-	Shipyards name plate
3	-	Sounding scale (5m stainless steel scale)
1	-	Side scuttle clamping handle
1	-	Bottom plug spanner
1	-	Sounding plug spanner

- | | | |
|--------|---|--|
| 1 | - | Portable bilge pump (32φ drain suction) |
| 2 | - | Vinyl hose with nozzles (20φx 20m, for deck washing) |
| 26 | - | Tire fender as spare (sed aircraft tire) |
| Each 2 | - | Paint can for repair (20L can, blue, white, green) |
| Each 1 | - | Paint can for repair (20L can, black, cream, red, light green) |

3 MACHINERY PART

3.1 General

3.1.1 General Description

The Boat shall be equipped with two (2) sets of vertical, in line, 4-stroke cycle, single acting, direct injection type marine diesel engines. Each diesel engine with turbo-charger and air cooler shall drive azimuth thrust propeller through a reverse/reduction gearbox.

For the shaft arrangement both torsional and lateral (bending) vibration analysis shall be performed to avoid resonances in the working speed range.

Main engine revolution shall be remotely controlled at the control stand installed in the wheelhouse. In case the remote control fails, main engine shall be controlled on the engine side.

Two (2) A.C. generators driven by two (2) diesel engines shall be installed in the engine room for driving various motors and for supplying electric power to communication system and lighting system.

Main engines, generators and other auxiliary machinery and equipment shall be arranged so that operation and maintenance can be easily performed and shall have enough headroom for maintenance.

Engine room shall be provided with sufficient ventilation. Piping system shall be arranged to avoid damages caused by thermal expansion and vibration, and piping installation shall be carried out so that maintenance and repair can be easily performed.

All mechanical systems and equipment shall be of approved or accepted type by the Classification Society.

3.1.2 Shop Test

Workshop test for the following machinery shall be carried out to meet the Classification requirements.

- (1) Main engine
- (2) Generator set
- (3) Major Auxiliary machinery & equipment

3.1.3 Sea Trial

Upon completion of the Boat, the sea trials shall be executed in the presence of the representative of the Employer/Engineer and the surveyor of the Classification Society as stipulated in the Hull Part of these Specifications.

During the sea trials, the measurements required for the items of machinery and equipment shall be performed and the results shall be submitted to the Employer/Engineer.

3.2 Main Engine and Propeller

3.2.1 General

Main propulsion machinery shall be of two (2) vertical, non-reversible in line, 4-stroke cycle, single acting, direction injection type, diesel engine with turbo-charger and air cooler. Cooling system of main engines shall be of fresh water cooling.

3.2.2 Particulars of Main Engines

Type of main engine shall be Vertical, single acting, 4 valves, 4-cycle, trunk, piston type with turbo charger and charged air cooler.

No. of set	: 2
Maximum continuous rating	: Capable of performing 60 tons bollard pull at output shaft end (Flywheel)
Cooling system	: Fresh water cooling (secondary)
Fuel oil	: Marine diesel oil
Lubricating system	: Forced lubrication
Starting system	: Intake compressed air
Direction of rotation	: Clock-wise viewed from stern

Accessories of engine

- Turbocharger
- Air cooler
- Cooling sea water pump
- Cooling fresh water pump
- Lubricating oil pump
- Fuel oil feed pump
- Lubricating oil cooler
- Fresh water cooler
- Air reservoir (200L x 2)

3.2.3 Azimuth Thrust Propeller

The fixed pitch propellers, Kaplan type, shall be designed for nominal diesel engine torque. The number of blades and gearbox reduction ratio shall be carefully chosen, to avoid vibrations. The frequency, hull and nozzle frequency shall be compared so resonant vibration can be avoided in the any direction of operation mode.

3.3 Shafting and Propelling System

3.3.1 General

The power of the main engine shall be transmitted to the propellers via reverse/reduction gears, intermediate shafts.

Starboard propeller shall be clockwise and port propeller shall be counter-clockwise turning as viewed from the stern.

The intermediate shafts shall be supported by roller bearings at suitable locations and these roller bearings shall be lubricated with main engine system oil supplied by main engine lubricating oil pump.

3.3.2 Flexible Coupling

Flexible coupling shall be fitted between main engine and intermediate shaft to protect the propelling unit from impact force and torsional vibration caused when main engines are started and stopped and to protect the main engine from fluctuation of the load transmitted from propellers.

3.3.3 Intermediate Shaft

The intermediate shafts shall be made of forged steel and have a specified diameters as required by the Classification Society.

3.4 Remote Control System

3.4.1 Remote Control System

Main engine speed shall be remotely operated through electronic-pneumatic and electric control system from the control stands in the wheelhouse.

Emergency stop of main engine shall be controlled remotely from the control stand in the wheelhouse.

3.4.2 Wheel House Control Stand

One (1) control stand shall be arranged in the front side of wheel house.

The design and layout shall comply with ergonomics experience and shall be approved and agreed by the Employer/Engineer.

3.5 Auxiliary Engines for Generators

3.5.1 General

Two (2) auxiliary diesel engines driving two (2) generators shall be installed in the engine room. The diesel engines shall be complete with attachments and accessories necessary for operation.

3.5.2 Particulars of Auxiliary Engines

Type of generator engine shall be single acting, 4-cycle, trunk piston type. The output power capacity of each generator shall be at least to provide power for the Boat's electrical load during operation and sailing at fully loaded conditions under peak ambient conditions. The unit shall be able to operate in parallel with automatic load sharing equipment.

No. of set : 2

Rated output : Approx. 90kW (to be proposed by the Contractor)

3.6 Engine Room Auxiliaries

3.6.1 Bilge, Firefighting and General Service Pump

Two (2) bilge, fire and general service pumps shall be installed. The bilge, fire and general service pump shall be used as standby cooling sea water pump for main engine.

3.6.2 Standby Main Engine Cooling Fresh Water Pump

One (1) centrifugal standby main engine cooling fresh water pump shall be installed.

3.6.3 Standby Main Engine Lubricating Oil Pump

One (1) gear type standby main engine lubricating oil pump shall be installed as standby pump for both main engines as well as pre-lubrication purpose.

3.6.4 Bilge Pump

One (1) self-priming centrifugal bilge pump shall be installed.

3.6.5 Fuel Oil Transfer Pump

One (1) gear type fuel oil transfer pump shall be installed. The pump transfers fuel oil from one tank to another, to service tank and to deck line.

3.6.6 Cooling Water Pump for Air Conditioning Unit

Cooling water pump for air conditioning unit shall be installed with a capacity and head to suit the air conditioning condensing unit(s).

3.6.7 Fresh Water Pressure Pump

One (1) fresh water pressure pump with a pressure tank shall be installed. The pump shall be arranged for automatic operations by pressure switches and manual operation.

3.6.8 Sanitary Pump

One (1) sanitary pump shall be installed. The pump shall be arranged for automatic operations by pressure switches and manual operation.

3.6.9 Oily Bilge Separator

One (1) MARPOL standard oily bilge separator complete with pump and oily water discharge alarm shall be installed.

3.6.10 Hydraulic Pump Unit for Deck Machinery

One (1) electric motor driven hydraulic pump shall be installed. The pump's start and stop shall be remotely controlled.

3.6.11 Ventilator for Engine Room

Two (2) electric motor driven reversible type vertical axial flow fans for engine room shall be installed.

3.6.12 Ventilator for azimuth thruster Room

One (1) electric driven reversible type vertical axial flow fan for azimuth thruster room shall be installed.

3.6.13 Air Compressor

Two (2) electric motor driven air compressors shall be installed.

3.6.14 Sewage treatment plant

One (1) sewage treatment plant shall be installed.

3.7 Engine Room Piping Arrangement

3.7.1 General

All pipes shall have sufficient diameter to suit the service of respective pumps and shall be coupled by flanges or screw joints conforming to JIS or equivalent.

In making installation of piping, extreme bends shall be avoided and bands shall be used for fixing at locations necessary to prevent vibration.

Effective expansion joints or bands shall be used for expansion of pipes.

Each pipe shall be painted for identification of piping system. Main valves and cocks shall be fitted with engraved brass name plates.

Sea chest shall be fitted with steel grid and to be of construction to prevent sea weed and foreign matters from entering piping system.

Studs and nuts used for sea chest and sea chest gratings shall be of stainless steel.

All piping systems shall be hydraulic pressure tested or leak tested.

3.7.2 Valves and Cocks

Shipside valves shall have cast steel or bronze body and shall be with the Classification Society Certificate.

Valves on bilge, ballast, cooling water of sea water and fresh water, fire and wash deck shall be bronze. Valves on compressed air system shall be steel or bronze. Valves for fuel and lubricating oil system shall be steel.

System	Size	Body	Mounting
Sea suction	65A and over	Cast steel	Bronze
	50A and below	Bronze	Bronze
Overboard	50A and over	Cast steel	Bronze
	40A and below	Bronze	Bronze
Bilge and ballast	50A and over	Cast iron	Bronze
	40A and below	Bronze	Bronze
Fire and wash deck	50A and over	Cast iron	Bronze
	40A and below	Bronze	Bronze
Fresh water service	50A and over	Cast iron	Bronze
	40A and below	Bronze	Bronze
Plumbing and soil pipe	50A and over	Cast iron	Bronze
	40A and below	Bronze	Bronze
Compressed air 2.94MPa	15A and over	Forged steel	Stainless steel
	10A and below	Bronze	Bronze
Compressed air 0.78 MPa	20A and below	Bronze	Bronze
FO and LO	50A and over	Cast iron	Bronze
	40A and below	Bronze	Bronze
Cooling water	50A and over	Cast iron	Bronze
	40A and below	Bronze	Bronze

3.7.3 Material of Piping

Pipe and fittings shall be in accordance with JIS (Japanese Industrial Standard) or equivalent.

Piping system	Service Pressure (Mpa)	Pipe		Joint
		JIS	Material	Material
Fuel oil pipe	1 or below	SGP	SS400	
Lubricating oil	1 or below	SGP	SS400	
Compressed air pipe	2.94 1 or below	STPG370 SGP	SF440A SS400	Galvanized
Sea Water Pipe	1 or below	SGP or STPG370	SS400	Galvanized
Fresh Water Pipe	1 or below	SGP	SS400	
Bilge Pipe	1 or below	SGP	SS400	Galvanized
Air Vent Pipe	1 or below	SGP	SS400	Galvanized
Mist Pipe	1 or below	SGP	SS400	Galvanized
Pressure gauge Pipe	1 or below	SGP or STPG370	-	
Hydraulic pipe	20	STPG370	SF440A	SUS
Sounding Pipe	1 or below	SGP	SS400	

3.7.4 Colour Coding

All exposed piping system shall be identified by colour code and arrows showing directions of flow. Colour coding shall be as follows where approved by the Employer/Engineer, or JIS colour coding.

Service	System	Band	Arrow
Sea water	Fire fighting	Red	White
	Cooling water	Green	White
Fresh water	Cooling water	Blue	White
	Portable	Blue	Red
Fuel	Diesel	Black	Yellow
Air	All	White	Black
Bilge	Suction and discharge	Medium Brown	White
Lubricating oil	All	Yellow	Blue
Hydraulic oil		Yellow	Blue

3.7.5 Engine Room Piping System

(1) Fuel Oil System

The fuel oil system shall be divided into a service of filling and transfer system. The service system shall comprise of service tank equipped with supply, filling and overflow pipes, high/low level alarms, and low level pressure switch to activate the fuel oil transfer pump. The shut-off valves in the fuel line to the engines shall be located as close as possible to the service tank. Drip trays shall be provided under service tank in the engine room.

(2) Lubricating Oil System

Main engine lubrication oil shall be supplied by the lubrication pump driven by main engine. The pump shall draw lubrication oil from lubrication sump tank through a duplex suction strainer and shall discharge to the main engine through the oil cooler and a duplex filter. Lubrication oil shall flow directly from the engine crankcase into the lubrication oil sump tank after lubrication.

The main engine lubrication oil shall have lubrication thermostatic control valve with by-pass line for regulating the lubrication oil temperature.

Each intermediate shaft bearing shall be lubricated by oil line distributed from main engine lubricating.

(3) Cooling Fresh Water System

The main and auxiliary engines shall be fresh water cooling system by main engine driven fresh water pump, fresh water cooler and fresh water expansion tank.

(4) Sea Water Cooling System

The cooling sea water line for main engine shall be separated into an independent port and starboard system for main propulsion system. Cooling sea water shall be led from two (2) sea chest at port and starboard through suction valve and strainers by main engine driven cooling sea water pump, and flow to air cooler, lubricating oil cooler and fresh water cooler, then discharged to outboard.

Cooling sea water for deck machinery hydraulic oil cooler shall be drawn from main engine cooling water line.

Cooling sea water for auxiliary engine and firefighting engine shall be led from one (1) sea chest through suction valve and strainer by engine driven sea water cooling pump.

(5) Compressed Air Piping System

Air compressor shall be automatic start and stop control system.

The compressed air system shall supply air for the following purpose and equipment.

- Starting air for the main engine
- Starting for auxiliary engine
- Instrument control air and drying
- Engine room miscellaneous services
- Air whistle
- Cleaning valve for sea chest

The compressed air discharge pipe from the main air compressor shall be led directly to the starting air reservoirs for main engine and auxiliary engine respectively. The relief valve and a pressure gauge shall be provided at air reservoirs. The system shall

be separated into a high pressure system of 30 bars and a low pressure of 7 bars. The low pressure line shall have reducing valve and filters.

(6) Exhaust Gas System

Exhaust gas of main engines and auxiliary engines shall be led from the engine room to the aft transom, and to be discharged into open air through spark arrester silencer.

Exhaust gas pipe shall be provided with a sufficient expansion joint to avoid thermal expansion. Outer surface of exhaust gas pipe shall be less than 100 degree Celsius in temperature by heat lagging of 50mm rock wool covered with tin plate.

Exhaust gas pipes for auxiliary engine shall be lagged with 25 mm rock wool covered with tin plate.

(7) Bilge Piping System

The engine room and steering gear room bilge system shall be served by bilge/general service pump, bilge pump and oil bilge separator.

An oily water separator shall take suction from the oily water storage tank, to discharge clean bilge water overboard with alarm for exceeding the oil content and separated oil to sludge tank.

(8) Hydraulic Oil Piping System

Hydraulic system for the deck machinery shall be served by electric hydraulic pump unit. Piping shall be processed by enough pickling and flushing. Exposed piping and flange shall be stainless and bolts and nuts shall be high tensile steel.

3.8 Engine Room Outfits

3.8.1 Floor Plates, Gratings and Ladder

Ladders and handrails shall be installed at necessary locations in the engine room to facilitate ascending and descending. Floor plates shall be installed so that the handling of machinery, valves, cocks, tanks and other installations can be easily performed.

Engine room floor plates shall be 4.5 mm thick checkered steel plate supported by angle steel.

3.8.2 Engine Control Room

Engine control room shall be provided in the forward of the engine room. Group starter panel, alarm panel, desk and chair shall be installed.

3.8.3 Fire Fighting Equipment

Fire main by means of bilge/general service pump shall be provided and to be complete with fire hydrants installed at suitable locations.

Portable 5.0 kg dry powder type fire extinguishers shall be installed in engine room, azimuth thruster room and engine control room.

3.8.4 Ventilation

Two (2) electric motor driven axial flow type ventilators for engine room shall be installed on the top of engine casing.

Ventilation ducts shall be led to the engine room from the engine room ventilators with openings provided at suitable locations.

One (1) natural ventilation for engine room shall be installed on the bridge deck.

One (1) electric motor driven axial flow type ventilation and one (1) natural ventilation for azimuth thruster room shall be installed on the aft upper deck.

3.8.5 Store and Work Table

A store with locker shall be provided in the engine room and fitted with wooden shelves.

A work table shall be equipped with electric grinder and vice.

3.8.6 Overhauling

Two (2) set of 1 ton manually operated chain block with trolley shall be provided for overhauling of main engines and auxiliary machinery.

3.8.7 Strainers & Flow Meters

Pump	Location	Quantity	Remark
Lubricating oil pump	Suction	2	Duplex type
	Delivery	2	(by M/E maker)
Fuel transfer pump	Suction	2	Single type
Fuel feed pump of main engine		2	Duplex type (by M/E maker)
Fuel feed pump of auxiliary engine		1	Duplex type
Cooling sea water pump of main engine		2	Duplex type (by M/E maker)
General service pump		1	Single type
Cooling sea water pump of auxiliary engine		1	Duplex type
Bilge suction		1	Single suction
Bilge pump for oily water separator		1	
Hydraulic oil pump for deck machinery		1	
Fire-fighting pump		1	
Cooling sea water pump for external fire-fighting engine		1	

3.8.8 Exhaust Silencers

Spark arrester silencers for main engines and generator engines shall be made of steel plate with drain cocks, etc. The silencer shall have sufficient capacity to noise level depression and the outside shall be insulated.

3.8.9 Painting

All machinery, equipment and piping shall be suitably painted in accordance with Hull Specifications.

Engine room, propeller room, machinery and all pipes shall be thoroughly cleaned and painted in accordance with the paint maker's standard.

3.9 Anti Pollution System

At least one (1) Boat shall be fitted with anti pollution system capable of working/participating in antipollution activities.

4 ELECTRIC PART

4.1 General

4.1.1 General Description

All electric equipment of the Boat shall be in accordance with the regulations of the Classification Society.

All electrical systems and equipment shall be approved or accepted type by the Classification Society where specified by the Classification rule.

While electrical works shall be carried out in accordance with the Contractor's customary practice approved by the Classification Society.

Marine type, water proof, totally enclosed or drip proof protection type equipment shall be used, depending upon the location.

Electrical equipment shall comply with the issued by following societies.

Japanese Industrial Standard (JIS)

Japan Electric Machine Industry Association (JEM)

International Electrotechnical Commission (IEC)

4.1.2 Voltage, Frequency and Wiring

(1) Voltage

Generator	AC	380V, 3 phase
Auxiliaries	AC	380V, 3 phase
Lighting	AC	220V, single phase or 3 phase
Emergency lighting	DC	24V
Small & special electric appliance	AC	220V, single phase
Interior communication & radio	AC	220V, single phase or DC
24V		

(2) Frequency

50Hz to be adopted for AC system

(3) Wiring Method

AC 3-phase circuit shall be of 3-wire insulated type, and AC single phase shall be 3-wire or 2-wire insulated type.

DC circuits shall be of 2-wire insulated type

4.1.3 Indication and Arrangement of Polarity

Bus bar and connecting conductors for electric equipment shall be, in principle, identified by colour as shown in the below, or otherwise shall be arranged in accordance with the following orders with coincide numbers.

(1) AC System

<u>Power Source Side</u>	<u>Load Side</u>	<u>Identifying Colour</u>
R phase	U phase	Red
S phase	V phase	White
T phase	W phase	Black

(2) DC System

<u>Pole</u>	<u>Identifying Colour</u>
Positive (+)	White
Negative (-)	Black

4.1.4 Name Plates

Name plates shall be made in English and metric figures.

4.1.5 Inspection and Test

(1) All major electric equipment shall be inspected and tested at the shop of the manufacturer in accordance with the manufacturer's standard.

(2) On Board Test

All electric equipment shall be inspected and tested after completion of installation on board in accordance with the relevant rules and regulations and the Contractor's standard.

4.2 Cable Installation

4.2.1 Cable

Cable shall be employed using marine cables except those for special purpose.

In general, cable application shall be as follows:

- (1) E.P. rubber insulated, vinyl sheathed and armored cables shall be used in the engine room and on the deck exposed to weather.
- (2) E.P. rubber insulated, vinyl sheathed and armored cables shall be used for the cables having section area of conductor not less than 38mm² or the cables being installed in the place where the ambient temperature exceeds 65 degree Celsius.
- (3) Heat resisting cables shall be used in the place where the ambient temperature exceeds 70 degree Celsius.
- (4) Cabtyre braided cord shall be used for the portable electric appliances as required.

4.2.2 Installation of Cable

- (1) Cables, which run in the main cable route, shall be supported by metal cable hanger and to be installed so that cable runs not to affect the painting work on the structure behind cable run.
- (2) Cables shall be installed avoiding the locations as far as practicable where water, oil or oily matters are apt to accumulate. In case installation is made in such locations inevitably, cables shall be protected with steel plate, steel pipe or vinyl conduit.
- (3) In case cables shall be installed in the accommodation quarters where to be lined with plywood, cable installation shall be executed between the structure and the linings. In any other place, cable installation shall be exposed to open space.
- (4) In case cable installation penetrates watertight bulkhead or deck, special care shall be taken to keep water tightness using gland or the Classification Society approved cable penetration method

4.3 Generators

4.3.1 Main Generators

Two (2) AC diesel engine driven generators shall be installed in the engine room.

Particulars of the generators shall be as follows, unless otherwise proposed by the Contractor and approved by the Employer:

Rated normal output:	According to the Contractor
Rated voltage	: AC380V
Power factor	: 80%
No. of phase	: 3 phase
Frequency	: 50Hz
Rating	: 100% continuous
Enclosure	: Drip-proof
Cooling	: Self-ventilated (Brushless)
Exciting system	: Self-excited
Insulated	: Class F

4.3.2 Use of Generators

One (1) generator shall have a capacity to carry the electric load required for either sea going, towing, entering and leaving the port, or anchoring. The other shall be standby. Parallel operation of generator shall be available manually at the time of change-over the generator for use.

4.4 Transformers and Battery

4.4.1 Transformers

The following transformers for lighting, navigation small electric apparatus and communication shall be installed in the Main Switch, unless otherwise proposed by the Contractor and approved by the Employer.

Purpose	: General Service
Type	: Dry, self-ventilated
Capacity	: 3Phase
Voltage	: 385/225V
Frequency	: 50Hz
Insulation	: Class H
No. of set	: One (1) set

4.4.2 Battery

Batteries shall be installed in the engine room and battery room for lighting, emergency lighting, remote control device for main engine, alarm system, radio communication system and etc, unless otherwise proposed by the Contractor and approved by the Employer.

Type	Copper type	Copper type
Voltage	DC12Vx200AHx2	DC12Vx120AHx2
Capacity	200 AH	120 AH

4.4.3 Charging and Discharging

Silicon type charging and discharging panel shall be provided, unless otherwise proposed by the Contractor and approved by the Employer.

Application	For general use	for firefighting engine
Charging system	Floating	Silicon
Input	AC380V x 3φx 50Hz	AC220V x 1φx 50Hz
Output	DC22-35V x 30A	DC20-35V x 10A
Remarks	Portable	

4.5 Switchboard**4.5.1 General**

The switchboard shall be of floor mounted and dead front type, and shall be fitted with handrail on the front of the panel and removable protective cover at the lower part on the rear of the panel.

4.5.2 Switchboard

The switchboard shall be consisted of generator panel, feeder panel, starter pane and charging/discharging panels. The list of switchboards are shown below, but not limited to:

No.1 AC generator panel	1 unit
No.2 AC generator panel	1 unit
380V feeder panel	1 unit
220V feeder panel	1 unit
Starter panel	1 unit
DC 24V charging and discharging panel	1 unit

4.5.3 Shore Connection Box

Drip-proof type shore connection box fitted with circuit breaker with trip-off device for overload shall be provided in the engine room to receive electricity of 60A, AC220V, 3 phases, 50 Hz from the shore while the Boat is in port, and shall be connected to a battery charger, unless otherwise proposed by the Contractor and approved by the Employer.

Safety interlock shall be provided in order to prevent the closing of circuit breaker for generator as long as shore connection remains on.

50m length of 25 mm² cabtyre cable shall be provided.

4.6 Electric Motors and Starters**4.6.1 General**

Motors shall be fed electricity from 380V feeder panel and other special motors and small electric appliances from 220V feeder panel directly or through the distribution panel.

Motors shall be of mono-speed, Class B, E or F insulated squirrel-cage induction motor type and to have characteristics to suit respective services unless otherwise proposed by the Contractor and approved by the Employer .

Motor bearings shall be of open type or sealed type. The open type bearing shall be fitted with grease nipples for greasing.

4.6.2 Motor Control Equipment

Each starter shall be equipped with power supply switch, push button, solenoid contractor, overload relay, running indicating pilot lamp and ammeter.

Motors above 7.5kW rating shall be fitted with star-delta starters and motors below 7.5kW rating shall be arranged for direct on line starting.

4.6.3 Motor

All motors shall be suitable for working in climatic conditions and in accordance with the requirements of classification society.

Rating, output and watch of all motors shall be suitable for their respective duty.

4.6.4 Starter

All motor starters shall be tested in accordance with the Classification Society.

As a rule, starting method of the motors shall be of across-the line starting, but where the starting of large capacity motor will occur disturbance on the electric system due to excessive starting current, reduced voltage starting method shall be applied.

All starters for motors above 0.4 kW shall be provided with low voltage protection or low voltage release.

Low voltage release shall be applied for automatic start-stop motors and low voltage protection shall be applied for the other motors. The thermal type over current relay shall be of hand reset type throughout.

Particular List of Motor and Starter is as follows

Auxiliaries	Motor			Starter Method	Remarks
	Type	Rating	Insulation		
S/B Cool. F.W. Pump	TE	Cont	B class	LNS	
S/B L.O. Pump	TE	Cont	B class	LNS	
G.S.& Fire Fighting Pump	TE	Cont	B class	SDS	
BILGE Pump	TE	Cont	B class	LNS	
F.O. Transfer Pump	TE	Cont	B class	LNS	Auto & remote start /stop with emergency stop
Fresh Water Pump	TE	Cont	B class	LNS	Auto start/stop
Sanitary Pump	TE	Cont	B class	LNS	Auto start/stop
Deck Mach. Hyd. Pump	TE	Cont	B class	SDS	
Air Compressor	TE	Cont	B class	LNS	Auto start/stop
E/R Vent. Fan	TE	Cont	B class	LNS	With emergency stop
Azimuth Thrust Prop. Room Vent. Fan	TE	Cont	B class	LNS	With emergency stop
Galley Vent. Fan	TE	Cont	B class	LNS	Exhaust only With emergency stop
A/C Cooling W. Pump	TE	Cont	B class	LNS	
A/C Fan	DP	Cont	B class	LNS	With emergency stop

Note : Abbreviations to be as follows;

S/B : Stand by
DP : Drip-proof type
TE : Totalley-enclosed type
LNS : Across the line starting
SDS : Star-delta starting
A/C : Air conditioning unit

4.6.5 Emergency stop system

Following Motors shall have an emergency stop function in case of emergency.

- Fuel transfer pump
- Ventilator for engine room
- Ventilator for steering gear room
- Air conditioning unit

4.7 Electric Lighting

4.7.1 Lighting Fixture and Electric Circuit Appliances

In general, waterproof lighting fixture shall be used for the galley, deck and locations exposed to weather. Drip-proof lighting fixture shall be used for the engine room and steering gear room as necessary.

The lightings shown in the following shall be proposed by the Contractor and approved by the Employer.

4.7.2 Ceiling light

Litings shall be furnished in the wheelhouse, accommodation quarters, engine control room, engine room, steering gear room, galley and shower room.

4.7.3 Candescent ceiling light

Candescent ceiling light with guard shall be furnished in lavatory, store, engine room and steering gear room.

4.7.4 Desk light

Desk light shall be furnished on the desk of captain room and chief engineer room.

4.7.5 Bed light

Bed light shall be fitted at the head of the berth.

4.7.6 Candescent light

Candescent light with dimmer shall be furnished on the chart table in the wheelhouse.

4.7.7 Outdoor light

Outdoor light shall be furnished outside of lower deckhouse.

4.7.8 Cabinet light

Cabinet light shall be furnished on the cabinet of basin.

4.7.9 Candescent light

Candescent light shall be furnished for instruments in the wheelhouse.

4.7.10 Working lights

Two (2) sets of candescent type searchlights shall be fitted on the top of wheelhouse and on the mast respectively, and which shall be remotely operated from the W/H.

Two (2) sets of candescent type projector shall be fitted on the top of wheelhouse and two (2) sets of projector shall be fitted on the mast.

4.7.11 Portable Lamps

Five (5) sets waterproof portable lamps shall be provided at the following locations.

Engine room	2
Steering gear room	1
Passageway	1
Bos'n store	1

4.7.12 Emergency Lights

Emergency lights shall be provided in the wheelhouse, engine room, steering gear room and accommodation quarters in accordance with the requirements of the Classification Society and the Authority.

4.7.13 Navigation Light and Signal Lights

The following navigation and signal lights shall be provided and controlled from the navigation light control panel in wheelhouse.

Mast lights	1
Side lights	1 pair
Stern light	1
Towing light	1
Anchor light	1
Red light	2
(Not under command light)	

4.8 Interior Communication**4.8.1 Alarm**

The alarm shall be provided and fitted to conform the requirement of classification society and conform the respective manufacturer's recommendations. Group alarm shall be fitted in the wheelhouse and specific alarm shall be fitted in the engine control room.

4.8.2 Fire and general alarm

Fire and general alarm shall be installed in accordance with the Rules and the Regulations of the flag state. Fire and general alarm shall be fitted in wheelhouse, engine room and main deck. Alarm bells shall be fitted in wheelhouse, forecastle deck and main deck. Alarm horn with red rotating beacon shall be fitted in engine room.

4.8.3 Fire detection alarm

Fire detection alarm shall be installed in accordance with the Rules and the Regulations of the flag state.

4.8.4 Engine Telegraph

One (1) lamp replying type telegraph from the Wheelhouse to the engine room shall be installed. Alarm and light shall be provided in the engine room.

4.8.5 Interior Telephone System

One (1) telephone system shall be provided as in wheelhouse, engine control room, steering gear room and mess room.

4.8.6 Public Address System

One (1) public address system shall be provided.

1 - amplifier (Wheelhouse)

2 - speakers (Wheelhouse top and mast)

4 - cabin speakers (Engine control room, mess room, accommodation quarter on the upper deck and wheelhouse)

1 - Handy type microphone (Ceiling in wheelhouse)

4.8.7 Air Whistle

One (1) air whistle shall be fitted.

4.9 Navigational Instruments

4.9.1 Window Wiper

Window wipers of swing type shall be fitted on the forward in the Wheelhouse.

Fresh water spray device to front wall of wheelhouse shall be fitted. Fresh water from fresh water pump through solenoid valve shall be sprayed by switch button in wheelhouse.

4.9.2 Marine Radar

One (1) set of X-band marine radar with screen and 64 nautical mile range capability shall be fitted in wheelhouse and antenna shall be fitted on the mast top.

4.9.3 Echo Sounder

One (1) set of echo sounder, 0-200m depth range shall be fitted in wheelhouse.

4.9.4 Doppler Speed Log

One (1) set of dual beam, pulse doppler system, 2MHz Doppler speed log shall be fitted.

4.9.5 DGPS Navigator

One (1) DGPS (Differential Global Positioning System) navigator shall be fitted in wheelhouse and a multi-channel GPS receiver shall be installed on the top of wheelhouse.

4.9.6 Anemometer

One (1) vane type anemometer shall be fitted on the mast and indicator shall be fitted.

4.9.7 Satellite Compass

One (1) satellite compass shall be provided. Antenna shall be fitted on the wheelhouse top and repeater compass shall be incorporated in main engine control stand in the wheelhouse.

4.9.8 Magnetic compass and auto pilot

One (1) set of magnetic compass and auto pilot shall be provided in wheelhouse.

Magnetic-compass

- 1- Master compass
- 1- Repeater compass for auto pilot
- 1- Repeater compass for emergency steering position

Steering system

Steering system shall have following operation modes.

- Automatic steering
- Manual steering

4.9.9 GPS Compass

One (1) set of GPS Compass with three antenna radome type shall be provided in wheelhouse.

Display : 4.5" monochrome LCD

4.9.10 Electric Chart Display System (ECDIS)

One (1) set of ECDIS shall be proposed by the Contractor and approved by the Employer.

Function: Chart display, Ship's position fixing, Route planning, Track control, Route monitoring, Radar image, ARPA data display and maker's standard function

Electronic navigational chart (ENC) shall be obtained by the Contractor unless otherwise provided by the Employer.

4.9.11 AIS (Automatic Identification System)

One (1) set of AIS shall be provided in wheelhouse

4.10 Radio equipment

The radio and safety communication equipment shall be designed and constructed in compliance with Global Maritime Distress and Safety System (GMDSS) requirement and shall meet the requirement for Ship Security Alert System (SSAS). The system shall be integrated with the GPS positioning system and consist of Inmarsat transmitter-receiver, a PC with Inmarsat software and an adequate omni-directional antenna. Inmarsat-C including back-up system shall be installed.

Sea area : A-1

Maintenance : Duplication equipment and Shore-based maintenance

4.11 External Communication System

Communication equipment shall be provided referring to the requirement of GMDSS A1 area (JG rule for non-international voyage) as design guide.

4.11.1 MF/HF Radio Telephone

One (1) set of MF/HF radio telephone shall be provided in wheelhouse.

4.11.2 VHF Radio Telephone

One (1) set of VHF radio telephone shall be provided in wheelhouse.

4.11.3 International NAVTEX Receiver

One (1) set of International NAVTEX Receiver shall be provided in wheelhouse.

4.11.4 Satellite EPIRB

One (1) set of Satellite EPIRB shall be provided in wheelhouse.

4.11.5 Radar Transponder (SART): 1 set

One (1) set of X band Radar transponder (SART) shall be provided in wheelhouse.

4.11.6 Other Communication Equipment

Two (2) sets of hand-held type VHF transceiver (floating type) with battery charger and hands free microphone (or speaker microphone) shall be supplied.

4.12 SUPPLEMENTARY OUTFITS

- 1 - 500 V megger
- 1 - Portable type volt-ammeters
- 1 - Portable circuit tester
- 2 - Nipper
- 2 - Side cutting pliers
- 3 - Screw driver (+) large, middle and small each 1
- 3 - Screw driver (-) large, middle and small each 1
- 2 - Adjustable spanner, large and small each 1
- 1 - Funnel
- 1 - Distilled water (18L)
- 1 - Dilute sulphuric acid (10L)
- 1 - Jack-knife
- 1 - Spouts
- 1 - Jug
- 1 - rubber glove
- 1 - Tools and multi tester (1 set each)
- 6 - Portable lamps

SECTION VI-3

PILOT BOAT

SECTION VI-3: PILOT BOAT

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SECTION VI-3: PILOT BOAT

1 GENERAL PART

1.1 Intent

It is the intent of this Employer's Requirements to describe the guidance and minimum requirement for the design, materials, equipping, inspection, testing and documenting of "Pilot boat" (hereinafter referred to as "the Boat") for Matarbari Port Development Project in People's Republic of Bangladesh.

This Guidance is descriptive and general in nature. It does not specify the Boat in detail, or the details of the equipment to be included in the scope of supply. The Contractor shall recognize that the Employer requires the design of the Boat and of the equipment they contain to be up-to-date and proven and in service and similar to that in use for pilot transfer boat at Chittagong port. The Boat will be used for transferring Pilots between the berth in the harbour and the large Oil Carriers in the vicinity of the SPM, Cargo vessels, Containers and so on. The Boat shall be capable of being safely operated while performing its required duties in both benign and adverse weather and sea conditions.

1.2 Scope of Works

- 1) Design, supply of materials, fabrication including inspection and testing, and delivery of the herein under-listed Equipment including associated equipment, spare parts, tools and documents to the Matarbari Port in Bangladesh.
- 2) Arrangement and assistance for the Employer's/Engineer's inspection and test for fabrication of pilot boat at the manufacturer's workshop.
- 3) Arrangement and assistance for the Employer's/Engineer's witness inspection and test at the site.
- 5) Training of the Employer's personnel or other personnel so directed by the Employer on the operation and maintenance of the supplied pilot boat at the Site.

