Organisation name: India Ports Global Ltd

Tender no: IPGL / RMQC / 2020, Tender type: Global Tender. Date: 31.08.2020

Tender for procurement of **Rail Mounted Quay Cranes (RMQCs).**

Scope of work: Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of **Four (04**) Nos. of New **RAIL MOUNTED QUAY CRANES (RMQCs)** of 65 MT capacity, Post Panamax Size.

Tender can be downloaded between 31.08.2020 to 04.10.2020 (up to 17:00 Hrs). Completed tenders shall be submitted to IPGL office up to on or before 05.10.2020, up to 15:00 hrs, and technical bid will be opened at 15: 30 hrs. On 05.10.2020.

Office address:

Managing Director
India Ports Global Ltd.
4th Floor, Nirman Bhavan,
M.P.Road, Mazgaon,
Mumbai,400 010, INDIA

Contact Details:

Websites : https://sdclinidia.com and www.ipa.nic.in
Phone : 022 66566253,+919833880764
E-mail: md.indiaportsglobal@gmail.com

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1. TENDER NOTICE
(GLOBAL TENDER NOTICE)
(Tender No: IPGL/RMQC/2020)

Sealed tenders in two-bid system (Technical & Price Bids) are invited on behalf of **India Ports Global Limited** (IPGL), from reputed manufacturers fulfilling the Minimum Eligibility Criteria (MEC). The scope of works, details of time schedule and EMD to be submitted by Tenderers for participation in this tender are given below:

i)	Scope of work	Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of Four (04) Nos. of New RAIL MOUNTED QUAY CRANES (RMQCs) of 65 MT capacity, Post Panamax Size.
ii)	Earnest Money Deposit (EMD)	**Euro 304,000** (Euro Three Hundred Four Thousand only) OR INR 2,65,00,000 (INR Two crore sixty five lakhs only) in favour of IPGL in the form of Bank Guarantee, as per Annex-**II** of Tender Document (Volume-I), from any Nationalised or Scheduled Bank having its branch at Mumbai or Demand Draft (DD) of the said amount in favour IPGL from any Nationalised or Scheduled Bank having its branch at Mumbai payable at Mumbai.
iii)	Sale of Tender Document	**On all working days (10:00 hrs to 17:00 hrs) From 31.08.2020** during office hours at the office of the Managing Director, India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P. Road, Mazgaon, Mumbai-400010.**Tender document will not be sent by post/courier.**
iv)	Pre-Bid Meeting	Pre-Bid Meeting to be held either in person at Conference Hall of India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P.Road, Mazgaon, Mumbai-400010 **or** through **Video Conferencing** on **14.09.2020** at **1430** hrs.
v)	Cost of Tender Document (set of two copies)	Rs. 10,000 +18% GST Rs 1800, Total **Rs 11,800** (Rupees Eleven Thousand eight hundred only) or Euro **135** (One hundred and thirty-five) the form of Demand Draft (non-refundable) drawn on any scheduled bank having its branch at Mumbai in favour of India Ports Global Limited. Tender Document shall have to be collected by the party through an Authorised person / Agent. The Tender document detailing the terms & conditions and the technical requirements can also be downloaded from the web sites: http://ipa.nic.in, and http://www.sdclindia.com from **31.08.2020** onwards till the date of submission of tender. The downloading of tender document shall be carried out strictly as provided on web site. In such case, the Cost of tender document can be deposited at the

		time of submission of the tender. Tender document will not be sent by post/courier.
vi)	Due date for submission of Tender Document	**On or before 05.10.2020 2020, up to 15:00 hrs.** at the office of the India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P. Road, Mazgaon, Mumbai- 400010.
vii)	Date of opening of Technical Bid	On **05.10.2020,** at **15:30 hrs.** At Conference Hall, India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P. Road, Mazgaon, Mumbai-400010.

Managing Director,

For India Ports Global Limited,

4th Floor, Nirman Bhavan,

M.P. Road, Mazgaon,

Mumbai-400010, India

Email:-md.indiaportsglobal@gmail.com

2. INSTRUCTIONS TO TENDERERS (ITT)

2.1 Sealed tenders in two-bid system (Technical & Price Bid), are invited on behalf of India Ports Global Limited (IPGL), for the following work : –

Name of the work: Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of Four (04) Nos. of New Rail Mounted Quay Cranes (RMQCs), of 65 Ton capacity, Post Panamax at Chabahar Port of Islamic Republic of Iran

2.1.1 Minimum Eligibility Criteria (MEC)

a. Financial Standing:

The average annual financial turnover or average annual of permanent assets of the tenderer over the past three years shall be at least US Dollars 32,000,000.00 (US Dollars Thirty two million only) or equivalent Euro or equivalent INR. (Audited and certified copies of annual financial reports from authorized/certified Chartered Accountant to be submitted). For documents in language other than English, translation in English duly certified by a Chartered Accountant shall be considered for evaluation.

b. Experience:

The tenderer should be in the business of designing, manufacturing, Supplying and Commissioning of RMQCs, at least for the last Seven (07) years. (Work order and completion certificate to be submitted for years 2013 or before)

c. Capacity and Capability:

The tenderer should have supplied at least Four (04) nos. RMQCs with similar or higher outreach and Lifting Capacity of 50 Tons and above under twin lift spreader, during any of the year in last Seven (07) years to the top Hundred Container Ports as per independent international publication such as Lloyds list etc along with documentary evidence.

d. Satisfactory Performance:

At least Two (02) RMQCs supplied in the last Seven (07) years must have completed warranty period satisfactorily. (Clients certificate to be submitted).

e. Recent Business Activities:

The tenderer should have supplied or is in the process of manufacturing at least Two (02) RMQCs during the last Five (05) years. (Work order and / or completion certificate to be submitted).

Note: During last five years means during last five years ending last day of the month previous to the one in which the tender is published/uploaded on websites.

All the tenderers participating in this tender shall be evaluated so as to meet the above requirements of MEC.

Note: If the Tenderer is a subsidiary Company, then for the purpose of meeting MEC criteria of clause 2.1.1, documents submitted by the tenderer of its holding Company and/or its sister company can be considered, provided the holding company certifies that the tenderer and/ or its sister company is their subsidiary and the holding company is severally and jointly responsible for compliance of the contract terms and conditions.

2.2 LAST DATE FOR SUBMISSION OF TENDER

2.2.1 Tenders shall be received in the office of the Managing Director, India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P. Road, Mazgaon, Mumbai-400010, up to **15:00 hrs on 05.10. 2020.**

2.2.2 IPGL, May at its own discretion, reserves the right to extend the date for receipt of tender. Tenders received after the aforesaid time and date or the extended time and date, if any, shall be returned unopened to the Tenderer. Tenderers to note that IPGL shall not be responsible for late receipt of any offer due to postal delays or any other delay for whatsoever reasons.

2.3 TENDERER TO INFORM HIMSELF FULLY

2.3.1 The Tenderer is expected to examine carefully the contents of the tender document like, Instructions to the Tenderers, General Conditions, scope of work, annexures and schedules, check-list of documents to be submitted along with the tender etc. Failure to comply with the requirements of the tender will be at the Tenderer's own risk. It would be deemed that prior to the submission of the tender the Tenderer has made a complete and careful examination of requirements and other information set out in the tender document. The Tenderer shall be deemed to have, visited the site and surroundings and have obtained all necessary information in all the matters whatsoever that might influence while carrying out the works as per the conditions of the tender and to satisfy himself to sufficiency of his tender, etc.

2.3.2 The Tenderer is advised to get acquainted himself with the job involved at the site, like availability of labour, means of transport, communication facilities, local laws and bye laws in force. The tenderer is essentially required to be abreast of latest Rules and Regulations in force as regards to local port authority and any other statutory bodies as well as security regulation for the permission to collect all information that may be necessary for preparing and submitting the tender and entering into Contract with IPGL.

2.3.3 Tenderer shall bear all costs associated with the preparation and submission of his tender and IPGL will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the tendering process.

2.3.4 The Tenderer and/or his representatives will be granted permits to visit the site for the purpose of inspection, on receipt of a formal written request. The Tenderer will be fully responsible for any injury (whether fatal or otherwise) to himself or his representatives for any loss or damage to property or for any other loss, damage, costs and expenses whatsoever caused which but for the granting of such permission would not have arisen. The Tenderer will be liable to indemnify the Employer against any loss or damage to the property of the Employer or neighbouring property which may be caused due to any act of the Tenderer or his representatives.

2.4 EARNEST MONEY DEPOSIT (EMD)

2.4.1 The tender shall be accompanied by Earnest Money Deposit as stipulated in the tender notice. **The tender not accompanied with EMD shall be treated invalid**. The E.M.D. shall be submitted in the form of Bank Guarantee (BG) as per enclosed format at **Annex-II (Volume-I of the Tender Document**) drawn in favour of India Ports Global Limited, Mumbai, from any Nationalised / Scheduled Bank (Nationalised / Scheduled Bank shall mean a bank defined under section 2 (e) of the Reserve Bank of India Act 1974) having its branch at Mumbai. Alternatively, Demand Draft (DD), in favour of IPGL, Mumbai, drawn on any Nationalised / scheduled bank enlisted under RBI, payable at Mumbai, for specified amount in the tender for EMD, is also acceptable.

2.4.2 In the event of Tenderer withdrawing his tender before the expiry of tender validity period of **180 days** from the date of opening of technical bid, the tender submitted by the tenderer shall be cancelled and EMD shall be forfeited.

2.4.3 The Earnest Money Deposit of unsuccessful Tenderers shall be returned on award of Contract to the successful Tenderer. No interest shall be payable on the amount of E.M.D in any case. The Earnest Money Deposit of the successful Tenderer shall be refunded only on receipt of Performance Bank Guarantee as stipulated in the tender.

2.4.4 IPGL reserves the right to forfeit the Earnest Money Deposit in respect of successful Tenderer, if he fails to furnish the necessary Bank Guarantee towards performance within 45 days and enter into a Contract within 30 days from the date of receipt of Letter of Acceptance (LOA) as per clause 2.18.3 (d) of the tender.

2.4.5 EMD shall not be enclosed with the sealed covers containing technical offers, but shall be submitted separately in a properly sealed envelope so super scribed.

2.5 IPGL'S Right to Annul the Bidding Process

2.5.1 Notwithstanding anything contained in this tender document, IPGL reserves the right to annul the bidding process at any time without any liability or any obligation for such annulment, without assigning any reason. It clarified that in case the tender process is annulled by IPGL under the provision of Clause 2.5.1, the EMD of the Bidders shall be returned within 21 days from the date of notice of annulment.

2.5.2 IPGL reserves the right to invite revised Technical Tenders and / or revised Financial Tenders from Bidders with or without amendment of the tender document at any stage, without liability or any obligation for such invitation and without assigning any reason.

2.5.3 IPGL reserves the right to reject any Tender if at any time, a material misrepresentation is made or uncovered OR the Bidder does not respond promptly and thoroughly to requests for supplemental information required for the evaluation of the tender.

2.6 TENDER VALIDITY:

The tender shall remain valid for acceptance for a period of **180 days** from the date fixed for opening of Technical Bid. IPGL reserves their right to extend the period of validity for a specific time. The request and the response, there to, shall be made in writing by post or by E-mail. However, in the event of the Tenderer agreeing to the request, he shall not be permitted to modify his tender. In the event of the Tenderer agreeing to the extension, the Tenderer shall correspondingly extend the validity of the tender suitably along with valid extension of the Bank Guarantee furnished towards EMD against this Tender. In case tenderers do not agree to extend the validity of their offer beyond the validity period, EMD of such tenderers shall be refunded after award of the contract.

2.7 AUTHORITY FOR SIGNING TENDER DOCUMENTS

2.7.1 The tender, if submitted on behalf of principals or a Partnership Firm should be signed either by all the partners or some of the partners or other person/s holding a valid "Power of Attorney" from other partners or all the partners constituting the firm or the Principals as the case may be.

2.7.2 In the event, the tender is signed by some of the partners or other persons or the Agents, the Tender should be accompanied by a valid Power of Attorney duly executed by partners/Principals specifying that the partners or person/s or Agents signing the tender has the authority to bind them or the firm as the case may be, in all matters pertaining to the tender.

2.7.3 In case of a Company, the tender should be signed by a person holding a valid Power of Attorney executed in his favour in accordance with the constitution of the Company.

2.8 AMENDMENTS

2.8.1 At any time, prior to the last date for submission of tenders, IPGL reserves the right to amend and modify the tender document. The amendments so carried out shall be forwarded to all the prospective Tenderers prior to the last date for submission of the tender in writing either by post or by Fax or by e-mail including displaying the said amendment on IPGL nominated web sites. The prospective Tenderers shall immediately acknowledge receipt thereof either by post or by fax.

2.8.2 The amendment so carried out shall form part of the tender and shall be binding upon the Tenderers. IPGL may at their discretion, extend the last date for submission of the tender, to enable the Tenderers to have reasonable time to submit their tender after taking into consideration such amendments.

2.9 ERRORS IN THE TENDER DOCUMENT

2.9.1 Tender shall be prepared, signed and submitted only by that bidder in whose name the tender documents have been issued. The tender shall be typed or written in indelible ink and all pages of the tender shall be signed.

2.9.2 The Tenderer shall submit complete tender and the same shall be without alterations, interlineations or erasure except those to accord that instructions issued by the IPGL or as may be necessary to correct errors made by the Tenderers. Person or persons signing the tender shall initial all such cancellations, alterations or amendments. If any discrepancies found in figures and words while reading the rates in the Price Schedule the rate quoted in words shall supersede the figures. In the event of any difference between the unit rate and the total amount stated therein, the unit rate should be reckoned as the correct one.

2.10 MODIFICATION, SUBSTITUTION AND WITHDRAWAL OF PROPOSAL

2.10.1 The Tenderer may modify, substitute or withdraw his proposal after submission, provided that written notice of modification, substitution or withdrawal is received by the Employer before the closing time on due date of submission. No offer shall be modified, substituted or withdrawn by the Tenderer after the closing time on due date. The Tenderer's modification, substitution or withdrawal notice shall be addressed to the Managing Director, India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P. Road, Mazgaon, Mumbai- 400010, with outer envelope clearly marked as Modification, substitution or withdrawal of the tender.

Withdrawal of a proposal during the interval between closing time on proposed due date and expiry of the proposal validity period would result in forfeiture of EMD in accordance with clause 2.4.2 (volume-I of Tender Document).

2.10.2 STAMP DUTY & OTHER EXPENSES:

All costs, charges and expenses including any duty in connection with the Contract as well as preparations and completions of agreement including registration of same by the tenderer, if he wishes to do so, shall be payable by the Tenderer. Tenderer shall ascertain the taxes and duties to be paid on his own due diligence before the submission of the bid. All taxes duties, to be paid to any statutory bodies in places other than destination country shall be paid by the tenderer.

The Bidder shall quote their CIF prices(Incoterm 2010) with insurance till receipt of equipment inclusive of all taxes and duties related to their country of export. The Bidder shall exclude from his price, the custom duty / related taxes (if any payable in destination country) for those items / equipments only which are appearing in the Price Schedule. These taxes / duties related to destination country , if payable, shall be initially borne by the bidder and later reimbursed on actual by IPGL, based on production of relevant proof.

For avoidance of doubt,

(i) It is further clarified that CIF value includes all dues at port of origin and vessel related charges at the disport, including insurance till receipt of equipment at the port of destination.

(ii) Wharfage at disport (if applicable) will be reimbursed to the bidder against the documentary evidence.

(iii) Taxes and duties for that items / equipments which are appearing in the Price schedule, the custom duty in destination country shall be borne by IPGL.

2.11 CONTRACT WORK AND CONTRACT PRICE:

2.11.1 The work to be carried out (hereinafter referred to as "the Contract Work") and the Price for the same (hereinafter called "the Contract Price") shall include the work described in the specifications, annexure, schedules, drawings, etc. annexed hereto.

2.11.2 Except where otherwise expressly provided, the Contractor shall provide all materials, labour and plant and things necessary in connection with the Contract work although everything may not be fully specified and although there may be errors and omissions in the specifications.

2.11.3 The Scope of Works, under this contract is as mentioned below;

Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of 04 Nos. of New post panamax size Rail Mounted Quay Cranes (RMQCs), of 65 Ton capacity at Shahid Beheshti port, Chabahar..

2.11.4 **Contract Price:** Price shall be inclusive of all charges for Design, Manufacture, Transportation including Transit / Marine Insurance, Handling, Supply and Delivery, Receipt of all Equipment / Items and handed over at Site, Installation, Trials, Testing, Commissioning of Equipment and Insurance at Site, Training of IPGL personnel, Cost of O & M Manuals and Training Manuals as per Contractual Conditions, cost of recommended maintenance tools supplied along with each equipments as per list of tools i.e. **Schedule 10-II (Volume-I),** Warranty support as per Contractual conditions and all other incidental charges like unloading, wharfage etc. as applicable at destination country for the execution of the Contractor.

2.11.5 Contractor shall arrange for training of 2(two) Officers of the Employer for training on PLC, Drives and CMMS at Contractor's works. This training shall be conducted by the manufacturer's qualified and experienced personnel while carrying out the trial run of the cranes at contractor's works. Accommodation during the training stay of these 2 Officers at contractor's site shall be arranged by the contractor. This training shall be conducted by the manufacturer's qualified and experienced personnel at contractor's works. The charges towards to and fro transportation from India / destination country to contractor's works, accommodation, including local transport during the training stay (Total stay of training shall be approx. 20 man-days) for these Officers at contractor's works, shall be arranged by the contractor and Cost towards the said training at contractor's works is deemed to be included in CIF Price of the equipment. Apart from above mentioned training, for Inspection & Testing of Work at Contactor's and Sub-Contractor's premises please refer Clause No. 3.24. The period of stay for Inspection & Testing shall depend on manufacturer's Schedule of such activities.