1.3 General Description

The Boat shall be designed and built as the mono-hull, semi-displacement hull form, high-tensile strength steel hulled pilot transfer boat equipped with twin diesel engines, coupled with fixed pitch propellers.

The hull and superstructure shall be of robust construction with special attention paid to gunwale reinforcement and fender in the forward half of the Boat.

The Boat shall therefore have excellent capabilities for pilot transfer and emergency evacuation and optimum manoeuvring capabilities are required in any expected weather condition.

The Boat shall have suitable stability and manoeuvrability for the purpose intended, and shall have suitable strength and arrangement.

The described detailed dimensions and specifications in the following section are the reference standard values, and shall be proposed by the Contractor for the Employer's approval.

1.4 Design Guideline

Safety, reliability and ease of operation, minimum maintenance and good accessibility to all areas for repair and maintenance shall be the principal consideration in the detailed design of the Boat.

Modern and practical operation area to the latest standards shall be practiced in the outfit, lighting and furniture and other interior spaces.

The design shall provide the maximum possible all-around visibility from the wheelhouse. A clear sight onto the upper deck and the equipment is required. The layout of control and alarm panels or desks within such locations as the wheelhouse and engine room shall conform to the latest ergonomic design criteria.

The exposed upper deck shall be equipped with mooring gears, ventilation and escape hatches. Ventilator and inflatable life raft shall be provided. Wheelhouse shall be arranged, and radar, mast, speaker, etc. shall be provided on the wheelhouse roof.

All equipment and machineries which are part of the Boat shall be brand new and shall be made by original manufacturers as stipulated in the Requirements.

Any same article or work mentioned twice or more in the Requirements shall be supplied and/or executed only once.

1.5 Definition

1. The words "the Employer" shall be understood to mean Chittagong Port Authority.
2. The words "the Contractor" shall be understood to mean the contractor who shall be responsible for the design, supply and construction of the Boat, including the work by all sub-contractors who may be engaged by the Contractor.
3. The terms "best marine practice" or "good shipbuilding practice" or their equivalent shall be understood to mean construction to soundly conceived and engineered plans and data incorporating the specified components so as to meet the intent of this technical guidance, utilizing the best construction and testing methods.
4. The terms "the Classification Society" shall be understood to mean "Nippon Kaiji Kyokai (NK)" or International Association of Classification Societies (IACS).
5. The word "Surveyor(s)" shall be understood to mean the person or persons duly authorized by Classification Society or other Statutory Authority.
6. The term "Employer's Representative" shall be understood to mean the Employer's or/and Engineer's Representative attending at the Contractor's yard during the period of construction.
7. The term "Contractor's standard" shall be understood to mean the standard established by the Contractor based on the international standard.

1.6 Language and Unit

1. All drawings, documents, and equipment manuals shall be prepared in English language and in metric (SI) units.
2. Equipment name plates and labels shall be in English.
3. JIS or equivalent system units shall be used for all instrumentation, notices and labels, machinery and fittings, identification and data.
4. All piping, valves and fittings shall be to JIS standards or equivalent.
5. All tank volumes, gauges, etc., shall be in litres.

1.7 Principal Particulars

The Contractor shall propose the design with optimal dimensions to meet the Requirements:

1. Principal Dimensions

Length, overall	abt. 25 meters
Breadth, moulded	abt. 6 meters
Depth, moulded	abt. 3 meters
Designed draft, moulded	abt. 1 meters

2. Tank Capacity

Fresh water tanks (100%)	not less than 3,800 Litres
Fuel oil tanks (100%)	not less than 7,500 Litres

3. Main Engines

High speed marine diesel engines	2 sets
Maximum Continuous Rating	abt. 700 kW/set

4. Speed and Endurance

Maximum speed on normal load of deadweight	not less than 20 knots
and at 100% Maximum Continuous Output (MCO) with no sea margin	
Endurance (at 15kts)	abt. 500 n. miles

5. Complement

Crew	4 persons
Others (Pilots)	12 persons
Total	16 persons

1.8 Materials and Workmanship

Materials, machinery, equipment and outfits shall be in accordance with Japanese Industrial Standard (JIS) or equivalent as far as practicable, and complies with the requirements of the Classification Society.

All materials and equipment used for the construction shall be new. The main hull of the Boat shall be constructed throughout of high-tensile strength steel plates and sections tested and approved as required by the Classification Society. Test Certificates shall be supplied as required.

All wood used in the Boat shall be well-seasoned, free from sap shakes, warps and other defects, and to be reasonably free from knots. All wood shall be impregnated with anti-pest and anti-rot composition. All smith work or fabricated fittings shall be of neat design, strong, smooth and free from defects, and shall be manufactured to the Classification Requirements and approval.

All cables, fastening, shackles, rigging, sheave blocks and light fittings shall be made of materials which have been tested, approved and certificates supplied.

ISO metric threads shall be used for screw threads as a rule. Materials, parts or products equivalent to the Requirements may be substituted for those specified in the Requirements with prior consent by the Employer/Engineer and the Classification Society if so required.

1.9 Rules, Regulations and Certificates

The Boat shall be commissioned as a pilot transfer boat and is to be designed, built and surveyed under the Rules and the Regulations of Nippon Kaiji Kyokai (NK) or International Association of Classification Societies (IACS).

The Boat shall not be engaged in international voyages and operated at a restricted water area.

1.9.1 Rules and Regulations

The following rules and regulations in force at the date of signing the Contract shall be applied.

- a) Maritime Rules and Regulations of the Bangladesh Government

- b) Rules and Regulations for the Survey and Construction of Steel Ships published by the Classification Society
- c) Regulations for Tonnage Measurement of small ships (under 24 meters) by JG or equivalent
- d) Convention on the International Regulations for Preventing Collisions at Sea, 1972 as Amended in 1981
- e) International Convention for the Prevention of Pollution from Ships, 1973 and the Protocol of 1978, ANNEX VI and its latest amendments
- f) For fire protection, detection and extinction, Classification requirements shall be applied
- g) For life-saving appliances, Japanese Regulations for Life-saving Appliance of Ships (non-international voyage, category four (4) vessel) shall be applied.

1.9.2 Certificates

The following certificates shall be furnished with the Employer/Engineer at the time of the delivery of the Boat.

Certificates	Issued by
a) Provisional Certificate of Bangladesh Registry	Bangladesh Government
b) Classification Certificate	Classification Society
c) Tonnage certificate (Non-convention)	Classification Society
d) Statement of Compliance for Engine Air Pollution Prevention	Classification Society
e) Certificates for anchors, chains, navigation lights, sound signals, life-saving apparatus, etc.	Classification Society
f) Builder's certificate	Contractor (Shipbuilder)
g) Compass Adjustment Certificate	Contractor (Shipbuilder)
h) Deratization Exemption Certificate	Government of Contractor's Country
i) Certificates as per The Inland Shipping Ordinance (1976)	Bangladesh Government

All Classification and statutory surveys, certificates and fees shall be paid by the Contractor. All necessary certificates, issued by the Classification Society, regulatory bodies and the Contractor shall be handed over to the Employer at the time of delivery of the Boat.

1.10 Inspection, tests and trials

1.10.1 General

The Boat's construction, machinery, outfits and equipment shall be inspected and tested at the premises of the Contractor or subcontractors under the presence of the Employer/Engineer and/or the surveyor(s) representing the Classification Society and/or Authority in accordance with their respective rule requirements at the time of signing the contract.

Inspections, tests and trials shall be carried out in accordance with Contractor's standards and class protocols for inspections, tests and trials, details of which shall be submitted to the Employer/Engineer for approval. The Contractor's standards for performance of inspections, tests and trials shall be subject to approval of the Classification Society, the Authority and the Employer/Engineer.

The Contractor shall deliver to the Employer/Engineer in duplicate a key schedule of inspections, tests and trials to be performed up to the delivery of the Boat and submit up-date if necessary. The Builder shall deliver to the Employer/Engineer details schedules of inspections, tests and trials during the construction periods of the Boat.

The Contractor shall bear all costs, including International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance etc. for the Employer/ Engineer to attend the inspections, tests and trials at the premises of the Contractor.

This schedule shall be prepared in consultation with the Employer/Engineer and shall be timely informed no later than 28 working days in advance to make arrangements for attending the inspections, tests and trials.

All tests, trials and re-trials will be at the expense of the Contractor. The tests and trials expense shall include fuel oil, lubrication oil, system oil, fresh water, food, crew, equipment, stand-by vessel and any other expense connected with the trials.

Any unsatisfactory test or part of it shall be repeated, after correction of defects, to the satisfaction of the Employer/Engineer and/or the Classification Society and/or the authority concerned.

The Contractor shall submit in triplicate copies of all inspection, test and trials reports carried in accordance with the requirement of the Specifications, Class etc.

Qualified personnel of the main engine, gearing, electrical/control & instrumentation, which and propulsion system manufacturers shall be in attendance during commissioning, dock trials and sea trials at the Contractor's expense.

Confirmation of accepted tests and trials shall be by the signature of the Employer/Engineer and/or the Classification Society and/or the representative of the Authority concerned. On completion of the trials a general survey shall be made and defects which may have developed, or any work found incomplete is to be corrected and made good by the Contractor before delivery.

Prior to sea trials, the Boat shall be dry docked for final inspection and bottom painting. The Boat shall be dry docked after the sea trials in case serious underwater defects are expected, in order to allow for a complete inspection of the underwater hull, propellers, anodes and paint.

Before the sea trials all underwater painting work shall be finished, propellers and rudders inspected and polished or painted. After the sea trials, the Contractor shall submit a sea trial record book in which all data and records are to be carefully analysed and compiled.

All installations including main engines, auxiliary machinery, electric generators, electric equipment, instrumentation and controls commissary equipment, weather tight doors, any key equipment, winch, etc. shall be thoroughly tested on board by the Contractor or manufacturers to demonstrate their suitability for the purpose intended and that the Requirements have been fulfilled.

Prior to the commencement of the sea trials the main engines shall run at least for two (2) hours.

The sea trials shall be performed at normal load condition under deep sea condition with a wind speed not exceeding Beaufort 2. Trial loading condition shall be submitted to the Employer/Engineer for approval not later than 14 working days in advance of the sea trials. Upon completion of sea trials, any machinery considered necessary by the Employer/Engineer and/or the Classification Society shall be opened up for inspection.

The result of these tests shall be submitted to the Employer/Engineer within seven (7) working days of the tests being completed.

1.10.2 Shop Tests

The shop tests program shall be submitted to the Employer/Engineer no later than 30 working days in advance.

Main engines, propulsion machinery and other equipment shall be shop tested in accordance with requirements of the Classification Society and/or the standard protocols of the manufacturers and to the satisfaction of the Employer/Engineer.

The shop test of main engines and generator set will be conducted in attendance of the Employer/Engineer and the Contractor. All reading and data of the inspections, tests and trials performed shall be submitted to the Employer/Engineer for approval.

1.10.3 Shipyard Testing

All tanks and main hull compartments shall be tested for oil and water tightness according to the Classification Society requirements prior to any paint application except shop primer. Before testing, all tanks shall be structurally complete, with all external pipe fittings, connections fitted and cleaned. Subject to the specific requirements of the Classification Society and the Employer/Engineer, no tank or compartment boundary welded connections shall be coated or painted until testing has completed and the tank or compartment has been passed by the Employer/Engineer. Spaces with bulkheads permanently exposed to drip and splash water and floors which are covered with cement or tiles, before painting and before floor coverings are laid, will be tested according to the Classification Society requirements.

Weather tightness of exterior doors, windows and hatch covers shall be tested by means of hose testing as required by relevant regulations.

1.10.4 Launching

The Contractor shall be responsible for the satisfactory launching of the Boat. The Contractor shall make all necessary arrangements and inform the Employer/Engineer and the Classification Society in writing fourteen (28) days in advance of the date of launching. The launching shall be carried out in daylight.

1.10.5 Dock Trial

Dock trial shall be carried out at the Contractor's expense prior to the official sea trial in accordance with the completion program agreed with the Employer/Engineer, to ensure correct performance of all machinery.

Engine room, machinery and systems shall be cleaned and free from loose building materials before testing will take place.

The trial shall include the testing of at least the following machinery, installations and systems but not limited to the following:

- Main engines and propulsion systems
- Auxiliary machinery
- Load tests of alternator set and switchboard tests
- All deck machinery
- All piping system including pumps, valves, cocks
- All electrical systems including alarms and control systems, navigation equipment
- Ventilation supplies and exhaust systems
- Air conditioning systems

Before trials of main machinery are commenced, tests for entire auxiliary machinery shall have been completed and proven to be in good working order.

The main propulsion system will be tested for a minimum continuous duration of two (2) hours under the supervision of the main engine manufacturer after ensuring satisfactory alignment of the main engine, propulsion units and shafting in accordance with manufacturer requirements and within their specified limits.

Each pump shall be operated on the respective systems.

The necessary water and sanitary systems shall be in continuous operation during trials, and each tap, water closet, etc., together with all fittings are to be operated and the specified pressures maintained on the system.

All defects shall be remedied by the Contractor and re-tested to the satisfaction of the Employer/Engineer before sea trials.

Lifesaving equipment shall be tested and demonstrated to the satisfaction of the Employer/Engineer, Classification Society and the Authority concerned.

1.10.6 Official Sea Trial

Official Sea Trial shall be carried out in accordance with the Contractor's program approved by the Employer/Engineer, the Classification Society and the authority concerned. During the official sea trials, the Boat shall be under the command of an experienced captain nominated by the Contractor.

The Contractor shall prepare and submit a detailed trial program 28 days working days prior to commencement of the official sea trial showing the method, order and time schedule of the trials to the Employer/Engineer for approval.

The Contractor shall perform the following tests and trials, but not limited to, in the attendance of the Employer/Engineer and the Classification Society.

- Progressive speed trial
- Crash stop astern and crash stop ahead test
- Steering gear test
- Turning test
- Endurance test including measurement of fuel oil consumption
- Anchoring test
- Starting test of main engines
- Dead slow test of main engines
- Test and/or adjustment of nautical equipment
- Noise & vibration measurement
- Air conditioning system test

(1) Progressive Speed Trial

Progressive speed trial shall consist of the following runs over officially measured mile course and the speed in each case shall be determined as an average of one (1) double runs in opposite directions.

Main Engine Revolution at	round trip
1/4 of maximum continuous revolution	1

2/4 of maximum continuous revolution	1
3/4 of maximum continuous revolution	1
4/4 of maximum continuous revolution	1
MCO or corresponding to maximum allowable shaft revolution	1

On completion of the official sea trials, the Contractor shall present immediately the report including speed-power curves to the Employer/Engineer.

Main engine output shall be estimated from the measured engine data during the speed trial using the results of the shop test of main engines.

(2) Endurance Trial

To consist of 30 minutes approx. 10% over speed and two (2) hours with the engine running at maximum continuous rated rpm.

The following data shall be recorded at 30 minutes intervals:

- Engine room temperature
- Main engine jacket water temperature & pressure
- Main engine lubricating oil pressure & temperature
- Main engine exhaust temperature
- Fuel rack setting
- RPM of main engine
- Other data to be advised by Engine Maker and the Employer/Engineer
- Main engine cooling sea water inlet temperature

1.11 Stability and Trim

The Boat shall have enough stability and freeboard. The calculation sheets of each condition based on the inclining experiment shall be submitted to the Employer/Engineer, the Classification Society and the authority, concerned.

The stability of the Boat for any reasonable condition of loading shall conform to the criteria by the Classification Society and as requirement by relevant authorities.

1.12 Inclining Experiments

When the Boat has reached a sufficiently advanced stage of construction, and only minor work remains to be completed, the lightweight, vertical and longitudinal centre of gravity of the Boat shall be determined by means of an inclining experiment.

The inclining experiment shall be attended by the Employer/Engineer and/or his representative and the Classification Society and/or the Authority who shall be given notice for this purpose at least 28 days before. During the inclining experiment, the Boat shall be in a suitable condition approved by the Classification Society. No loose water or oil on board, and all shipyard equipment, rubbish etc., shall be removed.

A "Trim and Stability" booklet shall be prepared by the Contractor after the light Boat data has been calculated from the inclining experiment. Each condition listed in the booklet to state the correction made to the metacentric height for the free surface effects and the tanks included in the free surface correction. Sufficient number of conditions to satisfy the Classification Society shall be provided.

1.13 Basic Numerical Value

Specific gravity used for design of the Boat to be as follows:

Sea Water	1.025
Fresh Water	1.000
Fuel Oil	0.850
Lubricating Oil	0.900

1.14 Vibration

The Contractor shall take all practical steps to minimize vibration particularly in the accommodation, main mast and wheelhouse to the satisfaction of the Employer/Engineer and the Classification Society. Any excessive vibration abnormal for this type of the Boat discovered during trials shall be rectified by the Contractor at his own expense.

1.15 Drawings and Plans**1.15.1 Approval Drawing**

The Contractor shall prepare and submit to the Employer/Engineer, the Classification Society and the authority for approval of drawings, calculations, documentations and other technical details required for the constructions and fitting out of the Boat.

The Contractor shall be responsible for the approval procedure with the Classification Society and the authority, and shall submit to the Employer/Engineer copies of all correspondence concerning technical matters between the Contractor and the Classification Society and the Authority.

Prior to commencing the design of the Boat, the Contractor shall submit a list of drawings including manufacturer's drawings to the Employer/Engineer for approval. Before starting prospective works, the Contractor shall submit each one (1) copy in electric format and three (3) print copies of the drawings and plans specified in the lists of the drawings and plans for approval to the Employer/Engineer, and one (1) copy each to be returned to the Contractor with approval or comments, if any, by the Employer/Engineer. The approved drawings and plans shall be returned to the Contractor within three (3) weeks after submission by the Contractor to the Employer/Engineer. If the approved drawings and plans are not returned to the Contractor within the said period, it is considered that those are approved without comments. List of drawings for approval shall include the following contents, but not limited to:

(1) General

- 1) Technical Specifications
- 2) General Arrangement
- 3) Lines
- 4) Hydrostatic table
- 5) Cross table of stability
- 6) Bonjean table
- 7) Initial calculation of weight, trim and stability
- 8) Tonnage Calculation
- 9) Tank capacity plan
- 10) Speed power curves including calculation for propeller particulars
- 11) Test method of official sea trial

(2) Hull Construction

- 1) Midship section
- 2) Construction profile and deck plan
- 3) Shell expansion
- 4) Scantling calculation
- 5) Frame lines
- 6) Fore construction
- 7) Engine room construction including main engine bed
- 8) Aft construction
- 9) Wheelhouse construction
- 10) Skeg construction
- 11) Windlass seats and under deck stiffening
- 12) Towing fittings and under deck stiffening
- 13) Anodes
- 14) Docking plan
- 15) Welding procedures

(3) Hull Fitting

- 1) Wheelhouse arrangement
- 2) Mooring arrangement
- 4) Accommodation arrangement
- 5) Arrangement of outfitting
- 6) Chain pipe and hawse pipe
- 7) Mast construction
- 8) Fender arrangement
- 9) Arrangement of life saving equipment and firefighting appliance
- 10) Painting scheme
- 11) Insulation of deck covering
- 12) Arrangement of hull piping
- 13) Air conditioning units and ventilations
- 14) Windows and sidelights
- 15) Internal and external doors
- 16) Hull inventory list
- 17) Equipment list for accommodation

(4) Machinery

- 1) Engine room arrangement
- 2) Shaft arrangement

- 3) Piping diagrams
- 4) Arrangement of exhaust gas piping in engine room
- 5) Insulation of exhaust gas pipe
- 6) Details of tanks
- 7) Sea inlet details
- 8) Arrangement of hull fitting valves
- 9) Torsional vibration calculation
- 10) Arrangement of floor, ladder and grating in engine room
- 11) Machinery inventory list

(5) Electric

- 1) Wiring diagram of power circuit
- 2) Wiring diagram of lighting circuit
- 3) Wiring diagram of nautical and communication equipment
- 4) Electric power balance calculation
- 5) General arrangement of electric installation
- 6) Remote control system drawing for main engine and propeller
- 7) Navigation lights
- 8) Electric Inventory list

1.15.2 Finished Drawing

Upon delivery of the Boat, four (4) sets of the finished drawings and plans specified in the lists of the finished drawings and plans generally include but not limited to, results of various tests and inspections and a detailed list of spare parts, inventories and tools provided, and shall also submit four (4) sets of the instruction manuals for all items of machinery, electrical, and electronic equipment written in English shall be handed over to the Employer/Engineer, and one (1) copy each to be placed on board the Boat. One (1) copy shall be provided in electronic format.

One (1) set of the following finished plans shall be mounted in frames and displayed on board.

- General Arrangement
- Other plans as required by the regulations

1.16 Identification

Draft mark, ship's name, port of registry, each steel plate make shall be welded to the hull.

Each room, valve, pipe head and manhole, etc. shall be fitted with name plates where necessary as per requirements of the Employer/Engineer and the Classification Society.

Furthermore, all switchboard controls shall be identified by English labelling.

1.17 Site Conditions

The Boat, machinery and all equipment shall be suitable for operation under climatic conditions in the waters around Chittagong port and newly developed Matarbari port, Bangladesh.

Allowance shall be made for ambient air temperature of 45 degrees C, sea water temperature of 35 degrees C and seasonal high relative humidity.

1.18 Building Berth, Launching and Docking

During building and in the assembling of pre-fabricated sections at the berth, the utmost care shall be taken to ensure good alignment and fairness. Keel sightings and measurements shall be recorded at regular intervals.

Careful allowances shall be made before final welding to avoid permanent distortion. At all times during building the hull shall be earthed.

1.19 Supervision and Inspection

During the entire period of construction, the Contractor shall permit the Employer's/Engineer's Representatives to enter the Shipyard for supervision of the works. This supervision does not include Inspection, Tests and Trials as described in Section 1.10 above. The required number of the Representatives and supervision period is shown below.

No. of Supervision	Purpose	Schedule	No. of Inspector		Days
			Employee	Engineer	
1	Survey of Manufacturing capacity of Factory	After Contract signing	4	2	4 (3 nights)
2	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
3	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
4	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)

To enable the Employer/Engineer to execute their duties and attend trials of any of the larger units shall be conducted at the Contractor's yard or at their sub-contractor's premises; the Contractor shall notify the Employer/Engineer at least fourteen (28) days in advance of the time and location of any trials.

The Contractor shall be advised by the Employer/Engineer of the names of the person authorized to give decisions on the Employer's behalf and also the extent of the authority vested in such persons. The decision of such persons shall be final and binding upon the Employer/Engineer.

The expense of the Employer's/Engineer's Representatives required for supervision at the manufacturing factory of the Contractor such as International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance, shall be borne by the Contractor.

Drawings, specifications, lists of materials and other relevant information as required by the Employer's/Engineer's Representatives shall be furnished and made available to them. Copies of the technical correspondence as well as of all minutes taken down at meetings by

the Contractor shall be made available to the Employer's/Engineer's Representatives, all in English.

Any inspection carried out by the Employer's/Engineer's Representatives shall be for the purpose of verifying the quality control function of the Contractor and shall not be used to relieve the Contractor of his responsibility to maintain a high standard of workmanship through competent and thorough supervision.

1.20 Quality Control

The Contractor, using its quality control team, shall ensure that the labour standard and material quality during construction is in accordance with the Contractor's standard shipbuilding practice, the rules of the Classification Society and the statutory regulations.

One member of the Contractor's quality control team shall be assigned to and shall maintain close liaison with the Employer's/Engineer's supervisors. The Contractor shall provide the Employer's/Engineer's supervisors with complete access and availability to tests, test reports, X-rays, samples and unpriced purchase orders etc., involved in the construction.

A quality plan shall be submitted by the Contractor and agreed between the Employer/Engineer and the Contractor. The requirements in the quality plan to include quality assurance system of sub-contractors. A list of major sub-contractors should be provided to the Employer/Engineer for their approval.

1.21 Construction Progress

Construction progress report shall be issued by the Contractor for the Employer's/Engineer's guidance. The Contractor shall submit monthly progress report to the Employer/Engineer.

1.22 Delivery and Taking-Over

Upon satisfactory completion of the trial program, the Boat, all compartments, tanks, machinery, accommodation spaces, bilges, and tank top shall be thoroughly cleaned and prepared for delivery to the Employer. All deteriorated paint-works shall be restored and rusted areas shall be power brushed, primed and painted.

In accordance with the Contract, the Boat shall be transported to Chittagong port, People's Republic of Bangladesh by the Contractor at the Contractor's own responsibility and cost. The Boat shall be taken over afloat to the Employer at Chittagong Port Authority office after acceptance inspection by the Employer/Engineer.

1.23 Provisional Registry

The Boat shall be registered under the laws and regulations of People's Republic of Bangladesh. The Employer shall apply for the provisional registry of the Boat within 14 days after receipt of the following certificate.

- 1) Classification (Hull & Machinery)
- 2) Tonnage
- 3) Contractor's Certificate
- 4) Bill of Sale

The Employer is responsible for registration of the Boat and all costs incurred in relation to registration of the Boat.

The Contractor shall apply the custom and de-ratting certificate from the local authorities after the Employer has submitted the provisional registry to the Contractor.

1.24 Defect Liability

The Contractor shall guarantee for a period of not less than twelve (12) months the workmanship, materials including paint work and equipment of the Boat against defects.

Not later than twelve (12) months after delivery, the Boat shall be dry-docked at a shipyard designated by the Employer for final inspection of hull, shafting, propellers, rudders, gearing, etc.

Defects found during dry docking shall be made good at the Contractor's account and to the Employer's/Engineer's satisfaction. The Contractor shall bear all the cost of the final inspection. If any defects are found, any necessary expenses within the scope of guarantee shall be to the Contractor's account.

1.25 Spare Parts, Inventories and tools

Mandatory (standard) spare parts, inventories, and tools for two years operation shall be provided in accordance with the requirements by the Rules and Regulations of the Classification Society, and those items not specified in the Rules and Regulations shall be provided in accordance with the Contractor's/manufacture's standards. Special tools for maintenance purposes shall be provided.

If the Contractor recommends additional spare parts, he shall submit the Recommended Spare Parts List to the Employer/Engineer which includes details of the items and unit costs.

1.26 Delivery Period

Boats shall be delivered to the Employer within 18 months from the commencement of the Works.

1.27 Training

The Contractor shall provide training for the Employer's Personnel for the whole Boat at the Site. The Contractor shall provide experienced engineer(s) at the Site to execute the training at his own expense. All training texts and lecture materials shall be prepared by the Contractor free of charge, whilst a lecture room shall be arranged by the Employer. The instruction and training shall be in English. The detailed training programme shall be submitted to the Employer/Engineer for approval at least six (6) months before the arrival of the Boat at the Site. The Contractor shall, at his own expense, provide all necessary tools, materials, equipment and manpower for the training.

The number of trainees and duration of the training of the maintenance and operation personnel shall be at least as shown in Table below:

Table 1.1 Training Schedule for Pilot Boat at the Site

Item	Trainee		Min. duration of training
Pilot Boat At the Site	Maintenance	Seven (7) mechanical engineers Seven (7) electrical engineers	14 days
	Operator	Nine (9) persons	14 days (4 h/day)

2 HULL PART

2.1 Hull Construction

2.1.1 General

Scantlings of structural members shall be in conformity with the requirement of the Classification Society and shall have adequate strength for the purpose intended. Careful consideration shall be paid to maintain continuity of structural strength. Where structural continuity is insufficient, necessary compensation shall be provided by taper, overlap and brackets.

Main hull shall be built by high-tensile strength steel. Superstructure such as wheelhouse, radar mast, etc. shall be constructed by aluminum alloy.

Steel-titanium-aluminum clad plate shall be inserted where steel construction and aluminum alloy construction are joined.

Hull construction shall be approved by the Classification Society.

All works for hull construction shall be carried out in accordance with the Contractor's practice and under the survey of the Classification Society. Temporary access and ventilation openings may be provided on deck, tank top etc., where necessary, for convenience of work, and shall be recovered in place by welding subject to the approval of the Classification Society.

Prefabrication shall be used wherever possible for the maximum use of down hand welding. Structures contributing to the longitudinal strength of the Boat shall be generally continuous. Abrupt changes of strength shall be prevented and the scantling of longitudinal strength members shall be changed gradually where necessary. The termination of strength members shall be arranged in a manner to minimize a concentration of stresses.

The main and auxiliary engine girders shall be efficiently integrated with the main hull structure. In way of deck machinery, mooring fittings and elsewhere as required, welded deck plates of increased thickness shall be inserted and the structure in way it shall be strengthened. Main and auxiliary engines shall be seated on resin chock. Deck machinery shall be seated on steel machined foundation.

2.1.2 Welding

The Boat shall be constructed by the block construction method.

The Boat shall be of all welded construction. The welding shall be conducted in the best practice, approved sequences and every endeavour shall be made to avoid locked-in stresses.

All slag shall be removed. All furnished welds shall be sound, uniform and substantially free from slag enclosures, porosity, undercutting gas enclosures and other defects. Where plate edge gaps are excessive, filling in pieces, liners or packing places shall not be used except with the permission of the Employer/Engineer.

X-rays of area as required by the Classification Society shall be taken and to be for the Contractor's account including re-examination for defects.

2.1.3 Scantling

All scantlings shall be in accordance with the Classification Society's requirements for the thickness of plating and modules of sections, except where specifically strengthened for the loadings specified.

2.1.4 Bottom and Side Shell

The bottom shell shall be constructed using longitudinal rib system consisting of a centre keelson, side keelsons, longitudinal ribs, rib frame and shell plate.

The side shell shall be constructed using a longitudinal frame system of longitudinal frames, transverse girders and shell plate.

2.1.5 Deck

The deck structure shall be constructed using a longitudinal rib system. The deck shall consist of a centre girder, side girder, deck beams and shell plate.

2.1.6 Bottom Construction

Bottom shall be of single bottom construction, and shall be reinforced with centre keelson, side keelson and floor.

2.1.7 Chine and stopper

The shell plate shall have steel chine for rolling stabilizer from bow to stern. Round bar stoppers shall be provided at gunwale (top of side shell) for anti-slip

2.1.8 Skeg and Shaft bracket

Skeg to be installed at the bottom along the centre line.

Shaft bracket shall be made of stainless steel.

2.1.9 Main Engine Foundation

Main engine bed shall be of rigid welded construction, and to bear weight and vibration of main engine. Construction under engine bed shall be reinforced with string girder plates.

Auxiliary machinery bed shall be of all welded construction. Construction under generator bed shall be reinforced with girder plates, etc.

2.1.10 Fresh Water Tank

One (1) fresh water tank of not less than 3,800 litres shall be fitted. a cleaning opening, air vent pipe, drain pipe, etc.

2.1.11 Fuel Oil Tanks

Two (2) fuel oil tanks of not less than 7,500 litres shall be fitted with a cleaning opening, air vent pipe, drain pipe, etc.

2.1.12 Corrosion

Attention shall be given to the non-compatibility of dissimilar metals and the galvanic corrosion that may occur, especially in a marine environment.

2.1.13 Steel Fender

One (1) line of steel fender of half-round bar shall be fitted on side shell at each side.

2.2 Hull Fittings**2.2.1 Steering Gear**

One (1) set of hydraulic type steering gear shall be equipped. Hydraulic pump shall be driven by main engine or electric motor. Two (2) sets of hanging rudders shall be equipped.

2.2.2 Anchors and Ropes

Anchors, anchor rope and mooring ropes shall be equipped in accordance with the requirements by the rule's applicable.

<u>Items</u>	<u>Type & Particulars</u>	<u>Quantity</u>	<u>Remarks</u>
Anchor	Danforth type, 25kg	2	-
Anchor rope	Nylon Rope 20mm dia.	70m x 2	-
Towing rope	Nylon Rope 21mm dia.	110m x 1	-
Mooring rope	Nylon Rope 20mm dia.	40m x 3 80m x 1	-

One (1) anchor shall be lashed at bow hand rail and the other shall be installed and lashed on seat at store.

The final weight, size, length, etc. shall be decided after approval from Classification society.

2.2.3 Deck machinery

One (1) set of an electric motor driven capstan shall be installed at bow as follows.

Location	Type	Capacity	Quantity
Bow	Electric motor driven, vertical, rewind	abt. 0.2 tf x 15m/min	1

The capstan shall be used for rope mooring and anchor handling.

2.2.4 Mooring and Fittings

Mooring fittings, such as bollards, mooring holes, etc. shall be arranged and supplied.

Items	Material	Quantity	Remarks
Cross bitt	Steel (large)	6	Bow x 3, Stern x 3
Cross bitt	Steel (small)	6	Bow x 2, Midship x 4
Fairleader	Steel	7	Open or Closed type
Cleat	Steel	AR	As Required
Pendant fender	Synthetic foamed rubber, 250φ	4	with rope, pillow type

2.2.5 Rubber and Steel Fenders

Rubber fenders with the following particulars shall be fitted on suitable locations.

Location	Type	Material	Size (mm x m)	Quantity
Bow	Hollow cylindrical	Synthetic rubber	φ150 x 8.0	1
Midship	Hollow cylindrical	Synthetic rubber	φ150 x 1.0	6
Stern	Hollow cylindrical	Synthetic rubber	φ150 x (0.8+0.8)	2

One (1) line of steel fender of half round bar shall be fitted on side shell at each side.

2.2.6 Painting

Prior to the application of coating materials, steel surfaces shall be well cleaned by disc sander, scraping and/or wire-brushing in order to remove rust, oil, water, dust, and/or other foreign materials.

The surface of steel plate and sections used for hull structure shall be shot-blasted to remove all mill scale and coated with shop primer before construction work. The grade of shot blasting shall be equivalent to SA 2.5.

Painting scheme to be recommended by paint makers and approved by the Employer/Engineer.

Steel outfits for mooring (except stainless steel portion) shall be galvanized.

2.2.7 Cathodic Protection

A sacrificial type zinc anodes cathodic protection system with suitable size and number for sufficient endurance shall be provided. The lifetime of the anode and necessary amounts of spare parts shall be proposed by the Contractor and approved by the Employer.

2.2.8 Air Conditioning System

Central cooling with duct system shall be applied for wheel house and accommodation. The system shall be designed to meet the following conditions.

	<u>Temperature</u>	<u>Humidity</u>
Outside air	35 °C	70% RH
Inside air	23 °C	50% RH
Sea water	35 °C	-

Spot cooling system shall be applied to pilot seats in wheelhouse and galley.

Cooling unit shall be installed on upper deck and under deck. Air shall be sent to each room unit through ducts.

The air conditioning ducts shall basically be made of aluminum alloy and the ducts shall be insulated by glass wool (25mm thick with aluminum cloth) secured with metal hardware.

Two (2) sets of condensing units of air conditioning system shall be installed in engine room and cooling water pumps for the system shall be installed in engine room.

Air conditioning system shall be stopped from wheelhouse.

2.2.9 Ventilation System

Mechanical ventilation shall be provided as follows.

<u>Location</u>	<u>Type</u>	<u>Quantity</u>
Engine room	Mushroom (reversible)	2
Steering gear room	Mushroom (reversible)	2
Wheelhouse	Multi-blade (exhaust)	1
Cabin	Multi-blade (exhaust)	1
Toilet	Multi-blade (exhaust)	1
Galley	Multi-blade (exhaust)	1

Natural ventilation made of aluminum alloy shall be provided at wheelhouse, fore cabin and galley space.

In addition to the space mentioned above, all spaces where not under air conditioned and/or not under mechanical ventilated shall be provided with natural ventilation where such as gooseneck, mushroom, etc.

The ventilator shall have a closable device and fire cover.

Each ventilator for wheelhouse and living quarter shall have an insect screen.

2.2.10 Life Saving Equipment

Life-saving equipment shall be provided as follows.

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Inflatable life raft	1	20 persons in FRP container
Life jacket	16	
Life buoy	2	with 30m line
Self-igniting signal light	1	
Self-activating smoke signal	2	
Parachute signal	4	
Rocket star signal	2	
First aid kit	1	

Items and quantity shall be decided finally to meet the requirement by applicable laws/regulations.

2.2.11 Fire Fighting Equipment

Fire-fighting equipment shall be provided as follows.

<u>Items</u>	<u>Quantity</u>	<u>Compartment</u>
Portable powder extinguisher, 5kg	2	Engine room and cabin
Portable CO ₂ extinguisher, 5kg	3	Wheelhouse, engine room and cabin
Auto diffusion type extinguisher	2	Engine room
Fire axe, bucket, etc.	AR	(As required by applicable laws/regulations)

Items and quantity shall be decided finally to meet the requirement by applicable laws/regulations.

2.2.12 Accommodation Fittings

The design of Insulation and lining, floor and floor plate, windows and doors shall be proposed by the Contractor for the Employer's approval.

2.2.13 Accommodation Equipment

Accommodation Equipment of wheelhouse and cabin space shown below, but not limited to, shall be provided by the Contractor.

2.2.12-1 Wheelhouse

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Steering console	1	-
Ship horn / Public addresser system	1 set	-
Magnetic compass	1	-
Navigation equipment	1 set	-
Radio equipment	1 set	-
Barometer / Inclinator / Clock	1 each	-
Pilot chair	2	With dumper
Crew chair	6	-
Chart table	1	Light with dimmer
Binocular storage box	1	-
Whiteboard	1	-

* Wash basin shall be arranged outside of closet and washing hose shall be fitted nearby water closet.

2.2.12-2 Cabin Space

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Sofa	2	-
Table	1	-
Locker	3	-
Sink with water faucet	1	-
Refrigerator	1	300ℓ
Hotplate	1	
Microwave oven	1	
Whiteboard / Clock	1 each	

2.2.14 Deck Piping

Pipes, valves, cocks, flanges, etc. of the piping systems on the Boat shall be in accordance with the requirements of the Classification Society and the regulatory bodies.

Proper care shall be taken to be well supported at probable vibrations and to have reasonable accesses for overhauling where necessary.

Where pipes pass through watertight bulkheads or decks, bulkhead or deck pieces shall be fitted.

Piping materials shall be as follows.

Pipe line	Materials	Remarks
Fuel oil	Carbon steel, Aluminum alloy	-
Lubricating oil	Carbon steel, Aluminum alloy	-
Fresh water	Stainless steel (SUS316), Aluminum alloy, PVC	-
Sea water	Stainless steel (SUS316L), Carbon steel with lining inside	-
Drainage / Bilge / Air escape	Stainless steel (SUS316), Aluminum alloy, Carbon steel	-
Refrigerant	Copper	-

(1) Fresh water pipes

One (1) filling pipe shall be provided between filling cap and fresh water tank. The filling cap shall be installed higher than the upper deck level.

The pipes shall be led so that freshwater is supplied from the fresh water tank through the freshwater pump to the lavatory water faucet, the gallery sink faucet, the multi-use faucet in the machinery room, the multi-use water faucet at the rear of the deck (close to the rear of the machinery room casing), the wheelhouse window washer and the front of the deck.

In addition, the wheelhouse window washer shall be of an electric valve control type. The nozzle for the window washer shall be installed below the window.

(2) Sea water pipes

Cooling water pipes for air conditioning system shall be provided and water shall be discharged overboard. One (1) cooling water pump and two (2) condensing units shall be arranged in engine room. One (1) additional stand-by cooling water pump shall be provided as back up.

All refrigerant pipes for air conditioning system shall be insulated by glass wool.

The sanitary pipes shall be led so that seawater can be supplied to lavatory for flushing from sanitary pump in engine room.

(3) Wash deck pipe

Wash-deck line shall be installed. This pipe line shall be supplied with sea water by bilge and general service pump in engine room. One (1) hydrant for deck wash shall be provided.

(4) Bilge pipes

The pipes shall be led to discharge the bilge water from the accommodation space, engine room and steering gear room using the bilge, fire and general service pump or bilge wing pump(manual operation) in engine room.

For fore store, bilge shall be discharged by portable bilge pump.

(5) Drainage pipes and wastewater pipes

The pipes shall be led to discharge wastewater from the galley sink and lavatory to outside of the Boat. One (1) storm check valve shall be installed.

The drainage pipes from the air conditioner and other drainage pipes shall be combined and wastewater can be discharged directly through the pipes to outside of the Boat. One (1) storm check valve shall be installed if necessary.

The deck scupper and gutter way shall be arranged around the wheelhouse to discharge the water to the upper deck.

2.2.15 Hatches and Manholes

Hatches and manholes shall be constructed according to the rules of the Classification Society and the Authority's requirement concerning weather tightness and coaming height.

The following hatches shall be provided.

<u>Location</u>	<u>Type</u>	<u>Quantity</u>
Cabin	Weather-tight, aluminum alloy	1
Fore store	Weather-tight, steel	1
Engine room	Weather-tight, steel	2
Steering gear room	Weather-tight, steel	1

The bolted maintenance hatch for main engines shall be fitted at the aft of deck.

2.2.16 Ladders and Steps

Stairway and handrail between wheelhouse and cabin shall be arranged. Stairs shall be of aluminum alloy and have PVC covering and slip-proofing.

Vertical ladder made of aluminum alloy at each hatch, etc. shall be provided. A handle clip shall be provided at top of each ladder.

Steps and/or grips shall be fitted for access to the top of wheelhouse, masts and where necessary.

One (1) aluminum gang plank of 5 m length shall be supplied for boarding/unboarding.

2.2.17 Hand Rails and Awning

To avoid the damage of safety hand rails when the Boat shall be rolled and pushed along the large vessels, safety rails(stanchion) shall be arranged inboard at/around the wheelhouse, etc.

All railings and stanchions shall be made of steel or aluminum pipes with plastic coated stainless steel wires. The railing shall be removable where necessary.

Storm rails (aluminum alloy) shall be fitted at wheelhouse, cabin, lavatory and so on.

An awning made of canvas shall be provided aft of wheelhouse.

2.2.18 Mast and Pole

One (1) aluminum alloy mast shall be arranged on the top of wheelhouse for all radio aerials, VHF aerial, radar scanner and radar reflector (mounted as high as practical), navigation lights and flag halyards.

Platform for outfit such as aerials, navigation lights, a vane anemometer, etc. shall be provided.

Removable flag pole and its foundation shall be provided (stainless steel) at stern.

2.2.19 Name of Boat, Draft Marks, Name Plates and Tallies

(1) Name of Boat

The name of the Boat shall be welded on and painted on the bow, port and starboard. The name and port of registry of the Boat shall be welded to the transom of the Boat and painted. All letters of the Boat's name shall be not less than 300 mm in height. Port of registry shall be 200 mm in height.

The Employer's logo shall be positioned on the superstructure side, port and starboard.

(2) Draft Marks

The draft marks measured above the bottom of the keel shall be welded on and painted on the stem and at the stern, port and starboard.

The draft marks in Arabic numerals shall be marked in meter. The figures shall be 100 mm height, spaced 200 mm apart and the bottom edge if each number is to correspondent to the exact draft indicated by that number.

(3) Name Plates

Each room, store, entrance shall be provided with lock and name plate.

One (1) shipyard name plate (indicating shipyard name, yard number and launching date) shall be displayed in front of wheelhouse.

An ODA (Official Development Aid) mark and/or Japanese flag as designated by Japanese Government shall be clearly indicated onboard as appropriate.

(4) Tallies

Tally plates shall be provided for the following to ensure correct identification and operation of all items of machinery and equipment:

- Identification of pipelines, valve operation, switches, controls and gauges.
- Safety signs
- Machinery operation notices

2.2.20 Deck Outfits

All deck outfits shall be in accordance with the requirement of the Classification Society.

(1) Outfits to be supplied.

2	-	Anchors
2	-	Anchor rope, nylon, 20mm ϕ x 70m
4	-	Mooring line
1	-	Towing line
1	-	Flag pole

(2) Navigation Outfits

1	-	Magnetic Compass
1	-	Spare bowl for the above (with box)
1	-	Portable Magnetic Compass
1	-	Bell (300 mm ϕ)
1	-	Clock
1	-	Binoculars
1	-	Barometer (Aneroid)
1	-	Black ball (net type)
3	-	Black diamond shape (net type)

2	-	National flag
1	-	International signal flag
1 set	-	International code book
1	-	Call sign flag

(3) Chart Room Inventory

1 set	-	Chart
2 sets	-	Square set
2	-	Divider
2	-	Scale
2	-	Parallel ruler
6	-	Chart weight
2	-	Triangles(navigator)

(4) Navigation Lights

1	-	Mast light
1 pair	-	Side light
1	-	Stern light
1	-	Anchor light
1	-	Not under command light

(5) Deck Inventory

1	-	Clinometer
1	-	Thermometer
Each 1	-	Painting tools (Paint scraper, paint pot)
Each 3	-	Painting tools (Brush (big, small)
1 set	-	Carpenter's tools
1	-	Aluminum gang plank (5 m length)
Each 1	-	Frame for certificate (certificate of ship's nationality, Certificate of ship's survey)
1	-	Key box
Each 1	-	Crew's name plates rack
2	-	White board
Each 1	-	Room name plates and locks
1	-	Shipyards name plate including yard number and launching day
1	-	Bottom plug spanner
1	-	Portable bilge pump (32φ drain suction)
2	-	Vinyl hose with nozzles (20φx 20m, for deck washing)
Each 2	-	Paint can for repair (20L can, blue, white, green)
Each 1	-	Paint can for repair (20L can, black, cream, red, light green)
Each 1	-	Canvas cover (Exposed electrical lighting equipment)

3 MACHINERY PART

3.1 General Description

The whole machinery installation shall comply with the requirements of the Classification Society and other rules and regulations concerned. Machinery, equipment and their accessories shall be of marine quality and suitable for the purposes intended.

Main engines, engine for alternator and other auxiliary machinery and equipment shall be arranged so that operation and maintenance can be easily performed and shall have enough headroom for maintenance.

Engine room shall be provided with sufficient ventilation. Piping system shall be arranged to avoid damages caused by thermal expansion and vibration, and piping installation shall be carried out so that maintenance and repair can be easily performed.

3.1.1 Shop Test

Workshop test for the following machinery shall be carried out to meet the Classification requirements.

- (1) Main engines
- (2) Alternator set
- (3) Major Auxiliary machinery & equipment

3.1.2 Sea Trial

Upon completion of the Boat, the sea trials shall be executed in the presence of the representative of the Employer/Engineer and the surveyor of the Classification Society as stipulated in the General Part of these Requirements.

During the sea trials, the measurements required for the items of machinery and equipment shall be performed and the results shall be submitted to the Employer/Engineer.

3.2 Main Engines

Two (2) sets of main engines shall be installed as follows.

Type	Non reversible, 4 stroke, single acting, high speed marine diesel engine with turbo- charger	IMO Tier 2
Numbers	2 sets	
Maximum continuous output	abt. 700kW	To be proposed
Engine speed	abt. 2,000 min ⁻¹	To be proposed
Continuous service output	85 – 90% MCO	To be proposed
Cooling system	Fresh water cooling (Sea water indirect cooling)	
Starting method	Cell motor start	
Fuel oil	Light gas oil	
Resilient mount	To be studied and proposed	
Accessories	• Air cooler • Turbocharger • Governor • Fresh cooling pump • Sea water cooling pump • Fuel oil pump • Lubricating oil pump • Control monitor	

Engine control shall be as follows:

Starting and stopping	From engine room (engine side)
Engine speed control	From wheelhouse and engine room (engine side)
Ahead and astern clutches	From wheelhouse and engine room (engine side)

3.3 Propellers and Shafts

The power of the main engines shall be transmitted to propellers via reduction gears and shafts.

3.3.1 Propellers

Two (2) sets of fixed pitch propellers shall be installed as follows.

Type	High skewed fixed pitch propellers	
Number	2 sets	
Number of blades	3 or 4 blades	
Propeller materials	aluminum bronze	
Propeller shaft	Stainless steel	
Stern tube	Mechanical seal	

3.3.2 Reverse Reduction Gear and Shaft

Two (2) sets of reverse reduction gear shall be installed as follows connecting to main engine with a flexible coupling and take axial thrust.

Type of reduction gear	Hydraulic operation, wet sump	
Number	2 sets	
Propeller shaft	Stainless steel	
Stern tube	Mechanical seal	

3.4 Generator set

One (1) set of generator consisted of a marine engine and a generator shall be installed.

Type generator engine	4 stroke, single acting, high speed marine diesel engine	Cell motor start
Number	1 set	
Continuous rating output	abt. 47kW	
Cooling system	Fresh water cooling (Sea water indirect cooling)	
Generator	abt. 38kVA(30kWe)	
Resilient mount	Rubber mount	

3.5 Piping Systems

Pipe materials and fittings shall be heavy duty and of a high marine commercial standard. All piping shall be conveniently arranged to facilitate access and repairs, and where feasible, shall be kept clear of electrical equipment, storage space, etc. It shall be well secured with rubber or plastic chafing pieces as required.

Pipe line	Materials	Remarks
Fuel oil	Carbon steel, Aluminum alloy	
Lubricating oil	Carbon steel, Aluminum alloy	
Fresh water	Stainless steel (SUS316), Aluminum alloy, PVC	
Sea water	Stainless steel (SUS316L), Carbon steel with lining inside	
Drainage / Bilge / Air escape	Stainless steel (SUS316), Aluminum alloy, Carbon steel	
Exhaust gas pipes	Stainless steel	

All pipes and valves shall be in accordance with JIS or equivalent. The material of valves shall be of bronze cast in general.

The joints shall generally not be made close to switchboards and electrical equipment.

The pipe lines shall be color-coded.

3.5.1 Cooling Water System

The main engines shall be cooled by heat exchangers. The cooling system shall incorporate a crossover facility, to allow engine to be cooled from either seawater inlet.

The main cooling system shall run seawater through the main engine heat exchanger and then out through the exhaust system.

Seawater for gearbox cooling shall be bled off from the main engine circuit at the outlet of the integral cooling pump, and through the gearbox to valved outlet skin fittings. Alternatively, if a dedicated seawater pump is required for gearbox cooling, it shall be directly driven from the main engine.

Same as main engines, generator engine shall be cooled by heat exchangers.

3.5.2 Fuel Oil Pipes

In order to supply fuel oil to both main engines, the pipes shall be installed from the fuel oil tank through the fuel oil collection tank to the fuel oil supply inlet of each main engine. The pipes for returning oil shall be installed to the fuel oil tank from each separately.

The fuel oil supply pipes for the diesel generator set shall be installed from the fuel oil collection tank to the fuel oil inlet of the generator. The pipe for returning oil shall be installed to the fuel oil tank.

The pipe for transferring small quantities of fuel oil shall be installed from the oil tank to the machinery room using a small, manual fuel oil pump.

3.5.3 Lubricant Pipes

The lubricant drain shall be able to be discharged to the machinery room by the lubricant discharge pump (portable electric type) through one (1) detachable hose connected to the lubricant drain outlet provided at each machinery.

3.5.4 Sea Water Pipes

The independent sea water suction inlet with strainer shall be provided for each main engine. Sea water used for cooling the main engines shall be discharged at each side or stern. Sea water suction shall be made by an integral, engine mounted pump.

Also, some seawater used for cooling the main engines is used to cool the stern tube seal equipment.

The independent sea water suction inlet with strainer shall be provided for generator engine. The cooling sea water used for the generator engine shall be discharged after cooling the exhaust gas silencer. Sea water suction shall be made by an integral, engine mounted pump.

The independent cooling sea water suction inlet shall be provided for cooling water pumps of air conditioner and the sanitary pump.

3.5.5 Bilge Pipes

The bilge piping for each watertight compartment, except the fore store, shall have a change valve for discharging from the Boat and onto the deck using both bilge, fire and general service pump and manual bilge pump. The bilge, fire and general service pump shall be used as standby cooling sea water pump for main engines

3.5.6 Exhaust Gas Pipes and Silencer

The silencer of main engines shall be wet type and made of titanium double tube type in accordance with Contractor's standard.

The exhaust gas pipe for main engines shall be led to transom and the material shall be of stainless steel.

The exhaust gas pipe for the diesel generator set shall be fitted with a wet type silencer.

3.5.7 Drain Pipes

The drained oil from the fuel oil filter of each main engine and the diesel generator set shall be transferred to the fuel oil drainage tank under the floor of the machinery room through each oil pan.

3.5.8 Marine Growth Prevention System

Marine growth prevention system (chemical dosing) shall be fitted in sea chest and controlled in engine room.

3.6 Pumps and Auxiliaries in Engine Room

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Bilge, fire and general service pump	1	electric motor driven
Bilge pump	1	manual operation
Portable bile pump	1	for fore store
Sanitary pump	1	electric motor driven
Fresh water pump	1	automatic operation by pressure switch
Cooling water pump for air conditioning system	2	1 set for back up
Fuel oil transfer pump	1	manual operation
Oil drain pump	1	manual operation
Lubricant transfer pump	1	electric motor driven
Other pumps	As required	

3.7 Other Fittings in Engine Room

Othe fittins in the engine room shown below, not limited to, shall be provided.

- Checkered aluminum plate shall be laid in engine room
- 1 x work bench with drawer and vice
- 1 x whiteboard
- Tool box
- Hand rail as required around machinery, stainless or aluminum

4 ELECTRIC PART

The whole electrical equipment and installations shall comply with the requirements of the Classification Society.

Materials, equipment and their accessories shall be of marine use type, good designs and substantial makes, assuring long life and easy of handling and maintenance.

Generators and power motors shall be tested at their makers' shops as required by the Classification Society.

Lighting and communication appliances, navigation aids, etc. shall be tested at the makers' shops as necessary before installed aboard.

After installation on board, these machinery, equipment and systems shall be tested under the working conditions.

Insulation tests shall be made for all electric equipment and systems after installation on board.

Results of these tests and trials shall be submitted to the Employer/Engineer.

4.1 Distribution Systems

The nominal voltage, frequency and distribution for electric equipment shall be proposed by the Contractor and approved by the Employer.

4.2 Electric Cable

All cables, in general, shall be of such quality and complying with the requirements of the Classification Society.

<u>Location</u>	<u>Type</u>
Machinery space	Ethylene propylene (E.P.) rubber insulated, polyvinyl chloride (P.V.C.) sheathed and steel wire braided cable
Wheelhouse, cabin and galley space	Same as above
Exposed space to weather	E.P rubber insulated, P.V.C. sheathed and steel wire braided with P.V.C. covering

Where cables pass through watertight decks or bulkheads, watertight cable glands shall be fitted. Where cables pass through beams or non-watertight decks or bulkheads, bushing or coamings with round edges shall be used as necessary for protection of cables.

The earthing work shall be carried out according to the Contractor's standard.

4.3 Electric Power Source**4.3.1 AC Generator**

One (1) set of the following A.C. generator directly coupled to diesel engine prime mover shall be installed.

Type	Semi-enclosed, drip-proof, self-ventilated, bluishless
Frequency, voltage, etc.	50Hz, 220V, 3-phase, 3-wire
Number and rated output	1 set, abt. 38kVA(30kWe)
Factor, rating and insulation	0.8, continuous, class "F"

Final rated output shall be proposed by the Contractor based on the electric power demand calculation including its prime mover for the Employer's approval.

4.3.2 Battery Charging Generators

Two (2) sets of battery charging generator driven by each main engine for DC 24V system/line shall be installed.

4.3.3 Storage Battery

The following storage battery for starting main engines, generator engine, emergency lights and internal/radio communication equipment shall be installed.

Type	Lead acid battery
Voltage and Capacity	DC 24V, 200Ah
Number	3 sets

Final capacity and number shall be decided by the Contractor.

4.3.4 Charging Rectifier

One (1) set of the following charging rectifier shall be installed at main switchboard.

Type	Silicon
Input	AC 220V, 3phase
Output	DC 22 - 35V, 30 - 40A

4.3.5 Shore Connection

Shore connection shall be provided to receive power from shore and connected to the main switchboard.

The receiving power capacity shall be proposed by the Contractor and approved by the Employer after detail design and site survey for shore supply facility at mooring berth.

4.4 Switchboard and Distribution Board**4.4.1 Main Switchboard**

Main switchboard made of aluminum alloy shall be installed in engine room as follows, but not limited to.

Type	Drip-proof, dead-front, Self-Standing with hinged front panel and insulated handrail
Consist of	1) Power generator panel – moulded case circuit braker, A.C. voltmeter, A.C. ammeter, wattmeter, frequency meter, etc. 2) AC 220V feeder pane - moulded case circuit braker, ground indicator lamp, A.C. voltmeter, A.C. ammeter, etc. 3) Charging-discharging panel - moulded case circuit braker, A.C. voltmeter, A.C. ammeter, etc. 4) Charging rectifier

4.4.2 Concentrated Board and Distribution Board

Concentrated board and distribution board made of aluminum alloy shall be installed in wheelhouse. The boards shall be provided with the following devices and other necessary equipment.

- | | |
|--------------------------------|--|
| + Navigation light indicator | + Searchlight and projectors on/off switch |
| + Wheelhouse lighting switch | + Push button for fire and general alarm |
| + Nautical and radio equipment | + Emergency stop switch |
| + Others | |

4.4.3 Distribution/Section Boards

Distribution/section boards shall be provided onboard where necessary. The boards shall be enclosed by protecting drip-proof metal (aluminum alloy) cases and shall be equipped with moulded case circuit breakers or fuse.

4.5 Power System

4.5.1 Electric Motors

Motors installed in the engine room and other spaces where protected from weather shall be of semi-enclosed, drip-proof type, while those installed on decks exposed to weather or those exposed to weather or moisture because of their duties or the manners of installation shall be of totally enclosed, water-proof construction. Insulation of motors shall be of class E, B or F.

4.5.2 Starters

In principle, across-the-line type starters shall be employed for all motors.

All starters shall be complete with magnetic contactors, overload relays, low voltage protection devices, pilot lamps and push button switches, except those for motors of 0.4 kW and below, which are to be equipped with knife switches, fuses and pilot lamps.

4.5.3 Emergency Stop Switch

Motors driving mechanical ventilating fans for engine room, air conditioning unit, etc. shall be arranged for simultaneous shut-down from outside of the engine room and the wheelhouse in case of emergency and break-out in fire.

4.6 Lighting System

The general and emergency lighting system shall be installed. General lighting system shall be sourced with A.C., 220V of MSB. Emergency lighting system shall be sourced with D.C. 24V back-up lighting circuits fed from the general use storage batteries.

The illumination level shall meet the provision in Japanese Industrial Standard JIS-F8041 throughout the Boat.

All lighting fixtures of marine use shall be as follows depending on their location:

<u>Type of fixtures</u>	<u>Locations</u>
Drip-proof type	Engine room, other machinery spaces, galley, lavatories
Waterproof type	Weather decks and spaces where exposed to heavy spray or moisture.
Non waterproof type	Wheelhouse, accommodation space and other dry spaces

Generally, the fluorescent type LED ceiling lights shall be provided for general lighting at each compartment. The incandescent lamps type LED shall be provided for supplemental lighting, localized lighting and emergency lighting.

4.6.1 Search Light and Flood Lights

One (1) search light of 1,000W Xenon type shall be provided on top of wheelhouse. Pan/tilt shall be operated from wheelhouse inside. The body shall be of corrosion resistant and light material such as aluminum alloy.

Two (2) sets of LED flood light shall be provided, one at the front and the other at back of the wheelhouse canopy as a deck work light.

4.6.2 Navigation Light

The following navigation lights shall be provided in accordance with Convention on the International Regulations for Preventing Collisions at Sea, 1972 as amended in 1981.

- 1 - Masthead light of single type
- 1 - Port side light with red lens, of single type
- 1 - Starboard side light with green lens, of single type
- 1 - Stern light of single type
- 1 - Anchor light of single type
- 2 - Not-under-command light (red pendant lantern)

4.6.3 Other Lights and Lamps

Other lights and lamps such as

- LED bed lamps (if required)
- One (1) set of 10W LED hand lamp with basket guards and flexible cabtyre cable of 20 meters in length
- Chart table light with an extensible arm and dimmer switch

Shall be provided.

4.7 Inboard Communication System

4.7.1 Common Battery Telephone

Four (4) sets of common battery telephone shall be installed for the communication among wheelhouse, engine room, steering gear room and cabin space.

4.7.2 Signal Bell

One (1) signal bell system, operated on D.C., 24 V, shall be provided for communication between wheelhouse and engine room.

4.7.3 Loud Hailer System

One (1) set of 20W loud hailer system shall be installed for outboard and inboard announcement. Speakers shall be arranged at the following place.

- + Wheelhouse top outside + Engine room
- + Wheelhouse + Cabin space

The electric power source shall be AC220V. In case of failure of AC220V power, D.C. 24V shall automatically be used as backup.

4.8 Navigation System

Multi-function display (MFD) system shall be adopted for radar, AIS, ECDIS, DGPS Navigator, etc. Details shall be consulted with the suppliers and/or makers

4.8.1 Multi-function Display(MFD) : 2 sets

- + 19" Color LCD displays

- + Displays for
 - Chart plotter (GPS plotter)
 - Radar
 - Echo sounder
 - AIS
 - Others

4.8.2 X band Radar : 1 set

- + Maximum Range : 36 nautical miles with ARPA
- + Antenna : 24" Radome
- + Display : MFD

4.8.3 Echo Sounder : 1 set

- + Frequency : 200kHz
- + Measuring Range : 2 – 200m
- + Display : MFD

4.8.4 GPS Compass : 1 set

- + Three antenna radome type
- + Display : 4.5" monochrome LCD

4.8.5 Magnetic Compass : 1 set

- + Desk top type, Card Diameter 125mm
- Also one (1) set of portable magnetic compass shall be supplied.

4.8.6 DGPS Navigator : 1 set

- + GPS/Beacon Antenna, RF 1575.42MHz, RC C/A
- + Display : MFD
- + Display data : Ship speed, Latitude, Longitude, Ship course
- + Position signal shall be supplied to relative equipment through processor.

4.8.7 Electric Chart Display System(ECDIS) : 1 set

One (1) set of ECDIS shall be proposed by the Contractor and approved by the Employer.

Function : Chart display, Ship's position fixing, Route planning, Track control, Route monitoring, Radar image, ARPA data display and maker's standard function

Electronic navigational chart (ENC) shall be supplied by the Employer.

4.8.8 AIS (Automatic Identification System) : 1 set

One (1) set of AIS shall be provided.

The GPS compass signal shall be feed to AIS system and AIS signal shall be taken out to ECDIS for AIS display.

4.8.9 Weather Meters : 1 set

- + Anemometer and Anemoscope
- + Barometer and Thermometer

4.8.10 Other Fittings

- + Ship Horn : 1set
- + Clock(wheelhouse) : 1 set
- + Inclinator(wheelhouse) : 1 set

4.9 External Communication System

Communication equipment shall be provided referring to the requirement of GMDSS A1・A2 area(JG rule for non-international voyage) as design guide.

4.9.1 MF/HF Radio Telephone : 1 set

One (1) set of MF/HF radio telephone shall be provided in wheelhouse.

4.9.2 VHF Radio Telephone : 1 set

One (1) set of VHF radio telephone shall be provided in wheelhouse.

4.9.3 International NAVTEX Receiver : 1 set

One (1) set of International NAVTEX Receiver shall be provided in wheelhouse.

4.9.4 Satellite EPIRB : 1 set

One (1) set of Satellite EPIRB shall be provided in wheelhouse.

4.9.5 Radar Transponder (SART) : 1 set

One (1) set of X band Radar transponder (SART) shall be provided in wheelhouse.

4.9.6 Other Communication Equipment

Two (2) sets of hand-held type VHF transceiver (floating type) with battery charger and hands free microphone (or speaker microphone) shall be supplied.

4.10 Supplementary Outfit and Spare Parts**4.10.1 Supplementary Outfit**

Special tools for handling control, overhauling and maintenance of electric machinery and equipment shall be supplied in accordance with their makers' standards.

The following tools, measuring instruments shall be supplied for general use.

1	-	500 V megger
1	-	Multi - tester, 0 ~600 V, A.C.
1	-	Clamp Ammeter
1	-	Electric solder trowel, 220 V, A.C.
1 roll	-	Solder
1 can	-	Soldering paste
1	-	Electro checker
1	-	Knife
4	-	Screw drivers, assorted size and head
1	-	Monkey wrench 12 in
1	-	Pincer
1	-	Radio pincer
6	-	Vinyl tapes, 2 red, 2 blue & 2 white

- | | | |
|---|---|--------------|
| 1 | - | Nipper |
| 1 | - | Vice grip |
| 1 | - | Rubber glove |

SECTION VI-4

SURVEY BOAT

SECTION VI-4: SURVEY BOAT

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Section VI-4: SURVEY BOAT

1 GENERAL PART

1.1 Intent

It is the intent of this Employer's Requirements to describe the guidance and minimum requirement for the design, materials, equipping, inspection, testing and documenting of "Hydrographic survey boat" (hereinafter referred to as "the Boat") for Matarbari Port Development Project in People's Republic of Bangladesh.

This Guidance is descriptive and general in nature. It does not specify the Boat in detail, or the details of the equipment to be included in the scope of supply. The Contractor shall recognize that the Employer requires the design of the Boat and of the equipment they contain to be up-to-date and proven and in service and similar to that in use for hydrographic survey boat around Chittagong port. The Boat will be used for hydrographic survey around Matrabari port including the vicinity of the SPM. The Boat shall make the patrol boat mission when it does not conduct survey work. The Boat shall be capable of being safely operated while performing its required duties in both benign and adverse weather and sea conditions.

1.2 Scope of Works

- 1) Design, supply of materials, fabrication including inspection and testing, and delivery of the herein under listed Equipment including associated equipment, spare parts, tools and documents to the Matarbari Port in Bangladesh.
- 2) Arrangement and assistance for the Employer's/Engineer's inspection and test for fabrication of survey boat at the manufacturer's workshop.
- 3) Arrangement and assistance for the Employer's/Engineer's witness inspection and test at the site.
- 5) Training of the Employer's personnel or other personnel so directed by the Employer on the operation and maintenance of the supplied survey boat at the Site.

1.3 General Description

The Boat shall be designed and built as the mono-hull, semi-displacement hull form, high-tensile strength steel hulled hydrographic survey boat equipped with twin diesel engines, coupled with fixed pitch propellers.

For easy maintenance, survey sensors shall be mounted over the side or the bow of the vessel, using a suitable pole and flange arrangement.

The Boat shall have suitable stability and manoeuvrability for the purpose intended, and shall have suitable strength and arrangement.

The described detailed dimensions and specifications in the following section are the reference standard values, and shall be proposed by the Contractor for the Employer's approval.

1.4 Design Guideline

Safety, reliability and ease of operation, minimum maintenance and good accessibility to all areas for repair and maintenance shall be the principal consideration in the detailed design of the Boat.

Modern and practical operation area to the latest standards shall be practiced in the outfit, lighting and furniture and other interior spaces.

The design shall provide the maximum possible all-around visibility from the wheelhouse. A clear sight onto the upper deck and the equipment is required. The layout of control and alarm panels or desks within such locations as the wheelhouse and engine room shall conform to the latest ergonomic design criteria.

The exposed upper deck shall be equipped with mooring gears, ventilation and escape hatches. Ventilator and inflatable life raft shall be provided. Wheelhouse shall be arranged, and radar, mast, speaker, etc. shall be provided on the wheelhouse roof.

All equipment and machineries which are part of the Boat shall be brand new and shall be made by original manufacturers as stipulated in the Requirements.

Any same article or work mentioned twice or more in the Requirements shall be supplied and/or executed only once.

1.5 Definition

1. The words "the Employer" shall be understood to mean Chittagong Port Authority.
2. The words "the Contractor" shall be understood to mean the Contractor who shall be responsible for the supply and construction of the Boat, including the work by all sub-contractors who may be engaged by the Contractor.
3. The terms "best marine practice" or "good shipbuilding practice" or their equivalent shall be understood to mean construction to soundly conceived and engineered plans and data incorporating the specified components so as to meet the intent of this technical guidance, utilizing the best construction and testing methods.
4. The terms "the Classification Society" shall be understood to mean "Nippon Kaiji Kyokai (NK) or International Association of Classification Societies (IACS)".
5. The word "Surveyor(s)" shall be understood to mean the person or persons duly authorized by Classification Society or other Statutory Authority.
6. The term "Employer's Representative" shall be understood to mean the Employer's or/and Engineer's Representative attending at the Contractor's yard during the period of construction.
7. The term "Contractor's standard" shall be understood to mean the standard established by the Contractor based on the international standard.

1.6 Language and Unit

all drawings, documents, and equipment manuals shall be prepared in English language and in metric (SI) units.

1. Equipment name plates and labels shall be in English.
2. JIS or equivalent system units shall be used for all instrumentation, notices and labels, machinery and fittings, identification and data.
3. All piping, valves and fittings to JIS standards or equivalent.
4. All tank volumes, gauges, etc., shall be in litres.

1.7 Principal Particulars

The Contractor shall propose the design with optimal dimensions to meet the Requirements:

1. Principal Dimensions

Length, overall	abt. 30 meters
Breadth, moulded	abt. 6 meters
Depth, moulded	abt. 4.5 meters
Designed draft, moulded	abt. 2.5 meters
2. Tank Capacity and Gross Tonnage

Fresh water tanks (100%)	not less than 5,000 Liters
Fuel oil tanks (100%)	not less than 8,000 Liters

Gross tonnage (by JG rule)	abt 25 tons
3. Main Engines	
High speed marine diesel engines	2 sets
Maximum Continuous Rating	abt. 650 kW/set
4. Speed and Endurance	
Operation speed on normal load of deadweight	abt. 12 knots
and at 100% Maximum Continuous Output (MCO) with no sea margin	
Endurance (at 12kts)	abt. 500 n. miles
5. Complement	
Crew	4 persons
Others (Surveyors)	12 persons
Total	16 persons

1.8 Materials and Workmanship

Materials, machinery, equipment and outfits shall be in accordance with Japanese Industrial Standard (JIS) or equivalent as far as practicable, and complies with the requirements of the Classification Society.

All materials and equipment used for the construction shall be new. The main hull of the Boat shall be constructed throughout of high-tensile strength steel plates and sections tested and approved as required by the Classification Society. Test Certificates shall be supplied as required.

All wood used in the Boat shall be well-seasoned, free from sap shakes, warps and other defects, and to be reasonably free from knots. All wood shall be impregnated with anti-pest and anti-rot composition. All smith work or fabricated fittings shall be of neat design, strong, smooth and free from defects, and shall be manufactured to the Classification Requirements and approval.

All cables, fastening, shackles, rigging, sheave blocks and light fittings shall be made of materials which have been tested, approved and certificates supplied.