2.11.6 Tenderer are required to quote in Price **Schedule 11** for all the spare parts as listed at **Schedule 10** of the tender. However, IPGL reserves the right to order the same..

2.12 LANGUAGE OF TENDER

The Tender submitted by the Tenderer and all correspondence and documents relating to the Tender exchanged by the Tenderer and the IPGL shall be written in the **English language**. Any printed literature, other than English language, shall be accompanied by an English translation, in which case, for purpose of interpretation of the tender, the English translation shall govern. Anything given in a language other than English shall not be taken into

consideration for any purpose. For MEC of Financial Standing, the audited report in language other than English, translation in English duly certified by a Chartered Accountant shall be considered for evaluation.

2.13 CONVERSION OF SINGLE CURRENCY

The Tenderers are required to quote their offer as per Price schedule of the tender document, in **Euros or Indian rupees**. To facilitate evaluation and comparison, IPGL shall convert all tender Prices, expressed in the Euros in to Indian Rupees, at the bill selling rate quoted by State Bank of India on the date of opening of tender i.e. date of opening of Technical Bid. If on this date, due to any reasons such exchange rates are not available (Forex Market may be closed) the latest available rates prior to the date of opening shall be considered. The due payment of the contract shall be paid in the same currency as quoted.

2.14 TENDER SUBMISSION

The tender submitted by Tenderer shall comprise the following:

2.14.1 A covering letter along with check list – **Schedule 13 (Volume-I)** giving details of the documents being submitted with tender confirming validity of bid for **180 days** & submission of Earnest Money Deposit and the Tender Document fee, if not already paid - **Envelope 1** so super scribed with the contents therein.

2.14.2 Earnest Money Deposit as per tender condition- **Envelope 2** so super scribed with the contents therein.

2.14.3 The tender document (downloaded from SDCL, IPA website) to be submitted in two sets, one being marked as **"ORIGINAL"** and other as **"DUPLICATE"**. (**TECHNICAL BID**), with each page of it duly paginated, signed by the authorised person and stamped with company's seal in token of having been read and accepted the tender conditions along with Letter of application cum Tender form duly signed by the person / persons who is / are competent to sign as per format enclosed to this tender document. A scanned copy of the signed documents along with **MS-WORD / EXCEL** copy (as the case may be) of the technical bid shall also be submitted on a **CD / Pen Drive. - Envelope 3** so super scribed with the contents therein.

2.14.4 **Price Bid - Envelope 4** so super scribed with the contents therein i.e. **Schedule 11 Part-I & Part-II.**

2.14.5 One Duplicate Copy of Technical Bid (clearly marked) of the offer shall be submitted along with the original offer, as stated 2.14.3.

2.14.6 Tenderers are required to put each of the elements viz., Covering letter, Earnest Money Deposit, Technical Bid with tender form and Tender Document, Price Bid and Duplicate Copy of Technical Bid in separate sealed envelopes. These four envelopes shall be super

scribed as "Tender No. IPGL/RMQC/2020 "Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of 04 Nos. of New RMQCs of 65 MT capacity Post Panamax size at Shahid Behesti Port, Chabahar, and shall be addressed to The Managing Director, India Ports Global Limited, 4th Floor, Nirman Bhavan, M.P. Road, Mazgaon, Mumbai- 400010, Maharashtra, India.

2.15 TECHNICAL BID

Technical Bid should not contain Prices i.e. it should not contain Schedule 11 i.e. Schedule of price. "Disclosure/indication of Price in the Technical Bid shall render the tender disqualified and rejected".

The Technical Bid shall comprise of the following information /documents which will be used in the evaluation of Tenders.

2.15.1 The Tenderer while submitting their offer for this Tender, shall also confirm in writing along with all relevant documents supporting to fact that they are meeting the MEC as specified at clause 2.1.1 of this tender document.

2.15.2 General Information / Particulars of the Tenderers as specified in the **Schedule 1 (Volume-I)** of this tender document.

2.15.3 Duly Audited Annual Reports on financial standing of the Tenderer / holding company ,including annual turnover, for the last three years, as per **Schedule 2 (Volume-I)** of this tender document.

2.15.4 Documentary evidence related to business registration / commencement.

2.15.**5** List and copies of work orders executed during the last (07) seven years and documentary evidence of completion of work i.e. clients final acceptance certificates mentioning details of work- order with dated signature indicating supply of RMQCs as per Clause 2.1.1.b.

2.15.6 Copy of certificate indicating supply of at least Four (04) Nos. of RMQCs supplied during last (07) seven years as per Clause 2.1.1.c, to top 100 container ports along with documentary evidence of the claimed port being amongst top 100 container ports during any of the past (07) seven years, along with the documentary evidence.

2.15.7 Copy of client's certificates for satisfactory completion of warranty period of at least Two (2) Nos. of RMQCs during the last Seven (7) years as per Clause 2.1.1.d.

2.15.8 Copy of the work orders for supply or in the process of manufacturing at least Two (2) Nos. of RMQCs during last Five (5) years as per Clause 2.1.1.e.

2.15.9 The bidder shall submit documentary evidence for having sea-front for assembly and roll-on facility.

2.15.10 Technical data of the crane as per Clause 1.5 and 1.6 of Volume-II of this tender document.

2.15.11 Work Schedule showing as per **Schedule 3 (Volume-I)** of this tender document:

2.15.12 Details of the training programme of various categories of IPGL or its Associates as per **Schedule 4 (Volume-I)** of this tender document.

2.15.13 Quality Assurance Plan indicating all activities steps by step at various stage of project as per **Schedule 5 (Volume-I)** and details of instruments for Testing & quality control as per **Schedule 6 (Volume-I)** of this tender document.

2.15.14 Details of Sub Contractors involved in the various activities according to **Schedule 7 (Volume-I)** of this tender document.

2.15.15 Details of the Organisation showing hierarchy and key personnel i.e. Organisation chart.

2.15.16 Details of current commitments and details of work completed in past, period etc along with documentary evidence.

2.15.17 Experience in having executed similar Works along with and other related details.

2.15.18 Tentative drawings of various arrangements of the crane as per clause3.26 (Volume-I) of this tender document.

2.15.19 **a)** Arrangement for importing spare parts, tie up with local firms for supply of spare parts, if any, and arrangement for after sales service. Tenderer shall submit the information as per **Schedule 8 (volume-I)** of the Tender Document.

b) Details of bought off out items and its quality certification plan. The bidder is expected to provide the details of major bought out items in their submission and must provide QAP for all items except for those which are bought out items from various suppliers and the same may be provided at an appropriate stage.

2.15.20 Information regarding any current litigation.

2.15.21 Any other details, which shall establish the technical competency and any deviation from technical specification.

2.15.22 The deviations if any, shall be submitted as per **Schedule 9 (volume-I)** of the Tender Document along with Technical Bid without disclosure of the Price adjustments for withdrawal of deviations proposed by the Tenderer. However, the price adjustments proposed for withdrawal of Deviations if any, as specified by the tenderer in the **Schedule 9**, shall be submitted along with the **PRICE SCHEDULE** of the Tender. If Price adjustments are not given in the price schedule, it is deemed that particular deviation does not bear any financial implication for withdrawal of deviation. In case there are no

deviations, **Schedule 9** shall be stroked off by writing **"NO DEVIATIONS"** on it. The bidder is expected to comply with all terms of the tender and no deviations are envisaged. However, in case of any deviation considered by the bidder, the same shall need to be indicated in **Schedule 9.** The deviations not acceptable to IPGL should be withdrawn by the bidder. The bidder shall provide price implications, if any, for the deviated items, along with the price bid

2.15.23**.** List of spare parts quoted as per **Schedule 10 (Volume-I)** without disclosure of the price. **Schedule 10 A (Volume-I)** is details of **Operation and Maintenance Manual** and **Schedule 10 B (Volume-I)** is List of the Tools to be supplied with each equipment, cost of which is included in CIF Price of the Equipment.

2.15.24 **Schedule of Price** i.e. **Schedule 11 (Volume-I) Part – I and Part - II** to be submitted separately in sealed **Envelope 4**, superscribed as **Price Bid.** Price adjustment offered for each deviation should also be attached along with.

2.15.25 Undertaking to ensure **Integrity Agreement** as per **Schedule 12 (Volume-I):** The tenderer shall give an undertaking that they have not made any payment or illegal gratification to any person /authority connected with the bid process so as to influence the bid process and have not committed any offence in connection with the bid. The bidder shall disclose any payments made or proposed to be made to any intermediaries (agent etc.) in connection with the bid.

2.15.26 Check List as per **Schedule 13 (Volume-I).**

2.15.27 **Confidentiality and Non-Disclosure Agreement Schedule 14 (Volume-I):** Except with the written consent of IPGL, the successful tenderer and its personnel shall not at any time communicate to any person or entity any confidential information acquired in the course of the Project execution or the services rendered, this contract or IPGL's Business Operations nor shall the vendor/Consultant and its Personnel make public the recommendations formulated in the course of, or as a result of the services. However, in case of requirement of sharing of critical business/technical information with third party, a Non-disclosure agreement shall be signed between authorised official of the successful tenderer and IPGL as per the **Schedule 14 (Volume-I)** of the tender document.

2.15.28 Details of organisation showing hierarchy and key personnel **Schedule 15 (Volume-I)** (Organisation Chart).

2.15.29 Current Commitments in Hand as per **Schedule 16 (Volume-I).**

2.15.30 Details of works completed in past as per **Schedule 17 (Volume-I).**

2.15.31 Experience in having executed similar Works along with and other related details as per **Schedule 18 (Volume-I)** of this tender document.

2.15.32 Tentative drawings of various arrangements of the crane as per clause 3.26 (Volume-I) of this tender document.

Note: Technical offer with counter condition shall be liable for rejection and disqualification.

2.16 PRICE BID:

2.16.1 The "Price Bid" as per the **Price Schedule** of **Volume-I** of the tender document shall contain following;

i. CIF Price of the equipment.

ii. CIF Price included for Tools. **Schedule 10 B (Volume-I)**.

iii. Price breakup of Spares as mentioned in **Schedule 10 (Volume-I)**.

iv. Custom duty / any other taxes payable.

v. Price for Testing and Commissioning of the equipment.

vi. Cost for imparting training to IPGL personnel at contractor's works (Clause 2.11 of Volume I of the Tender Document) which shall deem to be included in the cost of the equipment.

vii. Cost for imparting training to IPGL personnel at site as per clause 1.12 of Volume II of the Tender Document.

viii. Cost towards inspection of equipment at contractor's works (as per clause 3.24 & 3.25 Volume-I of the tender document) which shall deem to be included in the cost of the equipment.

ix. Cost towards Training Operation and Maintenance Manuals. **Schedule 10 A (Volume-I)**

x. Cost towards Warranty support.

The expenses on the training and inspection at contractor's works for the officers deputed shall include to and fro travelling expenses from IPGL to Contractor's works and vice-a-versa, lodging & boarding, local transportation at Contractor's works.

2.16.2 Conditional Price Bid shall be liable for rejection.

2.16.3 The "Price Bid" shall contain rates of RMQC's, as per the **Price Schedule of Vol.-I of the tender document i.e. Schedule11.** The Price Schedule shall contain all applicable taxes payable, CIF Price of the equipment and spare parts / Tools as per **relevant Schedule of (Volume-I)** Price for Testing and Commissioning of the equipment, the cost for imparting training to IPGL personnel at work site i.e. Chabahar Port, , the cost for imparting training

to two IPGL officers at contractor's works on PLCs, Drives / CMMS (including cost for Transportation & Accommodation & lodging of two officials of IPGL during the period of testing of manufactured equipment at contractor's site / work. **It may be noted that Custom Duty at Chabahar is exempted on import of ONLY those items / equipment appearing in the Price Schedule of this tender document. Anything other than the subjected to the contract is liable for duties as applicable.**

The Bidder shall quote their CIF prices inclusive of all taxes and duties related to their country of export. The Bidder shall exclude from his Price only the custom duty / related taxes if any payable in destination country for the items / equipments appearing in the Price Schedule.

The bidder shall exclude from his price the custom duty/related taxes if any, payable in destination port for the items / equipments appearing in the price schedule.

2.16.4 Tenderers shall quote the Total cost for the entire work as per Contract conditions and as per format given in the Price Schedule.

2.16.5 Tenderers shall quote for each and every item of the work of the Tender as per price schedule of the tender. Partial offer by any tenderer shall be liable for rejection and will not be considered by the IPGL

2.17 PRE-BID CONFERENCE

IPGL shall hold a pre-bid meeting either in person or through Video Conferencing, in order to clarify and discuss issues with respect to the tender vis-à-vis terms and conditions or any other related issues. The meeting shall be held on **14.09.2020**, and would start at 14:30 Hrs. Tenderers are advised to formulate their views and forward the same to The Managing Director, IPGL, on or before **11.09.2020** on e-mail md.indiaportsglobal@gmail.com, mons.indiaportsglobal@gmail.com indicating their intention to attend the pre-bid meeting. The prospective tenderers, who intend to attend the pre-bid conference, are required to submit authorisation letter from the tenderer for the representative attending meeting . During the pre-bid meeting, the queries received in advance would be clarified first, followed by those submitted in writing, during the meeting. No further queries shall be entertained after the Pre-Bid meeting. The changes, if any, proposed by the Tenderer would be discussed and the IPGL's response would be provided to all the Tenderers. The queries received from all the prospective Tenderers would be consolidated and IPGL's response to the same would be communicated to all the Tenderers in writing (through e-mail) well in advance to the last date of submission of tenders. The clarifications so issued would form part of the tender and remain binding on all the Tenderers which shall be accepted and submitted by all the Tenderers along with their offer, duly signed by the authorised signatory on each page.

Your queries, if any, in soft copy may be sent by **E-mail / CD / USB in MS - WORD** format in the following tabular form latest by **11.09.2020** as the Pre- Bid Meeting is Scheduled to be held at **14:30 Hrs.** on **14.09.2020.**

Sr. No.	Volume-I & II Clause No.	Page No.	Tenders Specification Requirements	Queries	Clarification From IPGL

2.18 TENDER OPENING AND EVALUATION

2.18.1 OPENING OF TECHNICAL BID:

Technical Bids of the tender, received up to closing time on stipulated date, shall be opened on the same day i.e**. 05.10.2020 at 15:30 Hrs at Conference Hall, IPGL**, Nirman Bhavan M.P. Road, Mazgaon, Mumbai-400010 in presence of Tenderers' duly authorised representative, who may wish to be present. The Tenderer -representatives who are present shall sign a register evidencing their attendance. Tenders shall be opened as per the following procedures:

a) In the first instance the envelopes containing cost of tender document for the tenderers who have downloaded the tender document from web site will be checked and opened. Then the envelope containing covering letter and confirmation of submission of the tender as required (Envelope - 1) and EMD (Envelope -2) shall be opened and checked.

b) Thereafter the Letter of application cum Tender form and Technical Bids i.e. Volume I of the tender document (Envelope -3) of those tenderers whose tenders are accompanied by EMD shall be opened. At the time of opening only the contents of the covering letter and salient details of Technical Bids as considered appropriate by the tender opening Officers shall be read out.

c) The **envelopes containing the Price Bid i.e. Envelope 4, shall not be opened.** All the sealed Price Bids of the Tenderers shall be put in separate cover and sealed in presence of the Tenderer's representatives. The sealed cover containing Price Bids shall be kept in the safe custody of IPGL to be opened at subsequent date as per the procedure.

2.18.2 SCRUTINY AND EVALUATION OF THE TENDERS

a) In the first instance the documents submitted with the Technical Bid will be scrutinised to ascertain whether the Tenderer fulfils the requirements as stipulated in

the Minimum Eligibility Criteria Clause 2.1.1. The tenderer who do not fulfil the Minimum Eligibility Criteria shall not be considered for further evaluation

b) The Technical Bids of the tenderers who fulfil the Minimum Eligibility Criteria at Clause 2.1.1 shall be thereafter scrutinised for responsiveness. For this purpose, a tender shall be treated as substantially responsive which meets with the all requirements of the tender documents and is without any deviations.

c) After the tender opening, the whole process involving scrutiny, clarifications, evaluation and comparison of tenders and recommendations regarding award of Contract shall be confidential. Any efforts on part of any Tenderer to influence the IPGL or any officials in any way in the process of scrutiny, evaluation, comparison of tenders and decision concerning award of Contract may result in rejection of the Tenderer's bid.

d) To assess the scrutiny, evaluation and comparison of tenders, the IPGL may ask Tenderer individually for clarifications. Request for clarification and response thereto, shall be in writing or through FAX, e mail followed by post or through speed post. No change in Price or substance of the tender shall be sought, offered or permitted nor is the Tenderer permitted to withdraw the tender before the expiry of the validity period of the tenders in the process of clarifications.

2.18.3 OPENING OF PRICE BID

a) Tenders, which are found to be in conformity with IPGL's Tender requirement and are considered substantially responsive, shall be considered for opening of Price Bid.

b) The Tenderers found to be responsive shall be informed about the date and time of opening of their Price Bids. On the stipulated date and time the Price Bids of such Tenderers, who are found to be responsive, shall be opened in the presence of authorised representatives of such Tenderers who wish to remain present.

c) For Award of Contract, the Comparison and Evaluation of Price Bid will be based on the lowest of the total landed cost of the Equipment quoted by the Tenderers covering CIF Price of the equipment for Design, Manufacture, Supply, including, transportation, transit / Marine insurance, Assembly, testing, commissioning and other cost involved for making the equipment / items available at site till it is handed over at site, including insurance as per tender, price quoted for imparting necessary operational & maintenance training to IPGL personal as per conditions of the Contract, warranty service during 2 years guarantee period and excluding cost of spare

parts and special tools (**optional and not taken for evaluation**) enlisted under **Schedule 10**).

d) The Tenderer whose bid is accepted by the IPGL shall be duly informed in writing. Within 15 days of receipt of intimation, regarding acceptance of its bid i.e**.** Letter Of Acceptance (LOA), the Tenderer shall submit draft Contract Agreement in the format approved by the IPGL as per **ANNEX IV** (volume-I) and within Fifteen days thereafter, successful tenderer shall submit performance guarantee as per clause 3.40.1 (Volume-I) and **Annexure V.** Within a week of submission of Performance BG, the **Contract Agreement and Work Order** shall be signed between the IPGL and the successful Tenderer.

e) The Tenderer whose offers are found not in conformity with the conditions of the tender, will not be considered for opening of price bids and their un-opened price bids will be returned after award of work to the successful tenderer.