ISO metric threads shall be used for screw threads as a rule. Materials, parts or products equivalent to the requirement of the Specifications may be substituted for those specified in the Specifications with prior consent by the Employer/Engineer and the Classification Society.

1.9 Rules, Regulations and Certificates

The Boat shall be commissioned as a hydrographic survey boat and is to be designed, built and surveyed under the Rules and the Regulations of Nippon Kaiji Kyokai (NK) or International Association of Classification Societies (IACS)".

The Boat shall not be engaged in international voyage and operated at restricted water area.

1.9.1 Rules and Regulations

The following rules and regulations in force at the date of signing the contract shall be applied.

- a) Maritime Rules and Regulations of the Bangladesh Government
- b) Rules and Regulations for the Survey and Construction of Steel Ships published by the Classification Society
- c) Regulations for Tonnage Measurement of small ships (under 24 meters) by JG or equivalent

- d) Convention on the International Regulations for Preventing Collisions at Sea, 1972 as Amended in 1981
- e) International Convention for the Prevention of Pollution from Ships, 1973 and the Protocol of 1978, ANNEX VI and its latest amendments
- f) For fire protection, detection and extinction, Classification requirements shall be applied
- g) For life-saving appliances, Japanese Regulations for Life-saving Appliance of Ships (non-international voyage, category four (4) vessel) shall be applied.

1.9.2 Certificates

The following certificates shall be furnished with the Employer/Engineer at the time of the delivery of the Boat.

Certificates	Issued by
a) Provisional Certificate of Bangladesh Registry	Bangladesh Government
b) Classification Certificate	Classification Society
c) Tonnage certificate (Non-convention)	Classification Society
d) Statement of Compliance for Engine Air Pollution Prevention	Classification Society
e) Certificates for anchors, chains, navigation lights, sound signals, life-saving apparatus, etc.	Classification Society
f) Builder's certificate	Contractor (Shipbuilder)
g) Compass Adjustment Certificate	Contractor (Shipbuilder)
h) Deratization Exemption Certificate	Government of Contractor's Country
i) Certificates as per The Inland Shipping Ordinance (1976)	Bangladesh Government

All Classification and statutory surveys, certificates and fees shall be paid by the Contractor. All necessary certificates, issued by the Classification Society, regulatory bodies and the Contractor shall be handed over to the Employer at the time of delivery of the Boat.

1.10 Inspection, tests and trials

1.10.1 General

The Boat's construction, machinery, outfits and equipment shall be inspected and tested at the premises of the Contractor or subcontractors under the presence of the Employer/Engineer and/or the surveyor(s) representing the Classification Society and/or Authority in accordance with their respective rule requirements at the time of signing the contract.

Inspections, tests and trials shall be carried out in accordance with Contractor's standards and Class protocols for inspections, tests and trials, details of which shall be submitted to the Employer/Engineer for approval. Contractor's standards for performance of inspections, tests and trials shall be subject to approval of the Classification Society, Authority and the Employer/Engineer.

The Contractor shall deliver to the Employer/Engineer in duplicate a key schedule of inspections, tests and trials to be performed up to the delivery of the Boat and submit update if necessary. The Contractor shall deliver to the Employer/Engineer details schedules of inspections, tests and trials during the construction periods of the Boat.

The Contractor shall bear all costs, including International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance etc. for the Employer/Engineer to attend the inspections, tests and trials at the premises of the Contractor.

This schedule shall be prepared in consultation with the Employer/Engineer and shall be timely informed no later than 28 working days in advance to make arrangement for attending the inspections, tests and trials.

All tests, trials and re-trials will be at the expense of the Contractor. The tests and trials expense shall include fuel oil, lubrication oil, system oil, fresh water, food, crew, equipment, stand-by vessel and any other expense connected with the trials. The contractor shall bear all costs, including the travel expense, lodging expense and allowance, etc. for the Employer/Engineer to attend the inspections, tests and trials at the premises of the Contractor. The times, numbers and timing to attend those inspections, etc., shall be finalized between the Employer/Engineer and the Contractor.

Any unsatisfactory test or part of it shall be repeated, after correction of defects, to the satisfaction of the Employer/Engineer and/or the Classification Society and/or the Authority concerned.

The Contractor shall submit in triplicate copies of all inspection, test and trials reports carried in accordance with the requirement of specification, Class etc.

Qualified personnel of the main engine, gearing, electrical/control & instrumentation, which and propulsion system manufacturers shall be in attendance during commissioning, dock trials and sea trials at the Contractor's expense.

Confirmation of accepted tests and trials shall be by the signature of the Employer/Engineer and/or the Classification Society and/or representative of the Authority concerned. On completion of the trials, a general survey shall be made and defects which may have been developed or any work found incomplete are to be corrected and made good by the Contractor before delivery.

Prior to sea trials, the Boat shall be dry docked for final inspection and bottom painting. The Boat shall be dry docked after the sea trials in case serious underwater defects are expected, in order to allow for a complete inspection of the underwater hull, propellers, anodes and paint.

Before the sea trials all underwater painting work shall be finished, propellers and rudders inspected and polished or painted. After the sea trials the Contractor shall submit a sea trial record book in which all data and records are to be carefully analysed and compiled.

All installations including main engines, auxiliary machinery, electric generators, electric equipment, instrumentation and controls commissary equipment, weather tight doors, any key equipment, winch, etc. shall be thoroughly tested on board by the Contractor or manufacturers to demonstrate their suitability for the purpose intended and that the Requirements have been fulfilled.

Prior to the commencement of the sea trials the main engines shall run at least for two (2) hours.

The sea trials shall be performed at normal load condition under deep sea condition with a wind speed not exceeding Beaufort 2. Trial loading condition shall be submitted to the Employer/Engineer for approval not later than 14 working days in advance of the sea trials. Upon completion of sea trials, any machinery considered necessary by the Employer/Engineer and/or the Classification Society shall be opened up for inspection.

The result of these tests shall be submitted to the Employer/Engineer within seven (7) working days of the tests being completed.

1.10.2 Shop Tests

The shop tests program shall be submitted to the Employer/Engineer no later than 30 working days in advance.

Main engines, propulsion machinery and other equipment shall be shop tested in accordance with requirements of the Classification Society and/or the standard protocols of the manufacturers and to the satisfaction of the Employer/Engineer.

The shop test of main engines and generator set will be conducted under the Employer/Engineer and Contractor. All reading and data of the inspections, tests and trials performed shall be submitted to the Employer/Engineer for approval.

1.10.3 Shipyard Testing

All tanks and main hull compartments shall be tested for oil and water tightness according to the Classification Society requirements prior to any paint application except shop primer. Before testing, all tanks shall be structurally complete, with all external pipe fittings, connections fitted and cleaned. Subject to the specific requirements of the Classification Society and the Employer/Engineer, no tank or compartment boundary welded connections shall be coated or painted until testing has completed and the tank or compartment has been passed by the Employer/Engineer. Spaces with bulkheads permanently exposed to drip and splash water and floors which are covered with cement or tiles, before painting and before floor coverings are laid, will be tested according to the Classification Society requirements.

Weather tightness of exterior doors, windows and hatch covers shall be tested by means of hose testing as required by relevant regulations.

1.10.4 Launching

The Contractor shall be responsible for satisfactory launching of the Boat. The Contractor shall make all necessary arrangements and inform the Employer/Engineer and the Classification Society in writing fourteen (14) days in advance of the date of launching. The launching shall be carried out in daylight.

1.10.5 Dock Trial

Dock trial shall be carried out at the Contractor's expense prior to the official sea trial in accordance with the completion program agreed with the Employer/Engineer, to ensure correct performance of all machinery.

Engine room, machinery and systems shall be cleaned and free from loose building materials before testing will take place.

The trial shall include the testing of at least the following machinery, installations and systems but not limited to the following:

- Main engines and propulsion systems
- Auxiliary machinery
- Load tests of alternator set and switchboard tests
- All deck machinery
- All piping systems including pumps, valves, cocks
- All electrical systems including alarms and control systems, navigation equipment
- Ventilation supplies and exhaust systems
- Air conditioning systems

Before trials of main machinery are commenced, test for entire auxiliary machinery shall have been completed and proven to be in good working order.

The main propulsion system will be tested for a minimum continuous duration of two (2) hours under the supervision of the main engine manufacturer after ensuring satisfactory alignment of the main engine, propulsion units and shafting in accordance with manufacturer requirements and within their specified limits.

Each pump shall be operated on the respective systems.

The necessary water and sanitary systems shall be in continuous operation during trials, and each tap, water closet, etc., together with all fittings are to be operated and the specified pressures maintained on the system.

All defects shall be remedied by the Contractor and re-tested to the satisfaction of the Employer/Engineer before sea trials.

Lifesaving equipment shall be tested and demonstrated to the satisfaction of the Employer/Engineer, Classification Society and the Authority concerned.

1.10.6 Official Sea Trial

Official Sea Trial shall be carried out in accordance with the Contractor's program approved by the Employer/Engineer, the Classification Society and Authority. During the official sea trials, the Boat shall be under the command of an experienced captain nominated by the Contractor.

The Contractor shall prepare and submit a detailed trial program 28 days working days prior to commencement of the official sea trial showing the method, order and time schedule of the trials to the Employer/Engineer for approval.

The Contractor shall perform the following tests and trials, but not limited to, in the attendance of the Employer/Engineer and the representatives of the Classification Society.

- Progressive speed trial
- Crash stop astern and crash stop ahead test
- Steering gear test
- Turning test
- Endurance test including measurement of fuel oil consumption
- Anchoring test
- Starting test of main engines
- Dead slow test of main engines
- Test and/or adjustment of nautical equipment
- Noise & Vibration measurement
- Air conditioning system test

(1) Progressive Speed Trial

Progressive speed trial shall consist of the following runs over officially measured mile course and the speed in each case shall be determined as an average of one (1) double runs in opposite directions.

Main Engine Revolution at	round trip
1/4 of maximum continuous revolution	1
2/4 of maximum continuous revolution	1
3/4 of maximum continuous revolution	1
4/4 of maximum continuous revolution	1
Maximum Continuous Output (MCO) or corresponding to maximum allowable shaft revolution	1

On completion of the official sea trials, the Contractor shall present immediately the report including speed-power curves to the Employer/Engineer.

Main engine output shall be estimated from the measured engine data during the speed trial using the results of the shop test of main engines.

(2) Endurance Trial

To consist of 30 minutes approx. 10% over speed and two (2) hours with the engine running at maximum continuous rated rpm.

The following data shall be recorded at 30 minutes intervals:

- Engine room temperature
- Main engine jacket water temperature & pressure
- Main engine lubricating oil pressure & temperature
- Main engine exhaust temperature
- Fuel rack setting
- RPM of main engine
- Other data to be advised by Engine Maker and the Employer/Engineer
- Main engine cooling sea water inlet temperature

1.11 Stability and Trim

The Boat shall have enough stability and freeboard. The calculation sheets of each condition based on the inclining experiment shall be submitted to the Employer/Engineer, the Classification Society and the Authority.

The stability of the Boat for any reasonable condition of loading shall conform to the criteria by the Classification Society and as required by relevant authorities.

1.12 Inclining Experiments

When the Boat has reached a sufficiently advanced stage of construction, and only minor work remains to be completed, the lightweight, vertical and longitudinal centres of gravity of the Boat shall be determined by means of an inclining experiment.

The inclining experiment shall be attended by the Employer/Engineer and/or his representative and the Classification Society and/or Authority who shall be given notice for this purpose at least 28 days before. During the inclining experiment, the Boat shall be in a suitable condition approved by the Classification Society. No loose water or oil on board, and all shipyard equipment, rubbish etc., shall be removed.

A "Trim and Stability" booklet shall be prepared by the Contractor after the light Boat data has been calculated from the inclining experiment. Each condition listed in the booklet to state the correction made to the metacentric height for the free surface effects and the tanks included in the free surface correction. Sufficient number of conditions to satisfy the Classification Society shall be provided.

1.13 Basic Numerical Value

Specific gravity used for the design of the Boat to be as follows:

Sea Water	1.025
Fresh Water	1.000
Fuel Oil	0.850
Lubricating Oil	0.900

1.14 Vibration

The Contractor shall take all practical steps to minimize vibration particularly in the accommodation, main mast and wheelhouse to the satisfaction of the Employer/Engineer and the Classification Society. Any excessive vibration abnormal for this type of the Boat discovered during trials shall be rectified by the Contractor at his own expense.

1.15 Drawings and Plans

1.15.1 Approval Drawing

The Contractor shall prepare and submit to the Employer/Engineer, the Classification Society and the Authority for approval of drawings, calculations, documentations and other technical details required for the constructions and fitting out of the Boat.

The Contractor shall be responsible for the approval procedure with the Classification Society and the Authority and shall submit to the Employer/Engineer copies of all correspondence concerning technical matters between the Contractor and the Classification Society and the Authority.

Prior to commencing the design of the Boat, the Contractor shall submit a list of drawings including manufacturer's drawings to the Employer/Engineer for approval. Before starting prospective works, the Contractor shall submit each one (1) copy in electric format and three (3) print copies of the drawings and plans specified in the lists of the drawings and plans for approval to the Employer/Engineer, and one (1) copy each to be returned to the Contractor with approval or comments, if any, by the Employer/Engineer. The approved drawings and plans shall be returned to the Contractor within three (3) weeks after submission by the Contractor to the Employer/Engineer. If the approved drawings and plans are not returned to the Contractor within the said period, it is considered that those are approved without comments. List of drawings for approval shall include the following contents, but not limited to:

(1) General

- 1) Technical Specifications
- 2) General Arrangement
- 3) Lines
- 4) Hydrostatic table
- 5) Cross table of stability
- 6) Bonjean table
- 7) Initial calculation of weight, trim and stability
- 8) Tonnage Calculation
- 9) Tank capacity plan
- 10) Speed power curves including calculation for propeller particulars
- 11) Test method of official sea trial

(2) Hull Construction

- 1) Midship section
- 2) Construction profile and deck plan
- 3) Shell expansion
- 4) Scantling calculation
- 5) Frame lines
- 6) Fore construction
- 7) Engine room construction including main engine bed
- 8) Aft construction
- 9) Wheelhouse construction
- 10) Skeg construction

- 11) Windlass seats and under deck stiffening
- 12) Towing fittings and under deck stiffening
- 13) Anodes
- 14) Docking plan
- 15) Welding procedures

(3) Hull Fitting

- 1) Wheelhouse arrangement
- 2) Mooring arrangement
- 4) Accommodation arrangement
- 5) Arrangement of outfitting
- 6) Chain pipe and hawse pipe
- 7) Mast construction
- 8) Fender arrangement
- 9) Arrangement of life saving equipment and firefighting appliance
- 10) Painting scheme
- 11) Insulation of deck covering
- 12) Arrangement of hull piping
- 13) Air conditioning units and ventilations
- 14) Windows and sidelights
- 15) Internal and external doors
- 16) Hull inventory list
- 17) Equipment list for accommodation

(4) Machinery

- 1) Engine room arrangement
- 2) Shaft arrangement
- 3) Piping diagrams
- 4) Arrangement of exhaust gas piping in engine room
- 5) Insulation of exhaust gas pipe
- 6) Details of tanks
- 7) Sea inlet details
- 8) Arrangement of hull fitting valves
- 9) Torsional vibration calculation
- 10) Arrangement of floor, ladder and grating in engine room
- 11) Machinery inventory list

(5) Electric

- 1) Wiring diagram of power circuit

- 2) Wiring diagram of lighting circuit
- 3) Wiring diagram of nautical and communication equipment
- 4) Electric power balance calculation
- 5) General arrangement of electric installation
- 6) Remote control system drawing for main engine and propeller
- 7) Navigation lights
- 8) Electric Inventory list
- 9) Equipment for Patrol Mission
- 10) Bathymetric Survey Equipment

1.15.2 Finished Drawing

Upon delivery of the Boat, four (4) sets of the finished drawings and plans specified in the lists of the finished drawings and plans generally to include but not limited to, results of various tests and inspections and a detailed list of spare parts, inventories and tools provided, and shall also submit four (4) sets of the instruction manuals for all items of machinery, electrical, and electronic equipment written in English shall be handed over to the Employer/Engineer, and one (1) copy each to be placed on board the Boat. One (1) copy shall be provided in electronic format.

One (1) set of the following finished plans shall be mounted in frames and displayed on board.

- General Arrangement
- Other plans as required by the regulations

1.16 Identification

Draft mark, ship's name, port of registry, each steel plate make shall be welded to the hull.

Each room, valve, pipe head and manhole, etc. shall be fitted with name plates where necessary as per requirements of the Employer/Engineer and the Classification Society.

Furthermore, all switchboard controls shall be identified by English labelling.

1.17 Site Conditions

The Boat, machinery and all equipment shall be suitable for operation under climatic conditions in the waters around Chittagong port and newly developed Matarbari port, Bangladesh.

Allowance shall be made for ambient air temperature of 45 degrees C, sea water temperature of 35 degrees C and seasonal high relative humidity.

1.18 Building Berth, Launching and Docking

During building and in the assembling of pre-fabricated sections at the berth, the utmost care shall be taken to ensure good alignment and fairness. Keel sightings and measurements shall be recorded at regular intervals.

Careful allowances shall be made before final welding to avoid permanent distortion. At all times during building the hull shall be earthed.

1.19 Supervision and Inspection

During the entire period of construction, the Contractor shall permit the Employer's/Engineer's Representatives to enter the Shipyard for supervision of the works. This supervision does not include Inspection, Tests and Trials as described in Section 1.10 above. The required number of the Representatives and supervision period is shown below.

No. of Supervision	Purpose	Schedule	No. of Inspector		Days
			Employer	Engineer	
1	Survey of Manufacturing capacity of Factory	After Contract signing	4	2	4 (3 nights)
2	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
3	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)
4	Progress and Quality Inspection during Manufacturing	During fabrication	4	2	4 (3 nights)

To enable the Employer/Engineer to execute their duties and attend trials of any of the larger units shall be conducted at the Contractor's yard or at their sub-contractor's premises; the Contractor shall notify the Employer/Engineer at least fourteen (14) days in advance of the time and location of any trials.

The Contractor shall be advised by the Employer/Engineer of the names of the person authorized to give decisions on the Employer's/Engineer's behalf and also the extent of the authority vested in such persons. The decision of such persons shall be final and binding upon the Employer/Engineer.

The expense of the Employer's/Engineer's Representatives required for supervision at the manufacturing factory of the Contractor such as International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance, shall be borne by the Contractor.

Drawings, specifications, lists of materials and other relevant information as required by the Employer/Engineer shall be furnished and made available to them. Copies of the technical correspondence as well as of all minutes taken down at meetings by the Contractor shall be made available to the Employer's/Engineer's Representatives, all in English.

Any inspection carried out by the Employer's/Engineer's Representatives shall be for the purpose of verifying the quality control function of the Contractor and shall not be used to relieve the Contractor of his responsibility to maintain a high standard of workmanship thorough competent and thorough supervision.

1.20 Quality Control

The Contractor, using its Quality Control Team, shall ensure that the labour standard and material quality during construction is in accordance with the Contractor's Standard Shipbuilding practice, the rules of the Classification Society and the statutory regulations.

One member of the Contractor's Quality Control Team shall be assigned to and shall maintain close liaison with the Employer's/Engineer's supervisors. The Contractor shall provide the Employer's/Engineer's supervisors with complete access and availability to tests, test reports, X-rays, samples and unpriced purchase orders etc., involved in the construction.

A quality plan shall be submitted by the Contractor and agreed upon between the Employer/Engineer and the Contractor. The requirements in the quality plan to include quality

assurance system of sub-contractors. A list of major sub-contractors should be provided to the Employer/Engineer for their approval.

1.21 Construction Progress

Construction progress report shall be issued by the Contractor for Employer's/Engineer's guidance. The Contractor shall submit monthly progress report to the Employer/Engineer.

1.22 Delivery and Taking-Over

Upon satisfactory completion of the trial program, the Boat, all compartments, tanks, machinery, accommodation spaces, bilges, and tank top shall be thoroughly cleaned and prepared for delivery to the Employer. All deteriorated paint-works shall be restored and rusted areas shall be power brushed, primed and painted.

In accordance with the Contract, the Boat shall be transported to Chittagong port, People's Republic of Bangladesh by the Contractor at the Contractor's responsibility and cost. The Boat shall be taken over afloat to the Employer at Chittagong Port Authority office after acceptance inspection by the Employer/Engineer.

1.23 Provisional Registry

The Boat shall be registered under the laws and regulations of People's Republic of Bangladesh. The Employer shall apply for the provisional registry of the Boat within 14 days after receipt of the following certificate.

- 1) Classification (Hull & Machinery)
- 2) Tonnage
- 3) Contractor's Certificate
- 4) Bill of Sale

The Employer is responsible for the registration of the Boat and all costs incurred in relation to the registration of the Boat.

The Contractor shall apply the custom and de-ratting certificate from the local authorities after the Employer has submitted the provisional registry to the Contractor.

1.24 Defect Liability

The Contractor shall guarantee for a period of not less than twelve (12) months the workmanship, materials including paint work and equipment of the Boat against defects.

Not later than twelve (12) months after delivery, the Boat shall be dry-docked at a shipyard designated by the Employer for final inspection of hull, shafting, propellers, rudders, gearing, etc.

Defects found during dry docking shall be made good at the Contractor's account and to Employer's/Engineer's satisfaction. The Contractor shall bear all the cost of the final inspection. If any defects are found, any necessary expenses within the scope of guarantee shall be to the Contractor's account.

1.25 Spare Parts, Inventories and tools

Mandatory (standard) spare parts, inventories, and tools for two years operation shall be provided in accordance with the requirements by the Rules and Regulations of the Classification Society, and those items not specified in the Rules and Regulations shall be provided in accordance with the Contractor's/manufacture's standards. Special tools for maintenance purpose shall be provided.

If the Contractor recommends additional spare parts, he shall submit the Recommended Spare Parts List to the Employer/Engineer which includes details of the items and unit costs.

1.26 Delivery Period

Boats shall be delivered to the Employer within 18 months from the commencement of the Works.

1.27 Training

The Contractor shall provide training for the Employer's Personnel for the whole Boat at the Site. The Contractor shall provide experienced engineer(s) at the Site to execute the training at his own expense. All training texts and lecture materials shall be prepared by the Contractor free of charge, whilst a lecture room shall be arranged by the Employer. The instruction and training shall be in English. The detailed training programme shall be submitted to the Employer/Engineer for approval at least six (6) months before arrival of the Boat at the Site. The Contractor shall, at his own expense, provide all necessary tools, materials, equipment and manpower for the training.

The number of trainees and duration of the training of the maintenance and operation personnel shall be at least as shown in Table below:

Item	Trainee		Min. duration of training
SurveyBoat At the Site	Maintenance	Seven (7) mechanical engineers Seven (7) electrical engineers	14 days
	Operator	Nine (9) persons	14 days (4 h/day)

2 HULL PART

2.1 Hull Construction

2.1.1 General

Scantlings of structural members shall be in conformity with the requirement of the Classification Society and shall have adequate strength for the purpose intended. Careful consideration shall be paid to maintain continuity of structural strength. Where structural continuity is insufficient, necessary compensation shall be provided by taper, overlap and brackets.

Main hull shall be built by high-tensile strength steel. Superstructure such as wheelhouse, radar mast, etc. shall be constructed by aluminum alloy.

Steel-titanium-aluminum clad plate shall be inserted where steel construction and aluminum alloy construction are joined.

Hull construction shall be approved by the Classification Society.

All works for hull construction shall be carried out in accordance with the Contractor's practice and under the survey of the Classification Society. Temporary access and ventilation openings may be provided on deck, tank top etc., where necessary, for the convenience of work, and shall be recovered in place by welding subject to the approval of the Classification Society.

Prefabrication shall be used wherever possible for the maximum use of down hand welding. Structures contributing to the longitudinal strength of the Boat shall be generally continuous. Abrupt changes of strength shall be prevented and the scantling of longitudinal strength members shall be changed gradually where necessary. The termination of strength members shall be arranged in a manner to minimize a concentration of stresses.

The main and auxiliary engine girders shall be efficiently integrated with the main hull structure. In way of deck machinery, mooring fittings and elsewhere as required, welded deck plates of increased thickness shall be inserted and the structure in way it shall be strengthened. Main and auxiliary engines shall be seated on resin chock. Deck machinery shall be seated on steel machined foundation.

2.1.2 Welding

The Boat shall be constructed by the block construction method

The Boat shall be of all welded construction. The welding shall be conducted in the best practice, approved sequences and every endeavour shall be made to avoid locked-in stresses.

All slag shall be removed.

All furnished welds shall be sound, uniform and substantially free from slag enclosures, porosity, undercutting gas enclosures and other defects. Where plate edge gaps are excessive, filling in pieces, liners or packing places shall not be used except with the permission of the Employer/Engineer.

X-rays of area as required by the Classification Society shall be taken and to be for the Contractor's account including re-examination for defects.

2.1.3 Scantling

All scantlings shall be in accordance with the Classification Society's requirements for thickness of plating and modules of sections, except where specifically strengthened for the loadings specified.

2.1.4 Bottom and Side Shell

The bottom shell shall be constructed using longitudinal rib system consisting of a centre keelson, side keelsons, longitudinal ribs, rib frame and shell plate.

The side shell shall be constructed using a longitudinal frame system of longitudinal frames, transverse girders and shell plate.

2.1.5 Deck

The deck structure shall be constructed using a longitudinal rib system. The deck shall consist of a centre girder, side girder, deck beams and shell plate.

2.1.6 Bottom Construction

Bottom shall be of single bottom construction, and shall be reinforced with centre keelson, side keelson and floor.

2.1.7 Chine and stopper

The shell plate shall have steel chine for rolling stabilizer from bow to stern. Round bar stoppers shall be provided at gunwale (top of side shell) for anti-slip

2.1.8 Skeg and Shaft bracket

Skeg to be installed at the bottom along the centre line.

Shaft bracket shall be made of stainless steel.

2.1.9 Main Engine Foundation

Main engine bed shall be of rigid welded construction, and to bear weight and vibration of main engine. Construction under engine bed shall be reinforced with string girder plates.

Auxiliary machinery bed shall be of all welded construction. Construction under generator bed shall be reinforced with girder plates, etc.

2.1.10 Fresh Water Tank

One (1) fresh water tank of not less than 5,000 litres shall be fitted. a cleaning opening, air vent pipe, drain pipe, etc.

2.1.11 Fuel Oil Tanks

Two (2) fuel oil tanks of not less than 8,000 litres shall be fitted with a cleaning opening, air vent pipe, drain pipe, etc.

2.1.12 Corrosion

Attention shall be given to the non-compatibility of dissimilar metals and the galvanic corrosion that may occur, especially in a marine environment.

2.1.13 Steel Fender

One (1) line of steel fender of half round bar shall be fitted on side shell at each side.

2.2 Hull Fittings

2.2.1 Steering Gear

One (1) set of hydraulic type steering gear shall be equipped. Hydraulic pump shall be driven by main engine or electric motor. Two (2) sets of hanging rudders shall be equipped.

2.2.2 Anchors and Ropes

Anchors, anchor rope and mooring ropes shall be equipped in accordance with the requirements by the rule's applicable.

<u>Items</u>	<u>Type & Particulars</u>	<u>Quantity</u>	<u>Remarks</u>
Anchor	Danforth type, 25kg	2	
Anchor rope	Nylon Rope 20mm dia.	70m x 2	
Towing rope	Nylon Rope 21mm dia.	110m x 1	
Mooring rope	Nylon Rope 20mm dia.	40m x 3 80m x 1	

One (1) anchor shall be lashed at bow hand rail and the other shall be installed and lashed on seat at store.

The final weight, size, length, etc. shall be decided after approval from the Classification society.

2.2.3 Deck Machinery

One (1) set of an electric motor driven capstan shall be installed at bow as follows.

Location	Type	Capacity	Quantity
Bow	Electric motor driven, vertical, rewind	abt. 0.2 tf x 15m/min	1

The capstan shall be used for rope mooring and anchor handling.

2.2.4 Mooring and Fittings

Mooring fittings, such as bollards, mooring holes, etc. shall be arranged and supplied.

Items	Material	Quantity	Remarks
Cross bitt	Steel (large)	5	Bow x 3, Stern x 2
Cross bitt	Steel (small)	6	Bow x 2, Midship x 4
Fairleader	Steel	7	Open or Closed type
Cleat	Steel	AR	As Required
Pendant fender	Synthetic foamed rubber, 250φ	4	with rope, pillow type

2.2.5 Rubber and Steel Fenders

Rubber fenders with the following particulars shall be fitted on suitable locations.

Location	Type	Material	Size (mm x m)	Quantity
Bow	Hollow cylindrical	Synthetic rubber	φ150 x 8.0	1
Midship	Hollow cylindrical	Synthetic rubber	φ150 x 1.0	6
Stern	Hollow cylindrical	Synthetic rubber	φ150 x (0.8+0.8)	2

One (1) line of steel fender of half-round bar shall be fitted on side shell at each side.

2.2.6 Painting

Prior to the application of coating materials, steel surfaces shall be well cleaned by disc sander, scraping and/or wire-brushing in order to remove rust, oil, water, dust, and/or other foreign materials.

The surface of steel plate and sections used for hull structure shall be shot-blasted to remove all mill scale and coated with shop primer before construction work. The grade of shot blasting shall be equivalent to SA 2.5.

Painting scheme to be recommended by paint makers and approved by the Employer/Engineer.

Steel outfits for mooring (except stainless steel portion) shall be galvanized.

2.2.7 Cathodic Protection

A sacrificial type zinc anodes cathodic protection system with suitable size and number for sufficient endurance shall be provided. The lifetime of the anode and necessary amounts of spare parts shall be proposed by the Contractor and approved by the Employer.

2.2.8 Air Conditioning System

Central cooling with duct system shall be applied for wheelhouse and accommodation. The system shall be designed to meet the following conditions.

	<u>Temperature</u>	<u>Humidity</u>
Outside air	35 °C	70% RH
Inside air	23 °C	50% RH
Sea water	35 °C	-

Spot cooling system shall be applied to pilot seats in wheelhouse and galley.

Cooling unit shall be installed on upper deck and under deck. Air shall be sent to each room unit through ducts.

The air conditioning ducts shall basically be made of aluminum alloy and the ducts shall be insulated by glass wool (25mm thick with aluminum cloth) secured with metal hardware.

Two (2) sets of condensing units of air conditioning system shall be installed in engine room and cooling water pumps for the system shall be installed in engine room.

Air conditioning system shall be stopped from wheelhouse.

2.2.9 Ventilation System

Mechanical ventilation shall be provided as follows.

<u>Location</u>	<u>Type</u>	<u>Quantity</u>
Engine room	Mushroom (reversible)	2
Steering gear room	Mushroom (reversible)	2
Wheelhouse	Multi-blade (exhaust)	1
Cabin	Multi-blade (exhaust)	1
Toilet	Multi-blade (exhaust)	1
Galley	Multi-blade (exhaust)	1

Natural ventilation made of aluminum alloy shall be provided at wheelhouse, fore cabin and galley space.

In addition to the space mentioned above, all spaces where not under air conditioned and/or not under mechanical ventilated shall be provided with natural ventilation such as gooseneck, mushroom, etc..

The ventilator shall have a closable device and fire cover.

Each ventilator for wheelhouse and living quarter shall have an insect screen.

2.2.10 Life-Saving Equipment

Life-saving equipment shall be provided as follows.

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Inflatable life raft	1	20 persons in FRP container
Life jacket	16	-
Life buoy	2	with 30m line
Self-igniting signal light	1	-
Self-activating smoke signal	2	-
Parachute signal	4	-
Rocket star signal	2	-
First aid kit	1	-

Items and quantity shall be decided finally to meet the requirement by applicable laws/regulations.

2.2.11 Fire Fighting Equipment

Fire-fighting equipment shall be provided as follows.

<u>Items</u>	<u>Quantity</u>	<u>Compartment</u>
Portable powder extinguisher, 5kg	2	Engine room and cabin
Portable CO ₂ extinguisher, 5kg	3	Wheelhouse, engine room and cabin
Auto diffusion type extinguisher	2	Engine room
Fire axe, bucket, etc.	AR	(As required by applicable laws/regulations)

Items and quantity shall be decided finally to meet the requirement by applicable laws/regulations.

2.2.12 Accommodation Fittings

The design of Insulation and lining, floor and floor plate, windows and doors shall be proposed by the Contractor for the Employer's approval.

2.2.13 Accommodation Equipment

Accommodation Equipment of wheelhouse and cabin space shown below, but not limited to, shall be provided by the Contractor.

2.2.13-1 Wheelhouse

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Steering console	1	
Ship horn / Public addresser system	1 set	
Magnetic compass	1	
Navigation equipment	1 set	
Radio equipment	1 set	
Barometer / Inclinator / Clock	1 each	
Pilot chair	2	With dumper
Crew chair	3	
Chart table	1	Light with dimmer
Binocular storage box	1	
Whiteboard	1	

* Wash basin shall be arranged outside of closet and washing hose shall be fitted nearby water closet.

2.2.12-2 Cabin Space

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Sofa & bed	5	
Table	1	
Locker	5	
Sink with water faucet	1	
Refrigerator	1	300ℓ
Hotplate	1	
Microwave oven	1	
Whiteboard / Clock	1 each	

2.2.14 Deck Piping

Pipes, valves, cocks, flanges, etc. of the piping systems on the Boat shall be in accordance with the requirements of the Classification Society and the regulatory bodies.

Proper care shall be taken to be well supported at probable vibrations and to have reasonable accesses for overhauling where necessary.

Where pipes pass through watertight bulkheads or decks, bulkhead or deck pieces shall be fitted.

Piping materials shall be as follows.

Pipe line	Materials	Remarks
Fuel oil	Carbon steel, Aluminum alloy	-
Lubricating oil	Carbon steel, Aluminum alloy	-
Fresh water	Stainless steel (SUS316), Aluminum alloy, PVC	-
Sea water	Stainless steel (SUS316L), Carbon steel with lining inside	-
Drainage / Bilge / Air escape	Stainless steel (SUS316), Aluminum alloy, Carbon steel	-
Refrigerant	Copper	-

(1) Fresh water pipes

One (1) filling pipe shall be provided between filling cap and fresh water tank. The filling cap shall be installed higher than the upper deck level.

The pipes shall be led so that freshwater is supplied from the fresh water tank through the freshwater pump to the lavatory water faucet, the gallery sink faucet, the multi-use faucet in the machinery room, the multi-use water faucet at the rear of the deck (close to the rear of the machinery room casing), the wheelhouse window washer and the front of the deck.

In addition, the wheelhouse window washer shall be of an electric valve control type. The nozzle for the window washer shall be installed below the window.

(2) Sea water pipes

Cooling water pipes for air conditioning system shall be provided and water shall be discharged overboard. One (1) cooling water pump and two (2) condensing units shall be arranged in engine room. One (1) additional stand-by cooling water pump shall be provided as back up.

All refrigerant pipes for air conditioning system shall be insulated by glass wool.

The sanitary pipes shall be led so that seawater can be supplied to lavatory for flushing from sanitary pump in engine room.

(3) Wash deck pipes

Wash-deck lines shall be installed. This pipe lines shall be supplied with sea water by bilge, fire and general service pump in engine room. One (1) hydrant for deck wash and One (1) hydrant for fire hose shall be provided.