2.19 NOTIFICATION AND AWARD OF CONTRACT:

Prior to the expiry of the prescribed period of tender validity or such extended time, the IPGL shall notify the successful Tenderer with Letter of Acceptance (L.O.A.), by a FAX, e mail followed by registered letter that his tender has been accepted. The notification of award shall constitute the formation of the Contract. The successful tenderer, at his cost shall prepare and submit to IPGL five bound sets containing their technical offer and the various documentary transactions taken place between the employer and tenderer till the finalisation and award of the Contract.

2.20 EXPORT APPROVAL

This contract will be subject to the respective export approval laws of the country of origin.

3. GENERAL CONDITIONS OF CONTRACT

3.1 DEFINITION AND INTERPRETATIONS:

In the Contract, as hereinafter defined, the following words and expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

3.1.1 "IPGL" or "Employer" or "Company" means Board of Directors of India Ports Global Limited, a company incorporated on 22nd January, 2015, under Indian Company Act 2013.

3.1.2 "Contractor" means the firm, corporation or company whose tender has been accepted by the IPGL and includes the Contractor's servants, agents and workmen, personal representatives, successors and permitted assigns.

3.1.3 "Sub-Contractor" shall mean a person or persons to whom a part or full portion of the work has been assigned by the Contractor with information to IPGL in writing.

3.1.4 "Contract" means and includes Tender Documents, Instructions to Tenderers, General Conditions of Contract, special conditions, if any, drawings, specifications, Price Schedule and other annexures and Schedules etc., any amendments / clarifications thereto, Letter of Acceptance (LOA) and the Contract Agreement entered into between the IPGL and the Contractor as per format given in Annex- IV of the tender document.

3.1.5 "Contract Price" means the sum named in the Letter of Acceptance (LOA) subject to such additions thereto, or deductions there from, as may be made under the provisions of the Contract.

3.1.6 "Specification" means the specification referred to in the Tender document and any modification thereof or addition thereto as may from time to time be furnished or approved in writing by the Employer.

3.1.7 "Site" means the land and other areas on, under, in or through which the Works are to be executed or carried, or any other places provided by the Employer for the purpose of the Contract.

3.1.8 "Works" means Design, Manufacture, supply, Installation, Testing, Commissioning & Guaranteeing the performance of 04 Nos. of New RAIL MOUNTED QUAY CRANES (RMQCs), post panamax size, to be supplied at Container Terminal, India Ports Global Limited, Shahid Behesti Port, Chabahar.,

3.1.9 "Approved/Approval" means the approval in writing.

3.1.10 "Engineer-In-Charge" means the Project Manager, IPGL, or any officer authorised by IPGL.

3.1.11 "Drawings" means the drawings referred to in the Specification and any modification of such drawings approved in writing by the Engineer- In – Charge and such other drawings as may from time to time be furnished or approved in writing by the Engineer-In-Charge.

3.1.12 "Schedule" shall mean the schedule annexed to the tenderers bid.

3.1.13 “Tests on completion” shall mean such tests as are prescribed by the applicable Design Standards (latest editions), codes and described in the tender document, to be made by the Contractor before the equipment / items are supplied, delivered and taken over by the Employer.

3.1.14 “Writing” shall include any manuscript, typewritten or printed statement under or over signature and seal as the case may be.

3.1.15 "Defect Liability Period" has the meaning assigned in the clause no. 3.29 of the tender document (Vol. I).

3.1.16 "Month" means calendar month.

3.1.17 "Day" means calendar day.

3.1.18 "Letter of Acceptance’’ means the formal acceptance, made by or on behalf of the Employer, of the tender including any adjustments or variation to the tender agreed between the Employer and the Contractor.

3.1.19 "Foreign currency" means the currency other than Indian Currency.

3.1.20 “Commissioning of Equipment” has the meaning assigned in clause no.3.38 of the tender document (Volume-I).

3.2 SINGULAR AND PLURAL:

Words implying the singular only also include the plural and vice versa where the context required.

3.3 HEADINGS OR NOTES:

The headings in these conditions of Contract and instructions to tenders shall not be taken to be part thereof, or be taken into consideration in the interpretation, or construction thereof, or of the Contract.

3.4 ENGINEER-IN-CHARGE AND HIS REPRESENTATIVE

3.4.1 The Engineer-In-charge shall carry out such duties in issuing decisions, certificates and orders as are specified in the Contract.

3.4.2 The Engineer-In-charge may from time to time, in writing delegate to his Representative any of the powers, discretion, function and/or authorities vested in him and he may at any time revoke any such delegation. Any written decision, instruction or approval given by the Engineer In Charge to the Contractor in accordance with such delegation shall bind the Contractor provided always that:

a) Any failure of the Engineer In Charge to disapprove any plant/ workmanship shall not prejudice the power of the Engineer In Charge thereafter such plant or workmanship and to order the rectification thereof in accordance with these conditions;

b) If the Contractor shall be dissatisfied by reason of any decision of the Engineer In Charge he shall be entitled to refer the matter to the officer above the rank of Engineer In Charge who will thereupon confirm, reverse or vary such decision.

3.4.3 Wherever by these conditions the Engineer-In-charge is required to exercise his discretion, by giving a decision, opinion, consent or to express satisfaction or approval, or to determine value or otherwise take action which may affect the rights and obligations of the Contractor, the Engineer- In-charge shall exercise such discretion fairly within the terms of the Contract and having regard to all the circumstances. If either party disagrees with the action taken by the Engineer-In - Charge he shall be at liberty to refer the matter to Appellate Authority with these conditions.

3.5 OBLIGATIONS OF THE CONTRACTOR

3.5.1 The Contractor shall exercise all reasonable care and diligence in the discharge of all technical, professional and Contractual duties to be performed by them under this Contract as specified in the Scope of Work within the Time for Completion and provide all labour, including the supervision and security thereof, Contractor's Equipment necessary thereof and for carrying out his obligation, so far as the necessity for providing the same is specified in or is reasonably to be inferred from the Contract. The Contractor shall be fully responsible to the IPGL for proper, efficient and effective discharge of their duties.

3.5.2 Contractor shall furnish bond in the form of Bank Guarantee towards the performance of the work as per clause 3.40 (Volume-I) of this tender document.

3.5.3 If the Employer shall consider himself entitled to any claim under the performance Guarantee he shall forthwith so inform the Contractor specifying the default of the Contractor upon which he relies. If the Contractor fails to remedy such default within 30 days after the receipt of such notice the Employer shall be entitled to forfeit to the extent of the loss or damage incurred by reason of the default.

3.5.4 The Contractor shall proceed with the Works in accordance with the decisions, instructions and orders given by the Engineer In Charge in accordance with the condition of the Contract.

3.6 ASSIGNMENT AND SUBLETTING

3.6.1 The Contractor may sub let the Works or any part thereof with prior intimation and approval from the Employer.

3.6.2 He shall neither assign his right and interest in these presents tender nor assume a fresh partner or partners, or dissolve the partnership existing between him in reference to this Contract without the written permission of the IPGL.

3.6.3 In the event of any activity being sub-contracted, the total liability and responsibility for meeting obligations and performance under Contract agreement shall rest with the Contractor. In the event of the Contractor contravening this condition, the IPGL shall be entitled to terminate the Contract forthwith and award a fresh Contract to some other party at risk and cost of the Contractor who shall be liable for any loss or damage which the IPGL may sustain in consequence arising out of such replacement of the Contractor. In such case the performance guarantee shall be forfeited.

3.6.4 Such consent, if any, shall not relieve the Contractor from any liability or obligations under the Contract and he shall be responsible for the acts, defaults and neglects of any Sub-Contractor or his servants, agents or workmen fully if they were the acts, defaults or neglects of the Contractor provided always that the provisions of labour or a piecework basis shall not be deemed to be sub-letting under this clause.

3.7 PATENT RIGHTS:

3.7.1 The Contractor shall fully indemnify the Employer against any action, claim or demand, costs or expenses arising from or incurred by reason of any infringement or alleged infringements of letters, patents, Design, trademark or name, copyright or other protected rights in respect of any machine, plant, work, materials or things, system or methods of using, fixing working or arrangement used for fixed or supplied by the Contractor in India, or elsewhere.

3.7.2 All payments, or otherwise shall be deemed to be included by the Contractor in the Prices named in the tender and shall be paid by him to whom they may be payable.

3.7.3 In the event of any claim being made or action brought against the Company in respect of any such matter as aforesaid, the Contractor shall be immediately notified thereof and he shall, with the assistance if he so requires of the Company, but at the sole expense of the Contractor, conduct all negotiations for the settlement of the same or any litigation that may arise there from, provided that the conduct of such negotiations or litigations shall be conditional upon the Contractor giving to the Employer such security as shall from time to

time, reasonably required by the Employer to recover the ascertained or agreed amount as the case may be of any compensation, damages, expenses and cost which might be payable by IPGL in respect of or as result of any negotiation or litigation.

3.7.4 Intellectual property rights developed by seller shall remain with him and buyer shall not claim any right of business on the same.

3.8 GENERAL OBLIGATION OF THE EMPLOYER

In execution of the Works no person other than the Contractor, sub Contractors and his and their employees shall be allowed on the site except by the written permission of the Engineer In Charge or his authorised representative, but the Engineer in charge, his authorised representative, other authorities and officials of the Employer shall be afforded to inspect all facilities arranged by the Contractor at site.

3.9 CUSTOMS DUES, PORT DUES etc.

3.9.1 In case Contractor brings in any special tools or material for commissioning of the Cranes (as appearing in the price schedule), the Contractor shall pay all applicable duties in respect of any such materials to be imported / exported to / from destination port.

3.9.2 It shall be the responsibility of the successful Contractor to comply with all the required formalities for custom clearance for items stated in 3.9.1 at destination port and pay the, charges as applicable and take necessary clearance required from the customs department.

3.9.3 Custom clearance for items appearing in the price schedule of this tender document and associated custom duty (if any), shall be the responsibility of IPGL. However the Contractor will provide all support / documents, as required.

3.9.4 If available, Office space including electricity and water, as indicated by the tenderer shall be provided on chargeable basis.

For avoidance of doubt:

(i) It is further clarified that CIF value includes all dues at port of origin and vessel related charges at the disport, including insurance till receipt of equipment at disport.

(ii)Wharfage at disport (if applicable) will be reimbursed to the bidder against the documentary evidence.

(iii)Taxes and duties for those items / equipments which are appearing in the Price Schedule, the custom duty at the destination port shall be borne by IPGL.

3.10 SHIPMENT:

3.10.1 The shipment of the consignment shall be arrange by the Contractor subject to applicable laws of country of origin.

3.10.2 It is necessary that notice to be given regarding rediness of the cargo for the shipment.

3.10.3 The Bill of Lading should be drawn so as to show:

3.10.4 Shippers : Tenderers Nominee

3.10.5 Consignee: India Ports Global Limited or its SPV.

3.10.6 The contractor shall submit shipping list to the IPGL for information.

3.10.7 The Bills of Lading (clean and shipped on board) should be made to order and bank endorsed. Copy of bill of lading should be sent to IGPL.

3.10.8 Import permission, if required, at the port of destination will be obtained by IPGL on request from the supplier prior to shipment/delivery.

3.11 PACKING AND MARKING FOR SHIPMENT:

3.11.1 All equipment/spare parts required under this Contract shall be packed, securely placed and protected by the Contractor during transportation to destination country. Packing cases shall be of a size convenient for cases containing easily damageable articles.

The Contractor will be held responsible for the improper packing and protection of the parts.

3.11.2 The cases, crates and packages shall be permanently branded and painted with the shipping marks. The marking shall be carried out with a view to the mark remaining unobliterated, when the consignment reaches destination but as a further precaution, a reproduction of the shipping marks shall be placed inside each case, crate and packages.

3.11.3 Packages or bundles, which cannot be permanently branded, shall have metal label, With the above particulars stamped or attached to them by strong wire.
04 RMQCs shall be supplied in fully erected and pre tested condition.

3.12 COMPLETION PERIOD OF WORK:

Under this tender IPGL intends to invite price offer for acquiring 04 Nos. RMQCs.

The period of completion for total Works, under this Contract shall be as given below:

Name of the work: Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of 4 Nos. of New Rail Mounted Quay Cranes (RMQCs) of 65 MT capacity Post Panamax size at Shahid Behesti Port,Chabahar with a

Total completion period of **16 (Sixteen)** months from the date of opening of Letter of Credit (LC).

The bidder shall be required to follow either of the following schedules, clearly indicating the option 1 or option 2 in the technical bid and once opted in the technical bid, cannot be changed later.

Option 1:

Supply of all 4 Nos. RMQC: within a period of **16 (Sixteen)** months from the date of opening of Letter of Credit (LC).

Option 2:

Supply of 2 Nos. RMQC: within a period of **14 (Fourteen)** months from the date of opening of Letter of Credit (LC).

Supply of balance 2 Nos. RMQC: within a period of **20 (Twenty)** months from the date of opening of Letter of Credit (LC).

Liquidated Damages as per the Clause shall be applicable in both the options.

It may further be noted that if the Bidder opts to go with Option 2, incentives as per clause 3.49 shall not be applicable.

3.13 RATES AND AMOUNTS INCLUDE ALL CHARGES:

The rates and amounts submitted by the Tenderer shall include all payments on account of taxes, levies, duties, royalties etc. as applicable and payable in the country of origin including all incidental charges that the tenderer may have to bear for the execution of works.

3.14 ADDITIONS AND ALTERNATIONS:

3.14.1 IPGL may give instructions and directions as may appear (necessary and proper) to the IPGL for the guidance of the Contractor and good and efficient execution of the Works under this contract without altering major conditions and scope of work of the Contract.

3.14.2 The Contractor shall receive, obey and be bound by the same according to the true intent and meaning thereof.

3.15 EXECUTION:

The Contractor shall, in consideration of payments to be made to him as hereinafter provided, execute and do the Works set forth as described in the scope of the work and specifications, including any amendments to tender clauses.

3.16 EXTRAS:

Any extra expenses incurred in connection to the Works by the IPGL in the performance of the Works owing to the neglect or omission on the part of the Contractor, in any of the case mentioned in this Contract shall be deducted from any sum due or which may thereafter become due to the Contractor or from any amount lying with them or under their control or he may be called upon to pay the amount of such extra expense to such person or persons as the IPGL may appoint to receive the same and in the event of the Contractor failing to make such payment, the said amount shall be recoverable from him in such manner as the IPGL may determine.

3.17 USE OF GROUND:

The Contractor shall be allowed to use such an area as in the opinion of the IPGL may be absolutely necessary for the proper and efficient execution of Works and on completion of Works or termination of his Contract, he shall clear away all his tools, plant, rubbish and other materials within a fortnight and hand over vacant and peaceful possession of the same to the IPGL in a tidy and clean condition. The Contractor shall not be allowed to erect any structures on any property of the IPGL. .

3.18 CONTRACT DOCUMENT MUTUALLY EXPLANATORY:

3.18.1 The several documents forming the Contract are to be taken as mutually explanatory of one another and should anything appear in one that is not described in the other, no advantage shall be taken of any such omission.

3.18.2 In case of any discrepancies or inconsistencies however appear, or should any misunderstandings arise as to the meaning and of the specifications or drawings or as to the dimensions or the quality of the material or proper execution of the Works or as to the measurement or quality and valuation of the Works executed under this Contract or as extra thereupon, the same shall be explained by the Engineer-in-charge or his authorised representative.

3.18.3 The explanation of Engineer-in-charge or his authorised representative shall be final and binding upon the Contractor and the Contractor shall execute the Works according to such explanations, and without extra charge or deductions to/from the Prices specified in the

bill of quantities and do all such Works and things as may be necessary for the proper completion of the work as implied by the specification and drawings, even though such work and things are not specifically shown and described therein.

3.19 ACCESS TO SITE:

The Contractor shall obtain prior permission of the IPGL before any person connected with the Works visits the site. The Contractor shall abide by the regulations and rules of India Ports Global Limited/Security agency at destination country in respect of entry/exit and movement in the premises and any other directives issued by the Government / Statutory Agency from time to time during execution of the contract.

3.20 CONTRACTOR'S EQUIPMENT:

3.20.1 The Contractor shall be responsible for supply, use and maintenance of all the equipment and he shall ensure that they are suitable for the work and are maintained in such a manner as to ensure their efficient working.

3.20.2 IPGL may, if they deem fit, direct the Contractor to remove from site any equipment which are not efficient and/or prejudicial to the quality of the work to be replaced by equipment to their satisfaction. The Contractor shall immediately follow IPGL's directions/instructions.

3.21 EXISTING SERVICES:

3.21.1 Drains, pipes, cables, overhead wires and similar services whether above or below the ground which may be encountered in the course of the Works shall be saved and kept harmless from injury and/or loss or damages by the Contractor at his own costs and expenses so that they continue to be in full and uninterrupted use to the IPGL.

3.21.2 The Contractor shall not store any materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such or any services. The Contractor shall at his own costs and expenses and without any delay repair and make good to the satisfaction of the Employer, any injury and/or loss or damage caused by the Contractor to the same.

3.22 LABOUR:

3.22.1 The Contractor shall make his own arrangements for the engagement of all labour for doing the work at site or in respect of or in connection with the execution of work as also for the transport, housing, feeding and payment thereof. Since time is the essence of this Contract, requisite number of labour force has to be kept, so as to complete the

Installation, Testing and Commissioning of the equipment within the completion period as stipulated in the tender.

3.22.2 In the event of any outbreak of illness or an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

3.22.3 The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.

3.22.4 The Contractor shall at all times during the continuance of the Contract comply fully with all existing Acts, Regulations and bye law as including all statutory amendments and re-enactment of state, Central Government authorities and other local authorities and any other enactment and acts that may be passed in future either by the State or the Central Government or local authority, including Labour Laws, Factories Act, Minimum Wages Act etc

3.22.5 If as a result of Contractor's failure, negligence, omission, default or non-observance of any provisions of any laws, the IPGL is called upon by any authority to pay or reimburse or required to pay or reimburse any amount, the IPGL shall be entitled to deduct the same from any moneys due or that they become due to the Contractor under this Contract or any other Contract or otherwise recover from the Contractor any sums which the IPGL is required or called upon to pay or reimburse on behalf of the Contractor. All registration and statutory inspection fees in respect of his work pursuant to the Contract shall be paid by the Contractor.

3.22.6 The Contractor shall pay the labourer engaged by him on the work not less than a fair wage, which expression shall mean, whether for time or piece work, rate of wages as may be fixed by the relevant statutory authority as fair wages for payable to the different categories of labourers or those notified under the Minimum Wages Act or applicable local laws of respective country.

3.22.7 **Safety Gears Etc**.: The Contractor shall at his own expenses provide all safety gears for all labours engaged during the work and failing to do so, IPGL shall provide the same and recover the cost thereof from any amount due or which may become due to the Contractor or from any amount lying with them or under their control.

3.23 PLANT AND EQUIPMENT:

The Contractor shall at his own costs and expenses provide all labour, plant, haulage, transportation of plant and equipment to be used for executing the Contract, all materials, stores etc required for efficiently carrying out and completing the work to the satisfaction of the IPGL.

3.24 INSPECTION AND TESTING OF WORK AT CONTRACTOR'S AND SUB CONTRACTOR'S PREMISES:

3.24.1 The Engineer In-charge or his Representative shall have at all reasonable time access to the Contractor's and sub-contractors premises/work site and shall have the power at all reasonable time to inspect, examine and test the materials & workmanship of the work during its Manufacture. The employer shall depute two engineers for inspection & testing at contractor's works and sub contractor's premises for which the necessary co-ordination & arrangements shall be made by the contractor at his cost. The contractor shall give at-least 30 (thirty) days' advance notice to the Engineer-In-Charge for each pre-shipment inspection.

3.24.2 The expenses of two engineers deputed for inspection of cranes to contractor's work shall be deemed to be included in the price of equipment. i.e. travelling from Mumbai to works and back, lodging & boarding, transportations at contractor's works etc. Only such works will be accepted for which the Engineer In-charge or his authorised representative may certify to be in accordance with the Contract.

3.24.3 The Engineer In-charge or authorised representative on giving seven days' notice in writing to the Contractor setting out any ground of objections which may have in respect of the work, shall be at liberty to reject all or any materials of workmanship in the subject of any of the said grounds of objection which are not in accordance with the Contract.

3.24.4 In all cases where the Contract provides for tests whether at the premises of the Contractor or any sub-Contractor or elsewhere, the Contractor except where otherwise specified shall provide free of charges such labour, materials, electricity, fuel, water, stores, apparatus and instruments as may reasonably be demanded, to carry out sufficiently such tests of the work in accordance with the Contract and shall at all time facilitate the Engineer In-charge and his assistant to accomplish such Testing.

3.24.5 The cost of all tests and/or analysis effected at the Contractor's or sub- Contractor's work and on the installation site shall be borne by the Contractor. The cost of independent test and/or analysis which the Engineer In-charge or his authorised representative may cause to be made and which prove satisfactory shall be borne by the Contractor and also the Contractor will be called upon to pay all expenses incurred by the Employer in respect of

any work found to be defective or of inferior quality, adulterated or otherwise unacceptable.

3.24.6 Third Party Inspecting Agency shall certify the RMQCs before shipment at Contractor's site. The Contractor shall give the Engineer In-charge such reasonable notice of the progress of the work and shall intimate the tentative date of shipment & arrival at IPGL well in advance. The contractor shall furnish a certificate issued by Third Party Inspection Agency towards "Ready to ship" prior to transportation of RMQCs from contractor's works.

3.24.7 The crane without inspection, examination and Testing shall not be prepared for shipment or transportation, as the case may be, without the consent of the Engineer In-charge, as being ready for shipment or transportation. Such passing or consent shall not relieve the Contractor from the liability to complete the Contract Works in accordance with the Contract.

3.24.8 a) IPGL shall appoint an Internationally reputed Third Party Inspection Agency (TPIA) at his own cost for carrying out stage wise inspection like Design verification including Structural Material, Welding, Sub-assemblies, Painting, Erection, Testing, Commissioning etc. and TPIA shall submit the certificates to Engineer In-charge or authorised representative at the time of shipment of the equipment or the parts of equipment and the same shall be submitted to the Employer before Commissioning of the equipment at site. The third party agency appointed shall also monitor the work progress reports at the contractor's works and report to the employer in addition to inspection reports.

b) The contractor shall provide following;

i) All necessary documents required for execution of the job by TPIA as specified in the Scope of work for TPIA at Annexure-VII of Volume-I of tender document.

ii) Schedule for inspection during manufacturing, assembly, erection, testing and commissioning and requirement of inspectors from TPIA shall be communicated at least one month in advance.

c) In case, the scheduled inspection is cancelled due to the reasons attributable to the contractor, the fees of TPIA inspectors will be on contractor's account and same shall be deducted from the payment due to the contractor.

d) In case, the contract gets delayed due to the reasons attributable to the contractor, the fees of TPIA inspectors during the delayed period will be on contractor's account and same shall be deducted from the payment due to the contractor.

3.24.9 The scope of work of Third Party Inspection at Contractor's Works and Employer's site shall be as per the scope indicated at **Annexure-VII** of this tender.

A copy of tender document along with amendments & clarifications must be issued to the Third Party Inspection agency to understand the contract.

3.24.10 Third Party Inspection Agency shall submit fortnightly progress report to the Employer directly by e-mail.

3.25 TESTING OF EQUIPMENT AT CONTRACTOR'S AND EMPLOYER'S SITE

3.25.1 The tests shall include operational and capacity tests. The capacity test for hoist motion shall be with an overload of 10% in excess of the rated working load. The date for operational and capacity test shall be set by the Contractor and shall be informed to Engineer-In charge in advance. The Contractor shall be responsible for any adjustments or corrections found necessary during the test.

3.25.2 The Contractor shall arrange to test the equipment for load test by a Competent Agency notified by competent authority at Employer's site and submit the certificate to this effect to the Engineer-In charge. The test load in containers required shall be arranged by the contractor at his cost and risk. The contractor shall produce the certificates issued by the competent authority for these test load / containers being used for load test at site.

3.25.3 Adequate strength of qualified & experienced engineers shall be deputed at work site to attend recurring faults on advice of the Engineer In Charge during the testing, commissioning & warranty period. The cost of the same shall be deemed to be included in the quoted price.

3.26 DRAWINGS:

The Tenderer shall submit along with the tender, minimum one copy of each of the following drawings for new RMQC's:

3.26.1 General arrangement of the crane offered with principal details and leading dimensions etc.

3.26.2 Schematic electric, electronic and programmable controller details.

3.26.3 Schematic arrangement of hoist & boom hoist wire ropes, Electric room and Machinery house arrangement etc.

3.26.4 General arrangement of the operator's cabin, clearly indicating the location of various controls and indicators.

3.26.5 Any other special features, which the bidder wishes to highlight

3.26.6 Diagram showing stage wise activities of the project.

3.26.7 All technical details of electrical infrastructure proposed for RMQC

Note: All dimensions of the drawings shall be in Metric units and all writings shall be in English.

3.27 TESTS ON COMPLETION AT EMPLOYER'S SITE

3.27.1 On completion of fabrication of all items at the Contractor's premises and also when Installation/final adjustments at site are completed in accordance with the Contract, the Contractor shall give the Engineer In-charge notice in writing thereof and before making the tests on completion of 7 days' notice in writing of the date on which he will be ready to make the said tests in accordance with and in the manner prescribed in the specifications.

3.27.2 The tests on completion shall be made on each item when final adjustments and tests are completed at the Contractor's premises in the presence of Engineer In charge or his authorised representative if desired necessary, in accordance with the Contract and also when erection/Installation is completed at IPGL site in accordance with the Contract.

3.27.3 If any portion of work fails under the tests to fulfil the Contract conditions, tests of the faulty portion shall, if required by the Engineer In-charge or by the Contractor, be repeated within reasonable time upon the same terms and conditions.

3.27.4 The 'Endurance test' (Durability Test) as per clause 1.18.2 (Volume-II of the tender document) shall be carried out by the Contractor within one week after the time fixed by the Engineer In-Charge for the commencement of commercial operations and if in opinion of the Engineer In-charge the tests are being unduly delayed, the Engineer In-charge may, in writing, call upon the Contractor under three days notice to make such tests. The Engineer In-charge may proceed to make such tests himself, at the Contractor's risk and expense.

3.27.5 If the Contractor neglects to make the 'Performance test' (Acceptance Test) as per clause 1.18.1 (Volume-II of the tender document), within the time stipulated by the Contractor, the Employer shall nevertheless have the right of using the Installations at the Contractor's risk until the 'Performance test' are successfully carried out.

3.28 REJECTION OF DEFECTIVE WORK:

3.28.1 If the complete erection/Installation at site or any portion thereof before being taken over, under Clause 3.30 (Volume-I of Tender Document) is defective, or fail to fulfil the requirements of the Contract, the Engineer In-charge shall give notice to the Contractor setting forth particulars of such defects and the Contractor shall forthwith make the

defective supply/plant/ Installation good, or alter the same to make it comply with the requirements of the Contract.

3.28.2 If Contractor fails to do so within a reasonable time, IPGL may reject and replace the same at the cost of Contractor, the whole, or any portion of the work, as the case may be, which is defective or fails to fulfil the requirements of the Contract. The Contractor's full and extreme liability under this clause shall be satisfied by the payment to IPGL, the extra cost, if any, of such replacement delivered and erected. Such extra cost being ascertained shall be deducted from the Contractor's bill.

3.28.3 If any supply of defective items shall have caused delay in the completion of the Contract so as to give rise to a claim for damage on the part of the IPGL nothing contained in this clause shall interfere with or prejudice any rights of the Employer with respect to such claim.

3.29 DEFECT LIABILITY PERIOD

In this condition the expression 'Defect liability period' shall mean a period of **24 months** calculated from the date certified at the time of acceptance in accordance with clause 3.31 (Volume-I of Tender Document).

3.30 DEFECTS AFTER TAKING OVER

3.30.1 The Contractor within 4 weeks from the date of communication by the Engineer In charge, shall be responsible for making good at his expense any defect in or damage to any portion of the Works which may appear or occur during the defect liability period and which arises either:

a) From any defective materials, workmanship or Design or

b) From any act or omission of the Contractor done or omitted during the said period.

3.30.2 If any such defects shall appear or damage occur the Engineer- In –Charge shall forthwith inform the Contractor thereof stating in writing the nature of defect or damage. The provision of this clause shall apply to all replacements or renewals carried out by the Contractor to remedy defects and damage as if the said replacements and renewals had been taken over on the date they were completed to the satisfaction of Engineer In Charge. Replacements or renewals of parts shall be warranted for a period of 24 months of operation from the date of final acceptance of the crane.

3.30.3 If any such defect or damages were not remedied within a reasonable time, IPGL may proceed to do the work at the Contractor's cost & risk.

3.31 TIME OF ACCEPTANCE:

The supply, delivery and Installation of the equipment/ items at site shall be deemed to have been accepted by IPGL when the same shall have been installed, tested & commissioned and the Engineer-In-charge shall have issued the final acceptance certificate as per clause 3.36.4.

3.32 TERMS OF PAYMENT:

Mode of Payment: The payment to the contractor for acquisition of the equipment under the contract shall be effected by IPGL through irrevocable letter of credit (L/C), which is acceptable to both side,against stage-wise payments. The charges towards opening of L/C within India shall be borne by the Employer (IPGL) and charges towards opening of L/C outside India shall be borne by the Contractor. Any charges against extension of L/C shall be borne by the Contractor, both in India and outside India if the extension attributed to contractor.

(a) First stage: Initial advance up to 10 % of CIF Price of equipment mentioned in the LOA against submission of a Bank Guarantee equivalent to 110% of the advance amount and this initial advance will not carry interest. However, if the contract is terminated due to default of the contractor the initial advance would be deemed as interest bearing advance at an interest rate of base Prime Lending Rate of SBI + 2% p.a. to be compounded quarterly.

(b) Second stage: 60 % of CIF Price mentioned in LOA after shipment of the equipment and submission of shipment documents of satisfactory evidence of shipment of equipment.

Documents required for second stage payment:

(i) Original clean and shipped onboard Bill of Lading, 3 copies
(ii) Commercial invoice,(03) copies
(iii) Certificate of origin,(03) copies
(iv) Packing list for each Crane

Note: In case advance payment is not taken by the contractor, second stage payment after shipment of equipment as 70% can be claimed by the contactor.

(c) Third stage: 20% of CIF Price mentioned in LOA against Completion of commissioning of equipment and compliance of operation to endurance test activities and on verification and certification by Engineer-In-Charge against commissioning of equipment and handing over of the cranes for commercial operations.

(d) Fourth stage: 10% of CIF Price mentioned in LOA after issuance of final acceptance certificate (FAC) by the Engineer-In-charge for the Equipment.

Note: For the second, third and fourth stage payments, pro-rata payment shall be considered in case the contractor opts for staggered delivery schedule. (Option 2).

Note: Charges for rendering Training (if any) and warranty support shall not be counted in LC amount. It shall be paid separately after successfully completion of training and warranty support.

3.32.1 Training Charges: Charges for Training as mentioned in the LOA shall be paid after completion of Training of IPGL Personnel and issuance of certificate for completion of training by Engineer In-charge, as per terms of Contract.

3.32.2 **Payments** towards Spare Parts as listed out at **Schedule – 10 (volume I)** shall be made in two stages as mentioned below;

A	50 % of CIF Price mentioned in the LOA against delivery of Spare parts as per the list attached at Schedule – 10 (volume I) at Employers Main Stores duly certified by the Engineer –In -Charge for receipt of the same.
B	50 % of CIF Price mentioned in the LOA on commencement of commercial operation of the equipment.

Note: Spare Parts as listed in schedule-10 are **optional and not to be considered for evaluation.** However, the bidder has to confirm that prices quoted for spares will remain valid for 2 years from date of Final Acceptance.

3.32.3 **Payment for rendering Warranty Support:**

Charges for rendering Warranty Support as mentioned in the LOA shall be paid after satisfactory completion of Warranty period as per clause 3.59 of the tender and issuance of certificate by the Engineer-In-Charge.

IPGL will endeavor release of payment subject to compliance of required documents by the Contractor, within 30 days.

3.32.4 **Payment of Duties**

It may be noted that Custom Duty at Chabahar is exempted for IPGL on import of ONLY those items / equipment appearing in the Price Schedule of this tender document.

The bidder shall quote their CIF prices inclusive of all taxes and duties related to their country of export. The bidder shall exclude from his price only the custom duty/related taxes if any payable in Iran for the items/equipments appearing in the Price Schedule. These taxes/duties related to Iran shall be initially borne by the bidder and later reimbursed on actual by IPGL ,based on production of relevant proof.

3.33 Payment of taxes and Levies

The Contractor shall pay all taxes, levy as applicable in the country of origin including all incidental charges that the tenderer may have to bear for the execution of works.

3.34 NO INTEREST ON ACCOUNT OF DELAYED PAYMENTS:

Any claim for interest will not be entertained by the IPGL with respect to any payment or balance which may be in their hands owning to any disputes between themselves and the Contractor or with respect to any delay on part of the IPGL in making payment.

3.35 CERTIFICATE AND PAYMENT

3.35.1 **Certificate of payment**

The Contractor may at the times and in the manner following apply for interim and final certificates as referred to in Clause 3.32 (Terms of Payment - Volume-I of Tender Document) for Plant shipped to the site and for work executed on the site.

3.35.2 **Certificate for receipt of Equipment at site**

Application for Certificate for receipt of Equipment at site may be made to the Engineer In Charge against arrival and safe unloading of cranes and spares at site, accompanied by certificate for ready to shipment issued by Third Party Inspecting Agency, inspection release note, certificate for receipt of all parts of entire equipment in safe condition at site by Third Party Inspection Agency, certificates from Marine Insurance Company(s) which covers all risks and other documents as the Engineer In Charge may reasonably require. Application shall state the amount claimed and shall set forth in detail, in the order of the schedule of Prices, particulars of the equipment received at the site along with declaration of the contractor to this effect. The Engineer In Charge shall issue to the Contractor a

Certificate for receipt of Equipment at site within 14 days after receiving an application thereof.

3.35.3 **Issue of Provisional Certificate:**

Application for Provisional Certificate for satisfactory commencement of commercial operations of Equipment may be made to the Engineer In-Charge against release of equipment for commercial operations accompanied by undertaking that the pending punch list items shall be attended within 6 weeks from the date of this application. The Engineer In-Charge shall issue to the Contractor the Provisional Certificate for Commercial Operations within 14 days after receiving an application thereof.