(4) Bilge pipes

The pipes shall be led to discharge the bilge water from the accommodation space, engine room and steering gear room using the bilge, fire and general service pump or bilge wing pump(manual operation) in engine room.

For fore store, bilge shall be discharged by portable bilge pump.

(5) Drainage pipes and wastewater pipes

The pipes shall be led to discharge wastewater from the galley sink and lavatory to outside of the Boat. One (1) storm check valve shall be installed.

The drainage pipes from the air conditioner and other drainage pipes shall be combined and wastewater can be discharged directly through the pipes to outside of the Boat. One (1) storm check valve shall be installed if necessary.

The deck scupper and gutter way shall be arranged around the wheelhouse to discharge the water to the upper deck.

2.2.15 Hatches and Manholes

Hatches and manholes shall be constructed according to the rules of the Classification Society and the Authority's requirement concerning weather tightness and coaming height.

The following hatches shall be provided.

<u>Location</u>	<u>Type</u>	<u>Quantity</u>
Cabin	Weather-tight, aluminum alloy	1
Fore store	Weather-tight, steel	1
Engine room	Weather-tight, steel	2
Steering gear room	Weather-tight, steel	1

The bolted maintenance hatch for main engines shall be fitted at the aft of deck.

2.2.16 Ladders and Steps

Stairway and handrail between wheelhouse and cabin shall be arranged. Stairs shall be of aluminum alloy and have PVC covering and slip-proofing.

Vertical ladder made of aluminum alloy at each hatch, etc. shall be provided. A handle clip shall be provided at top of each ladder.

Steps and / or grips shall be fitted for access to the top of wheelhouse, masts and where necessary.

One (1) aluminum gang plank of 5 m length shall be supplied for boarding / unboarding.

2.2.17 Hand Rails and Awning

Stanchions and safety hand rails shall be provided in the periphery of the exposed decks.

Stanchions and hand rails shall be made of steel or aluminum pipes with plastic coated stainless steel wires. The railing is removable where necessary.

Storm rails (aluminum alloy) shall be fitted at wheelhouse, cabin, lavatory and so on.

An awning made of canvas shall be provided aft of wheelhouse.

2.2.18 Mast and Pole

One (1) aluminum alloy mast shall be arranged on the top of wheelhouse for all radio aerials, VHF aerial, radar scanner and radar reflector (mounted as high as practical), navigation lights and flag halyards.

Platform for outfit such as aerials, navigation lights, a vane anemometer, etc. shall be provided.

Removable flag pole and its foundation shall be provided (stainless steel) at stern.

2.2.19 Name of Boat, Draft Marks, Name Plates and Tallies

(1) Name of Boat

The name of the Boat shall be welded on and painted on the bow, port and starboard. The name and port of registry of the Boat shall be welded to the transom of the Boat and painted. All letters of the Boat's name shall be not less than 300 mm in height. Port of registry shall be 200 mm in height.

The Employer's logo shall be positioned on the superstructure side, port and starboard.

(2) Draft Marks

The draft marks measured above the bottom of the keel shall be welded on and painted on the stem and at the stern, port and starboard.

The draft marks in Arabic numerals shall be marked in meter. The figures shall be 100 mm height, spaced 200 mm apart and the bottom edge if each number is to correspondent to the exact draft indicated by that number.

(3) Name Plates

Each room, store, entrance shall be provided with lock and name plate.

One (1) shipyard name plate (indicating shipyard name, yard number and launching date) shall be displayed in front of wheelhouse.

An ODA (Official Development Aid) mark and/or Japanese flag as designated by Japanese Government shall be clearly indicated onboard as appropriate.

(4) Tallies

Tally plates shall be provided for the following to ensure correct identification and operation of all items of machinery and equipment:

- Identification of pipelines, valve operation, switches, controls and gauges.
- Safety signs
- Machinery operation notices

2.2.20 Deck Outfits

All deck outfits shall be in accordance with the requirement of the Classification Society.

(1) Outfits to be supplied.

2	-	Anchors
2	-	Anchor rope, nylon, 20mmφ x70m
4	-	Mooring line
1	-	Towing line
1	-	Flag pole

(2) Navigation Outfits

1	-	Magnetic Compass
1	-	Spare bowl for the above (with box)
1	-	Portable Magnetic Compass
1	-	Bell (300 mmφ)
1	-	Clock
1	-	Binoculars
1	-	Barometer (Aneroid)
1	-	Black ball (net type)
3	-	Black diamond shape (net type)
2	-	National flag
1	-	International signal flag
1 set	-	International code book
1	-	Call sign flag

(3) Chart Room Inventory

1 set	-	Chart
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2 sets	-	Square set
2	-	Divider
2	-	Scale
2	-	Parallel ruler
6	-	Chart weight
2	-	Triangles (navigator)

(4) Navigation Lights

1	-	Mast light
1 pair	-	Side light
1	-	Stern light
1	-	Anchor light
1	-	Not under command light

(5) Deck Inventory

1	-	Clinometer
1	-	Thermometer
Each 1	-	Painting tools (Paint scraper, paint pot)
Each 3	-	Painting tools (Brush (big, small)
1 set	-	Carpenter's tools
1	-	Aluminum gang plank (5 m length)
Each 1	-	Frame for certificate (certificate of ship's nationality, Certificate of ship's survey)
1	-	Key box
Each 1	-	Crew's name plates rack
2	-	White board
Each 1	-	Room name plates and locks
1	-	Shipyard name plate including yard number and launching day
1	-	Bottom plug spanner
1	-	Portable bilge pump (32φ drain suction)
2	-	Vinyl hose with nozzles (20φx 20m, for deck washing)
Each 2	-	Paint can for repair (20L can, blue, white, green)
Each 1	-	Paint can for repair (20L can, black, cream, red, light green)
Each 1	-	Canvas cover (Exposed electrical lighting equipment)

3 MACHINERY PART

3.1 General Description

The whole machinery installation shall comply with the requirements of the Classification Society and other rules and regulations concerned. Machinery, equipment and their accessories shall be of marine quality and suitable for the purposes intended.

Main engines, engine for alternator and other auxiliary machinery and equipment shall be arranged so that operation and maintenance can be easily performed and shall have enough headroom for maintenance.

Engine room shall be provided with sufficient ventilation. Piping system shall be arranged to avoid damages caused by thermal expansion and vibration, and piping installation shall be carried out so that maintenance and repair can be easily performed.

3.1.1 Shop Test

Workshop test for the following machinery shall be carried out to meet the Classification requirements.

- (1) Main engines
- (2) Alternator set
- (3) Major Auxiliary machinery & equipment

3.1.2 Sea Trial

Upon completion of the Boat, the sea trials shall be executed in the presence of the representative of the Employer/Engineer and the surveyor of the Classification Society as stipulated in the General Part of these Specifications.

During the sea trials, the measurements required for the items of machinery and equipment shall be performed and the results shall be submitted to the Employer/Engineer.

3.2 Main Engines

Two (2) sets of main engines shall be installed as follows.

Type	Non reversible, 4 stroke, single acting, high speed marine diesel engine with turbo- charger	IMO Tier 2
Numbers	2 sets	
Maximum continuous output	abt. 650kW	To be proposed
Engine speed	abt. 2,000 min ⁻¹	To be proposed
Continuous service output	85 – 90% MCO	To be proposed
Cooling system	Fresh water cooling (Sea water indirect cooling)	
Starting method	Cell motor start	
Fuel oil	Light gas oil	
Resilient mount	To be studied and proposed	
Accessories	• Air cooler • Turbocharger • Governor • Fresh cooling pump • Sea water cooling pump • Fuel oil pump • Lubricating oil pump • Control monitor	

Engine control shall be as follows:

Starting and stopping	From engine room (engine side)
Engine speed control	From wheelhouse and engine room (engine side)
Ahead and astern clutches	From wheelhouse and engine room (engine side)

3.3 Propellers and Shafts

The power of the main engines shall be transmitted to propellers via reduction gears and shafts.

3.3.1 Propellers

Two (2) sets of fixed pitch propellers shall be installed as follows.

Type	High skewed fixed pitch propellers	
Number	2 sets	
Number of blades	3 or 4 blades	
Propeller materials	aluminum bronze	
Propeller shaft	Stainless steel	
Stern tube	Mechanical seal	

3.3.2 Reverse Reduction Gear and Shaft

Two (2) sets of reverse reduction gear shall be installed as follows connecting to main engine with a flexible coupling and take axial thrust.

Type of reduction gear	Hydraulic operation, wet sump	
Number	2 sets	
Propeller shaft	Stainless steel	
Stern tube	Mechanical seal	

3.4 Generator set

One (1) set of generator consisted of a marine engine and a generator shall be installed.

Type generator engine	4 stroke, single acting, high speed marine diesel engine	Cell motor start
Number	1 set	
Continuous rating output	abt. 47kW	
Cooling system	Fresh water cooling (Sea water indirect cooling)	
Generator	abt. 38kVA(30kWe)	
Resilient mount	Rubber mount	

3.5 Piping Systems

Pipe materials and fittings shall be heavy duty and of a high marine commercial standard. All piping shall be conveniently arranged to facilitate access and repairs, and where feasible, shall be kept clear of electrical equipment, storage space, etc. It shall be well secured with rubber or plastic chafing pieces as required.

Pipe line	Materials	Remarks
Fuel oil	Carbon steel, Aluminum alloy	-
Lubricating oil	Carbon steel, Aluminum alloy	-
Fresh water	Stainless steel (SUS316), Aluminum alloy, PVC	-
Sea water	Stainless steel (SUS316L), Carbon steel with lining inside	-
Drainage / Bilge / Air escape	Stainless steel (SUS316), Aluminum alloy, Carbon steel	-
Exhaust gas pipes	Stainless steel	-

All pipes and valves shall be in accordance with JIS or equivalent. The material of valves shall be of bronze cast in general.

The joints shall generally not be made close to switchboards and electrical equipment.

The pipe lines shall be color-coded.

3.5.1 Cooling Water System

The main engines shall be cooled by heat exchangers. The cooling system shall incorporate a crossover facility, to allow engine to be cooled from either seawater inlet.

The main cooling system shall run seawater through the main engine heat exchanger and then out through the exhaust system.

Seawater for gearbox cooling shall be bled off from the main engine circuit at the outlet of the integral cooling pump, and through the gearbox to valved outlet skin fittings. Alternatively, if a dedicated seawater pump is required for gearbox cooling, it shall be directly driven from the main engine.

Same as main engines, generator engine shall be cooled by heat exchangers.

3.5.2 Fuel Oil Pipes

In order to supply fuel oil to both main engines, the pipes shall be installed from the fuel oil tank through the fuel oil collection tank to the fuel oil supply inlet of each main engine. The pipes for returning oil shall be installed to the fuel oil tank from each separately.

The fuel oil supply pipes for the diesel generator set shall be installed from the fuel oil collection tank to the fuel oil inlet of the generator. The pipe for returning oil shall be installed to the fuel oil tank.

The pipe for transferring small quantities of fuel oil shall be installed from the oil tank to the machinery room using a small, manual fuel oil pump.

3.5.3 Lubricant Pipes

The lubricant drain shall be able to be discharged to the machinery room by the lubricant discharge pump (portable electric type) through one (1) detachable hose connected to the lubricant drain outlet provided at each machinery.

3.5.4 Sea Water Pipes

The independent sea water suction inlet with strainer shall be provided for each main engine. Sea water used for cooling the main engines shall be discharged at each side or stern. Sea water suction shall be made by an integral, engine mounted pump.

Also, some seawater used for cooling the main engines is used to cool the stern tube seal equipment.

The independent sea water suction inlet with strainer shall be provided for generator engine. The cooling sea water used for the generator engine shall be discharged after cooling the exhaust gas silencer. Sea water suction shall be made by an integral, engine mounted pump.

The independent cooling sea water suction inlet shall be provided for cooling water pumps of air conditioner and the sanitary pump.

3.5.5 Bilge Pipes

The bilge piping for each watertight compartment, except the fore store, shall have a change valve for discharging from the Boat and onto the deck using both bilge, fire and general service pump and manual bilge pump. The bilge, fire and general service pump shall be used as standby cooling sea water pump for main engines

3.5.6 Exhaust Gas Pipes and Silencer

The silencer of main engines shall be wet type and made of titanium double tube type in accordance with Contractor's standard.

The exhaust gas pipe for main engines shall be led to transom and the material shall be of stainless steel.

The exhaust gas pipe for the diesel generator set shall be fitted with a wet type silencer.

3.5.7 Drain Pipes

The drained oil from the fuel oil filter of each main engine and the diesel generator set shall be transferred to the fuel oil drainage tank under the floor of the machinery room through each oil pan.

3.5.8 Marine Growth Prevention System

Marine growth prevention system (chemical dosing) shall be fitted in sea chest and controlled in engine room.

3.6 Pumps and Auxiliaries in Engine Room

<u>Items</u>	<u>Quantity</u>	<u>Remarks</u>
Bilge, fire and general service pump	1	electric motor driven
Bilge pump	1	manual operation
Portable bile pump	1	for fore store
Sanitary pump	1	electric motor driven
Fresh water pump	1	automatic operation by pressure switch
Cooling water pump for air conditioning system	2	1 set for back up
Fuel oil transfer pump	1	manual operation
Oil drain pump	1	manual operation
Lubricant transfer pump	1	electric motor driven
Other pumps	As required	

3.7 Other Fittings in Engine Room

Othe fittins in the engine room shown below, not limited to, shall be provided.

- Checkered aluminum plate shall be laid in engine room
- 1 x work bench with drawer and vice
- 1 x whiteboard
- Tool box
- Hand rail as required around machinery, stainless or aluminum.

3.8 Spare Parts, Tools and Inventory

Spare parts and tools for all machinery and equipment shall be furnished in accordance with the requirement of the Classification Society's rule and Contractor's and/or manufacturer's standard.

Chemical liquid for marine growth prevention system shall be supplied (18 litter can x 5 sets).

4 ELECTRIC PART

The whole electrical equipment and installations shall comply with the requirements of the Classification Society.

Materials, equipment and their accessories shall be of marine use type, good designs and substantial makes, assuring long life and easy of handling and maintenance.

Generators and power motors shall be tested at their makers' shops as required by the Classification Society.

Lighting and communication appliances, navigation aids, etc. shall be tested at the makers' shops as necessary before installed aboard.

After installation on board, these machinery, equipment and systems shall be tested under the working conditions.

Insulation tests shall be made for all electric equipment and systems after installation on board.

Results of these tests and trials shall be submitted to the Employer/Engineer.

4.1 Distribution Systems

The nominal voltage, frequency and distribution for electric equipment shall be proposed by the Contractor and approved by the Employer.

4.2 Electric Cable

All cables, in general, shall be of such quality and complying with the requirements of the Classification Society.

<u>Location</u>	<u>Type</u>
Machinery space	Ethylene propylene (E.P.) rubber insulated, polyvinyl chloride (P.V.C.) sheathed and steel wire braided cable
Wheelhouse, cabin and galley space	Same as above
Exposed space to weather	E.P rubber insulated, P.V.C. sheathed and steel wire braided with P.V.C. covering

Where cables pass through watertight decks or bulkheads, watertight cable glands shall be fitted. Where cables pass through beams or non-watertight decks or bulkheads, bushing or coamings with round edges shall be used as necessary for protection of cables.

The earthing work shall be carried out according to the Contractor's standard.

4.3 Electric Power Source**4.3.1 AC Generator**

One (1) set of the following A.C. generator directly coupled to diesel engine prime mover shall be installed.

Type	Semi-enclosed, drip-proof, self-ventilated, bluishless
Frequency, voltage, etc.	50Hz, 220V, 3-phase, 3-wire
Number and rated output	1 set, abt. 38kVA(30kWe)
Factor, rating and insulation	0.8, continuous, class "F"

Final rated output shall be proposed by the Contractor based on the electric power demand calculation including its prime mover for the Employer's approval.

4.3.2 Battery Charging Generators

Two (2) sets of battery charging generator driven by each main engine for DC 24V system/line shall be provided.

4.3.3 Storage Battery

The following storage battery for starting main engines, generator engine, emergency lights and internal/radio communication equipment shall be installed.

Type	Lead acid battery
Voltage and Capacity	DC 24V, 200Ah
Number	3 sets

Final capacity and number shall be decided by the Contractor.

4.3.4 Charging Rectifier

One (1) set of the following charging rectifier shall be installed at main switchboard.

Type	Silicon
Input	AC 220V, 3phase
Output	DC 22 - 35V, 30 - 40A

4.3.5 Shore Connection

Shore connection shall be provided to receive power from shore and connected to the main switchboard.

The receiving power capacity shall be proposed by the Contractor and approved by the Employer after detail design and site survey for shore supply facility at mooring berth.

4.4 Switchboard and Distribution Board**4.4.1 Main Switchboard**

Main switchboard made of aluminum alloy shall be installed in engine room as follows, but not limited to.

Type	Drip-proof, dead-front, Self-Standing with hinged front panel and insulated handrail
Consist of	1) Power generator panel – moulded case circuit braker, A.C. voltmeter, A.C. ammeter, wattmeter, frequency meter, etc. 2) AC 220V feeder pane - moulded case circuit braker, ground indicator lamp, A.C. voltmeter, A.C. ammeter, etc. 3) Charging-discharging panel - moulded case circuit braker, A.C. voltmeter, A.C. ammeter, etc. 4) Charging rectifier

4.4.2 Concentrated Board and Distribution Board

Concentrated board and distribution board made of aluminum alloy shall be installed in wheelhouse. The boards shall be provided with the following devices and other necessary equipment.

- | | |
|--------------------------------|--|
| + Navigation light indicator | + Searchlight and projectors on/off switch |
| + Wheelhouse lighting switch | + Push button for fire and general alarm |
| + Nautical and radio equipment | + Emergency stop switch |
| + Others | |

4.4.3 Distribution / Section Boards

Distribution / section boards shall be provided onboard where necessary. The boards shall be enclosed by protecting drip-proof metal (aluminum alloy) cases and shall be equipped with moulded case circuit breakers or fuse.

4.5 Power System

4.5.1 Electric Motors

Motors installed in the engine room and other spaces where protected from weather shall be of semi-enclosed, drip-proof type, while those installed on decks exposed to weather or those exposed to weather or moisture because of their duties or the manners of installation shall be of totally enclosed, water-proof construction. Insulation of motors shall be of class E, B or F.

4.5.2 Starters

In principle, across-the-line type starters shall be employed for all motors.

All starters shall be complete with magnetic contactors, overload relays, low voltage protection devices, pilot lamps and push button switches, except those for motors of 0.4 kW and below, which are to be equipped with knife switches, fuses and pilot lamps.

4.5.3 Emergency Stop Switch

Motors driving mechanical ventilating fans for engine room, air conditioning unit, etc. shall be arranged for simultaneous shut-down from outside of the engine room and the wheelhouse in case of emergency and break-out in fire.

4.6 Lighting System

The general and emergency lighting system shall be installed. General lighting system shall be sourced with A.C., 220V of MSB. Emergency lighting system shall be sourced with D.C. 24V back-up lighting circuits fed from the general use storage batteries.

The illumination level shall meet the provision in Japanese Industrial Standard JIS-F8041 throughout the Boat.

All lighting fixtures of marine use shall be as follows depending on their location:

<u>Type of fixtures</u>	<u>Locations</u>
Drip-proof type	Engine room, other machinery spaces, galley, lavatories
Waterproof type	Weather decks and spaces where exposed to heavy spray or moisture.
Non waterproof type	Wheelhouse, accommodation space and other dry spaces

Generally, the fluorescent type LED ceiling lights shall be provided for general lighting at each compartment. The incandescent lamps type LED shall be provided for supplemental lighting, localized lighting and emergency lighting.

4.6.1 Search Light and Flood Lights

One (1) search light of 1,000W Xenon type shall be provided on top of wheelhouse. Pan/tilt shall be operated from wheelhouse inside. The body shall be of corrosion resistant and light material such as aluminum alloy.

Two (2) sets of LED flood light shall be provided, one at the front and the other at back of the wheelhouse canopy as a deck work light.

4.6.2 Navigation Light

The following navigation lights shall be provided in accordance with Convention on the International Regulations for Preventing Collisions at Sea, 1972 as amended in 1981.

- 1 - Masthead light of single type
- 1 - Port side light with red lens, of single type
- 1 - Starboard side light with green lens, of single type
- 1 - Stern light of single type
- 1 - Anchor light of single type
- 2 - Not-under-command light (red pendant lantern)

4.6.3 Other Lights and Lamps

Other lights and lamps such as

- LED bed lamps (if required)
- One (1) set of 10W LED hand lamp with basket guards and flexible cabtyre cable of 20 meters in length
- Chart table light with an extensible arm and dimmer switch

Shall be provided.

4.7 Inboard Communication System

4.7.1 Common Battery Telephone

Four (4) sets of common battery telephone shall be installed for the communication among wheelhouse, engine room, steering gear room and cabin space.

4.7.2 Signal Bell

One (1) signal bell system, operated on D.C., 24 V, shall be provided for communication between wheelhouse and engine room.

4.7.3 Loud Hailer System

One (1) set of 20W loud hailer system shall be installed for outboard and inboard announcement. Speakers shall be arranged at the following place.

- | | |
|--------------------------|---------------|
| + Wheelhouse top outside | + Engine room |
| + Wheelhouse | + Cabin space |

The electric power source shall be AC220V. In case of failure of AC220V power, D.C. 24V shall automatically be used as backup.

4.8 Navigation System

Multi-function display (MFD) system shall be adopted for radar, AIS, ECDIS, DGPS Navigator, etc. Details shall be consulted with the suppliers and/or makers

4.8.1 Multi-function Display(MFD) : 2 sets

+ 19" Color LCD displays

+ Displays for

- Chart plotter(GPS plotter)
- Radar
- Echo sounder
- AIS
- Others

4.8.2 X band Radar : 1 set

+ Maximum Range: 36 nautical miles with ARPA

+ Antenna: 24" Radome

+ Display: MFD

4.8.3 Echo Sounder : 1 set

+ Frequency : 30kHz-200kHz

+ Measuring Range : 2 – 200m

+ Display : MFD

4.8.4 GPS Compass : 1 set

+ Three antenna random type

+ Display : 4.5" monochrome LCD

4.8.5 Magnetic Compass : 1 set

+ Desk top type, Card Diameter 125mm

Also one (1) set of portable magnetic compass shall be supplied.

4.8.6 DGPS Navigator : 1 set

+ GPS/Beacon Antenna, RF 1575.42MHz, RC C/A

+ Display : MFD

+ Display data : Ship speed, Latitude, Longitude, Ship course

+ Position signal shall be supplied to relative equipment through processor.

4.8.7 Electric Chart Display System(ECDIS) : 1 set

One (1) set of ECDIS shall be proposed by the Contractor and approved by the Employer.

Function: Chart display, Ship's position fixing, Route planning, Track control, Route monitoring, Radar image, ARPA data display and maker's standard function

Electronic navigational chart (ENC) shall be supplied by the Employer.

4.8.8 AIS (Automatic Identification System) : 1 set

One (1) set of AIS shall be provided.

The GPS compass signal shall be feed to AIS system and AIS signal shall be taken out to ECDIS for AIS display.

4.8.9 Weather Meters : 1 set

+ Anemometer and Anemoscope

+ Barometer and Thermometer

4.8.10 Other Fittings

+ Ship Horn : 1set

+ Clock (wheelhouse) : 1 set

+ Inclinator(wheelhouse) : 1 set

4.9 External Communication System

Communication equipment shall be provided referring to the requirement of GMDSS A1 • A2 area (JG rule for non-international voyage) as design guide.

4.9.1 MF/HF Radio Telephone : 1 set

One (1) set of MF/HF radio telephone shall be provided in wheelhouse.

4.9.2 VHF Radio Telephone: 1 set

One (1) set of VHF radio telephone shall be provided in wheelhouse.

4.9.3 International NAVTEX Receiver : 1 set

One (1) set of International NAVTEX Receiver shall be provided in wheelhouse.

4.9.4 Satellite EPIRB: 1 set

One (1) set of Satellite EPIRB shall be provided in wheelhouse.

4.9.5 Radar Transponder (SART): 1 set

One (1) set of X band Radar transponder (SART) shall be provided in wheelhouse.

4.9.6 Other Communication Equipment

Two (2) sets of hand-held type VHF transceiver (floating type) with battery charger and hands free microphone (or speaker microphone) shall be supplied.

4.10 Supplementary Outfit and Spare Parts**4.10.1 Supplementary Outfit**

Special tools for handling control, overhauling and maintenance of electric machinery and equipment shall be supplied in accordance with their makers' standards.

The following tools, measuring instruments shall be supplied for general use.

1	-	500 V megger
1	-	Multi - tester, 0 ~600 V, A.C.
1	-	Clamp Ammeter
1	-	Electric solder trowel, 220 V, A.C.
1 roll	-	Solder
1 can	-	Soldering paste
1	-	Electro checker
1	-	Knife
4	-	Screw drivers, assorted size and head
1	-	Monkey wrench 12 in
1	-	Pincer
1	-	Radio pincer
6	-	Vinyl tapes, 2 red, 2 blue & 2 white
1	-	Nipper
1	-	Vice grip
1	-	Rubber glove

4.11 Equipment for Patrol Mission

The following equipment shall be provided for the patrol mission.

+ 1 pair of electric message boards at top of wheelhouse.

+ Two (2) sets of blue flashing light on the mast for patrol work.

5 SURVEY EQUIPMENT

5.1 Genral Description

The following survey equipment shall be equipped on the Boat. The specification of the equipment shall be proposed by the Contractor and approved by the Employer.

Item	Purpose	Remarks
Echo Sounder	Digital depth measurement	Accuracy: +/- 0.1%
DGPS	Global positioning	Accuracy: 30 cm at kinematic mode
Side Scan Sonar	Under water searching	Accuracy: 1.5 cm at 900 khz
Digital level	Digital leveling	Measuring range: 1.6 m ~ 100 m
Sub Bottom Profiler	Sub-bottom searching	Penetration: 6 m in coarse sand, 80 m in clay
Sound Velocity Profiler	Aqua SVP profiling	Accuracy: +/- 0.007 m/s
Acoustic Doppler	Acoustic current profiling	Accuracy: +/- 1%

5.2 Motor siren Bathymetric surveying equipment

One (1) set of multi-beam echo sounder shall be equipped on the Boat.

The multi-beam system shall be used for bathymetric surveying and mapping of the seabed in the port areas with water depths up to 50 m.

The requirements of the multi-beam system are at least, but not limited to:

- (1) The multi-beam system, including transducer array, processor and transceiver, shall be portable and easily mountable on the Boat.
- (2) The system, and all parts thereof, shall be applicable for temporary mounting on/in the Boat.
- (3) The system shall have a frequency of at least 200 kHz in order to detect (softer) upper seabed materials.
- (4) The cross track coverage (swathe performance) is at least 5 times the water depth.
- (5) The ping rate shall be at least 10 Hz.
- (6) Other systems which shall be at least included in conjunction with the multi-beam system are: Vertical Reference Unit (VRU) sensors, motion sensors, heave compensators, motion sensor and sound velocity sensor.
- (7) A Real Time kinetic GPS positioning system shall be provided, for which a differential base station onshore is required and two (2) marine receivers (of which one backup)
- (8) A suitable survey software operating package shall be provided, which can analyse and process the multi-beam echo sounder data, and interfaced with the equipment above. Furthermore, the software shall be able to produce 3-D displays and seabed charts.
- (9) Suitable hardware (PC) shall be provided, capable of withstanding the rugged marine environment (Boat motion and saline environment), and up to the latest standards.

SECTION VI-5

VTMS

SECTION VI-5: VTMS

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SECTION VI-5: VTMS

1 GENERAL PROVISION

1.1 Intent

It is the intent of this Employer's Requirements to describe the guidance and minimum requirement for the design, materials, equipping, inspection, testing, training and documenting of "Vessel Traffic Management System" (hereinafter referred to as "VTMS") for Matarbari Port Development Project in People's Republic of Bangladesh.

This Requirement is descriptive and general in nature. It does not specify the VTMS in details, or the details of the equipment to be included in the scope of supply. The Contractor shall recognize that the Employer requires the design of the VTMS and of the Tower and equipment they contain to be up-to-date and proven and in-service and similar to that in use for VTMS. The VTMS shall be capable of performing general coverage as per the International Standard and precise coverage with 24 NM for the entire harbour area.

1.2 Scope of Works

- 1) Design, supply and installation of system and equipments including inspection, testing, spare parts, tools and documents to the Matarbari Port in Bangladesh.
- 2) Design, supply and construction of VTMS tower on the Dock Office building.
- 3) Arrangement and assistance for the Employer's/Engineer's inspection and test for construction and installation of VTMS and its tower at Site.
- 4) Training of the Employer's personnel or other personnel so directed by the Employer on the operation and maintenance of the supplied VTMS at the Site.

1.3 General Description and Arrangement

The Product shall be used for full-time monitoring of vessel traffic to ensure safety as a VTMS.

VTMS shall be designed, built and installed so as to achieve safe and smooth vessel traffic management of the Matarbari area including energy terminals and extension project. The Contractor shall conduct planning, designing and installation of VTMS and necessary equipment such as monitoring tools and database tools, which are satisfied by the Employer/Engineer's.

VTMS tower shall be designed and constructed on the Dock Office building which will be constructed in the Package-1 Project. The Contractor shall coordinate with the Contractor of the Package-1 Project regarding the schedule, safety and quality of each work.

The described detailed dimensions and specifications in the following section are the reference standard values, and shall be proposed by the Contractor for the Employer's approval.

1.4 Design Guideline

The Contractor shall check and review all the related laws and regulations of Bangladesh related to VTMS, and shall follow the requirements of them. Requirements of laws and regulations shall be described in the design report.

Safety, reliability and ease of operation for the Employer, minimum maintenance and good accessibility to all areas for repair and maintenance shall be the principal consideration in the detailed design of VTMS.

VTMS shall have expandability, redundancy for fail-safe, antivirus system and software licencing.

The loads of the Products shall be taken into account in the design of radar tower. After the completion of the basic design, the Contractor shall design fitting details for the installation.

The Contractor shall prepare and submit the following design drawings;

- 1) General Layout
- 2) Overall System Configuration
- 3) VTMS Center in the Main Office Building
- 4) Cubicle at the Main Office Building
- 5) Other documents described in Section 3 below

Supply, construction and/or installation shall be conducted based on the plan and drawings which are designed by the Contractor and accepted by the Employer/ Engineer.

1.5 Definition

1. The word “the Employer” shall be understood to mean Chittagong Port Authority.
2. The words “the Contractor” shall be understood to mean the Contractor who shall be responsible for the supply and construction of the VTMS, including the work by all sub-contractors who may be engaged by the Contractor.
3. The term “Employer’s or Engineer’s Representative” shall be understood to mean the Employer’s or/and Engineer’s Representative attending at the Contractor’s yard during the period of construction.

1.6 Language and Unit

All drawings, documents, and equipment manuals shall be prepared in English language and in metric (SI) units.

1. Equipment nameplates and labels shall be in English.
2. JIS system units or equivalent shall be used for all instrumentation, notices and labels, machinery and fittings, identification and data.
3. All piping, valves and fittings shall be of JIS standards or equivalent.

1.7 Products and System

The system shall have one (1) X band radar units of Solid-state Type.

The system shall be able to display the data of vessel position and AIS on the same screen.

The Products such as Main control unit, Radar unit, VHF Radio with Digital Selective Channel (DSC), AIS, Meteorological Observation system, CCD/IR camera and Cubicle with necessary equipment shall be installed into VTMS Center in the Main Office Building.

The Products shall enclose an appropriate Data Communication System.

A distribution board, circuit breakers, communication cables, electrical wires, conduits and UPS for the Products shall be provided by the Contractor.

The Contractor shall design and propose the best layout for the products to the Employer/Engineer for his satisfaction.

The Contractor shall not only install Products but also configure and carry out communication properly in connection with all items.

1.8 Documentation

The Contractor shall submit necessary documents in accordance with this Employer's Requirements and General Section of the Requirements. The documents include the total system schematic diagram of VTMS discriminating the Products, the products drawings with installation heights (more than CDL+ 30 m for radar) at Radar Tower.

1.9 Radar System

The radar system shall be based on IALA V-128 basic, and AIS system shall be based on the latest standards of IMO, IEC and ITU, IMO Class A and B.

The range of radar shall be with general coverage as per the international standard along with 24 NM of precise coverage.

1.9.1 Radar Tower

Height of the tower shall be more than CDL+ 30 m for radar covering the port harbour area.

Two (2) lightning protection on the top of Radar Tower, conducting wire and grounding.

1.9.2 Cooperation with Building Works

The Contractor shall cooperate with the Contractor of the Phase-1 Project. If embedded anchors and base plates are necessary for the Radar Tower, they shall be provided by the Contractor and be installed during the construction of the building.

1.9.3 Composition

The following certificates shall be furnished with the Employer at the time of the delivery of the VTMS.

Item	Quantity
1. X-band Radar System	1 set
2. VHF Radio System with DSC	1 set
3. AIS System	1 set
4. Meteorological Observation System	1 set
5. Control System	1 set
6. Data Communication System	1 set
7. Power Supply System	1 set
8. Facility	1 set
9. Tower and Cubicle	1 set
10. Electronic Chart Display Unit	1 set
11. Oil Spill Detection System	1 set

1.10 Inspection, Tests and Trials**1.10.1 General**

The tower construction, facility supply and installation shall be inspected and tested at the Site under the presence of the Employer/Engineer in accordance with the respective rule requirements at the time of signing the contract.

Inspections, tests and trials shall be carried out in accordance with Contractor's standards, details of which shall be submitted to the Employer/Engineer for approval. Contractor's

standards for performance of inspections, tests and trials shall be subject to the approval of the Employer/Engineer.

The Contractor shall deliver to the Employer/Engineer in duplicate a key schedule of inspections, tests and trials to be performed up to the supply and installation of VTMS and submit up-date if necessary.

Oversea's inspection, testing and trial will not be required for VTMS.

This schedule of inspections, tests and trials shall be prepared in consultation with the Employer/Engineer and shall be timely informed no later than 28 working days in advance to make arrangements for attending the inspections, tests and trials.

All inspections, tests, trials and re-trials will be at the expense of the Contractor.

Any unsatisfactory test or part of it shall be repeated, after correction of defects, to the satisfaction of the Employer/Engineer.

The Contractor shall submit in triplicate copies of all inspection, test and trials reports carried in accordance with the requirement of the specification.

The result of inspections, tests and trials shall be submitted to the Employer/Engineer within seven (7) working days of the tests being completed.

1.11 Drawings and Plans

1.11.1 Approval Drawing

The Contractor shall prepare and submit to the Employer/Engineer for approval of drawings, calculations, documentations and other technical details required for the construction of the tower and installation of the system.

Prior to commencing the design of VTMS, the Contractor shall submit a list of drawings including manufacturer's drawings to the Employer/Engineer for approval. Before starting prospective works, the Contractor shall submit each one (1) copy in electric format and three (3) print copies of the drawings and plans specified in the lists of the drawings and plans for approval to the Employer/ Engineer, and one (1) copy each to be returned to the Contractor with approval or comments, if any, by the Employer/Engineer.

1.12 Site Conditions

The tower, machinery and all facilities installed outside shall be suitable for operation under climatic conditions of the Site.

Allowance shall be made for an ambient air temperature of 55 degrees C. Seasonal high relative humidity, maximum wind speed shall be 70 m/s of 10m above the ground.