Subject to completion of requirements of clause 3.38.3 an application for Provisional Certificate for satisfactory commencement of commercial operations of Equipment may be made to the Engineer In-charge against release of equipment for commercial operations accompanied by undertaking that the pending punch list items shall be attended within 6 weeks from the date of this application. The Engineer In-charge shall issue to the Contractor the Provisional Certificate for Commercial Operations within 14 days after receiving an application thereof along with punch list. If any works related to safety of the equipment are balance to be attended then even though the cranes are in operation the same shall not be declared as commercial operation but under Trial operation and at the risk and cost of the contractor till issue of Provisional certificate by IPGL for accepting the cranes for commercial operations. During such time of trial operations the Insurance risk of the cranes will be responsibility of the contractor.

3.35.4 **Issue of Final Acceptance Certificate**

Application for Final Acceptance Certificate of Equipment may be made to the Engineer In Charge against satisfactorily attending of punch list items and after the Contractor has ceased to be under any obligation under Clause 3.3 provided that, if a Provisional Certificate has been issued in respect of any Section or Portion of the Works, the Contractor may apply for a separate final certificate at any time after the said obligation has ceased in relation to such Section or Portion. Where the Contractor has carried out replacements or renewals to the Works in compliance with Clause 3.30 the Contractor's obligations shall continue, but the right of the Contractor to apply for a final certificate other than for the replacements or renewals shall not be affected by that fact and after the Contractor has ceased to be under any obligation under Clause 3.30 in respect of the replacements or renewals he may apply for a final certificate in respect thereof.

If the punch list items are attended within 6 weeks from the date of issue of provisional certificate, then the Final Acceptance Certificate shall be issued with effect from the date of issue of Provisional Certificate and in case the punch list items are completed beyond 6 weeks from the date of issue of provisional certificate, then the Final Acceptance Certificate shall be issued with effect from the date of Application for Final Acceptance Certificate after verification of completion of punch list items by Engineer In Charge. The Engineer In Charge shall issue to the Contractor the Final Acceptance Certificate within 28 days after receiving an application thereof.

3.35.5 **Final Certificate conclusive**

A final certificate shall, save in the case of fraud or dishonesty relating to or affecting any matter dealt with in the certificate, be conclusive evidence as to the sufficiency of the Works and of the value thereof unless any proceedings arising out of the Contract whether under Clause 3.51/ 3.53 (Arbitration Dispute Resolution- Volume-I of Tender Document) or otherwise shall have been commenced by either party before the final certificate has been issued or within three months thereafter.

3.35.6 **Adjustment to Certificates**

If any sum shall become payable to the Contractor under the Contract otherwise than for work executed or Plant delivered, the amount thereof shall be included in the next certificate (interim or final) issued by the Engineer In charge, and if any sum shall become payable under the Contract by the Contractor to the Employer, prior to the issue of the final certificate, whether by deduction from the Contract Sum or otherwise, the amount thereof shall be deducted in the next certificate.

3.35.7 **Corrections and with-holding of certificates**

The Engineer-In-Charge may in any certificate give effect to any correction or modification that should properly be made in respect of any previous certificate. Engineer-In-Charge shall have power to withhold any certificate if the Works or any part thereof is not being carried out to his satisfaction.

3.36 GUARANTEE PERIOD FOR 04 NOS. NEW RMQCs:

3.36.1 The RMQC's to be supplied under this Contract shall be guaranteed for a period of **twenty four (24) months** towards satisfactory performance of each components. The steel structures and paintings & anti-corrosions application shall be guaranteed for a period of sixty (60) months and thirty six (36) months respectively and same shall be in force from

the date of final acceptance of the cranes, under this Contract, by the Engineer-In-Charge. The Contractor shall be responsible for any defects that may develop under proper use arising from faulty materials, Designs, workmanship in the work but not otherwise and shall at his own cost remedy such defects when called upon to do so by the Engineer In-Charge who shall state in writing in what respect any portion is faulty.

3.36.2 If it becomes necessary for the Contractor to replace or renew any defective portions of the supply of the items under this clause, the provisions of this clause shall apply to the portions of the supply so replaced or renewed until the expiry of 24 months from the date of such replacement or renewal. If any defects are not remedied within a reasonable time, the IPGL may proceed to do the work at the Contractors' risk and expenses but without prejudice to any other rights, which IPGL may have against the Contractor in respect of such defects.

3.36.3 If the replacement or renewals are of such a character as may affect the efficiency of the items supplied, the Engineer In-charge shall have the right to give to the Contractor within one month of such replacement or renewal notice in writing the 'Test on Completion' be made in which case test shall be carried out as provided in Clause 3.27.4 (volume-I). Costs of all the tests shall be borne by the Contractor.

3.36.4 All inspection, adjustments, replacement or renewal carried out by the Contractor during the period referred in this clause shall be subject to the conditions of this Contract which shall be binding on the Contractor in all respects during the guarantee period and extended guarantee period if any.

3.37 COMMISSIONING OF NEW EQUIPMENT (04 new RMQCs):

3.37.1 Contractor shall complete the whole work such as Design, Manufacture, Supply, Installation, Testing and Commissioning of the cranes within a period stipulated in clause 3.12 (Volume-I), from the date of issue of Letter of Acceptance.

3.37.2 Contractor shall arrange to commission the equipment after due Testing and approval of the Engineer In-Charge within a minimum period from the date of Installation of the equipment at Employers' site and this period shall be considered within the total completion period stipulated in clause 3.12 (Volume-I) of Tender Document). All necessary testing materials, tools, slings etc. required for the Testing of the equipment shall be arranged by the Contractor at his own cost & risk. Since time is the essence of this contract, contractor shall ensure that requisite number of labour force / resources are made available at site, so as to complete the installation, testing and commissioning of all equipment at IPGL site within the completion period of the contract.

3.37.3 Commissioning of equipment shall mean handing over of equipment for regular operations after completion of Endurance test (Durability Test) as per clause 1.18.2 of the tender (Volume-II), without compromising safety norms and satisfying all functional requirements without affecting the productivity of the equipment.

i. Any punch item which is not affecting safety norms and functional requirements without affecting the productivity of the equipment shall be closed within six weeks from the date of commissioning of equipment and put in regular commercial operations to consider the date of commencement of regular commercial operations as the date of acceptance of the equipment.

ii. In case punch items are not closed within six weeks from the date of commissioning of the equipment, the date of closure of punch item shall be considered as date of acceptance. Defect liability period shall commence from the date of final acceptance of the equipment to be done.

3.38 REMOVAL OF MATERIAL ON COMPLETION:

The Contractor shall, on completion of the Works or when directed by the Employer, remove all plant, equipment, tools, materials, temporary constructions etc. and rubbish which may have been accumulated during the execution of the work, other than those permanently used into the Works, at Employer's site.

3.39 PERFORMANCE GUARANTEES BOND TOWARDS PERFORMNACE OF CONTRACT:

3.39.1 Within 45 days of the receipt of the notification of the award of Contract from the Employer, i.e. LOA or 30 days signing of contract between IPGL and Contactor, whichever is earlier, the successful tenderer shall furnish to the Employer, a bond in the form of a Bank Guarantee (B.G), from a any Nationalised / Scheduled Bank covered under section 2 (e) of the Reserve Bank of India Act 1974, having their branch in Mumbai, for an amount equivalent to 10% of the Contract Price (as indicated in LOA) guaranteeing the performance of the Contract, as per the draft Bank Guarantee form at **Annex-V** of this tender document. The validity of such bank guarantee issued, towards performance of the Contract, shall be up to handover/FAC of cranes after successful completing all due tests and tirals..

3.39.2 Failure of the successful Tenderer to submit the required Performance Guarantee shall constitute sufficient grounds for termination of the Contract & forfeiting the Earnest Money Deposit. The BG submitted towards performance shall be returned after deploying

the cranes for regular operations and after receipt of performance BG towards defect liability period and upon making application thereof by the contractor.

3.39.3 **Performance Bond during Defect Liability period for 04 new RMQCs:** After successful completion of the work, final Testing & Commissioning of the crane and before handing over of the 04 new RMQCs supplied to IPGL under this contract, the Contractor shall submit a B.G, for an amount equivalent to 10% of the Contract Price towards guaranteeing the performance of the new cranes during defect liability period as per the draft Bank Guarantee form at Annex-V of this tender document. The validity of such bond issued shall be for a period of 24 months from the date of final acceptance certificate, with a claim period of 3 months thereafter. In this case, the Para 1 of the BG format at Annex-V may be suitably worded indicating the work of contract for 04 new RMQC only for this Guarantee.

3.39.4 **Performance Bond after completion of Defect Liability period for 04 Nos. new RMQCs:** The contractor shall submit a Performance Bond, in respect of 04 new RMQCs supplied under this contract in the form of B.G for an amount equivalent to 5% of the Contract Price, towards performance of steel structures and painting, at least 30 days before the expiry of validity of bond mentioned under clause 3.39 (Volume-I of Tender Document) as per the draft Bank Guarantee form at Annex-V (Volume-I) of this tender document. The validity of this bond shall be for a period of 36 months, after defect liability period, with 3 months claim period thereafter. In this case, the Para 1 of the BG format at Annex- V may be suitably worded indicating the work of contract for 04 Nos. RMQC only for this Guarantee.

Note: The tenderer has the option to submit only one Bank Guarantee covering Performance Bank Guarantee as well as warranty period (defect liability period), with a claim period of three (03) months, after completion of warranty.

3.39.5 In the event of failure of Contractor to ensure the performance of the equipment, during the guarantee period and not responding to the requirement of the situation as indicated in clause 3.37 (Volume-I of Tender Document), of this tender document and if the Employer is compelled to encash the B.G. to meet the situation, the Contractor shall revalidate the said guarantee for the suitable period as agreed by the Employer.

3.39.6 The BG submitted by the Contractor towards the performance of the equipment during defect liability will be returned to the Contractor after successful completion of the defect liability period, to the satisfaction of the Employer and on making an application thereof.

Note: All Bank Guarantee shall be submitted verbatim as per the Annex of Tender.

3.40 SECURITY DEPOSIT TOWARDS ADVANCE PAYMENT FOR OF CONTRACT (i.e. NEW 04 RMQCs):

3.40.1 The successful Tenderer shall furnish to the Employer, a security deposit in the form of a Bank Guarantee (B.G) from a Nationalised/Scheduled/International Bank, having their branch in Mumbai for an amount equivalent to 110% of the advance amount to be made to the Contractor, for advance payment. Such B.G shall be as per the draft Bank Guarantee form at Annex-VI (volume-I) of this tender document, applicable for the first stage payment at clause 3.32.1 A.

3.40.2 The Employer shall release advance as indicated in clause 3.32 (Volume-I), Terms of Payment, of this tender document to the Contractor against submission of Security deposit in the prescribed form.

3.40.3 The B.G issued, towards security deposit of advance payment, shall be valid for a period of 2 months beyond the date of completion of the contract i.e. dates of Final Acceptance Certificate, with a claim period of 3 months. The B.G submitted by the Contractor under this clause will be returned to the Contractor after successful commencement of commercial operations of the equipment and on making an application thereof.

3.40.4 In the event of failure of Contractor to complete the work within stipulated period, the Contractor shall revalidate the B.Gs for an extended period as agreed by the Employer however this will not relieve the Contractor from the obligation of liquidated damages as indicated in clause 3.43(Volume-I) of this tender document.

3.41 FORFEITURE OF SECURITY DEPOSIT

IPGL shall be entitled to encash the Bank Guarantee deposited by the Contractor / Contractors with IPGL in the following event.

a) In case of failure on the part of the Contractor/ Contractors, at any time, during the continuance of this Contract, to comply with any of the conditions herein contained, or

b) In case of any breach of any portion of this Contract.

3.42 INDEMNITY:

3.42.1 Notwithstanding that all reasonable and proper precautions may have been taken by the Contractor at all times during the progress of the work, the Contractor shall nevertheless

be wholly responsible for all damages, whether to the Works themselves or to any other property of IPGL, or to the lives, persons, property of others during the progress of the work until handing over the crane/final acceptance by IPGL

3.42.2 In case any damage occurs to the existing structure due to the Contractor's operation, the same shall be made good by the Contractor at his own risk and cost. The areas, which are likely to be unsafe for use, shall be barricaded and all the necessary precautionary measures like displaying notices shall be taken by the Contractor, during Commissioning and Testing of equipment at site.

3.43 LIQUIDATED DAMAGES:

a) The Contractor has to Design, Manufacture, Supply, Install, Test, Commission and hand over the new equipment within the completion period as stipulated in **clause 3.12 (Volume-I of Tender Document**).

b) In the event of failure on the part of the Contractor to commission the new equipment for any reason whatsoever within the period stipulated in clause 3.12, an amount of per week shall be levied for delayed period as Liquidated Damages as stipulated below for the work of Design, Manufacture, Supply, Install, Test, Commission and hand over the new RMQCs at Shahid Beheshti Port, Chabahar,

c) Except as provided in the Cl. no. 3.54 of GCC (Force Majeure), if contractor fails to deliver any or all of the Goods by the Date(s) of delivery or perform the Related Services within the period specified in the Contract, the Employer may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to 1 % per week or part thereof, of the delivered price of the delayed Goods for each week or part thereof of delay until actual delivery, up to a maximum deduction of the percentage of 10% of Total Contract Price, However in case of part delivery or staggered delivery under Option 2 of Clause 3.12, LD of 1% per week or part thereof, shall be calculated based on the delivered price of balance/ un fulfilled portions of the contractual obligations i.e. not delivered to the Employer (IPGL). This does not absolve the contractor from his obligation of completion of whole of the work in an expeditious manner. Contract price shall be inclusive of CIF price plus all taxes and duties payable for computing Liquidated Damages. Further, in case of staggered delivery under Option 2 of Clause 3.12, the payment of LD in the first part of delivery shall not entitle the Contractor to extend the delivery schedule for the second part and the timeline for the second part shall remain unchanged.

d) Once the maximum LD is reached, the Employer may terminate the Contract pursuant to Clause no. 3.52.of the GCC. The maximum amount of liquidated damages shall be 10% of total Contract Price. Even in case of the part taking over, maximum ceiling limit remain in reference to the total contract price.

e) The necessary Liquidated Damages shall be recovered by the Employer from any stage payment due to the Contractor.

f) No claim will be made by the Employer for consequential losses due to delay in delivery and handover.

g) Delay penalties shall be recovered in the currency of bid.

3.44 INSURANCE OF WORK AT MANUFACTURER'S SITE FOR NEW RMQCs:

3.44.1 Unless the Employer shall have approved in writing other arrangements, the Contractor shall, insure, so far as reasonably practicable the Works and keep each part thereof insured as may be mutually agreed between the Employer and the Contractor against all loss or damage from whatever cause arising, until the RMQC's are received at employer's site in good condition duly certified by the Third party inspection agency. The value of such insurance shall be at least equal to **110% of the contract price of 04 no. new RMQCs excluding spare parts / tools cost.**

3.44.2 **Insurance during installation at employer's site** : The Contractor shall so far as reasonably practicable insure against the Contractor's liability in respect of any loss or damage occurring whilst the Contractor is at EMPLOYER'S site for the purpose of making good a defect or carrying out the tests on completion during the installation & commissioning of the equipment at employer's site or for the purpose of completing any outstanding work and against any loss or damage arising during defect liability period from a cause occurring prior to taking over of new RMQCs by the employer. The value of such insurance shall be at least equal to 110% of contract priced of 04 new RMQC excluding spare parts/tools cost.

3.44.3 The Contractor shall from time to time when so required by the Engineer-In-Charge, produce the policy and receipts for the premium or premiums or satisfactory evidence of insurance cover. All monies received under any such policy shall be applied in or towards the replacement and repair of the Works lost, damaged or destroyed but this provision shall not affect the Contractor's liabilities under the Contract.

3.45 INSURANCE AGAINST THIRD PARTY LIABILITY (FOR 04 Nos. NEW RMQCs) at Employer site:

3.45.1 Before commencing the execution of work, the Contractor shall insure in the joint names of the IPGL and the Contractor, covering Third Party Liability (TPL) against any damage or loss or injury which may occur to the equipment being installed or to any property or to any person (including property and employees of the Employer) by or arising out of the execution of the Works or temporary Works in carrying out of the Contract. The value of TPL policy shall be Minimum of Euro 29500 (Euro Twenty nine thousand five hundred only) against occurrence of each incidence. The Contractor shall revalidate the insurance coverage after each incidence and keep the insurance coverage till certification of completion.

3.45.2 Such insurance shall be effected with an local insurance company as directed by IPGL and in terms approved by the IPGL & Tenderer shall submit the copy of policy of insurance to Engineer-In-Charge before arrival of equipment at site and shall be valid till Final Acceptance Certificate.

3.46 COMPENSATION:

The Contractor shall indemnify IPGL in the event being held liable to pay compensation for injury to any Contractor's servants or workmen under the any act of country of destination or any other laws, acts or provisions as applicable and as amended from time to time and shall take out an insurance policy covering all risks under the Act and shall keep the same renewed from time to time as necessary for the duration of the Contract and produce the same before arrival of equipment to the Engineer-In-Charge and shall be valid till issuance of Final Acceptance Certificate (FAC) for the contract.

3.47 DEFAULT OF THE CONTRACTOR:

If the Contractor makes any default or on the happenings of anyone or more of the following events that is to say:

a) If the Contractor without reasonable cause suspends/abandons the Contract or

b) Suspends the carrying out of the Works for a reasonable time after receiving written notice from the IPGL without any lawful excuse or fails to make proper progress with Works after receiving written notice from the Engineer –In Charge or

c) Fails to proceed diligently with the work or

d) Fails to give the IPGL proper facilities for inspection of the Works of any part thereof for three days after receiving notice in writing by the IPGL demanding the same or

e) The Contractor has become insolvent or

f) The Contractor has gone into liquidation or passed the resolution for winding up or

g) Upon the Contractor making an arrangement with or assignment in favour of his creditor or

h) Upon his assigning this Contract or

i) Upon an execution being levied upon the Contractor's good or

j) Upon winding up order being passed by the court or a Receiver or manager is appointed in respect of any of the property of the Contractor or

k) Possession is taken by or on behalf of any holder of any debentures secured by floating charges of any of the property of the Contractor or

l) Fails to complete all or any part of the Works during the time specified for completion of the Contract or such extended time as may be granted by the IPGL.

IPGL shall have every right to terminate the Contract after issuing 60 days' notice to the Contractor, on his omission or negligence or neglect or default or failure to comply with any of the condition of the Contract.

3.48 IPGL'S LIEN

IPGL shall have a lien on over all or any money that may become due and payable to the Contractor under this Contract or from any amount lying with [IPGL] in respect of any debt or sum that may become due and payable by the IPGL to the Contractor under this Contract or other transaction of any nature whatsoever between the IPGL and the Contractor.

3.49 INCENTIVE FOR EARLY DELIVERY

IPGL prefers that all 04 Nos. RMQCs or part thereof are delivered and commissioned before the scheduled delivery period. Therefore if the Contractor can deliver & commission before the scheduled delivery, IPGL may consider accepting early delivery and in such case incentive per RMQC will be paid @ 0.25% CIF value per week subject to maximum limit of 1% of CIF value. Contractor shall raise claim for such incentive along with payment against PAC.

Incentive as per this clause will not be applicable in case bidder opts for Option-2 under the clause 3.12.

3.50 SETTLEMENT OF DISPUTES:

3.50.1 **ENGINEER IN CHARGE'S DECISION:** If disputes of any kind arises between the Employer and the Contractor in any connection with, or arising out of the Contract or the

execution of the Works whether during the execution of the Works or after the completion and whether before or after repudiation or termination of the Contract, including any dispute as to any opinion, instruction, determination, certificate or valuation of Engineer, the matter in dispute shall in the first place, be referred in writing to the Engineer In Charge. Such reference shall state that it is made pursuant to this clause. No later than thirty days after the day on which he receives such reference, the Engineer-In-Charge shall give notice of his decision to the Contractor. Such decision shall state that it is made pursuant to this clause.

3.50.2 Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the Works with all due diligence and the Contractor and the Employer shall give effect forthwith to every decision of the Engineer-In-Charge unless and until the same shall be revised, as hereinafter provided, in an amicable statement or an arbitrate award.

3.50.3 If the Contractor is dissatisfied with any decision of the Engineer In Charge or if the Engineer-In-Charge fails to give notice of his decision on or before the thirtieth day after the day on which he received the reference, then the Contractor may, on or before the seventieth day after the day on which he received the notice of such decision, or on or before the seventieth day after the day on which the said period of 30 days expired, as the case may be, give notice to the Employer, of his intention to commence arbitration, as hereinafter provided as to the matter in dispute. Such notice shall establish the entitlement of the party to commence arbitration, as hereinafter provided, as to such dispute no arbitration in respect thereof may be commenced unless such notice is given.

3.50.4 If the Engineer-In-Charge has given notice of his decision to a matter in dispute to the Employer & the Contractor and no notification of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the seventieth day after the day on which the parties received notice as such decision from the Engineer-In-Charge, the said decision become final and binding upon the Employer and Contractor.

3.51 AMICABLE SETTLEMENT:

Where notice of intention to commence arbitration as to the dispute has been given in accordance with Clause 3.50 (Volume-I of Tender Document) arbitration of such dispute shall not be commenced unless an attempt has first been made by the parties to settle such dispute amicably.

Both the Parties shall first make attempt to settle the dispute amicably and may take assistance of a third party (cost of which will be jointly shared). Provided that, unless the parties otherwise, agree, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of intention to commence arbitration of such dispute was given, whether or not any attempt at amicable settlement thereof has been made.

3.52 ARBITRATION

Disputes if any, between IPGL and the Contractor during the currency of the Contract or after the completion of the work or abandonment thereof shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996 (Amended in 2015) or any statutory modification or re-enactment thereof and rules made there under and for the time being in force shall apply to arbitration proceedings under this Contract. The disputes so raised shall be referred to a panel of two arbitrators, of which one to be appointed by the IPGL and other by the Contractor. The arbitration proceeding shall take place in India or at Singapore, as mutually decided by IPGL and the Contractor. In case of litigation, same shall be under jurisdiction of Indian Court / Laws.

3.53 TERMINATION OF CONTRACT:

If the Contractor does not perform the Contractual obligations satisfactorily, as far as Commissioning the equipment for commercial use within stipulated time frame, the Contract is liable to be terminated after issue of notice of 60 (Sixty) days to the Contractor.

3.54 FORCE MAJEAURE:

If the supply, Commissioning and Testing of equipment is hindered due to force majeure such as, war, riots, civil commotion, fire, epidemics, natural calamities, etc. such period shall be exempted from completion period as mentioned in clause 3.12 (Volume - I) of this tender document. It is clarified that a change in applicable international laws and regulations, if and to the extent such change results in major change in duties/obligations of the affected party and leads to undesirable impact on contractual obligations, the same would fall within the meaning of "Force Majeure" if it is beyond the control of the affected party and has a material and adverse effect as set out in the contract.

Further, it is clarified that (i) In case the duration of the force majeure is less than **365 days**, the contract will be suspended during this period and after extinction of the force majeure,

the contract will continue. (ii) In case the duration of the force majeure is more than 365 days, the contract may be terminated upon mutual consent.

In case of change in applicable international laws and regulations leading to undesired impact in execution of the contract obligation, e.g. prohibiting delivery of equipments at agreed destination port and as per tender terms, then suitable alternative destination and cost implication thereof shall be decided by mutual agreement.

3.55 LABOUR LAWS:

The Contractor shall comply with all the provisions of the destination country or any other local authority or State regarding Labour Laws and the rules and regulations made there under as amended from time to time and as applicable from time to time with regard to the employees to be deployed by the Contractor for erection, testing, Commissioning of equipment.

3.56 OUTBREAK OF WAR

If during the currency of the Contract, there shall be an outbreak of war (whether war is declared or not) in any part of the world which, whether financially or otherwise, materially affects the execution of the Works the Contractor shall, unless and until the Contract is terminated under the provision in this clause contained, use his best endeavours to complete the execution of the Works, provided always that either the Employer or the Contractor shall be entitled, at any time after such outbreak of war, to terminate this Contract by giving notice in writing to the other, and upon such notice being given this Contract shall terminate, but without prejudice to the rights of either party in respect of any antecedent breach.

3.57 MISTAKE IN CONTRACTOR'S DRAWING

The Contractor shall be responsible for and shall pay for any alterations of the work due to any discrepancies, errors or omissions in the drawings or other particulars supplied by him, whether such drawings or other particulars supplied by him, have been approved by the Engineer In-charge or not.

3.58 DEFAULT OF THE EMPLOYER

In the event of the Employer:

a) Failing to pay Contractor the amount due under Contract as per stipulated condition or

b) Interfering with or obstructing the written approval in this Contract, the Contractor shall be entitled without prejudice to any other rights or remedies to terminate his employment under the Contract by giving 90 (Ninety) days prior notice in writing to Employer.

3.59 WARRANTY

During the 24 months of the Defects Liability Period the contractor shall post at least one competent, experienced and responsible Technical person who has experience of Erection, Testing and Commissioning of the Equipment, to co-ordinate and execute all works to be attended by the Contractor as per Contractual obligations. The cost for the same shall deemed to be included in the services during guarantee period. The Contractor shall also authorize his technical representative to carry out monthly inspection and submit a monthly report before 10^{th} day of succeeding month to the Engineer-In-Charge. The contractor shall quote for the cost of this service as per price schedule which shall be paid after satisfactory completion of 24 months of the Defects Liability Period as certified by the Engineer In charge.

3.60 WARRANTY SUPPORT

The Tenderer shall submit warranty support programme, in detail, covering the methodology and approach which shall be adopted to ensure minimum failures and maximum availability of the cranes. The Tenderer shall provide details of his warranty program and after sales service capability including an organization chart, guaranteed response times to requests for technical assistance and spare parts and a 24-hour help line.

3.61 REFERENCES

The Tenderers shall provide details of similar cranes that he has recently manufactured together with a list of customers who are willing to act as reference points.

3.62 Limitation of Liability:

(i) To the fullest extent permitted by the law, the total liability, in the aggregate, of the Contractor, Contractor's officers, directors, partners, employees, agents, and subcontractors, to Employer (IPGL), and anyone claiming by, through, or under Employer for any claims, losses, costs, or damages whatsoever arising out of, resulting From or in any way related to the Tender from any cause or causes, including but not limited to negligence, professional errors and

omissions, strict liability, breach of contract, or breach of warranty, shall not exceed 100 % of the Contract Price.

(ii) As regards damages and indemnifications, the Contractor shall not be liable for incidental, indirect or consequential damages to the extent such limitation of liability is valid under applicable law.

(iii) This clause is enforceable until expiry of entire defect-liability period.

SECTION – 4

4. ENVIRONMENTAL CONDITIONS AT CHABAHAR

4.1. GENERAL

The Port is in a sheltered location with natural deep-water close offshore outside the Persian Gulf to the East of the Straits of Hormuz. The surrounding area is characterized by the sea, the atmosphere containing a lot of salt and small particles of sand. The humidity level in the region of the site is high. The region is regarded as one of the most humid of destination country

The following is the summary of environmental conditions prevailing at the Site:

Maximum temperature	50 ^{0}C
Average temperature	25 ^{0}C
Minimum temperature	5 ^{0}C
Average annual rainfall	108 mm
Maximum annual rainfall	244 mm
Average humidity	70%
Maximum humidity	99%
Climate description	sea-climate
Prevailing wind direction	south
Average wind	99% of the time < 15 m/s
Maximum gust wind	44 m/s

4.2. TIDES AND STORM SURGE

Tidal Levels with reference to Chart Datum

High Water springs (HWS)	+3.15 m
Mean High Water Springs (MHWS)	+ 2.53 m
Mean High Water Neaps (MHWN)	+ 1.93 m
Mean Sea Level	+ 1.63 m
Mean Low Water Springs (MLWS)	+ 1.28 m
Mean Low Water Neaps (MLWN)	+ 0.69 m
Low Water Neaps (LWN)	- 0.25 m

Land Datum at Chabahar Port is 1.61 m above Chart Datum.

Storm Surges

Return Period (Year)	Max Storm Surge (m)
2	0.15
10	0.24
25	0.35
50	0.64
100	1.11

4.3. WIND

Direction (Deg)	Speed (m/s) for Return Periods	
	1 in 50 years	1 in 100 years

Direction (Deg)	Speed (m/s) for Return Periods	
	1 in 50 years	1 in 100 years
0	12	13
30	13	13
60	17	18
90	16	17
120	20	22
150	19	20
180	16	17
210	19	20
240	20	21
270	25	27
300	18	19
330	13	14

The maximum gust speed for design shall be taken as 44m/sec.

4.4. WAVES

Based on hydrodynamic and sedimentation studies report, the design wave heights (H_s) and periods (T_p) are as follows:

(a) Waves Generated within Chabahar Bay

Return Period	1 in 10 Years		1 in 25 years		1 in 50 years		1 in 100 years	
Direction ^{0}N	H_s (m)	T_p (Sec)	H_s (m)	T_p (Sec)	H_s (m)	T_p (Sec)	H_s (m)	T_p (Sec)
270	1.4	4.0	1.5	4.1	1.5	4.2	1.6	4.3
300	1.1	3.6	1.2	3.8	1.3	3.8	1.3	3.9
330	1.0	3.5	1.1	3.6	1.2	3.7	1.2	3.8

Source : Consultant's Analysis.

(b) Deep Water Waves

Return Period	1 in 1 year		1 in 10 years		1 in 25 years		1 in 50 years		1 in 100 years	
Direction ^{0}N	H_s (m)	T_p (sec)	H_s (m)	T_p (sec)	H_s (m)	T_p (sec)	H_s (m)	T_p (sec)	H_s (m)	T_p (sec)
120	2.33	6.17	4.1	6.8	4.6	7.3	5.0	7.6	5.3	7.8
150	1.09	5.22	5.1	7.7	6.8	8.5	8.3	9.1	10.5	9.7
180	3.24	7.94	4.6	7.3	5.1	7.7	5.5	8.0	5.8	8.2
210	3.05	7.35	5.0	7.6	5.8	8.2	6.3	8.5	6.8	8.9
240	2.73	7.06	4.1	6.9	4.6	7.3	4.9	7.5	5.2	7.7

Source: Analysis of British Meteorological Office data

(c) Shallow Water Waves

Return period	1 in 1year	1 in 5 years	1 in 10 years	1 in 25 years	1 in 50 years	1 in 100 years
H_s (m)	1.39	2.00	2.25	2.50	2.70	2.90
Direction ^{0}N	141	145	145	146	147	148
H_s(m)	0.96	2.70	3.40	4.60	5.10	5.30
Direction^{0}N	156	163	164	166	167	168
H_s(m)	2.69	3.50	3.80	4.20	4.50	4.80
Direction^{0}N	183	182	182	182	182	182
H_s(m)	2.5	3.50	4.00	4.60	4.90	5.20
Direction ^{0}N	203	201	200	200	199	199
H_s(m)	2.02	2.70	2.90	3.20	3.40	3.60
Direction ^{0}N	223	220	219	218	217	216
H_s(m)	1.25	2.10	2.50	2.80	3.10	3.40
Direction ^{0}N	248	242	239	235	233	231

Source : Consultant's analysis

4.5. CURRENTS

Tidal current speed is in the range 0.1 ~ 0.3 m/s.

4.6. RAINFALL

	Rainfall (mm)
Maximum annual rainfall	244.4
Mean annual rainfall	108.2

4.7. TEMPERATURE

Month / Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ave. (^oC)	19.20	20.44	23.53	26.57	29.57	31.50	30.80	29.68	27.55	27.43	24.09	21.20	25.98
Ave. Max (^oC)	24.32	24.90	27.92	30.81	33.76	34.77	33.52	32.30	30.78	32.32	29.46	26.25	30.04
Ave. Min (^oC)	15.10	16.09	19.14	22.32	25.40	27.92	28.08	27.11	24.31	22.56	18.74	16.17	21.91
Abs. Max (^oC)	31.00	33.00	38.00	42.00	46.00	47.00	46.00	42.00	42.00	41.00	37.00	32.00	47.00
Abs Min (^oC)	7.00	7.00	9.60	14.00	19.20	22.00	21.00	23.00	19.00	13.20	9.20	7.00	7.00

The maximum ambient temperature for design shall be taken as 50^{o}C

The Minimum ambient temperature for design shall be taken as 5^o C.

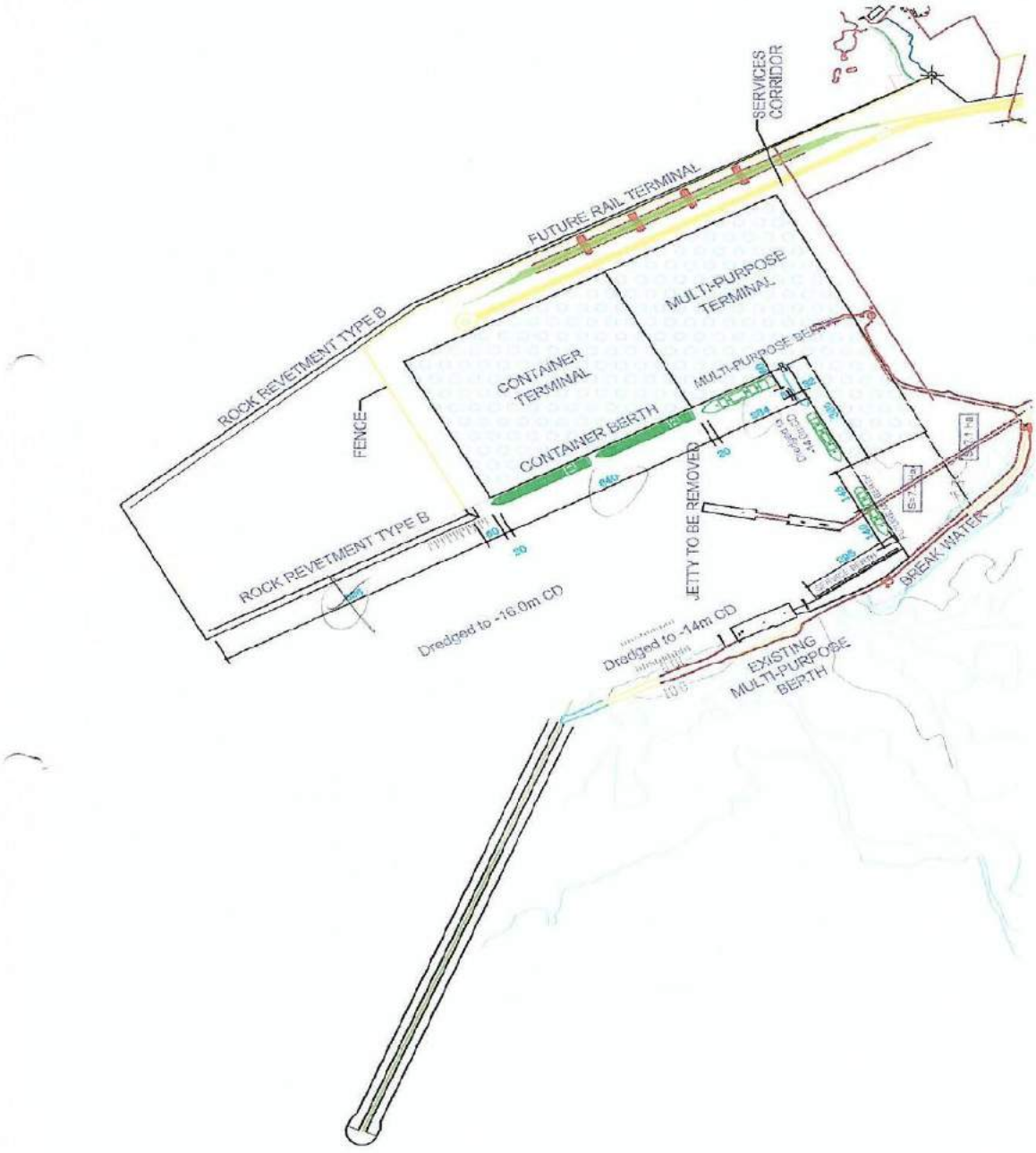
4.8 HUMIDITY As a Percentage:

Months Time	Jan	Feb	Mar	Apr.	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
6:30	68.96	72.13	76.46	79.29	81.96	84.3	82.83	83.17	79.42	81.92	77.48	74.78	78.46
2:30	52.92	56.21	58	60.88	64.13	67.8	70.71	70.46	63.46	60.42	55.3	52.13	61.07

The maximum relative humidity for design shall be taken as 99%.