1.13 Quality Control

The Contractor, using its Quality Control Team, shall ensure that the labour standard and material quality during construction and installation is in accordance with the Contractor's Quality Control Plan.

One member of the Contractor's Quality Control Team shall be assigned to and shall maintain close liaison with the Employer's/Engineer's supervisors. The Contractor shall provide the Employer's/Engineer's supervisors with complete access and availability to tests, test reports, samples and unpriced purchase orders etc., involved in the construction and installation.

A quality plan shall be submitted by the Contractor and agreed upon between the Employer/Engineer and the Contractor. The requirements in the Quality plan to include a quality assurance system of sub-contractors. A list of major sub-contractors should be provided to the Employer/Engineer for their approval.

1.14 Construction Progress

Construction/installation progress report shall be issued by the Contractor for Employer's/Engineer's guidance. The Contractor shall submit a monthly progress report to the Employer/Engineer.

1.15 Taking-Over

Upon satisfactory completion of the trial program, VTMS and all facilities shall be thoroughly cleaned and prepared for handover to the Employer.

1.16 Defect Liability

The Contractor shall guarantee for a period of not less than twelve (12) months the system and tower including facilities and equipment against defects.

Defects found during the Defect Liability Period shall be made good at the Contractor's account and to Employer's/Engineer's satisfaction.

1.17 Spare Parts, Inventories and Tools

Mandatory (standard) spare parts, inventories, and tools for two years of operation shall be provided in accordance with the Contractor's/manufacturer's standards. Special tools for maintenance purpose shall be provided.

If the Contractor recommends additional spare parts, he shall submit the Recommended Spare Parts List to the Employer/Engineer which includes details of the items and unit costs.

1.18 Delivery Period

VTMS including tower shall be completed including training within 42 months from the commencement of the Works.

1.19 Training

The Contractor shall provide training for the Employer's Personnel for VTMS. The Contractor shall provide experienced engineer(s) at the Site and overseas to execute the training at his own expense. All training texts and lecture materials shall be prepared by the Contractor free of charge, whilst a lecture room at the Site shall be arranged by the Employer. The instruction and training shall be in English. The detailed training programme shall be submitted to the Employer/Engineer for approval at least two (2) weeks before completion of the installation. The Contractor shall, at his own expense, provide all necessary tools, materials, equipment and manpower for the training.

Overseas OJT shall be conducted at the existing port where same proposed VTMS have been applied. The Contractor shall bear all costs, including International Flight charge (Business Class), other transportation costs, Accommodation cost, Domestic transportation cost, Meal, (Breakfast, Lunch Dinner), Overseas allowance etc. for the Employer/Engineer for the overseas training.

The number of trainees and duration of the training of the maintenance and operation personnel shall be at least as shown in Table below:

Item	Trainee		Min. duration of training
VTMS At the Site	Maintenance	Seven (7) mechanical engineers Seven (7) electrical engineers	14 days
	Operator	Nine (9) persons	14 days (4 h/day)
VTMS Overseas OJT	Operator	Six (6) persons	4 days

2 SPECIFICATION

2.1 X-band Radar System (1 set)

- 1) Manufacturer to be specified by the Contractor
- 2) Model to be specified by the Contractor
- 3) Type of Radar Solid-state
- 4) Antenna (1 no.) X-band Radar Antenna
 - Size Minimum 18 feet
 - Range Scale General coverage as per the Internatioanl Standard along with 24 NM precise coverage
 - Scanner Length 9 ft or more
 - Frequency Band 9 GHz band
 - Scanning 24 rpm or less
 - Beam Width
 - Horizontal: 0.95 degree or less
 - Vertical: 25 degree or less
 - Polarization Horizontal
- 5) Transmitter/Receiver (1 no.)
 - Type X-band
 - Frequency 9 GHz band
 - Peak Power 25 kW (Magnetron)
- 6) Function of Radar Data Processing
 - a) Video processing control
 - b) Plot extracting
 - c) Tracking
 - d) Radar control
 - e) Data communication of track data, radar video data and radar control/monitor data
 - f) Suppression of noise, sea-clutter and rain-clutter
 - g) Sending extract plot data of target positional information and raw radar video data to Tracking
 - h) Displaying radar video image on a display screen
 - i) Compressing data to distribute the radar image via LAN and radio communication link
 - j) Controlling radar antenna and radar transmitter receiver
- 7) Function of Tracking
 - a) Integration of Video signal, Radar Tracking Area and AIS Tracking Area
 - b) Display and integration of video signal to display at the main console
 - c) Display and integration of radar tracked target among the adjacent radar station
 - d) Display and integration of AIS tracked data among adjacent AIS stations
 - e) Correlation and integration between radar tracked target and AIS tracked target
 - f) Lost processing for tracked target

- g) Output of processed data of Video signal for display, Radar Tracked Signal, AIS Tracked Signal, Integrated data of radar tracked echo and AIS tracked echo
- h) Tracking capacity at each radar of 200 targets or more
- i) Alarms of Guard zone entry, Speed limit (Upper, Lower)

2.2 VHF Radio System (1 set)

- 1) Manufacturer to be specified by the Contractor
- 2) Model to be specified by the Contractor
- 3) VHF Antenna (3 sets) to be specified by the Contractor
- 4) VHF Transceiver (3 nos.) two for voice and one for DSC
- Channel 16 channels 1 no.
Working channel 1 no.

The Contractor shall have the information of a working channel via confirmation with the Employer during the design stage.

- Preset Channels 8 channels or more
- Press Talk Function Shall be equipped
- Method of reception Double super heterodyne
- Sensibility 0 dB emf or less for 20 dB noise quieting method
- Transmission method TCP/IP (100Base-TX/10Base-T)
- 5) Antenna Duplexer to be specified by the Contractor
- Insertion Loss (TX to ANT) 2 dB or less at the specified center frequency
- Insertion Loss (ANT to TX) 2 dB or less at the specified center frequency
- Allowable Transmission Power 50W or more

2.3 AIS System (1 set)

- 1) Manufacturer to be specified by the Contractor
- 2) Model to be specified by the Contractor
- 3) VHF Antenna (1 set) to be specified by the Contractor
- 4) GPS Antenna (1 set) Outdoor type
- 5) Transponder (1 no.)
- 6) AIS information to be received transmitted
 - Information from Class A, B, C, vessel and Buoy AtoN.
 - Information from SAR Airplane
 - Information from AIS other terrestrial station
 - Safety Information
- 7) AIS Information to be Transmitted
 - AIS Station information
 - Safety information and others
 - Binary or Text message
- 8) Function of AIS station (IMO Class A and B)
 - a) Saving function for the received AIS information.

- b) Communication with AIS station system installed at sensor sites of this system.
- c) Correlative calculation of AIS information of same vessels received through two or more AIS station of this system. Function of data transfer to the same vessel from AIS zone to another AIS zone.
- d) Filtering function for AIS information.
- e) Replay of navigating status on the display with sea chart based on AIS information.
- f) Rejection of data from the non-surveillance area.
- g) Saving of AIS Tracking data for vessels.
- h) Saving of track data for each AIS station.
- i) To monitor status and remote control for AIS station.
- j) To display a tracking AIS target on an electrical sea chart.
- k) To edit and transmit binary/text message.
- l) To back up function of AIS information if required.

2.4 Meteorological Observation System

- 1) Function of Meteorological Observation
 - a) Sensor units are installed at radar sensor sites to measure meteorological data to support the safe navigation of vessels.
 - b) The measuring items are wind direction, wind speed, air temperature, humidity and air pressure.
 - c) The measured data are transferred to VTMS center
 - d) The received data are processed and displayed on Main Console.
 - e) The meteorological information will contribute to the safe navigation of vessels on the sea.
 - f) The sensor shall be installed basically on the tower.
 - g) This console shall display and save the meteorological data from respective sensor sites.
 - h) All meteorological data are displayed on the console in the graphic mode.
 - i) In case the operator gives a command, the display site can be changed to another one.
 - j) Meteorological data are displayable on Main Console.
 - k) Form and item (Compass mode of wind direction)
- 2) Function of Sensor Interface Unit
 - a) An interface unit shall allow the interface to transfer the integrated meteorological data to the main console at VTMS center.
 - b) A sensor unit is installed at the radar site.

2.5 Control System (1 set)

- 1) Manufacturer to be specified by the Contractor
- 2) Model to be specified by the Contractor
- 3) Hardware for Main Console for VTMS Center unit
 - Control PC (1 no.) The latest model with full spec
Intel 12th gen core-i7 or equivalent CPU

- | | |
|--|----------------------------------|
| | Main memory 16 GB or more |
| | Hard disk 500 GB or more |
| Display monitor | 32 inch color LCD 3 nos. x 1 set |
| With CD-R/W, LAN Port, Keyboard, Mouse, Headsets, Speaker and other necessary accessories. | |
| Including licence of hardware and software, if needed. | |
- 4) Hardware for PC Server
- | | |
|--|---|
| Server (1 no.) | The latest model with full spec |
| | Intel 12th gen core-i7 or equivalent CPU |
| | Main memory 16 GB or more |
| | Hard disk 10 TB or more (capacity with one month) |
| Display monitor | 32 inch color LCD 1 set |
| With CD-R/W, LAN Port, Keyboard, Mouse, and other necessary accessories. | |
| Including licence of hardware and software, if needed. | |
- 5) Hardware for Monitoring unit (uncontrollable)
- | | |
|--|--|
| Control PC (1 no.) | The latest model with full spec |
| | Intel 12th gen core-i7 or equivalent CPU |
| | Main memory 16 GB or more |
| | Hard disk 500 GB or more (capacity with one month) |
| Display monitor | 50/70 inch color LED 3 sets |
| With LAN Port, Keyboard, Mouse, and other necessary accessories. | |
| Including licence of hardware and software, if needed. | |
- 6) Camera
- | | |
|-----------------------|---|
| CCD/IR camera (1 set) | 10KM visibility (Day/Night time) for the entire
horbour area |
|-----------------------|---|
- 7) General Function
- a) Management and configuration of VTMS shall be carried out on the Main Console unit at VTMS Center with access right (password) basically.
 - b) Monitoring units shall be able to act for the Main Console unit by access right and configuration change of priority right in case of emergency.
- 8) Function of PC Server
- a) Data to be recorded in PC Server as database
 - b) Entering record file
 - c) Processing for summing up of data
 - d) There shall be several files to be made in the database such as the vessel's specific data file, the entering and departing data file, and the entering record file. (The files should be prepared by the Employer)
 - e) PC server shall have a backup system as same as VTMS system on the Main Console to secure high reliability.
 - f) The navigating status of vessels in the covered areas shall be included in the recorded information.

9) Function of Main Console

- a) Main Console is composed of 3 sets of LCD colour monitor, computer, mouse and keyboard.
- b) Radar signal, AIS signal, meteorological data and relative information shall be displayed for the monitoring sea areas.
- c) The Main Console should have the function to set up the number and assignment of the person(s)-in-charge.
- d) The displayed symbol on the console shall comply with IALA Standard and other standards.
- e) The allocation of symbol, information, layout of display shall be designed for easy operation by operators.
- f) This console shall also have a monitoring function and a control function for equipment installed at VTMS Center.
- g) Each radar capacity to be managed shall cover 200 vessels or more.
- h) Total capacity of monitoring sea area shall cover 1,500 targets or more.
- i) Equipment installed at the Site shall be controlled and monitored by Main Console.

10) Function of Display Monitor

- a) The designed monitoring area of this VTMS is monitored continuously on the combined LCD display.
- b) The displayed sea area on three monitors shall be able to display and handle as one sea area.
- c) Each monitor display shall be able to display radar/AIS composite display, vessel information, meteorological data and others simultaneously by multi-window technique.
- d) Radar, AIS signal and others shall be displayed individually.
- e) Radar echo image and tracking image shall be displayed by graduation technique to grasp easily the dynamic status of vessels.
- f) Movement of vessels shall be displayed by a graphic symbol in accordance with radar and AIS tracking information.
- g) Type of mark, category of line, display colour and others on the console shall be changeable by the system manager having authority.
- h) The wake of tracking target shall be displayable by dot or segment of line.
- i) Radar image and displayed data shall be renewed every one (1) scanner rotation (Approx. 3 sec).
- j) Raw radar and tracking data for vessel shall be overlaid on the IHO/IMO standard S57 Ed.3 or S63 Electric Sea Chart with coastal line, navigating course, buoy and others. In the event it is not possible to use the IMO/IHO standard because it has not been issued, "C-MAP" chart data shall be used
- k) Tracking graphic symbol of radar/AIS shall have information such as coordinate, vector line of speed and course. In case of display with AIS information, the heading of vessel shall be displayed.
- l) In the tag of symbol, ship ID, speed, course, ship name and others shall be shown. In case the tag has AIS information, MMSI number shall be shown also. The information tag shall disappear in case the operator requires. By referring to MMSI, the information of designated vessel shall be found easily from the database for vessel traffic information and the information shall be displayed on Main Console.

- m) The distance of two (2) points indicated by the mouse shall be measured in the unit of KM or NM (unit is selectable). The course from the first point to the second shall be also measured.
- n) In case the mouse indicates any point, the coordinate of the designated point shall be displayed on the console.
- o) In case the radar video image of two adjacent radar systems is overlapped, one video image out of the two radar systems shall be displayed.
- p) The ID and tracking data of any vessel shall be taken over to the adjacent radar system if the overlapped echo is decided for the same vessel. The applied symbol shall be the same after the taking over of relevant data for the vessel. No operation shall be required for the operator to take over ID and other data.

11) Function of Monitoring

- a) Radar System: Remote control (Start and stop of the scanner, Selection of TRX unit, ON and OFF of TRX, ON and OFF Monitoring (Status of power for TRX, Status of TRX on transmitting))
- b) AIS Transponder: Operation and display (Transmitting operation of message, Display of received message)
- c) The monitoring includes optimal view with 10KM visibility of the entire harbour area by CCD camera (for day time) and IR camera (for night time)

12) Function of Recording and Playback

- a) Recording Duration: In case of recording traffic data, those data shall be compressed as much as possible. Retrieved data, however, shall be the same one as the original.

The recording duration shall be one (1) month. The recording data for the period beyond the duration shall be automatically and sequentially deleted.

The recorded data can be retrieved and saved in external media (to be recommended by Tenderer) if necessary. Operators may assign date and time of data to be retrieved and saved in external media.

- b) Items to be recorded

Radar video data for display

Target data tracked by radar

Target data tracked by AIS

AIS transmitting and receiving message

Warning data

Audio signal of VHF maritime radio (4 chs or more)

- c) Method of playback: To retrieve the data recorded on the same time from the media such as hard disk or other media (to be recommended by Contractor)

To display the Radar tracking data, AIS tracking data, VHF communication voice and others with electronic sea chart.

To renew the playback vessel traffic data with indicated time speed of playback.

- d) Tracking data: To record the tracking data for all detected vessels. The recorded data should be utilized to confirm movement of suspicious ships in case accident or affairs have occurred.

The movement of ship should be shown on the display by continuous line and trace certainly the wake of ship. To print out the display of monitor.

Operator should indicate the date/time, ship name and others.

- e) Duplication of recording media: Recording media (hard disk) shall be duplicated such as RAID-1 to attain high reliability of the system and to avoid loss of the recorded data.

2.6 Data Communication System (1 set)

- 1) Manufacturer to be specified by the Contractor
- 2) Model to be specified by the Contractor
- 3) Microwave Radio (2 nos.) Data capacity not less than 30 Mbps
Parabolic Antenna: 7/8 GHz 0.6m or more, 2 nos.

2.7 Power Supply System and Others

- 1) Power distribution board Suitable capacity,
Grounding terminal shall be equipped
- 2) Online UPS 1 no. Type-A at VTMS Center
1 no. Type-C at Cubicle
- 3) Isolation Transformer 1 no. Type-A at VTMS Center
1 no. Type-C at Cubicle
- 4) Fast Ethernet Switch Suitable capacity with suitable number
- 5) Router with Firewall Suitable capacity with suitable number
- 6) Server Rack 1 nos. with suitable size
- 7) Color Printer 2 nos. Laser Color Printer
Printout the display screen of network-connected computer system
- 8) Function of UPS
 - a) Capacity for minimum 30 min at full load. for continuous and uninterrupted performance shall be required for the above Products depending on the Contractor's calculation of power consumption considering the whole Products to be installed by the Contractor and an air-conditioner to be installed at VTMS Center.
- 9) Generator 1 no. Minimum 30 kVA Capacity

2.8 Facility

- 1) Furniture Wide desk and chair (w1800): 2 sets
xDesk and chair (w1200): 6 sets
Air conditioner: As required
- 2) Function Server room and Operator room shall be separated.
Each room shall have adequate air-conditioning system.

2.9 Tower

- 1) Radar Installation Height High enough to cover the entire harbour area for precise radar coverage and to cover the approach channel are for general radar coverage
- 2) Type Self-supported type
- 3) Plating Hot dip galvanizing

- | | |
|----------------|---|
| 4) Accessories | Obstruction light, lighting rod and grounding plate |
| 5) Wind | 70 m/s of 10m above the ground surface |

2.10 Cubicle

Design of Cubicle shall be proposed by the Contractor and as approved by the Employer/Engineer.

The Contractor shall provide Products information such as load data, anchor bolts (e.g. chemical anchor) in the detailed design.

Heat prevention of equipment and dew condensation prevention shall be considered.

Weather resistance, salt resistance and durability for the materials of the cubicle shall be considered.

The Supplier shall provide three (3) keys for a lock of Cubicle.

3 ATTACHMENT / CONSUMABLES / OTHERS

- 1) Products List to be installed
- 2) Implementation Work Schedule
- 3) Detailed catalogues
- 4) Detailed System Diagram Drawing
- 5) Typical drawings for fitting of the Products on the radar tower
- 6) Detailed Products layout drawing for VTMS Center with Electrical drawings
- 7) Detailed Products layout drawing for Cubicle with Electrical drawings
- 8) Calculation of Total weight of the equipment for VTMS Center, Radar Tower and Cubicle
- 9) Calculation of Power Consumption
- 10) Software programs used in the programming of the devices (if any)
- 11) Spare parts List with unit price
- 12) Other standard accessories, if any.

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VII. General Conditions (GC)

The General Conditions of Contract shall be the “General Conditions” of the “FIDIC General Conditions of Contract for Plant and Design Build for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor”, First edition 1999 released by the *Fédération Internationale des Ingénieurs-Conseils* (FIDIC).

Copies of the FIDIC “Conditions of Contract for Plant and Design Build for Electrical and Mechanical Plant, and for Building and Engineering Works, Designed by the Contractor” can be obtained from:

International Federation of Consulting Engineers

World Trade Centre II
P.O. Box 311
CH-1215 Geneva 15
Switzerland

Phone: +41 22 799 49 00

Fax: +41 22 799 49 01

Email: fidic@fidic.org

WWW: <http://www.fidic.org>

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Section VIII. Particular Conditions (PC)¹

¹ Based on the General Conditions of Contract for Plant and Design Build Engineering for Electrical and Mechanical Plant and for Building and Engineering Works, Designed by the Contractor © FIDIC 2018 – Licenced to JICA 2018 -2023.

Particular Conditions (PC)

The following Particular Conditions shall supplement the GC. Whenever there is a conflict, the provisions herein shall prevail over those in the GC.

Part A - Contract Data (CD)

Conditions	Sub-Clause	Data
Employer's name and address	1.1.2.2 & 1.3	Chittagong Port Authority (CPA) Room No. 528, Bandar Bhaban, Chittagong - 4100, Bangladesh.
Engineer's name and address	1.1.2.4 & 1.3	Matarbari Port Consultants (MPCT) The Joint Venture of Nippon Koei Co., Ltd. (Japan), the Overseas Coastal Area Development Institute of Japan (Japan), Japan Port Consultants, Ltd. (Japan) and Development Design Consultants Ltd. (Bangladesh) 5-4, Kojimachi Chiyoda-ku, 102-8539 Japan.
Bank's name	1.1.2.11	The Japan International Cooperation Agency (JICA)
Borrower's name	1.1.2.12	Chittagong Port Authority (CPA)
Time for Completion	1.1.3.3	The Time for Completion of the whole of the facilities shall be 42 months. Delivery period of boats shall be 18 months from the Commencement Date.
Defects Notification Period	1.1.3.7	365 days
Sections	1.1.5.6	There are no Sections.
Electronic transmission systems	1.3	E-mail
Contractor's name and address	1.3	[insert Contractor's name and address]
Governing Law	1.4	The laws of the People's Republic of Bangladesh
Ruling language	1.4	English

Conditions	Sub-Clause	Data						
Language for communications	1.4	English						
The Contractor’s Liabilities as to the payment taxes and duties:	1.16(A)	<u>Duties, taxes and levies which are Exempted.</u>						
		<table><tr><th>Duty/ Tax/ Levy</th><th>Exemption Category</th></tr><tr><td>Personal Income Tax of Foreign Staff and Labour working on the Works Under the Contract payable in Bangladesh</td><td>No Pay</td></tr><tr><td>Contractor's Equipment imported on Re-export basis</td><td>No Pay</td></tr></table>	Duty/ Tax/ Levy	Exemption Category	Personal Income Tax of Foreign Staff and Labour working on the Works Under the Contract payable in Bangladesh	No Pay	Contractor's Equipment imported on Re-export basis	No Pay
	Duty/ Tax/ Levy	Exemption Category						
Personal Income Tax of Foreign Staff and Labour working on the Works Under the Contract payable in Bangladesh	No Pay							
Contractor's Equipment imported on Re-export basis	No Pay							
	1.16(B)	<u>Duties, taxes and levies which shall be paid by the Employer on behalf of the Contractor</u> (i) Local taxes and duties on imported Materials and Plant to be incorporated in the Works. (ii) Value Added Tax (VAT) (iii) Advanced Income Tax (AIT)						
Time for access to, and possession of all parts of, the Site	2.1	14 days after the Commencement Date.						
Engineer’s Duties and Authority	3.1(B)(ii)	All variations resulting in an increase of the Accepted Contract Amount shall require approval of the Employer.						
Performance Security	4.2	The Performance Security shall be in the form of a demand guarantee in the amount(s) of 10 percent of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.						

Conditions	Sub-Clause	Data
Contractor's Representative's Name	4.3	<i>[insert the name of the Contractor's Representative agreed by the Employer prior to Contract signature]</i>
Period for notifying unforeseeable errors, faults and defects in the Employer's Requirements	5.1	42 days after the Commencement Date.
Normal working hours	6.5	Sunday to Thursday, eight (8) hours a day from 8:00 to 12:00 and 13:00 to 17:00
Period for supply of Spare Parts (Mandatory Spare Parts and Recommended Spare Parts)	7.9(a) and (b)	2 years after the Taking Over of the Works.
Commencement of Works	8.1(c)	14 days after the Commencement Date.
Delay damages for the Works	8.7	Whole of the Works: One tenth of a percent (0.1%) of the Accepted Contract Amount per day.
Maximum amount of delay damages	8.7	Ten percent (10%) of the Accepted Contract Amount.
Provisional Sums	13.5(b)(ii)	Fifteen percent (15%)
Total advance payment	14.2	Advance payment shall not exceed 10% of the contract price and shall be supported by an advance payment guarantee covering the total amount of advance payment.
Repayment amortization rate of advance payment	14.2(b)	Twenty percent (20 %)
Percentage of Retention	14.3(c)	Ten Percent (10%)
Limit of Retention Money	14.3(c)	Ten percent (10%) of the Accepted Contract Amount.

Conditions	Sub-Clause	Data
Minimum Amount of Interim Payment Certificates	14.6	Zero point five percent (0.5%) of the Accepted Contract Amount.
The Disbursement Procedure	14.7	(A) local currency: Transfer Procedure as set forth in the Loan Agreement. (B) foreign currency: Transfer Procedure and Commitment Procedure as set forth in the Loan Agreement. The brochures describing JICA's Disbursement Procedures are available at : [https://www.jica.go.jp/english/our_work/types_of_assistance/oda_loans/oda_op_info/procedure]
Limitation of Liability	17.6	Not Applicable
Periods for submission of insurance: a. evidence of insurance	18.1	Fourteen (14) days
b. relevant policies		Twenty-eight (28) days
Maximum amount of deductibles for insurance of the Employer's risks	18.2(d)	USD 10,000 (United States Dollars ten thousand) or equivalent.
Minimum amount of third party insurance	18.3	USD 2,000,000 (United States Dollars two million) or equivalent for a single event, there being no limit on the number of incidents.
Date by which the DB shall be appointed	20.2	28 days after the Commencement Date
The DB shall be comprised of	20.2	One sole Member.
Appointment (if not agreed) to be made by	20.3	In case of the Contract with an international contractor, appointment to be made by the President of FIDIC.

Part B - Specific Provisions (SP)

Sub-Clause 1.1.1.2 Contract Agreement	Delete “(if any)”.
Sub-Clause 1.1.1.4 Letter of Tender	In Sub-Clause 1.1.1.4 and throughout the General Conditions of Contract “Letter of Tender” is replaced with “Letter of Technical Bid and Letter of Price Bid” or “Letter of Second Stage Bid” as appropriate.
Sub-Clause 1.1.1.9 Appendix to Tender	Delete the entire Sub-Clause and substitute: “1.1.1.9. “Contract Data” means the pages completed by the Employer entitled Contract Data which constitute Part B of the Particular Conditions.” As a consequence of this change, throughout the General Conditions of Contract “Appendix to Tender” is replaced by “Contract Data” except in Sub-Clause 13.8.
Sub-Clause 1.1.2.9 DAB	Delete the entire Sub-Clause and substitute: “1.1.2.9. “DB” means the person or three persons appointed under Sub-Clause 20.2 [<i>Appointment of the Dispute Board</i>] or Sub-Clause 20.3 [<i>Failure to Agree on the Composition of the Dispute Board</i>].” Throughout the General Conditions of Contract and Appendix thereof, “DAB” and “Dispute Adjudication Board” are replaced with “DB” and “Dispute Board” respectively.
Sub-Clause 1.1.2.11 Bank	Add the following as a new Sub-Clause: “1.1.2.11 “Bank” means the financing institution named in the Contract Data.”
Sub-Clause 1.1.2.12 Borrower	Add the following as a new Sub-Clause: “1.1.2.12 “Borrower” means the person named as the Borrower in the Contract Data.”
Sub-Clause 1.1.3.7 Defect Notification Period	Delete “as stated in the Appendix to Tender” and substitute: “which extends over 365 days except if otherwise stated in the Contract Data.”
Sub-Clause 1.1.5.5 Plant	Delete the entire Sub-Clause and substitute: “1.1.5.5. “Plant” means the apparatus, machinery and other equipment intended to form or forming part of the Permanent

Works, including vehicles purchased for the Employer and relating to the construction or operation of the Works.”

**Sub-Clause 1.1.5.9
Mandatory Spare Parts**

Add the following as a new Sub-Clause:

“1.1.5.9 “Mandatory Spare Parts” means the spare parts listed in the Schedule entitled “Mandatory Spare Parts” of the Price Schedule included in the Contract, which are required in the Contract and to be supplied by the Contractor, prior to the completion of the Works under Sub-Clause 7.9 [*Spare Parts*] (a), for the purpose of the proper and continuing functioning of the Works after the Taking-Over of the Works by the Employer in accordance with Clause 10 [*Employer’s Taking Over*].

If the said Schedule is not included in the Contract, this Sub-Clause shall not apply.”

**Sub-Clause 1.1.5.10
Recommended Spare Parts**

Add the following as a new Sub-Clause:

“1.1.5.10 “Recommended Spare Parts” means the spare parts listed in the Schedule entitled “Recommended Spare Parts” of the Price Schedule included in the Contract, which are to be supplied by the Contractor under an agreement between the Parties in accordance with Sub-Clause 7.9(b), prior to the completion of the Works, and are necessary for the proper and continuing functioning of the Works after the Taking-Over of the Works by the Employer in accordance with Clause 10 [*Employer’s Taking Over*].

If the said Schedule is not included in the Contract, this Sub-Clause shall not apply.”

**Sub-Clause 1.1.6.7
Site**

After “are to be executed”, insert “, including storage and working areas,”

**Sub-Clause 1.1.6.8
Unforeseeable**

Delete “date for submission of the Tender” and substitute:

“Base Date”.

**Sub-Clause 1.1.6.10
Notice of Dissatisfaction**

Add the following as a new Sub-Clause:

“1.1.6.10 “Notice of Dissatisfaction” means the notice given by either party to the other under Sub-Clause 20.4 [*Obtaining Dispute Board’s Decision*] indicating its dissatisfaction and intention to commence arbitration.”

**Sub-Clause 1.2
Interpretation**

Add the following as a new paragraph (e):

“the word “tender” is synonymous with “bid”, and “tenderer” with “bidder” and the words “tender documents” with “bidding

documents”.”

Further, at the end of the Sub-Clause, add the following:

“Throughout the General Conditions of Contract, the phrase “Cost plus reasonable profit” is replaced with “Cost plus profit”. “Cost plus profit” requires the profit to be five percent (5%) of the Cost unless otherwise indicated in the Contract Data.”

**Sub-Clause 1.3
Communications**

In the second line, delete “notices and request” and substitute: “notices, requests and discharges,”

**Sub-Clause 1.4
Law and Language**

Delete the entire Sub-Clause and substitute:

“The Contract shall be governed by the law of the country or other jurisdiction stated in the Contract Data.

The ruling language of the Contract shall be that stated in the Contract Data.

The language for communications shall be that stated in the Contract Data. If no language is stated there, the language for communications shall be the ruling language of the Contract.”

**Sub-Clause 1.5
Priority of Documents**

Delete “(d) the Particular Conditions” and substitute: “(d) the Particular Conditions - Part A (Contract Data), (e) the Particular Conditions - Part B (Specific Provisions),”

Renumber the documents listed as sub-paragraph “(e)” through “(h)” as “(f)” through “(i)” accordingly.

Add the following at the end of Sub-Clause 1.5:

“ Within the Safety Specification, the Particular Safety Specification shall have priority over JICA Standard Safety Specification (JSSS), and the Safety Specification shall have priority over the other parts of the Specification in respect of health and safety matters.”

**Sub-Clause 1.6
Contract Agreement**

In the second line, delete “unless they agree otherwise” and substitute:

“unless the Particular Conditions establish otherwise.”

**Sub-Clause 1.8
Care and Supply of
Documents**

Delete “of a technical nature” from the last paragraph.

**Sub-Clause 1.12
Confidential Details**

Delete the entire Sub-Clause and substitute:

“The Contractor’s Personnel and the Employer’s Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify compliance with the Contract and allow its proper implementation.

Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.”

**Sub-Clause 1.13
Compliance with Laws**

In sub-paragraph (a), insert “building permit” after “zoning”.

In sub-paragraph (a), delete “(or being)” and substitute:

“(or to be)”.

At the end of sub-paragraph (b), add the following:

“, unless the Contractor is impeded to accomplish these actions and shows evidence of its diligence.”.

**Sub-Clause 1.16
The Contractor’s
Liabilities as to the
payment taxes and
duties**

Add the following as a new Sub-Clause:

“1.16 The Contractor’s Liabilities as to the payment taxes and duties

The Contractor shall be liable to the payment of taxes and duties, unless otherwise stated in the Contract Data.

In this context;

(A) duties, taxes and levies listed in the Contract Data shall be exempted. Such exemptions are fallen into two categories, namely:

- (i) “No Pay” category: The Contractor shall be entitled to exemption from duties, taxes and levies falling into this category, without having to make any payment arising from or out of or in connection with such liabilities; or
- (ii) “Pay & Reimburse” category: The Contractor shall be

entitled to exemption from duties, taxes and levies, falling into this category, provided that he first makes all payments arising from or out of or in connection with such liabilities and then applies for their reimbursement from the relevant authority, following the procedure prescribed by such authority;

or

(B) duties, taxes and levies shall be paid by the Employer on behalf of the Contractor:

If the lists referred to in sub-paragraph (A) or (B) are not included in the Contract Data, this Sub-Clause shall not apply.”

The followings shall apply as shown in ANNEX to Part B “NBR letter ref.: 08.01.0000.002.09,007.18/97 dated: February 23, 2022”. If there raise any confusion between Bengali and English translation, Bengali version will prevail. In case of any conflict regarding levy, VAT, Tax and customs duty, the opinion of National Board of Revenue (NBR), Bangladesh via the referenced letter will govern.

With regard to import and custom related duties, taxes and levies, the following shall apply:

- (a) The project materials, machinery, tools and equipment imported for project implementation shall be subject to payment of customs duty and taxes applicable at clearance stage as per the Customs Act, 1969 and rules enacted thereunder;
- (b) in exercise of the powers conferred by section 21 (a) of The Customs Act 1969 and Value Added Tax & Supplementary Duty Act – 2012 the National Board of Revenue may allow the delivery of goods which are imported only temporarily with a view to subsequent exportation on the condition of submission of an unconditional and continuous bank guarantee of a scheduled bank for customs duties and taxes;
- (c) Only foreign experts and consultants who are direct employees of ‘International Organization’ or ‘Development Partner of Bangladesh’ specified in S.R.O.No.237-Law/2003/2015/Cus. dated 02-08-2003 be allowed the facilities and concessions admissible under the SRO as privileged persons. Other expatriate personnel in the project will not be entitled to any facilities or concessions.

With regard to the Value Added Taxes (VAT); the following shall apply:

- (a) The value added tax and supplementary duty (if any) applicable to the goods and services to be procured under the project / contract shall be payable in accordance with the Value Added Tax and Supplementary Duty Act, 2012 and Value Added Tax and Supplementary Duty Rules, 2016. If other services, including the services of international and local consultants, are accepted under the said project / agreement, the value added tax applicable to all such services will be payable.

In this case, the scope and rate of value added tax will be determined by the notification in force at the relevant time. If any service is purchased / imported from abroad under the project / contract in question, the value added tax applicable on it will be payable by the service recipient. In addition, in all other cases, all the provisions of the Value Added Tax and Supplementary Duty Act, 2012 shall be complied with.

With regard to the Income Tax, the following shall apply:

- (a) The income tax payable for project-related foreigners will be determined by the Dual Tax Avoidance Agreement (DTAA) signed by the Government of Bangladesh with the countries concerned and will be payable accordingly.

All types of income tax related to the project will be payable in accordance with the Income-tax Ordinance, 1984, Income-tax Rules, 1984, SRO and the rules framed thereunder.

The following provisional shall be read in conjunction with the above provisions.

1.16.1 Foreign Taxation on Imported Goods and Services

The prices and rates quoted in the Price Schedule by the Contractor shall include all taxes, duties, and other charges imposed outside the Employer's country on the production, manufacture, sale, and transport of the Goods, including Contractor's Equipment, Plant, Materials, Temporary Works and supplies, to be used on or furnished under the Contract, and on the services performed under the Contract.

1.16.2 Taxation on Locally Procured Goods and Services

The prices and rates quoted in the Price Schedule by the Contractor shall include all local taxes and duties that may be levied or become payable in accordance with the laws and regulations of Bangladesh on all locally procured Goods, including Contractor's Equipment, Plant, Materials, Temporary Works and supplies, to be used on or furnished under the Contract, and on the local services

performed under the Contract, including those from subcontractors of all tiers and suppliers.

1.16.3 Income Tax and VAT on Payments to Contractor

The individual prices and rates quoted in the Price Schedule by the Contractor shall exclude local Income Tax and Value Added Tax (VAT) that will be levied or become payable on payments from the Employer to the Contractor. The appropriate allowance for Income Tax and VAT shall be added to the Grand Summary of the Price Schedule after the output value of the Works to derive the Contract Price, which allowance for the Income Tax and VAT shall be deducted by the Employer from all payment certificates for remittance directly to the Tax Authority by the Employer in accordance with the applicable laws and regulations of Bangladesh.

1.16.4 Income Tax for Foreign Staff and Workers

The Contractor's foreign staff and labour working on the Works under the Contracts shall be liable to pay personal income taxes in the Employer's country in respect of their salaries and wages in accordance with the Dual Tax Avoidance Agreement (DTAA) signed by the Government of Bangladesh with the countries concerned.

1.16.5 Income Tax for Local Staff and Workers

The Contractor's local staff and labour involved in the works under the Contract shall be liable to pay personal income taxes in the Employer's country in respect of their salaries and wages as are chargeable under the laws and regulations for the time being in force.

1.16.6 Local Taxation and Duties on Imported Plant and Materials

The prices and rates quoted in the Price Schedule by the Contractor shall exclude all custom duties, import duties, and taxes that may be levied or become payable in accordance with the laws and regulations of Bangladesh on all imported Materials, Plant and equipment that are to be incorporated in the Permanent Works.

For each contract package, the Employer shall take necessary steps for obtaining exemption of import duties and taxes from National Board of Revenue (NBR) for the imported Plant, Materials and equipment to be incorporated in the Permanent Works. Such local Taxation and Duties on the imported Plant, Materials

and equipment to be incorporated in the Permanent Works shall be directly paid to the concerned authority by the Employer on submission of appropriate documents by the Contractor at the time of importation. However, all necessary formalities and documentations associated with the importation and for the clearance of consignments shall have to be initiated, prepared and arranged by the Contractor.

The Contractor shall be required to pay all duties and taxes on any imported spare parts, consumables, breakables and expendable items that are not intended for incorporation in the Permanent Works, at the time of clearance of such goods as per existing custom rules. Such duties and taxes shall not be separately reimbursed to the Contractor and accordingly the prices and rates shall include for them where relevant.

1.16.7 Contractor's Equipment imported on Re-export Basis

Permission for clearance of temporarily imported Contractor's Equipment, plant and Temporary Works items on re-exportable basis required for implementation of the Works will be granted free of duties and taxes in compliance with the general provisions of Sub-Section 2l(a) of the Custom Act 1969 and any corresponding Statutory Orders (SRO) and subsequent amendments, and according to the following:

- (a) The Contractor will be allowed to import only bona-fide plant, Contractor's Equipment and Temporary Works items, which may include transport and delivery equipment such as cars, microbuses, jeeps, pick-ups and trucks, certified by the Engineer as being essential for project implementation on temporary importation-cum-re-exportable basis. However, the Contractor shall post with the customs authorities at the port of entry an unconditional bank guarantee obtained from a scheduled bank, valid until the Time for Completion of the Works plus six months, in an amount equal to the full import duties and taxes which would be payable on the assessed imported value of such Contractor's Equipment, plant and Temporary Works items and callable in the event that the Contractor's Equipment and plant are not exported from the Employer's country on completion of the Works under the Contract. A copy

of the bond or bank guarantee endorsed by the customs authorities shall be provided by the Contractor to the Employer, and copied to the Engineer, upon the importation of individual items of the Contractor's Equipment, plant, Temporary Works items or goods.

To obtain exemption of Duties and Taxes on bona-fide plant, Contractor's Equipment and Temporary Works items, the Contractor shall submit a Master List, certified by the Engineer, to the National Board of Revenue for their information and final approval.

The Master List shall be based on the list of equipment submitted by the Contractor in the Bid. The list of equipment submitted by the bidder will be reviewed and modified, if necessary, at the time of finalization of the Contract Agreement in consultation with the National Board of Revenue.

- (b) The Contractor will be required to pay duties and taxes on imported spare parts, consumables, breakables and expendable items at the time of clearance of such goods as per existing customs rules. Such duties and taxes will not be reimbursed to the Contractor.
- (c) At the time of exportation of any of the Contractor's Equipment, plant and Temporary Works items which have been imported on the basis of exemption, the Contractor shall provide evidence to proof status of any such items being exported in the Master List, which has been approved by the Employer and the National Board of Revenue or other competent authorities for exemption of duties and taxes on re-exportable basis, and shall update the Master List to show the plant, the Contractor's Equipment and Temporary Works items still remaining on the Site and pending exportation by the Contractor.

The Contractor may be required to pay to the customs authorities the evaluated amount of duties and taxes equivalent to the proportionate amount of the exempted duties and taxes by comparing the depreciated value of the items to be exported with the original value of the same equipment and plant at

the time of importation. The Contractor will be responsible to pay for the applicable duties and taxes for the deflated portion of the value of the relevant Contractor's Equipment, plant and Temporary Works items which have been consumed during the works implementation period.

Any items of the Contractor's Equipment, plant and Temporary Works items which have been imported on the basis of exemption but are found or noticed as being not exported within the Contract execution period will be subject to imposition of the applicable duties and taxes in full with the payable amount becoming due at any time as determined by the customs authorities. The evaluation of the customs authorities or the National Board of Revenue for the payable amounts of duties and taxes for such exportable or demised items in any case shall be final and conclusive.

- (d) The Employer will give the required recommendation' for import of necessary equipment, materials, etc. and re-export of the same upon completion of the relevant works so that the Contractor may obtain possible tax exemption. The Contractor is solely responsible for realization and processing of the same. If any guarantee or other kind of documentations is required in this respect, it shall be the responsibility of the Contractor to arrange and to pay for the cost. The Employer will not be held responsible for any import duties or taxes which will become payable by the Contractor on account of any part of the Contractor's Equipment, plant or Temporary Works items for which exemption is not allowed by the customs authorities due to whatever reason.

1.16.8 Contractor's Equipment and Plant Imported Previously for Other Project

If the Contractor in his Bid, has proposed to use construction plant and equipment already imported to Bangladesh on re-export basis for another project, he shall have submitted with his Bid a letter of approval from National Board of Revenue approving the use of such equipment in this Project if the Contract is awarded to the Bidder.

If the National Board of Revenue requires that any duties, taxes or fees are to be paid to allow the use of such equipment in this Project, then any duties, taxes and fees are to be included in the prices and rates quoted by the Bidder and shall not be reimbursed under the Contract.

1.16.9 Custom Clearance

The Contractor shall bear all costs including port unloading, clearing and demurrage charges, related to or all other charges resulting from delays in obtaining custom clearance and inland transport charges in respect of any equipment, plant, materials and labour to be imported for the purpose of executing the Works under the Contract, or subsequent re-exportation if applicable, under the laws and regulations for the time being in force. The Employer will render its best endeavor in assisting the Contractor by giving necessary recommendations where required for obtaining the necessary custom clearance through the relevant authorities for the Contractor's Equipment, plant, materials etc., but in no way will the Employer be held responsible for any delay to the Works or any loss sustained as a result of or in the process of obtaining the custom clearance.

1.16.10 The Customs and Security Requirements

The Contractor shall comply with all regulations for the time being imposed by the customs and port security authorities in respect of the passage of plant, vehicles, equipment, materials, personnel, and any other articles etc. through custom barriers and security. The arrangement of adequate and proper security and protection of plant, vehicles, equipment, materials and any other articles, from its arrival in the port of the country to its safe transport to the project site for incorporation into the Works; shall be the sole responsibility of the Contractor. The Employer will not in any case reimburse any cost or loss sustained by the Contractor on this account.

**Sub-Clause 2.1
Right of Access to the
Site**

In the second paragraph, insert “without disruption” after “the Contractor to proceed”.

**Sub-Clause 2.2
Permits, Licenses or
Approvals**

Delete the entire Sub-Clause and substitute:

“The Employer shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain properly:

- (a) copies of the Laws of the Country which are relevant to the Contract but are not readily available, and
- (b) any permits, licenses or approvals required by the Laws of the Country:
 - (i) which the Contractor is required to obtain under Sub-Clause 1.13 [*Compliance with Laws*];
 - (ii) for the delivery of Goods, including clearance through customs; and
 - (iii) for the export of Contractor’s Equipment when it is removed from the Site.”

**Sub-Clause 2.4
Employer’s Financial
Arrangements**

Delete the entire Sub-Clause and substitute:

“The Employer shall submit, before the Commencement Date and thereafter within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price punctually (as estimated at that time) in accordance with Clause 14 [*Contract Price and Payment*]. Before the Employer makes any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.

In addition, if the Bank has notified to the Borrower that the Bank has suspended disbursements under its loan, which finances in whole or in part the execution of the Works, the Employer shall give notice of such suspension to the Contractor with detailed particulars, including the date of such notification, with a copy to the Engineer, within 7 days of the Borrower having received the suspension notification from the Bank. If alternative funds will be available in appropriate currencies to the Employer to continue making payments to the Contractor beyond a date 60 days after the date of Bank notification of the suspension, the Employer shall provide reasonable evidence in his notice of the extent to which such funds will be available.”

**Sub-Clause 2.5
Employer’s Claims**

Delete the second paragraph and substitute:

**Sub-Clause 3.1
Engineer's Duties and
Authority**

“The notice shall be given as soon as practicable and no longer than 28 days after the Employer became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.”

Delete the entire Sub-Clause and substitute:

“The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. The Employer shall promptly inform the Contractor of any change to the authority attributed to the Engineer.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (for the purposes of the Contract) the Employer shall be deemed to have given approval.

Except as otherwise stated in these Conditions:

- (a) whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer shall be deemed to act for the Employer;
- (b) the Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract;
- (c) any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances; and
- (d) any act by the Engineer in response to a Contractor's request except as otherwise expressly specified shall be notified in writing to the Contractor within 28 days of receipt.

The following provisions shall apply:

The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub-Clauses of these Conditions:

- (A) Sub-Clause 4.12: agreeing or determining an extension of

- time and/or additional cost.
- (B) Sub-Clause 13.1: instructing a Variation, except;
 - (i) in an emergency situation as determined by the Engineer, or
 - (ii) if such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the Contract Data.
 - (C) Sub-Clause 13.3: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2.
 - (D) Sub-Clause 13.4: Specifying the amount payable in each of the applicable currencies

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Employer.”

**Sub-Clause 3.3
Instructions of the
Engineer**

Delete the second paragraph and substitute:

“The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Engineer or a delegated assistant:

- (a) gives an oral instruction,
- (b) receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and
- (c) does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation,

then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).”

**Sub-Clause 3.4
Replacement of the
Engineer**

Delete the entire Sub-Clause and substitute:

“If the Employer intends to replace the Engineer, the Employer shall, not less than 21 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended replacement Engineer. If the Contractor considers the intended replacement Engineer to be unsuitable, he has the right to raise objection against him by notice to the Employer, with supporting particulars, and the Employer shall give full and fair consideration to this objection.”

**Sub-Clause 4.1
Contractor’s General
Obligations**

After the second paragraph, insert the following as the third paragraph:

“All equipment, material, and services to be incorporated in or required for the Works shall meet the requirements specified in Annex to Part B: Specific Provisions – Eligible Source Countries of Japanese ODA Loans hereto.”

**Sub-Clause 4.2
Performance Security**

In the second paragraph, delete “an entity and from within a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions” and substitute:

“a reputable bank or financial institution selected by the Contractor, and shall be in the form annexed to the Particular Conditions, as stipulated by the Employer in the Contract Data or in another form approved by the Employer”.

Further, delete the fourth paragraph and substitute:

“The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract”.

Add the following as the last paragraph:

“Without limitation to the provisions of the rest of this Sub-Clause, whenever the Engineer determines an addition or a reduction to the Contract Price as a result of a change in cost and/or legislation, or as a result of a Variation amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Engineer’s request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.”

**Sub-Clause 4.3
Contractor's
Representative**

In the second paragraph, insert “in terms of Sub-Clause 6.9 [*Contractor's Personnel*]” after “revoked.”

Add the following sentence at the end of the Sub-Clause:

“If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer.”

In the 7th paragraph, delete “and all these persons”.

**Sub-Clause 4.4
Subcontractors**

In the sub-paragraph (a), insert “solely” after “suppliers”.

Add the following at the end of the Sub-Clause:

“The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [*Confidential Details*] apply equally to each Subcontractor.

Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from the Country to be appointed as Sub-Contractors.

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Employer for the work carried out by the Subcontractor after the assignment takes effect.”

**Sub-Clause 4.6
Co-operation**

In the second paragraph, insert “to suffer delays and/or” before “to incur Unforeseeable Cost”.

**Sub-Clause 4.8
Safety Procedures**

Add the following at the end of the Sub-Clause:

“In addition to the foregoing provisions, the Contractor will be required to comply fully with the requirements and procedures during implementation of the work and to follow strictly the provisions of the Safety Specification which contains Particular Safety Specification and JICA Standard Safety Specification(JSSS). Whenever considerations are to be given in executing the precedence over and shall have higher priority than those stated in the other parts of the Specification in

respect of health and safety matters.”

**Sub-Clause 4.12
Unforeseeable Physical
Conditions**

In the fourth paragraph, insert “notice under” before “Sub-Clause 20.1 [*Contractor’s Claims*].”

Delete the last paragraph and substitute:

“The Engineer shall take account of any evidence of the physical conditions foreseen by the Contractor when submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor’s interpretation of any such evidence.

**Sub-Clause 4.13
Rights of Way and
Facilities**

Delete the entire Sub-Clause and substitute:

“Unless otherwise specified in the Contract the Employer shall provide effective access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities outside the Site which he may require for the purposes of the Works.”

**Sub-Clause 4.15
Access Route**

Add “at Base Date.” at the end of the first sentence.

**Sub-Clause 4.18
Protection of the
Environment**

Delete the second paragraph and substitute:

“The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor’s activities shall not exceed the values stated in the Employer’s Requirements or prescribed by applicable Laws.”

**Sub-Clause 4.19
Electricity, Water and
Gas**

At the end of the first paragraph, add the following after “require”:

“for his construction activities and to the extent defined in the Employer’s Requirements, for the tests”

**Sub-Clause 4.20
Employer’s Equipment
and Free-Issue
Materials**

“Material” in the title of the Sub-Clause 4.20 is replaced with “Materials”. Consequently, under this Sub-Clause and throughout the General Conditions of Contract, the title of Sub-Clause 4.20 is replaced by “Employer’s Equipment and Free-Issue Materials”.

**Sub-Clause 6.1
Engagement of Staff
and Labour**

Delete the entire Sub-Clause and substitute

“Except as otherwise stated in the Employer’s Requirements,

the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing.

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within the country.”

**Sub-Clause 6.2
Rates of Wages and
Conditions of Labour**

Add the following after the first paragraph:

“The Contractor shall inform the Contractor’s Personnel about their liability to pay personal income taxes in the country in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.”

**Sub-Clause 6.7
Health and Safety**

Add the following after “reasonable precautions” in first Sentence of the Sub-Clause 6.7: “including but not limited to those for the prevention of the spread of novel coronavirus (COVID-19)

Add the following at the end of the Sub-Clause:

“HIV-AIDS Prevention. The Contractor shall conduct an HIV-AIDS awareness program via an approved service provider, and shall undertake such other measures as are specified in this Contract to reduce the risk of the transfer of the HIV virus between and among the Contractor’s Personnel and the local community, to promote early diagnosis and to assist affected individuals.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Communication (IEC) campaigns, at least every other month, addressed to all the Site staff and Labour (including all the Contractor's employees, all Subcontractors and any other Contractor’s or Employer’s personnel employees, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to, of Sexually Transmitted Diseases (STD) - or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular; (ii) provide male or female condoms for all Site staff and labour as appropriate; and (iii) provide for STI and HIV/AIDS screening, diagnosis, counselling and

referral to a dedicated national STI and HIV/AIDS program, (unless otherwise agreed) of all Site staff and labour.

The Contractor shall include in the program to be submitted for the execution of the Works under Sub-Clause 8.3 an alleviation programme for Site staff and labour and their families in respect of Sexually Transmitted Infections (STI) and Sexually Transmitted Diseases (STD) including HIV/AIDS. The STI, STD and HIV/AIDS alleviation programme shall indicate when, how and at what cost the Contractor plans to satisfy the requirements of this Sub-Clause and the related Employer's Requirements. For each component, the programme shall detail the resources to be provided or utilized and any related sub-contracting proposed. The programme shall also include provision of a detailed cost estimate with supporting documentation.

COVID-19 Mitigation Plan with Countermeasures during Pandemic

As an integral part of the general health and safety policies, systems, procedure and implementation plans, the Contractor is required to develop, implement and maintain throughout the Contract period, an effective COVID-19 Mitigation Plan with Counter Measures during Pandemic which will apply to all activities and operations within the Site and other working areas to provide safe environment and to ensure health safety of all personnel including staff and workers of the Employer, the Engineer, the Contractor and subcontractors of all tiers, and visitors, etc. Guideline layout of the measures and set up details are provided in a particular section of the Employer's Requirement which contains outline details of the minimum requirements of the steps to be taken to mitigate the situation of Covid-19 epidemic, to help control of the spread of Coronavirus and/or other pandemic or contagious diseases and to minimize possible outbreak and infections among the people working or engaged in the Project and other affected inhabitants residing nearby the Site.

Before commencement of the work and as a mandatory obligation, the Contractor is required to develop and propose the Covid-19 Mitigation Plan with Counter-Measures during Pandemic with submission of all the details to the Engineer for approval prior to actual establishment and implementation of the measures on site.

The Contractor will then install such facilities and devices and

deploy sufficient manpower and resources to follow strictly the steps and procedures set forth in the approved Plan and to comply with all the details and procedures throughout the entire Contract period without failure. The approved Covid-19 Mitigation Plan and the Counter-Measures during Pandemic will need to be revised, modified and enhanced to cope with the actual development and situation of the epidemic from time to time following the direction of the Engineer and/or any other competent authorities.

In addition to the foregoing provisions, the Contractor will be required to comply fully with the requirements and procedures during implementation of the work and to follow strictly the provisions of the Safety Specification which contains Particular Safety Specification and JICA Standard Safety Specification (JSSS). Whenever considerations are to be given in executing the precedence over and shall have higher priority than those stated in the other parts of the Specification in respect of health and safety matters.”

**Sub-Clause 6.12
Foreign Personnel**

Add the following as a new Sub-Clause:

“6.12 Foreign Personnel

The Contractor may bring in to the Country any foreign personnel who are necessary for the execution of the Works to the extent allowed by the applicable Laws. The Contractor shall ensure that these personnel are provided with the required residence visas and work permits. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, and national or government permission required for bringing in the Contractor’s personnel.

The Contractor shall be responsible for the return of these personnel to the place where they were recruited or to their domicile. In the event of the death in the Country of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.”

**Sub-Clause 6.13
Supply of Foodstuffs**

Add the following as a new Sub-Clause:

“6.13 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food as may be stated in the Employer's Requirements at reasonable prices for the Contractor's Personnel for the purposes of or in connection with the Contract.”

**Sub-Clause 6.14
Supply of Water**

Add the following as a new Sub-Clause:

“6.14 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Contractor's Personnel.”

**Sub-Clause 6.15
Measures against Insect
and Pest Nuisance**

Add the following as a new Sub-Clause:

“6.15 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.”

**Sub-Clause 6.16
Alcoholic Liquor or
Drugs**

Add the following as a new Sub-Clause:

“6.16 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of the Country, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal thereof by Contractor's Personnel.”

**Sub-Clause 6.17
Arms and Ammunition**

Add the following as a new Sub-Clause:

“6.17 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person, any arms or ammunition of any kind, or allow

Contractor's Personnel to do so.”

**Sub-Clause 6.18
Festivals and Religious
Customs**

Add the following as a new Sub-Clause:

“6.18 Festivals and Religious Customs

The Contractor shall respect the Country's recognized festivals, days of rest and religious or other customs.”

**Sub-Clause 6.19
Funeral Arrangements**

Add the following as a new Sub-Clause:

“6.19 Funeral Arrangements

The Contractor shall be responsible, to the extent required by local regulations, for making any funeral arrangements for any of his local employees who may die while engaged upon the Works.”

**Sub-Clause 6.20
Forced Labour**

Add the following as a new Sub-Clause:

“6.20 Forced Labour

The Contractor shall not employ forced labour, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour -contracting arrangements.”

**Sub-Clause 6.21
Child Labour**

Add the following as a new Sub-Clause:

“6.21 Child Labour

The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where the relevant labour laws of the Country have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.”

**Sub-Clause 6.22
Employment Records of
Workers**

Add the following as a new Sub-Clause:

“6.22 Employment Records of Workers

The Contractor shall keep complete and accurate records of the

employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [*Records of Contractor's Personnel and Equipment*].”

**Sub-Clause 6.23
Workers’
Organizations**

Add the following as a new Sub-Clause:

“6.23 Workers’ Organizations

In countries where the relevant labour laws recognize workers’ rights to form and to join workers’ organizations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labour laws substantially restrict workers’ organizations, the Contractor shall enable alternative means for the Contractor’s Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where the relevant labour laws are silent, the Contractor shall not discourage the Contractor’s Personnel from forming or joining workers’ organizations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor’s Personnel who participate, or seek to participate, in such organizations and bargain collectively. The Contractor shall engage with such workers’ representatives. Workers’ organizations are expected to fairly represent the workers in the workforce.”

**Sub-Clause 6.24
Non-Discrimination
and Equal Opportunity**

Add the following as a new Sub-Clause:

“6.24 Non-Discrimination and Equal Opportunity

The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where the relevant labour laws provide for non-discrimination in employment, the Contractor shall comply with such laws. When the relevant labour laws are silent on non-discrimination in employment, the Contractor shall meet

this Sub-Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination."

**Sub-Clause 7.4
Testing**

In the second paragraph, insert the following before "The Contractor shall provide":

"Except as otherwise specified in the Contract,"

**Sub-Clause 7.7
Ownership of Plant and
Materials**

In the first paragraph, insert the following before "Each item of Plant and Materials":

"Except as otherwise specified in the Contract,".

Further in sub-paragraph (b), delete "when the Contractor is entitled to payment of the value" and substitute:

"when the Contractor is paid the corresponding value".

**Sub-Clause 7.9
Spare Parts**

Add the following as a new Sub-clause:

"7.9 Spare Parts

- (a) The Contractor shall supply to the Employer, the Mandatory Spare Parts, prior to the completion of the Works or any Section thereof, at such timing as specified in the Contract for the operation and maintenance of the Works for the period specified in the Contract Data after the Taking-Over by the Employer.

The price of the Mandatory Spare Parts shall be included in the Contract Price.

- (b) Upon the both Parties agree on the details of the Recommended Spare Parts for the operation and maintenance of the Works for the period specified in the Contract Data including the identity, specifications and quantities of such spare parts and the terms and conditions, a Variation is issued under Clause 13 [*Variations and Adjustments*] and the price of Recommended Spare Parts shall be included in the Contract Price. The Contractor shall supply to the Employer, the Recommended Spare Parts, prior to the completion of the Works.

The price of Recommended Spare Parts shall include the purchase price and other costs relating to the supply of spare parts such as transportation, port charge and the

Contractor's fees.

**Sub-Clause 8.1
Commencement of
Works**

Delete the entire Sub-Clause and substitute:

“Except as otherwise specified in the Contract, the Commencement Date shall be the date at which the following precedent conditions have all been fulfilled and the Engineer's notification recording the agreement of both Parties on such fulfilment and instructing to commence the Work is received by the Contractor:

- (a) signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of the Country;
- (b) delivery to the Contractor of reasonable evidence of the Employer's financial arrangements (under Sub-Clause 2.4 [*Employer's Financial Arrangements*]);
- (c) except if otherwise specified in the Contract Data, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 [*Compliance with Laws*] as required for the commencement of the Works;
- (d) receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [*Advance Payment*] provided that the corresponding bank guarantee has been delivered by the Contractor.

If the said Engineer's instruction is not received by the Contractor within 180 days from his receipt of the Letter of Acceptance, the Contractor shall be entitled to terminate the Contract under Sub-Clause 16.2 [*Termination by Contractor*].

The Contractor shall commence the design and execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.”

**Sub-Clause 8.4
Extension of Time for
Completion**

In the sub-paragraph (e), delete “on the Site”.

**Sub-Clause 8.6
Rate of Progress**

In the third paragraph, insert “notice under” before “Sub-Clause 2.5 [*Employer's Claims*]”.

Add the following at the end of the Sub-Clause:

“Additional costs of revised methods including acceleration measures, instructed by the Engineer to reduce delays resulting from causes listed under Sub-Clause 8.4 [*Extension of Time for Completion*] shall be paid by the Employer, without generating, however, any other additional payment benefit to the Contractor.”

**Sub-Clause 8.7
Delay Damages**

In the first paragraph, insert “notice under” before “Sub-Clause 2.5 [*Employer’s Claims*]” in the first paragraph.

**Sub-Clause 8.12
Resumption of Work**

Add the following at the end of the Sub-Clause after “suspension”:

“after receiving from the Engineer an instruction to this effect under Clause 13 [*Variations and Adjustments*]”.

**Sub-Clause 11.3
Extension of Defects
Notification Period**

In the first sentence, delete “defect or damage” and substitute:

“defect or by reason of damage attributable to the Contractor”.

**Sub-Clause 11.11
Clearance of Site**

In the second paragraph, delete “after the Employer receives a copy of the Performance Certificate” and substitute:

“after receipt by the Contractor of the Performance Certificate”.

**Sub-Clause 12.1
Procedure for Tests
after completion**

In the first paragraph, delete “Unless otherwise stated in the Particular Conditions” and substitute:

“Unless otherwise stated in the Employer’s Requirements”.

**Sub-Clause 13.5
Provisional Sums**

Add the following at the end of Sub-Clause 13.5:

“As an exception to the above, the Provisional Sum for the cost of the DB shall be used, in accordance with Sub-Clause 20.2 [*Appointment of the Dispute Board*], for payments to the Contractor of the invoices of the DB for its Regular Cost and one-half of its Non-Regular Cost.

No prior instruction of the Engineer shall be required with respect to the services of the DB.

The following shall apply to payments under the Provisional Sum of the cost of the DB:

(A) Requests for any payment under the Provisional Sum shall be included in those Statements submitted under Sub-Clause

14.3 [*Application for Interim Payment Certificates*] together with all necessary substantiations including:

- (i) invoices prepared by the DB members and provided to the Contractor for payment/ reimbursement of their fees and/or expenses; and
- (ii) evidence of payment of such invoiced amounts in full.

(B) The Contractor's overhead, profit, etc., shall not be included in the Provisional Sums for the cost of the DB.

(C) The Engineer's certification of such Statements under Sub-Clause 14.6 [*Issue of Interim Payment Certificates*] shall be based upon the invoices of the DB and evidence of payment of such invoiced amounts in full by the Contractor."

**Sub-Clause 13.7
Adjustments for
Changes in Legislation**

Add the following paragraph at the end of the Sub-Clause:

"Notwithstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8 [*Adjustments for Changes in Cost*]."

**Sub-Clause 13.8
Adjustments for
Changes in Cost**

In the first paragraph, delete "included in the Appendix to Tender" and substitute:

"for local and foreign currencies included in the Schedules".

Further in the 4th paragraph, delete "(quoted in the fourth and fifth columns respectively of the table)".

In the fifth paragraph, delete "(stated in the table)".

**Sub-Clause 14.1
The Contract Price**

Add the following new sub-paragraph at the end of this Sub-Clause:

"Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts therefor, imported by the Contractor for the sole purpose of executing the Contract shall be exempt from the payment of import duties and taxes upon importation."

The following is added at the end of the Sub-Clause:

“The Engineer shall agree or determine the value of those parts of the Works which are to be measured, in accordance with Sub-Clause 3.5. Measurement shall be made of the net actual quantities of those parts notwithstanding local practice.

Whenever the Engineer requires any part of the Works to be measured reasonable notice shall be given to the Contractor’s Representative, who shall:

- (a) promptly either attend or send another qualified representative to assist the Engineer in making the measurement, and
- (b) supply any particulars requested by the Engineer.

If the Contractor fails to attend or send a representative, the measurement made by (or on behalf of) the Engineer shall be accepted as accurate.

Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured by records, they shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree the records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend to examine and agree these records, they shall be accepted as accurate.

If the Contractor examines and disagrees with the records, and/or does not sign them as agreed, then the Contractor shall notify the Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them. If the Contractor does not so notify the Engineer within 14 days after being requested to examine the records, they shall be accepted as accurate.”

Sub-Clause 14.2
Advance Payment

Delete the entire Sub-Clause and substitute:

“The Employer shall make an advance payment, as an interest-free loan for mobilisation and cash flow support, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the Contract Data.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Contract Data, this

Sub-Clause shall not apply.

The Engineer shall deliver to the Employer and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [*Application for Interim Payment Certificates*]) and after the Employer receives (i) the Performance Security in accordance with Sub-Clause 4.2 [*Performance Security*] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be issued by a reputable bank or financial institution selected by the Contractor, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

Unless stated otherwise in the Contract Data, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Engineer in accordance with Sub-Clause 14.6 [*Issue of Interim Payment Certificates*], as follows:

(a) deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds 30 percent (30%) of the Accepted Contract Amount less Provisional Sums; and

(b) deductions shall be made at the amortisation rate stated in the Contract Data of the amount of each Interim Payment Certificate (excluding the advance payment and deductions for its repayments as well as deductions for retention money) in the currencies and proportions of the advance payment until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 90 percent (90%) of the Accepted Contract Amount less Provisional Sums has been certified for payment.

If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [*Termination by Employer*], Clause 16 [*Suspension and Termination by Contractor*] or Clause 19.6 [*Force Majeure*] (as the case may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [*Termination by Employer*], except for Sub-Clause 15.5 [*Employer's Entitlement to Termination for Convenience*], payable by the Contractor to the Employer."

**Sub-Clause 14.3
Application for Interim
Payment Certificates**

In second line of the first paragraph, delete "Contract" and substitute:
"Contract Data".

The following shall be read in conjunction with Sub-Clause 14.3(a):

The estimated contract value of the Works executed shall be calculated on the basis of the items of work as stated in the Price Schedule, which have been fully executed and completed to the satisfaction of the Engineer.

However, the Works executed in respect of any item partially executed (not completed) shall be calculated on the basis of the price breakdown, if any included in the Contract or agreed by the Parties. In the absence of any price breakdown included in the Contract or agreed by the Parties, such 'work executed' shall not be considered for the purposes of interim payments.

**Sub-Clause 14.4
Schedule of Payments**

In sub-paragraph (c), insert "or more" after "found to be less" and insert "or more" after "which progress is less".

**Sub-Clause 14.6
Issue of Interim
Payment Certificates**

Delete the first paragraph and substitute:

"No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 28 days after receiving a Statement and supporting documents, deliver to the Employer and to the Contractor an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Engineer on the Statement if any, and shall include any amounts due to or from the Contractor in accordance with a decision by the DB made under Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*]."

**Sub-Clause 14.7
Payment**

Delete sub-paragraphs (b) and (c) and substitute:

- “(b) the amount certified in each Interim Payment Certificate within 56 days after the Engineer receives the Statement and supporting documents including any amounts due in accordance with a decision by the DB which have been included in the Interim Payment Certificate ; or, at a time when the Bank’s loan (from which part of the payments to the Contractor is being made) is suspended, the amount shown on any statement submitted by the Contractor within 14 days after such statement is submitted, any discrepancy being rectified in the next payment to the Contractor; and
- (c) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate; or, at a time when the Bank’s loan or credit (from which part of the payments to the Contractor is being made) is suspended, the undisputed amount shown in the Final Statement within 56 days after the date of notification of the suspension in accordance with Sub-Clause 16.2 [*Termination by Contractor*].”

Delete the last paragraph of this Sub-Clause and substitute:

“Payment of the amount due in:

- (A) local currency, payable from the proceeds of the Loan, shall be made through as stated in the Contract Data; and
- (B) foreign currency, payable from the proceeds of the Loan, shall be made through as stated in the Contract Data

in accordance with the JICA’s Disbursement Procedures as stated in the Contract Data.

Payment of the amount due in each currency, payable from any source of finance other than the Loan Agreement such as the Employer’s own funds, shall be made directly into the bank account, nominated by the Contractor, in the payment country (for this currency) specified in the Contract.

Any charges or fees associated with or incidental to remittance of funds from JICA/ Employer to the Contractor’s account including but not limited to those for opening and amendment commissions of the Letter of Credit shall solely be borne by the Employer.”

**Sub-Clause 14.8
Delayed Payment**

In the second paragraph, insert the following after “the currency of payment”:

“or if not available, the interbank offered rate,”

**Sub-Clause 14.9
Payment of Retention
Money**

Delete the entire Sub-Clause and substitute:

“When the Taking-Over Certificate has been issued for the Works, and the Works have passed all specified tests (including the Tests after completion, if any), the first half of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

Promptly after the latest of the expiry dates of the Defects Notification Periods, the outstanding balance of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall be half (50%) of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

However, if any work remains to be executed under Clause 11 [*Defects Liability*] or Clause 12 [*Tests After Completion*], the Engineer shall be entitled to withhold certification of the estimated cost of this work until it has been executed.

When calculating these proportions, no account shall be taken of any adjustments under Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*].

Unless otherwise stated in the Particular Conditions, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a guarantee, in the form annexed to the Particular Conditions or in another form approved by the Employer and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money. The Contractor shall ensure that the guarantee is in the amounts and

currencies of the second half of the Retention Money and is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects, as specified for the Performance Security in Sub-Clause 4.2. On receipt by the Employer of the required guarantee, the Engineer shall certify and the Employer shall pay the second half of the Retention Money. The release of the second half of the Retention Money against a guarantee shall then be in lieu of the release under the second paragraph of this Sub-Clause. The Employer shall return the guarantee to the Contractor within 21 days after receiving a copy of the Performance Certificate.

If the Performance Security required under Sub-Clause 4.2 is in the form of a demand guarantee, and the amount guaranteed under it when the Taking-Over Certificate is issued is more than half of the Retention Money, then the Retention Money guarantee will not be required. If the amount guaranteed under the Performance Security when the Taking-Over Certificate is issued is less than half of the Retention Money, the Retention Money guarantee will only be required for the difference between half of the Retention Money and the amount guaranteed under the Performance Security.”

**Sub-Clause 14.11
Application for Final
Payment Certificate**

In the second paragraph, insert the following after “as the Engineer may reasonably require”:
“within 28 days from receipt of said draft”.

**Sub-Clause 14.13
Issue of Final Payment
Certificate**

Delete “issue, to the Employer,” in the first paragraph and substitute:

“deliver, to the Employer and to the Contractor”.

Delete sub-paragraph (a) and substitute:

“(a) the amount which he fairly determines is finally due, and”.

**Sub-Clause 14.15
Currencies of Payment**

Delete the entire Sub-Clause and substitute:

“The Contract Price shall be paid in the currency or currencies in which the bid price was expressed in the Letter of Price Bid or Letter of Second Stage Bid, as appropriate. If more than one currency is so named, payments shall be made as follows:

- (a) payment of the damages specified in the Contract Data, shall be made in the currencies and proportions specified in the Letter of Price Bid or Second Stage Bid, as appropriate;
- (b) other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by

the Employer, or in such currency as may be agreed by both Parties;

- (c) if any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
- (d) the applicable rates of exchange shall be those prevailing on the Base Date and determined by the central bank of the Country.”