ANNEX –I

LAYOUT MAP OF CHABAHAR PORT



ANNEX-II

BANK GUARANTEE FORMAT FOR EMD

KNOW ALL BY THESE PRESENT THAT ---------- (Name of the Bank), a Banking corporation carrying on banking business including Guarantees at Mumbai and other places and having its office at ---------- Mumbai (hereinafter called 'The Bank' which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include its successors and assigns) SEND GREETINGS:

WHEREAS The Board of Directors of INDIA PORTS GLOBAL LIMITED constituted under the COMPANY Act, 2013 (hereinafter called 'The Board' which expression shall unless repugnant to the context or meaning thereof be deemed to include its successors and assigns) had invited tenders for ---------- (hereinafter called Tender) as per Instruction to the Tenderers, General conditions of the Contract, scope of work, specifications and Price schedule covered under 'Tender No. ----------.

AND WHEREAS M/s ---------- (hereinafter called the 'Tenderer') has offered to carry out the work under the said Tender.

AND WHEREAS under the conditions of the Contract, the Tenderer is required to give a Earnest Money Deposit in the form of Bank Guarantee from a Scheduled Bank having its branch in Mumbai for the sum of Rs. ----------(Rupees ----------) / EURO_____ (EURO_____)

AND WHEREAS M/s ---------- have requested the Bank to furnish a Guarantee to the Board for the sum of Rs. ---------- (Rupees ----------) /EURO _____(EURO_____) which the Bank has agreed to do in the manner hereinafter appearing.

NOW THIS INDENTURE WITNESSETH that the said Bank doth hereby stand surety for the said sum of Rs. ---------- (Rupees ----------) / EURO _____(EURO_____)

AND DOTH HEREBY GUARANTEE TO AND COVENANT WITH AND irrevocably agree to pay to the Board upon demand in writing without referring to M/s ---------- (Name of the

Tenderer) and without questioning the right of the Board to make such demand or the propriety or legality of such demand, such sum or sums not exceeding in the whole a sum of Rs. ---------- (Rupees----------)/EURO_____ (EURO_____) as may be payable to the Board by the Tenderer by reason of withdrawing his Tender before the expiry of the day from the last date of the submission of the Tender or such time as may be extended by the Board to which M/s ---------- have agreed in writing, or in the event of the tender being accepted by the Board and fails to enter into a Contract or to furnish Performance Guarantee as per the terms of the Contract, in respect of which the decision of the Board shall be final and legally binding and the said Bank doth further covenant and declare that this security is irrevocable and shall remain in force up to and inclusive of the ---------- (date) and if the Contract is not awarded by the Board before the expiry of the aforesaid date, the said Banker undertakes to renew this Guarantee from month to month until 6 months after the aforesaid date i.e. up to ---------- (date) and the said Bank doth hereby further covenant and declare that if the said M/s -------- ---------- do not obtain and furnish renewals of this Guarantee for a further period of six months to the Board not less than 30 days prior to the expiry of the period of this Bank Guarantee or renewals thereof as to keep the same valid and subsisting till the Contract is awarded by the Board and for 6 months thereafter i.e. up to ---------- the entire amount of this Bank Guarantee in default of obtaining and furnishing the renewals of this Bank Guarantee in the manner and within the time aforesaid shall become forthwith due and payable to the Board notwithstanding :

1. that the period of the Guarantee of the renewal or renewals thereof has not expired or,
2. that the period of Guarantee of the renewal or renewals thereof has already expired

AND THE BANK further declares that notwithstanding anything to the contrary contained hereinabove, the Bank's liabilities under the Guarantee is restricted to Rs. ---------- (Rs. ---- ---------- ----------) / EURO _____(EUOR_____) and unless a demand in writing under the Guarantee is made with the Bank within the 3 months from the date of expiry i.e. by ----------
-----, all the rights of Board under this Guarantee shall be forfeited and the Bank shall be relieved and discharged from all liability thereunder :
Notwithstanding anything to the contrary contained herein:

Our liability under this Bank Guarantee shall not exceed Rs. ---------- (Rupees -- ---------- / EURO _____(EURO_____

This Bank Guarantee shall be valid up to ----------; and

We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written claim or demand on or before ----

IN WITNESS WHEREOF, the duly constituted attorneys of the Bank has here up to set his/their hands and seals on the ---------- of ----------2020.

SIGNED, SEALED AND DELIVERED

By the within named ----------

Through its duly ----------

Constituted Attorney Mr. ----------

& ---------- in the presence of

ANNEX –III

LETTER OF APPLICATION CUM TENDER FORM

To be submitted on company Letter Head by the Tenderer indicating full postal address, telephone number/s, fax number/s, email id, etc.

To,

Date:

India Ports Global Limited

4th Floor, Nirman Bhavan,

M.P. Road, Mazgaon,

Mumbai-400010 – INDIA.

Sub: Design, Manufacture, Supply, Installation, Testing, Commissioning & Guaranteeing the performance of 04 nos. Rail Mounted Quay Cranes at Container Terminal at Shahid Behesti Port Chabahar,

REF: **Tender No** : **IPGL/RMQC/2020**

Sir,

Being duly authorised and represent and act on behalf of M/s._____ hereinafter called the `Tenderer' and having fully understood Instructions to Tenderer/s, General Conditions of Contract, Scope of Work, Drawings & Specifications as given in the Tender Document and after visiting the Site, the undersigned hereby submits the Offer for the subject Works.

2. IPGL and its representatives are hereby authorised to conduct any enquiry or investigations to verify the statements, documents & information submitted in connection with this Tender and to seek clarifications from our bankers & Clients regarding any financial, commercial & technical

aspects. This letter of application will also serve as authorization to any individual or representatives of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourself to verify statements and information provided in this Tender, or with regard to the resources, experience, and competence of the Tenderer.

3. IPGL representatives may contact following persons for further information:

For General & Managerial inquiries	
Name of Contact Person	Mr.Arun Kumar Gupta
Telephone number/s	022 66566253,+91 9833880764
Fax Number/s	022 66566336
E-mail Id	md.indiaportsglobal@gmail.com

For Technical inquiries	
Name of Contact Person	Mr.Shailesh Kumar Makwana
Telephone number/s	+91 9029026177 +91 9904304864
Fax Number/s	022 6656636
E-mail Id	mons.indiaportsglobal@gmail.com

For Financial inquires	
Name of Contact Person	Mr.Krishna Kumar Singh
Telephone number/s	+91 9029026178 , +91 7909019302
Fax Number/s	022 6656636
E-mail Id	mfa.indiaportsglobal@gmail.com

4. This application is made in the full understanding that:

i. Tenders received from Tenderers will be subject to verification of all submitted information.

ii We agree to abide by this Tender for the period of 180 days from the last date fixed for receiving the same and it shall remain binding upon us and may be extended at any time, if requested by IPGL, before the expiry of the validity period as given in this Tender.

iii Notwithstanding anything contained in this tender document, IPGL reserves the right to annul the bidding process at any time without any liability or any obligation for such annulment, without assigning any reason.

iv If our Tender is accepted, we confirm to commence work from the date of issue of `Letter of Acceptance' and to complete all Works in good condition within the completion period as stipulated in this Tender.

v. If our Tender is accepted, we will furnish the Security Deposit and Performance Guarantee Bond for the due Performance of the Contract. The amount and format of such Guarantee will be in accordance with the subject Tender and Conditions of Contract.

vi. We have independently considered the amount/rate shown as Liquidated Damages & Consequential Losses as penalty for delay in completion of Works and agree that the same represent a fair estimate of the damages/losses likely to be suffered by IPGL in the event of delay in overall completion of the Work.

vii. We have downloaded the tender form from web site and we hereby certify that we have not made any changes to the Tender Document either in words or in sentences or deleted or added any word or sentences from/to the tender document.

5. The undersigned declares that the statements made & the information provided in the duly filled Forms is complete, true & correct in every detail.

Witness

Signature
Name and Designation with company seal

6.

Signature
Name and Designation with company seal
For & on behalf of (name of the Tenderer)

Witness

Signature
Name and Designation with company seal
For & on behalf of (name of the Tenderer)

Signature
Name and Designation with company seal

ANNEX - IV

FORM OF AGREEMENT

THIS AGREEMENT made at Mumbai this _____ day of _____ BETWEEN _____ (hereinafter called "the Contractor") which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include the party named and his heirs, executors and administrators or its successors and permitted assigns) of the one part and INDIA PORTS GLOBAL LIMITED, Mumbai incorporated by Companies Act 2013 being the successors (herein after called "The Employer") which expression shall unless excluded by or repugnant to the context or meaning hereof, be deemed to include their successors and assigns) of other part, WHEREAS the Board have accepted a tender by the Contractor for Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of Four Nos. New Rail Mounted Quay Cranes (RMQCs) of 65 MT capacity Post Panamax.
NOW THIS AGREEMENT WITNESSESTH AS FOLLOWS:

1. In this agreement words and expressions shall have the same meaning as are respectively assigned to them in the conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz -
    a) The said tender
    b) The acceptance of tender
    c) The conditions of Contract
    d) The specification
    e) The Price, schedule and all other schedules
    f) The Contractor’s specification and all correspondence, by which the Contract is added, amended, varied or modified in any way by mutual consent.
3. In consideration of the payments to be made to the Contractor as hereinafter mentioned the Contractor HEREBY CONVENANT with the Employer to Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of Four nos new RAIL MOUNTED QUAY CRANES (RMQCs) of 65 MT capacity, Post Panamax in conformity in all respects with the provision of the Contract.

4. The Employer HEREBY CONVENANT to pay to the Contractor in consideration of the Design, Manufacture, Supply, Installation, Testing, Commissioning and handing over the

04 new RMQCs of 65 MT capacity Post Panamax , as per the Contract Price at the time and in the manner prescribed by the Contract.

5. IN WITNESS WHEREOF the Contractor that hereunto set his hand and seal and the Managing Director, India Ports Global Limited for an on behalf of the Board has set his hand and seal and the common seal of the Employer has been hereunto affixed the day and year first above written.

Signed, sealed and delivered

by _____ for and on behalf of the said

_____ in pursuance of a resolution of

the Board of Directors of the

_____

passed at a meeting held on

Managing Director

the _____ CONSTITUTED ATTORNEY

_____ or

The Common Seal of the Contractor was hereto affixed in the presence of

SIGNED, SEALED AND DELIVERED

by The Managing Director,

for and on behalf of the Board of Directors of

India Ports Global Limited with the Common Seal of the Board

of Directors

ANNEX -V

FORMAT OF BANK GUARANTEE to be used FOR (i) PERFORMANCE of the Contract (ii) Performance of equipment during defect liability period and (iii) after completion of defect liability period for the contract.

In consideration of the India Ports Global Limited incorporated under Companies Act, 2013 (hereinafter called "The Employer" which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include the Board of Directors of India Ports Global Limited, its successors and assigns) has awarded the Contract for Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of Four Nos. new RAIL MOUNTED QUAY CRANES (RMQCs) of 65 MT capacity, Post Panamax, vide Managing Director, IPGL's letter No. ----------, dated ---------- (hereinafter called 'the said Contract') to ---------- (Name of the Contractor) (hereinafter called the 'Contractor'). Under the terms and conditions of the Contract, made between the Contractors and the Employer, the Contractor is bound to submit a performance Guarantee

of EURO ---------- (In words EURO ---------- only) / Rs. --------- --- (in words Indian Rupees ……) to Employer, we the ----------

(Name of the Bank and address) (hereinafter referred to as 'the Bank' at the request of the Contractors do hereby undertake to pay to the Employer an amount not exceeding EURO---------- (EURO ---------- only) / Rs. ---------- (in words Indian Rupees ……) against any loss or damage caused to or suffered or which would be caused to or suffered by the Employer by reason of any breach by the Contractors of any of the terms and conditions of the said Contract.

1. We ----------Bank do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the Employer stating that the amount claimed is due by way of loss or damage caused to or which would be caused to or suffered by the Employer by reason of the Contractor's failure to perform the said Contract. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding EURO---------- (EURo---------- only) / Rs. ---------- (in words Indian Rupees ……)

2. We, ---------- (Name of the Bank) undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor in any suit or proceeding before any court of Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

3. We, ---------- further agree with the Employer that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged or till the Managing Director of the said Employer certified that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractors and accordingly discharge this guarantee. Unless the demand or claim under this guarantee is made on us in writing on or before the ----------, we shall be discharged from all liabilities under this guarantee thereafter. This Guarantee will remain in force from the date hereof, i.e. till --------- and unless a demand or suit or action to enforce any claim under the guarantee is made within three months from the date of expiry of this guarantee, i.e. on or before ---------- all your rights under this guarantee shall be forfeited and we shall be relieved and discharged from all liabilities under this guarantee.

4. We, ---------- Bank further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend the time of performance by the said Contractors from time to time to postpone from any time or from time to time any of the powers exercisable by the Employer against the said Contractors and to forebear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the Contractors or for any forbearance, act or omission on the part of the Employer or any indulgence shown by the Employer on the part of the Employer or any indulgence shown by the Employer on the part of the Employer or any indulgence shown by the Employer to the Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have effect of so relieving us.

5. This Guarantee will remain valid for the entire period as agreed, even though there happens to be change in the constitution of the bank or that of the Contractor. It is also hereby agreed that the Courts in India shall have exclusive jurisdiction in respect of claims, if any, under this Guarantee.

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

   Dated ---------- day of ----------2020

   For (Name of the Bank)

   (Name with Designation)

   Signature

   Seal of The Bank

ANNEX -VI

FORM OF BANK GUARANTEE (SECURITY DEPOSIT)

(For Advance payment)

1 In consideration of the India Ports Global Limited incorporated under Companies Act, 2013 (hereinafter called "The Employer" which expression shall unless excluded by or repugnant to the context or meaning thereof be deemed to include the Board of Directors of India Ports Global Limited, its successors and assigns) has awarded the Contract for Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of Four nos. RAIL MOUNTED QUAY CRANES (RMQCs) of 65 MT capacity, Post Panamax, vide Board's Managing Director's letter Nos. ----------, dated ---------- (hereinafter called 'the said Contract') to ---------- (Name of the Contractor) (hereinafter called the 'Contractor'). Under the terms and conditions of the Contract, made between the Contractors and the Employer, the Contractor is bound to submit a Bank Guarantee towards security deposit, (against advance payment as per terms of contract) for EURO-- ---------- (EURO ---------- only) / Rs ----------(Rupees----------) to Employer, we the ---------- ---------- (Name of the Bank and address) (hereinafter referred to as 'the Bank' at the request of the Contractors do hereby undertake to pay to the Employer an amount not exceeding EURO---------- (EURO ---------- only) / Rs ----------(Rupees----------) against any loss or damage caused to or suffered or which would be caused to or suffered by the Employer by reason of any breach by the Contractors of any of the terms and conditions of the said Contract.

2. We ---------- Bank do hereby undertake to pay the amounts due and payable under this guarantee without any demur merely on a demand from the Employer stating that the amount claimed is due by way of loss or damage caused to or which would be caused to or suffered by the Employer by reason of the Contractor's failure to perform the said Contract. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding EURO ---------- (EURO ---------- only) / Rs ---------- (Rupees----------) We, ---------- (Name of the Bank) undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor in any suit or proceeding before any court of Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

3. We, ---------- further agree with the Employer that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged or till the Managing Director of the said Employer certified that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractors and accordingly discharge this guarantee. Unless the demand or claim under this guarantee is made on us in writing on or before the ----------, we shall be discharged from all liabilities under this guarantee thereafter. This Guarantee will remain in force from the date hereof, i.e. till --------- and unless a demand or suit or action to enforce any claim under the guarantee is made within three months from the date of expiry of this guarantee, i.e. on or before ------- all your rights under this guarantee shall be forfeited and we shall be relieved and discharged from all liabilities under this guarantee.

4 We, ---------- Bank further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend the time of performance by the said Contractors from time to time to postpone from any time or from time to time any of the powers exercisable by the Employer against the said Contractors and to forebear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation or extension being granted to the Contractors or for any forbearance, act or omission on the part of the Employer or any indulgence shown by the Employer on the part of the Employer or any indulgence shown by the Employer on the part of the Employer or any indulgence shown by the Employer to the Contractors or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision, have effect of so relieving us.

5 This Guarantee will remain valid for the entire period as agreed, even though there happens to be change in the constitution of the bank or that of the Contractor.

It is also hereby agreed that the Courts in Greater Bombay shall have exclusive jurisdiction in respect of claims, if any, under this Guarantee.