**Sub-Clause 15.5
Employer’s Entitlement
to Termination for
Convenience**

Add “for Convenience” at the end of the title. Consequently, throughout the General Conditions of Contract, the title of this Sub-Clause shall be replaced by “Employer’s Entitlement to Termination for Convenience”

Insert the following at the end of the first paragraph:

“or to avoid a termination of the Contract by the Contractor under Clause 16.2 [*Termination by Contractor*]”.

Further, in the second paragraph delete “Sub-Clause 19.6 [*Optional Termination, Payment and Release*]” and substitute:

“Sub- Clause 16.4 [*Payment on Termination*]”.

**Sub-Clause 15.6
Fraud and Corruption**

Add the following as a new Sub-Clause:

“15.6 Fraud and Corruption

If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt or fraudulent practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such termination had been made under Sub-Clause 15.2 [*Termination by Employer*].

Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt or fraudulent practice during the execution of the work then that employee shall be removed in accordance with Sub-Clause 6.9 [*Contractor’s Personnel*].

The Contractor is required to comply with JICA’s policy in regard to corrupt and fraudulent practices as declared in the

Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans.”

**Sub-Clause 16.1
Contractor’s
Entitlement to Suspend
Work**

Insert the following paragraph after the first paragraph:

“Notwithstanding the above, if the Bank has suspended disbursements under the loan or credit from which payments to the Contractor are being made, in whole or in part, for the execution of the Works, and no alternative funds are available as provided for in Sub-Clause 2.4 [*Employer’s Financial Arrangements*], the Contractor may by notice suspend work or reduce the rate of work at any time, but not less than 7 days after the Borrower having received the suspension notification from the Bank.”

**Sub-Clause 16.2
Termination by
Contractor**

Delete sub-paragraph (d) and substitute:

“the Employer substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/or the ability of the Contractor to perform the Contract,”

Further, delete “or” at the end of sub-paragraph (f) and add the following as a new sub-paragraph (h) in the end of sub-paragraph (g):

“(h) the Contractor does not receive the Engineer’s instruction recording the agreement of both Parties on the fulfilment of the conditions for the Commencement of Works under Sub-Clause 8.1 [*Commencement of Works*].”

Insert the following as penultimate paragraph:

“In the event the Bank suspends the loan or credit from which part or whole of the payments to the Contractor are being made, if the Contractor has not received the sums due to him upon expiration of the 14 days referred to in Sub-Clause 14.7 [*Payment*] for payments under Interim Payment Certificates, the Contractor may, without prejudice to the Contractor's entitlement to financing charges under Sub-Clause 14.8 [*Delayed Payment*], take one of the following actions, namely (i) suspend work or reduce the rate of work under Sub-Clause 16.1, or (ii) terminate the Contract by giving notice to the Employer, with a copy to the Engineer, such termination to take effect 14 days after the giving of the notice.”

**Sub-Clause 17.1
Indemnities**

Delete sub-paragraph (b) and substitute:

“damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor’s design, the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, wilful act or breach of the Contract by the Employer, the Employer’s Personnel, their respective agents, or anyone directly or indirectly employed by any of them.”

**Sub-Clause 17.3
Employer’s Risks**

Delete “The risks referred to in Sub-Clause 17.4 below are:” in the first paragraph and substitute:

“The risks referred to in Sub-Clause 17.4 [*Consequences of Employer’s Risks*] below, insofar as they directly affect the execution of the Works in the Country, are:”

Further, in sub-paragraph (b), insert “sabotage by persons other than the Contractor’s Personnel” before “, revolution”.

Further, in sub-paragraph (c) “and other employees of the Contractor and Subcontractors” is deleted.

**Sub-Clause 17.4
Consequences of
Employer’s Risks**

Delete “reasonable profit on the Cost shall also be included” in sub-paragraph (b) and substitute:
“Cost plus profit shall be payable”.

**Sub-Clause 17.6
Limitation of Liability**

Delete the entire Sub-Clause and substitute:

“Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [*Delay Damages*]; Sub-Clause 11.2 [*Cost of Remedying Defects*]; Sub-Clause 15.4 [*Payment after Termination*]; Sub-Clause 16.4 [*Payment on Termination*]; Sub-Clause 17.1 [*Indemnities*]; Sub-Clause 17.4(b) [*Consequences of Employer’s Risks*] and Sub-Clause 17.5 [*Intellectual and Industrial Property Rights*].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [*Electricity, Water and Gas*], Sub-Clause 4.20 [*Employer’s Equipment and Free-Issue Materials*], Sub-Clause 17.1 [*Indemnities*] and Sub-Clause 17.5 [*Intellectual and Industrial*

Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in the Contract Data, or (if such multiplier or other sum is not so stated) the Accepted Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.”

**Sub-Clause 17.7
Use of Employer’s
Accommodation/Facilities**

Add the following as a new Sub-Clause:

“17.7 Use of Employer’s Accommodation/Facilities

The Contractor shall take full responsibility for the care of the Employer provided accommodation and facilities, if any, as detailed in the Employer’s Requirements, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).

If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.”

**Sub-Clause 18.1
General Requirements
for Insurances**

Delete the third paragraph and substitute:

“Wherever the Employer is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.”

Further add the following as the final paragraph:

“The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to the insurance referred to Clause 18) with insurers from any eligible source country.”

**Sub-Clause 18.2
Insurance for Works
and Contractor's
Equipment**

Delete sub-paragraph (b) and substitute:

“shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the costs of rectifying the loss or damage,”

Further in sub-paragraph (d), insert the following after “(d) shall also cover”:

“to the extent specifically required in the Contract,”

**Sub-Clause 18.4
Insurance for
Contractor's Personnel**

Delete the second paragraph and substitute:

“The insurance shall cover the Employer and the Engineer against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.”

**Sub-Clause 19.1
Definition of Force
Majeure**

Insert the following in sub-paragraph (ii) before “revolution”:

“sabotage by persons other than the Contractor's Personnel,”

Further in the sub-paragraph (iii) delete “and other employees of the Contractor and Subcontractors”.

**Sub-Clause 19.4
Consequences of Force
Majeure**

At the end of sub-paragraph (b), add the following:

“including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause 18.2 [*Insurance for Works and Contractor's Equipment*].”

**Sub-Clause 19.7
Release from
Performance**

Delete “under the Law” in the title.

**Sub-Clause 20.1
Contractor's Claims**

Insert "Within the above defined period of 42 days" before "the Engineer shall proceed" in the eighth paragraph.

Further, insert the following as a new paragraph after the eight paragraphs:

"If the Engineer does not respond within the timeframe defined in this Clause, either Party may consider that the claim is rejected by the Engineer and any of the Parties may refer to the Dispute Board in accordance with Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*]."

**Sub-Clause 20.2
Appointment of the
Dispute Board**

Delete the entire Sub-Clause and substitute:

"Disputes shall be referred to a DB for decision in accordance with Sub-Clause 20.4 [*Obtaining Dispute Board's Decision*]. The Parties shall appoint a DB by the date stated in the Contract Data.

The DB shall comprise, as stated in the Contract Data, either one or three suitably qualified persons ("the members"), each of whom shall be fluent in the language for communication defined in the Contract and shall be a professional experienced in the type of construction involved in the Works and with the interpretation of contractual documents. If the number is not so stated and the Parties do not agree otherwise, the DB shall comprise three persons.

If the Parties have not jointly appointed the DB 21 days before the date stated in the Contract Data and the DB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The first two members shall recommend and the Parties shall agree upon the third member, who shall act as chairman.

However, if a list of potential members has been agreed by the Parties and is included in the Contract, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DB.

The agreement between the Parties and either the sole member or each of the three members shall incorporate by reference the General Conditions of Dispute Board Agreement contained in the Appendix A to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the DB consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment. The Employer shall be responsible for paying the Regular Cost and one-half of the Non-Regular Cost and the Contractor shall be responsible for paying one-half of the Non-Regular Cost.

For the purposes of this Sub-Clause:

- (a) “Regular Cost” means retainer fees of DB members, daily fees of the DB members for regular Site visits and all expenses of regular Site visits of the DB members.
- (b) “Non-Regular Cost” means all fees and expenses of the DB other than the Regular Cost.

If at any time the Parties so agree, they may jointly refer a matter to the DB for it to give its opinion. Neither Party shall consult the DB on any matter without the agreement of the other Party.

If a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment, a replacement shall be appointed in the same manner as the replaced person was required to have been nominated or agreed upon, as described in this Sub-Clause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DB (including each member) shall expire when the discharge referred to in Sub-Clause 14.12 [*Discharge*] shall have become effective.”

Sub-Clause 20.3
Failure to agree on the
Composition of the
Dispute Board

The title of the Sub-Clause is replaced by “*Failure to agree on the Composition of the Dispute Board*”.

Throughout the General Conditions of Contract thereof, the title of Sub-Clause 20.3 is replaced by “*Failure to agree on the Composition of the Dispute Board*”.

Further, add “, or fails to approve a member nominated by the other Party,” after “(for approval by the other Party)” in subparagraph (b).

**Sub-Clause 20.4
Obtaining Dispute
Board's Decision**

Delete the entire Sub-Clause and substitute:

“If a dispute (of any kind whatsoever) arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, either Party may refer the dispute in writing to the DB for its decision, with copies to the other Party and the Engineer. Such reference shall state that it is given under this Sub-Clause.

For a DB of three persons, the DB shall be deemed to have received such reference on the date when it is received by the chairman of the DB.

Both Parties shall promptly make available to the DB all such additional information, further access to the Site, and appropriate facilities, as the DB may require for the purposes of making a decision on such dispute. The DB shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the DB and approved by both Parties, the DB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.

If either Party is dissatisfied with the DB's decision, then either Party may, within 28 days after receiving the decision, give a Notice of Dissatisfaction to the other Party indicating its dissatisfaction and intention to commence arbitration. If the DB fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give a Notice of Dissatisfaction to the other Party.

In either event, this Notice of Dissatisfaction shall state that it is given under this Sub-Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in Sub-Clause 20.7 [*Failure to Comply with Dispute Board's Decision*] and Sub-Clause 20.8 [*No Dispute Board in Place*], neither Party shall be entitled to commence arbitration of a

dispute unless a Notice of Dissatisfaction has been given in accordance with this Sub-Clause.

If the DB has given its decision as to a matter in dispute to both Parties, and no Notice of Dissatisfaction has been given by either Party within 28 days after it received the DB's decision, then the decision shall become final and binding upon both Parties."

**Sub-Clause 20.6
Arbitration**

Delete the entire Sub-Clause and substitute:

"Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.5 above and in respect of which the DB's decision (if any) has not become final and binding shall be finally settled by arbitration. Arbitration shall be conducted as follows:

- (a) if the Contract is with a foreign contractor (or if the lead partner is a foreign contractor, in case of JV), international arbitration (1) with proceedings administered by the arbitration institution designated in the Contract Data, and conducted under the rules of arbitration of such institution; or, if so specified in the Contract Data, (2) with proceedings administered by Japan Commercial Arbitration Association (JCAA) and conducted under the arbitration rules of JCAA; or (3) if neither an arbitration institution nor arbitration rules are specified in the Contract Data, with proceedings administered by the International Chamber of Commerce (ICC) and conducted under the ICC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules.
- (b) if the Contract is with a domestic contractor (or if the lead partner is a domestic contractor, in case of JV), arbitration with proceedings conducted in accordance with the laws of the Country.

The place of arbitration shall be a neutral location determined in accordance with the applicable rules of arbitration; and the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [*Law and Language*].

The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DB,

relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Engineer from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrators to the evidence or arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DB shall not be altered by reason of any arbitration being conducted during the progress of the Works.”

**Sub-Clause 20.7
Failure to Comply with
Dispute Board’s
Decision**

Delete the entire Sub-Clause and substitute:

“In the event that a Party fails to comply with any decision of the DB, whether binding or final and binding, then the other Party may, without prejudice to any other rights it may have, refer the failure itself directly to arbitration under Sub-Clause 20.6 [*Arbitration*] in which case Sub-Clause 20.4 [*Obtaining Dispute Board’s Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply to this reference. The arbitral tribunal (constituted under Sub-Clause 20.6 [*Arbitration*]) shall have the power, by way of summary or other expedited procedure, to order, whether by partial award, an interim or provisional measure or award (as may be appropriate under applicable law or otherwise), the enforcement of that decision.”

**Sub-Clause 20.8
No Dispute Board in
Place**

Change the title of the Sub-Clause from “20.8 *Expiry of Dispute Adjudication Board’s Appointment*” to “20.8 *No Dispute Board in Place*”

Delete the entire Sub-Clause and substitute:

“If a dispute arises between the Parties in connection with, or arising out of, the Contract or the execution of the Works and there is no DB in place (or no DB is being constituted), whether by reason of the expiry of the DB’s appointment or otherwise:

(a) Sub-Clause 20.4 [*Obtaining Dispute Board’s Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply, and

(b) the dispute may be referred by either Party directly to arbitration under Sub-Clause 20.6 [*Arbitration*] without

prejudice to any other rights the Party may have.”

**Appendix
General Conditions of
Dispute Board
Agreement**

**Clause 2
General
Provisions**

Delete the entire Clause and substitute:

“Unless otherwise stated in the Dispute Board Agreement, it shall take effect on the latest of the following dates:

- (a) the Commencement Date defined in the Contract,
- (b) when the Employer, the Contractor and the Member have each signed the Dispute Board Agreement, or
- (c) when the Employer, the Contractor and each of the Other Members (if any have respectively each signed a dispute board agreement.

This employment of the Member is a personal appointment. At any time, the Member may give not less than 70 days’ notice of resignation to the Employer and to the Contractor, and the Dispute Agreement shall terminate upon the expiry of this period.”

**Clause 4
General
Obligation
of the
Member**

Delete sub-paragraph 4(h) through 4(i) and substitute:

- “(h) ensure his/her availability for all site visits and hearings as are necessary;
- (i) become conversant with the Contract and with the progress of the Works (and of any other parts of the project of which the Contract forms part) by studying all documents received which shall be maintained in a current working file;
 - (j) treat the details of the Contract and all the DB’s activities and hearings as private and confidential, and not publish or disclose them without the prior written consent of the Employer, the Contractor and the Other Members (if any); and
 - (k) be available to give advice and opinions,

on any matter relevant to the Contract when requested by both the Employer and the Contractor, subject to the agreement of the Other Members (if any).”

Clause 5 Add the following paragraph at the end of the Clause:

**General
Obligation
of Employer
and the
Contractor**

“Whenever the Employer or the Contractor refers a dispute to the DB under Sub-Clause 20.4 of the Conditions of Contract, which will require the Member to make a site visit and attend a hearing, the Employer or the Contractor shall provide appropriate security for a sum equivalent to the reasonable expenses to be incurred by the Member. No account shall be taken of any other payments due or paid to the Member.”

**Clause 6
Payment**

Delete the entire Clause and substitute:

“The Member shall be paid as follows, in the currency named in the Dispute Board Agreement:

(a) a retainer fee per calendar month, which shall be considered as payment in full for:

(i) being available on 28 days’ notice for all site visits and hearings;

(ii) becoming and remaining conversant with all project developments and maintaining relevant files;

(iii) all office and overhead expenses including secretarial services, photocopying and office supplies incurred in connection with his duties; and

(iv) all services performed hereunder except those referred to in subparagraphs (b) and (c) of this Clause.

The retainer fee shall be paid with effect from the last day of the calendar month in which the Dispute Board Agreement becomes effective; until the last day of the calendar month in which the Taking-Over Certificate is issued for the

whole of the Works.

With effect from the first day of the calendar month following the month in which the Taking-Over Certificate is issued for the whole of the Works, the retainer fee shall be reduced by one third. This reduced fee shall be paid until the first day of the calendar month in which the Member resigns or the Dispute Board Agreement is otherwise terminated.

(b) a daily fee which shall be considered as payment in full for:

(i) each day or part of a day up to a maximum of two days' travel time in each direction for the journey between the Member's home and the site, or another location of a meeting with the Other Members (if any);

(ii) each working day on Site visits, hearings or preparing decisions; and

(iii) each day spent reading submissions in preparation for a hearing.

(c) all reasonable expenses including necessary travel expenses (air fare in less than first class, hotel and subsistence and other direct travel expenses) incurred in connection with the Member's duties, as well as the cost of telephone calls, courier charges, faxes and telexes: a receipt shall be required for each item in excess of five percent of the daily fee referred to in subparagraph (b) of this Clause;

(d) any taxes properly levied in the Country on payments made to the Member (unless a national or permanent resident of the Country) under this Clause 6.

The retainer and daily fees shall be as specified in the Dispute Board Agreement. Unless it specifies otherwise, these fees shall remain fixed for the first 24 calendar months, and shall thereafter be adjusted by agreement between the Employer, the Contractor and the Member, at

each anniversary of the date on which the Dispute Board Agreement became effective.

If the parties fail to agree on the retainer fee or the daily fee, the appointing entity or official named in the Contract Data shall determine the amount of the fees to be used.

The Member shall submit invoices for payment of the monthly retainer and air fares quarterly in advance. Invoices for other expenses and for daily fees shall be submitted following the conclusion of a site visit or hearing. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor.

The Contractor shall pay each of the Member's invoices in full within 56 calendar days after receiving each invoice and shall apply to the Employer (in the Statements under the Contract) for reimbursement of the amount which the Employer is responsible for these invoices (the Regular Cost and one-half of the Non-Regular Cost). The Employer shall then pay the Contractor in accordance with the Contract.

If the Contractor fails to pay to the Member the amount to which he/she is entitled under the Dispute Board Agreement, the Employer shall pay the amount due to the Member and any other amount which may be required to maintain the operation of the DB; and without prejudice to the Employer's rights or remedies. In addition to all other rights arising from this default, the Employer shall be entitled to reimbursement of the amount which the Contractor is responsible for, including any additional excess of these payments, plus all costs of recovering these sums and financing charges calculated at the rate specified in Sub-Clause 14.8 of the Conditions of Contract.

If the Member does not receive payment of the amount due within 70 days after submitting a valid invoice, the Member may (i) suspend his/her services (without notice) until the

payment is received, and/or (ii) resign his/her appointment by giving notice under Clause 7.”

Clause 7 The title of the Sub-Clause is replaced by
Termination “*Termination*”.

Delete the entire Clause and substitute:

“At any time: (i) the Employer and the Contractor may jointly terminate the Dispute Board Agreement by giving 42 days’ notice to the Member; or (ii) the Member may resign as provided for in Clause 2.

If the Member fails to comply with the Dispute Board Agreement, the Employer and the Contractor may, without prejudice to their other rights, terminate it by notice to the Member. The notice shall take effect when received by the Member.

If the Employer or the Contractor fails to comply with the Dispute Board Agreement, the Member may, without prejudice to his other rights, terminate it by notice to the Employer and the Contractor. The notice shall take effect when received by them both.

Any such notice, resignation and termination shall be final and binding on the Employer, the Contractor and the Member. However, a notice by the Employer or the Contractor, but not by both, shall be of no effect.”

**Clause 8
Default of
Member**

The title of the Sub-Clause is replaced by “*Default of Member*”.

Delete the entire Clause and substitute:

“If the Member fails to comply with any of his obligations under Clause 4 (a) - (d) above, he shall not be entitled to any fees or expenses hereunder and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses received by the Member and the Other Members (if any), for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.

If the Member fails to comply with any of his obligations under Clause 4 (e) - (k) above, he shall not be entitled to any fees or expenses hereunder from the date and to the extent of the non-compliance and shall, without prejudice to their other rights, reimburse each of the Employer and the Contractor for any fees and expenses already received by the Member, for proceedings or decisions (if any) of the DB which are rendered void or ineffective by the said failure to comply.”

**Clause 9
Disputes**

Add the following as a new Clause:

“Clause 9 Disputes

Any dispute or claim arising out of or in connection with this Dispute Board Agreement, or the breach, termination or invalidity thereof, shall be finally settled by institutional arbitration. If no other arbitration institute is agreed, the arbitration shall be conducted under the Rules of Arbitration of the International Chamber of Commerce by one arbitrator appointed in accordance with these Rules of Arbitration.”

Annex
PROCEDURAL
RULES

Delete the entire Rules and substitute:

- “
1. Unless otherwise agreed by the Employer and the Contractor, the DB shall visit the Site at intervals of not more than 140 days, including times of critical construction events, at the request of either the Employer or the Contractor. Unless otherwise agreed by the Employer, the Contractor and the DB, the period between consecutive visits shall not be less than 70 days, except as required to convene a hearing as described below.
 2. The timing of and agenda for each Site visit shall be as agreed jointly by the DB, the Employer and the Contractor, or in the absence of agreement, shall be decided by the DB. The purpose of Site visits is to enable the DB to become and remain acquainted with the progress of the Works and of any actual or potential problems or claims, and, as far as reasonable, to endeavour to prevent potential problems or claims from becoming disputes.
 3. Site visits shall be attended by the Employer, the Contractor and the Engineer and shall be coordinated by the Employer in co-operation with the Contractor. The Employer shall ensure the provision of appropriate conference facilities and secretarial and copying services. At the conclusion of each Site visit and before leaving the site, the DB shall prepare a report on its activities during the visit and shall send copies to the Employer and the Contractor.
 4. The Employer and the Contractor shall furnish to the DB one copy of all documents which the DB may request, including Contract documents, progress reports, variation instructions, certificates and other documents pertinent to the performance of the Contract. All communications between the DB and the Employer or the Contractor shall be copied to the other Party. If the DB comprises three persons, the Employer and the Contractor shall send copies of these requested documents and these communications to each of these persons.

5. If any dispute is referred to the DB in accordance with Sub-Clause 20.4 of the Conditions of Contract, the DB shall proceed in accordance with Sub-Clause 20.4 and these Rules. Subject to the time allowed to give notice of a decision and other relevant factors, the DB shall:
 - (a) act fairly and impartially as between the Employer and the Contractor, giving each of them a reasonable opportunity of putting his case and responding to the other's case, and
 - (b) adopt procedures suitable to the dispute, avoiding unnecessary delay or expense.
6. The DB may conduct a hearing on the dispute, in which event it will decide on the date and place for the hearing and may request that written documentation and arguments from the Employer and the Contractor be presented to it prior to or at the hearing.
7. Except as otherwise agreed in writing by the Employer and the Contractor, the DB shall have power to adopt an inquisitorial procedure, to refuse admission to hearings or audience at hearings to any persons other than representatives of the Employer, the Contractor and the Engineer, and to proceed in the absence of any party who the DB is satisfied received notice of the hearing; but shall have discretion to decide whether and to what extent this power may be exercised.
8. The Employer and the Contractor empower the DB, among other things, to:
 - (a) establish the procedure to be applied in deciding a dispute,
 - (b) decide upon the DB's own jurisdiction, and as to the scope of any dispute referred to it,
 - (c) conduct any hearing as it thinks fit, not being bound by any rules or procedures other than those contained in the Contract and these Rules,
 - (d) take the initiative in ascertaining the facts and matters required for a decision,
 - (e) make use of its own specialist knowledge, if any,
 - (f) decide upon the payment of financing charges in accordance with the Contract,
 - (g) decide upon any provisional relief such as interim or conservatory measures,and
 - (h) open up, review and revise any certificate, decision, determination, instruction, opinion or valuation of the Engineer,

relevant to the dispute.

9. The DB shall not express any opinions during any hearing concerning the merits of any arguments advanced by the Parties. Thereafter, the DB shall make and give its decision in accordance with Sub-Clause 20.4, or as otherwise agreed by the Employer and the Contractor in writing. If the DB comprises three persons:
 - (a) it shall convene in private after a hearing, in order to have discussions and prepare its decision;
 - (b) it shall endeavour to reach a unanimous decision: if this proves impossible the applicable decision shall be made by a majority of the Members, who may require the minority Member to prepare a written report for submission to the Employer and the Contractor; and
 - (c) if a Member fails to attend a meeting or hearing, or to fulfil any required function, the other two Members may nevertheless proceed to make a decision, unless:
 - (i) either the Employer or the Contractor does not agree that they do so, or
 - (ii) the absent Member is the chairman and he/she instructs the other Members not to make a decision.”

Annex to Part B: Specific Provisions - Eligible Source Countries of Japanese ODA Loans.

All the countries and areas.

**ANNEX to Part B: NBR letter ref.: 08.01.0000.002.09,007.18/97 dated:
February 23, 2022**

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
জাতীয় রাজস্ব বোর্ড
রাজস্ব ভবন
সেগুনবাগিচা, ঢাকা।
(বোর্ড প্রশাসন-২)

নথি নং-০৮.০১.০০০০.০০২.০৯.০০৭.১৮/৭৭

১০ ফাল্গুন, ১৪২৮ বঙ্গাব্দ।
তারিখঃ ২৩ ফেব্রুয়ারি, ২০২২ খ্রিষ্টাব্দ।

বিষয়: জাইকা সহায়তাপুষ্টি নৌপরিবহন মন্ত্রণালয়ের আওতাধীন “মাতারবাড়ি বন্দর উন্নয়ন প্রকল্প (চবক অংশ)” এর আওতায় সড়ক ০৩ (তিন) টি প্যাকেজের জন্য প্রস্তুতকৃত দরপত্রের লেভি, ভ্যাট, কাস্টম ডিউটি ও ট্যাক্স সংক্রান্ত সেকশন সমূহের উপর জাতীয় রাজস্ব বোর্ড এর ভেটিং/মতামত প্রদান।

সূত্রঃ নৌপরিবহন মন্ত্রণালয়ের পত্র নং- ১৮.০০.০০০০.০৩৮.১৪.০০১.২২/২৭, তারিখ: ২৭/১/২০২২ খ্রিষ্টাব্দ।

উপর্যুক্ত বিষয় ও সূত্রের প্রেক্ষিতে জাইকা সহায়তাপুষ্টি নৌপরিবহন মন্ত্রণালয়ের আওতাধীন “মাতারবাড়ি বন্দর উন্নয়ন প্রকল্প (চবক অংশ)” এর আওতায় সড়ক ০৩ (তিন) টি প্যাকেজের জন্য প্রস্তুতকৃত দরপত্রের লেভি, ভ্যাট, কাস্টম ডিউটি ও ট্যাক্স সংক্রান্ত সেকশন সমূহের উপর জাতীয় রাজস্ব বোর্ড এর ভেটিং/মতামত নিয়ে প্রদান করা হলোঃ

শুদ্ধ বিষয়ক :

- The project materials, machinery, tools and equipment imported for project implementation shall be subject to payment of customs duty and taxes applicable at clearance stage as per the Customs Act, 1969 and rules framed thereunder ;
- Duty and Taxes have to be paid by the Importer (Project Implementing Agency or Contractor) at clearance stage;
- In exercise of the powers conferred by section 21 (a) of The Customs Act 1969 and Value Added Tax & Supplementary Duty Act -2012, the National Board of Revenue can allow the delivery of goods which are imported only temporarily with a view to subsequent exportation on the condition of submission of an unconditional and continuous bank guarantee of a scheduled bank for customs duties and taxes;
- Only foreign experts and consultants who are direct employees of “International Organization” or “Development Partner of Bangladesh” specified in S.R.O.No.237-Law/2003/2015/Cus.dated 02-08-2003 be allowed the facilities and concessions admissible under that SRO as privileged persons. Other expatriate personnel in the project will not be entitled to any facilities or concessions.

মুসক বিষয়ক :

প্রকল্প/চুক্তির আওতায় যে সকল পণ্য এবং সেবা সংগ্রহ করা হবে, তার উপর প্রযোজ্য মূল্য সংযোজন কর এবং সম্পূরক শুল্ক (যদি থাকে) মূল্য সংযোজন কর ও সম্পূরক শুল্ক আইন, ২০১২ এবং মূল্য সংযোজন কর ও সম্পূরক শুল্ক বিধিমালা, ২০১৬ অনুযায়ী পরিশোধযোগ্য হবে। আন্তর্জাতিক ও স্থানীয় পরামর্শকদের সেবাসহ অন্যান্য সেবা উক্ত প্রকল্প/চুক্তির আওতায় গ্রহণ করা হলে, সে সকল সেবার উপরও প্রযোজ্য মূল্য সংযোজন কর পরিশোধযোগ্য হবে। এক্ষেত্রে, মূল্য সংযোজন কর এর আওতা ও হার সংশ্লিষ্ট সময়ে বলবৎ প্রজ্ঞাপন দ্বারা নির্ধারিত হবে। আলোচ্য প্রকল্প/চুক্তির আওতায় যদি বিদেশ হতে কোন সেবা ক্রয়/আমদানি করা হয়, তবে তার উপর প্রযোজ্য মূল্য সংযোজন কর সেবা গ্রহীতা কর্তৃক পরিশোধযোগ্য হবে। এছাড়া, অন্যান্য সকল ক্ষেত্রে ভ্যাট সংক্রান্ত বিষয়ে মূল্য সংযোজন কর ও সম্পূরক শুল্ক আইন, ২০১২ এর সকল বিধি বিধান প্রতিপালন করতে হবে।

আয়কর বিষয়কঃ

প্রকল্প-সংশ্লিষ্ট বিদেশি ব্যক্তিবর্গের জন্য প্রদেয় আয়কর সংশ্লিষ্ট দেশসমূহের সাথে বাংলাদেশ সরকার কর্তৃক স্বাক্ষরিত দ্বৈত কর পরিহার চুক্তি (DTAA) দ্বারা নির্ধারিত হবে ও সেই মোতাবেক পরিশোধ যোগ্য হবে।

প্রকল্প-সংশ্লিষ্ট সকল ধরনের আয়কর 'আয়কর অধ্যাদেশ, ১৯৮৪', 'আয়কর বিধিমালা, ১৯৮৪', 'এসআরও' এবং এর ওপর ভিত্তি করে প্রণীত বিধি-বিধান অনুযায়ী পরিশোধ যোগ্য হবে"।

০২। উপর্যুক্ত মন্তব্য/শর্তের ব্যত্যয় হলে জাতীয় রাজস্ব বোর্ড সুবিধাদি দিতে অপারগ থাকবে।

নাফ ২৩/২
(বশীর আহমেদ)
অতিরিক্ত সচিব
সদস্য (বোর্ড প্রশাসন) ২০২২

সচিব

নৌপরিবহন মন্ত্রণালয়।

বাংলাদেশ সচিবালয়, ঢাকা।

(দৃঃআঃ জনাব সালাহউদ্দিন আহাম্মদ, উপসচিব (উন্নয়ন-১ অধিশাখা)

নথি নং-০৮.০১.০০০০.০০২.০৯.০০৭.১৮/২৭

অনুলিপি অবগতির জন্যঃ

তারিখঃ ১০ ফাল্গুন, ১৪২৮ বঙ্গাব্দ।
২৩ ফেব্রুয়ারি, ২০২২ খ্রিষ্টাব্দ।

১-৩। দ্বিতীয় সচিব (কর আইন-২)/(শুল্ক অব্যাহতি ও প্রকল্প সুবিধা)/(মুসক আন্তর্জাতিক সম্পর্ক ও কূটনৈতিক অব্যাহতি), জাতীয় রাজস্ব বোর্ড, ঢাকা। [এই পত্রে সংশ্লিষ্ট অনুবিভাগ সমূহ হতে প্রাপ্ত মতামত সঠিকভাবে প্রতিফলিত না হয়ে থাকলে ২ (দুই) কার্যদিবসের মধ্যে বোর্ড প্রশাসন-২, শাখাকে অবহিত করার জন্য অনুরোধ করা হলো।]

কাজিয়া সুলতানা
দ্বিতীয় সচিব (বোর্ড প্রশাসন-২)
ফোনঃ ৮৩১৮১২০-৬এক্স-৩৭৭

Section IX. Contract Forms

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Letter of Acceptance

[insert letterhead paper of the Employer]

[insert date]

To: *[insert name and address of the Contractor]*

This is to notify you that your Bid dated *[insert date]* for execution of the *[insert name of the Contract and identification number, as given in the BDS]* for the Accepted Contract Amount of the equivalent of *[insert amount in words and figures]* *[insert name of currency]*, as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted by *[insert name of Employer]*.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section IX, Contract Forms, of the Bidding Document.

Authorized Signature : _____

Name and Title of Signatory : _____

Name of Agency : _____

Attachment: Memoranda (*insert list of memoranda (if any) as referred in Sub-Clause 1.1.1.3*)

[Option A: Single-Stage Two-Envelope Bidding]

Contract Agreement

THIS AGREEMENT made the [insert day] day of [insert month], [insert year], between [insert name of the Employer] (hereinafter “the Employer”), of the one part, and [insert name of the Contractor] (hereinafter “the Contractor”), of the other part:

WHEREAS the Employer desires that the Works known as [name of the Contract] should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (a) the Letter of Acceptance;
 - (b) the Letter of Technical Bid;
 - (c) the Letter of Price Bid;
 - (d) addenda, if any;
 - (e) the Particular Conditions;
 - (f) the General Conditions;
 - (g) the Employer’s Requirements (including JSSS);
 - (h) the completed Schedules;
 - (i) the Contractor’s Proposal and any other documents;
 - (j) the Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans; and
 - (k) the Bidder’s Safety Declaration (Form JSSS/BSD)
3. In consideration of the payments to be made by the Employer to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed on the day and year first above written.

Signed by _____

for and on behalf of the Employer
in the presence of:

Signed by _____

for and on behalf the Contractor in the
presence of:

Witness;

Name :

Signature :

Address :

Witness;

Name :

Signature :

Address :

Performance Security

[insert Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of the Employer]*

Date: *[insert date of issue]*

PERFORMANCE GUARANTEE No.: *[insert guarantee reference number]*

Guarantor: *[insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the execution of *[insert name of the contract and brief description of the Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for its demand or the sum specified therein.

This guarantee shall expire and be returned to us, no later than the *[insert the day]* day of *[insert month]*, *[insert year]*², and any demand for payment under it must be received by us at this office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article

¹ The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

² Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9.

15(a) is hereby excluded.

[signature(s)]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

Advance Payment Security

Demand Guarantee

[insert Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and address of the Employer]*

Date: *[insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.: *[insert guarantee reference number]*

Guarantor: *[insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date of the contract]* with the Beneficiary, for the execution of *[insert name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum *[insert amount in figures]* (*[insert amount in words]*) is to be made against an advance payment guarantee.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*)¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

- (a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
- (b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment

¹ *The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*

referred to above has been credited to the Applicant on its account number *[insert number]* at *[insert name and address of Applicant's bank]*.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire and be returned to us, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the *[insert day]* day of *[insert month]*, *[insert year]*,² whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

² *Insert the expected expiration date of the Time for Completion.*

Retention Money Security

Demand Guarantee

[insert Guarantor letterhead or SWIFT identifier code]

Beneficiary: *[insert name and Address of Employer]*

Date: *[insert date of issue]*

RETENTION MONEY GUARANTEE No.: *[insert guarantee reference number]*

Guarantor: *[insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the execution of *[insert name of contract and brief description of Works]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of *[insert the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security]* is to be made against a Retention Money guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*)¹ upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or show grounds for its demand or the sum specified therein.

¹ *The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Beneficiary.*

A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Applicant on its account number *[insert account's number]* at *[insert name and address of Applicant's bank]*.

This guarantee shall expire and be returned to us no later than the *[insert day]* day of *[insert month]*, *[insert year]*², and any demand for payment under it must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

[signature(s)]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

² *Insert the same expiry date as set forth in the Performance Security, representing the date twenty-eight days after the completion date described in GC Clause 11.9.*