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

Dated ---------- day of ----------2020

For (Name of the Bank) (Name with Designation)

Signature/ Seal of The Bank

ANNEX –VII

SCOPE OF WORK FOR THIRD PARTY INSPECTION AGENCY TO BE APPOINTED BY IPGL

1. Approval of Main Structure Analysis Results
   a. Check for Design Criteria
   b. Check for Stress Results
   c. Check for Fatigue Stress
   d. Check for Main Structure Drawings of: Girder, Boom, Girder Support Beam, Leg, Portal Beam, Sill Beam, Top Leg, Top Beam, Fore-Stay & Back-Stay, Leg Diagonal, Top Leg Brace, Boom Hinge, Boom Stop Girder.
   e. Check the results and conformity with the technical specification of performance test

2. Documents Review:
   a. Technical Specification
   b. Approved Construction drawings
   c. Inspection and Test Plan
   d. WPS/PQR-WPQR
   e. NDE Procedures & NDE Personnel Certificates
   f. DE Procedures & DE Personnel Certificates
   g. Painting Procedure
   h. Commissioning Procedure etc.
   i. Review of raw material test certificate for compliance with code/specifications and identification of material with manufacturer's test certificate.
   j. Review of heat treatment records carried out where applicable.
   k. Examination of radiographs including review of radiographic technique and monitoring of other NDT requirements such as Ultrasonic, Magnetic particle and Liquid Penetrant testing are met with as per the relevant code/drawings/ QAP.
   l. Review of test certificate for all critical items but no limited to for:
   - Bogies, Portal, Main girder and boom girder beam, Trolley & Loading devices
   - Long travel, Trolley traversing, Main Hoist, Boom Hoist
   - Motors, Controller, Main Cables, Other bought out components any other like anemometer, rail clamps, hold down devices, rail sweeper, all safety devices, wire ropes etc.

3. Material Verification:
    a. Review Mill Certificate
    b. Verify the material traceability records
    c. Witness material test as per submitted QAP
4. Witness & Verification
    a. Witness Welder Qualification Test and certification by TPI
    b. Fit-up: witness on critical parts and randomly spot witness for the others
    c. Welding Process: monitoring/patrol inspection
    d. Non Destructive Test: review NDT results, spot check on the calibration of equipment & verify the qualification of personnel
    e. Final Inspection: witness on the final welds and dimensional/straightness
    f. Sub-assembly: witness on the final welds, alignment, dimension.
    g. Erection: witness on the final welds, final dimensional, bolt torque, levelling /straightness.
    h. Painting: witness on the surface preparation (after sand blasting), painting procedure and randomly spot check on the final DFT.
    i. Testing:-
        i) Electrical: review continuity check & megger test; verify electrical equipment installation etc.
        ii) Mechanical: witness alignment/installation, bolt torque, greasing/lubricating, idle running test, etc.
    j. Commissioning: witness on all testing as per approved commissioning procedures, including load test.
    k. Witness assembly of all the primary structural with the machinery and electrical equipment, spreader and safety devices at site.
5. Documentation & Certification
    a. Submit FORTNIGHTLY inspection report to IPGL
    b. Certification of parts of the crane before shipment to berth as per clause 3.24 (Volume-I)
    c. Certification of completion of installation & erection activities as per clause 3.27.

d. Certification of the crane for meeting the FEM classification and requirements as per TPIA.
e. Certification of the crane for “Ready to ship” prior to shipment from contractor’s site indicating that all the tests are successfully carried out as detailed in the tender document as per clause 1.18 (Volume-II).
f. Certification of completion of commissioning & testing as per contract.
g. Stamping and issue of certificates.

SCHEDULE 1

GENERAL INFORMATION

All individual firms submitting the tender must complete the information in this form.

1.	**Full name of the Firm:**	
2.	**Head Office address:**	
3.	**Contact person name at Head office:**	
4.	**Telephone number/s:**	
5.	**Fax number/s:**	
6	**E-mail Id**	
7.	**Branch Office address, if any:**	
8.	**Contact person name at Branch office:**	
9.	**Telephone number/s:**	
10.	**Fax number/s:**	
11.	**E-mail Id**	
12.	**Works address:**	
13.	**Contact person name at Works:**	
14.	**Telephone**	

	Number/s:	
15.	**Fax number/s:**	
16.	**E-mail Id**	

Page 2/2: Schedule -1

17.	**Place Of Registration/Incorporation:**	
18.	**Year of Registration/ Incorporation**	
19.	**Details of Mainlines of Business:**	

i.	**Since**
ii.	**Since**
Iii.	**Since**
iv.	**Since**
v.	**Since**

Signature & seal of the Tenderer

SCHEDULE 2

FINANCIAL DATA

A: Banker's Details:

Name of the Banker Bank Account details of tender Account holder name, Account no, Bank Name, IFSC code, Branch code	
Address of Banker	**Telephone No:**
	Fax No:
	Contact Person name:

C: Income tax and Sales tax details:

1. Permanent Income-Tax Account Number (PAN) or equivalent	
2. GST registration number or equivalent	

(Kindly enclose copies of supporting documents for above information)

E: The Tenderer must submit following document:

1. Copy of Latest GST clearance certificate or equivalent

Signature & Seal of the Tenderer

SCHEDULE 3

WORK SCHEDULE

Supply of 04 nos New RMQC(s):

3.1 Work schedule for design and manufacturing of the cranes at work.
(A bar chart/CPM/PERT for the entire completion period)

3.2 Shipment Schedule.

3.3 Unloading Schedule.

3.4 The time required for mobilizing the equipment at Chabahar Port including details of transportation, Installation, Commissioning & Testing of equipment

3.5 Manpower deployment during Installation, Testing and commissioning Phase.

3.6 Tenderer can indicate the minimum length of berth and period that will be required for Installation, Commissioning & Testing of the 04 new cranes at site, Chabahar Port.

3.7 Requirement for office space and other facilities if any to be provided by IPGL during Installation, Testing and Commissioning period.

Signature & Seal of the Tenderer

SCHEDULE 4
TRAINING SCHEME

The Tenderer shall describe in detail the training scheme that he is proposing for technicians, operators and supervisory personals of the Employer for efficient functioning of the equipment to be supplied by him. The scheme shall indicate the nature and duration of training required for various categories of personnel. The following particulars shall be furnished in the format given below: -

Sr. No.	Designation of each personnel and area of Training assignment.	Name and short resume showing experience of persons	Recommended no. of person to be trained in each category	Duration of training for each category

Signature & Seal of the Tenderer

SCHEDULE 4 - A

TRAINING SCHEDULE

- **TRAINING OF CRANE OPERATORS AND MAINTENANCE PERSONNEL:**

1.1 GENERAL:

The contractor can assign qualified mechanical and electrical specialists to instruct the employers Terminal operations personnel in the operating and maintenance on all equipment installed under this contract. The training session by OEM for Drives, PLC &CMMS will be performed at the site of the work. The contractor shall submit his fully structured and detailed proposed training programme under this contract.

1.2 TRAINING SESSIONS:

.1 The training sessions shall include operations, maintenance and servicing of all mechanical and electrical components of the crane. The detailed training programme will be finalized by the Contractor in consultation with the employer well in advance. The training shall be in sufficient depth to enable IPGL to use and maintain the crane in a safe and proper manner. Contractor shall impart operational & maintenance training to employer's personnel as per the following;

Location	Details	Total Training man- days
At the works of Contractor.	A) **Drive, PLC & CMMS** (total 04 Engineers in two batches of 02 Engineers in each batch) B) **Mechanical System** (total 04 Engineers in two batches of 02 Engineers in each batch)	Maximum 14 days
At employer's site after arrival equipment, in classroom.	**Mechanical** **Electrical** **Crane Operations**	4 4 4
On site in crane at IPGL	**Mechanical** **Electrical**	2 2

	Crane Operations	5

.2 The session shall also include hand-on-trouble shooting where the contractor inserts known faults into the system to demonstrate the fault diagnostic capabilities of the fault diagnostic.

.3 The contractor shall furnish detailed Training manual to employer 15 days before commencement of training.

.4 The contractor shall provide a full time engineer on the contractor's permanent payroll, on site who shall oversee the Erection /Commissioning works. He shall have authorization to make reasonable changes and modifications as required by the employer.

.5 A commissioning engineer with PLC knowledge shall remain at site for the first two weeks of the performance test period of each equipment.

Signature & Seal of the Tenderer

SCHEDULE 5

QUALITY ASSURANCE PLAN (QAP)

All stages of execution of the work shall be governed by Quality Assurance Procedures that shall comply with or better requirements of ISO standards. Tenderer shall submit in substantial detail a quality assurance plan indicating all activities step by step at various manufacturing/fabrication/construction premises including site to carry out to meet the requirement of this specification and International standards/regulations/practices to enable comprehensive assessment of its merit and reliability. This shall also indicate tentatively at what stages of manufacturing/ fabrication/construction of all items he proposes the customer control points according to which the inspection by the Employer and Engineer-In Charge could be planned.

QAP shall incorporate monitoring, inspection, Testing and Review as per the scope of Third Party Inspection Agency (TPIA) as given in the Annex VII of tender document.

Signature & Seal of the Tenderer

SCHEDULE 6

DETAILS OF INSTRUMENTS

FOR TESTING & QUALITY CONTROL

Tenderers are advised to furnish details regarding instruments that he will be using for `Testing & Quality Control' till completion of the subject Work. The information in this regard should be submitted in below mentioned format and separate sheets may be used to furnish necessary details, if required**.**

Sl. No.	**Brief Description & specifications of Testing & Quality Control Instruments**	**Qty**	**Year of Installation**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Signature & Seal of the Tenderer

SCHEDULE 7

SUB-CONTRACTORS

The Tenderer shall submit the name, address of persons, firms or companies, proposed by him as sub Contractors for carrying out the work under the Contract together with particulars of work to be carried out by each party. Written confirmation from sub Contractor shall be submitted along with the tender.

Sl. No.	Section of Works	Name and address of the proposed Supplier/sub-contractor	Name & Location of the Organisation previously supplied/worked
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

Signature & Seal of the Tenderer

SCHEDULE 8

ARRANGEMENT FOR SPARE PARTS

Tenderer shall submit following information pertaining to availability of spare parts

1	Name, address and Contact Number of Service Centres of tenderer's firm with spare parts stock in India/Destination country.	
2	The address of the dedicated website through which order for spare parts can be placed.	
3	Minimum number of days, on intimation, a service Engineers of tenderer's firm for this particular Equipment is available on site.	

Signature & Seal of the Tenderer

SCHEDULE 9

STATEMENT OF DEVIATIONS

1. The following are the particulars for deviations from the requirements of the Tender specifications: (A soft copy to be submitted in **Word Format** in the following tabular form):

Clause Ref.	**Proposed Deviations**	**Justification for proposed deviation.**

Signature & Seal of the Tenderer

2. **Note- 1. Where there are no deviations, the statement should be returned in duly signed manner with an endorsement indicating no deviations.**

3. **The Tenderer shall indicate the Price adjustment in terms of percentage against each deviation, which he may like to add to the Tender Price for withdrawing his deviation, if the same is unacceptable to the Employer.**

   The Tenderer shall indicate in this Schedule, the Price adjustment in terms of percentage against each deviation, which he may like to apply to the Tender Price for withdrawing his deviation, if the same is unacceptable to the Employer. However, the absolute amount of Price adjustment, if applicable, shall be mentioned in the Price Schedule, for each deviation.

4. In case of no submission of price-adjustment against any deviation, it will be deemed acceptance by the contractor without any price adjustment.

   The deviation which is not acceptable to IPGL is required to be withdrawn unconditionally, failing which the offer will be treated as conditional offer and the same is liable for rejection.

Signature and seal of the Tenderer

SCHEDULE -10

LIST OF SPARE PARTS to be supplied under this contract.
Consolidated List for four units RMQCs.

Supply of Spare parts shall be separate from scope of this tender. The rates / prices / amount shall be submitted in price Schedule 11, part II, which will be valid for a period of 2 years from final acceptance date. However the same shall not be taken in to consideration for evaluation of the tender.

ELECTRICAL SYSTEM:

Details	Spares	Qty
Electronics		
1	PLC (with rack CPU, power supply)	1 set
2	IO modules	2 nos. each type
3	Data communication modules	2 nos. each type
4	Load sensing devices & amplifiers	4 nos each
5	FDU with programme	1 no.
6	CMMS PC with all software	1no.
7	P.A System	two set
8	Complete electrical drives (with all control cards including profibus bus interface) loaded with complete software for main hoist, trolley & spreader cable reel drive	one each
9	Power semiconductor modules with heat sink	3 nos.
10	Boom load & angle measuring unit with sensors	1 set
Cables		
1	Spreader cable	2 nos.
2	Festoon cables	One set
3	Lift cable	1 no.
Switches & contactors		
1	Main contactor & relay for each drive	1 no/drive
2	Limit switches, magnetic switches, proximity switches &	2 nos. of each

	Encoders	type
3	Circuit breakers	1 no each type
4	Over speed switches	1 no each type
Other electrical		
items		
1	Fuses all types (Control, power & Drives)	1 set per crane
2	Meters(Voltage, Current, Power)	1 set
3	Long range ultrasonic sensors & laser sensors	2 sets
4	Long travel siren with flashing light	2 sets
5	Anemometer(transmitter & receiver)	2 sets
6	Vacuum circuit breaker	1no. Of each type.
7	Solid state Air circuit Breaker	1 no.
8	Master controller	1 no. each type.
9	SMPS	1 no. each type.
10	Slip ring (Collector) for spreader cable reel	1 no.
11	Slip ring (Collector) for Power cable	1 no.
12	Power cable Diverter complete assembly	1no.
Electrical motors & brakes		
1	Main hoist motor (LHS &RHS) with coupling	1 no
2	Trolley motor with coupling	1 no
3	Boom hoist motor with coupling	1 no
4	Gantry motors	2 nos
5	Lift motor with coupling & brake	1 no
6	EOT motor with coupling & brake	1 no
7	Boom Emergency brake	1no
8	Trolley rope tensioning motor with coupling	1no.

9	Spreader cable reel motor with coupling & encoder	1no.
10	Rail clamp motor with coupling	1 no
11	Other system motors with ventilation fan	1 nos each
12	Trim/List/Skew motor with coupling.	1no.
Spreader & head Block		
1	Complete spreader with cable & quick connectors.	1 no.
2	Head block	1 no
3	Spreader twist lock pins & nuts	16 nos
4	Twist lock cylinders	12 nos
5	Twist lock guide	16 nos.
6	Landed pins	8 nos
7	Flipper gear box	8 nos
8	Flipper motors	8 nos.
9	Flipper arm	8 nos
10	Limit switches-Proximities	24 nos.
11	CAN Open slave node	2nos.
12	Solenoid valves	1set
13	Spreader SCS3 node, can booster, ASI conversion, any bus gateway, CAN open modules	1set
14	HIS sensor, Encoder, LED indicator Lamp	1 each
15	Spreader Multi pin plug , Socket & cable	1no. Each
16	Head block twist lock pin	12 nos
17	Hydraulic pump & motor with coupling	2 nos.
18	Telescopic frames sliding pads	8 nos.
19	Cable drag chain	02 nos.
20	Hoses	2 sets
Mechanical:		

Reducers		
1	Main Hoist	1no.
2	Trolley	1no.
3	Gantry	2nos.
4	Spreader cable reel drive	1no.
5	Power cable reel drive	1no.
6	Personal lift	1 no.
Brakes		
1	Complete brake assembly for Main Hoist, boom & Trolley	1 each
2	Complete brake assembly for gantry	4 nos.
3	Boom emergency brake unit	one set
4	Lift brake assembly	1 no
5	EOT motor brake	1 no.
	Brake thruster assembly	
1	i)Main Hoist	2nos.
2	ii)Trolley	1no.
3	iii)Gantry with control unit	4 nos.
4	iv)Boom	1no.
5	v)Boom latch thrusters	2 nos.
	Brake Linings	
1	i)Main Hoist brake linings	4sets
2	ii)Main Trolley brake linings	2sets
3	iii)Main Gantry brake linings	4sets
4	iv)Main Boom brake linings	1set
5	vi) Lift brake liner	2 sets
Other (Mechanicals)		

1	Sheaves with bearings for Hoist	8nos.
2	Sheaves with bearings for Trolley	4nos.
3	Sheaves with bearings for Boom	2nos.
4	Coupling for all systems	1 set
5	Trolley wheel (with bearings)	one set
6	Wire ropes for main hoist	2sets
7	Wire ropes for trolley	2sets
8	Wire ropes for Boom	1set
9	All types of Rollers with bearings(including lift)	2 nos. each type
10	Operator's cabin seat/chair	1no.
11	Rope clamps for hoist & boom	one set
12	Rope clamp on drums	one set
13	Rail clamp unit	2 nos.
Hydraulic system		
1	A)Pump & solenoid valves for hydraulic unit	
2	i)Trim, list, skew unit	one set
3	ii)Rope tensioning unit	one set
4	iii)Rail clamp	one set
5	iv)Boom emergency	one set
6	B) Cylinder	
7	Trim, list, skew cylinders	one set
8	Rope tensioning unit cylinders	one set
9	C) Hoses	2 sets
10	D) Filters	2 sets
11	E) Pressure gauges	2 nos each type
12	F) Pressure switches	1 set

SCHEDULE 10 - A

OPERATIONS AND MAINTENANCE MANUALS

1 OPERATING AND MAINTENANCE (O&M) MANUAL

1.1 The contractor shall provide an operating and maintenance (O&M) manual which will cover the operation, lubrication, maintenance and inspection of the crane including routine and major maintenance of mechanical and electrical components. Routine and major inspection of the structure shall be covered by the structural maintenance manual. Detailed electrical record drawing shall be included with each O&M manual.

1.2 The O&M manual shall be durable and hardbound with properly indexed for easy reading. The contractor shall furnish 6 sets of O&M manuals with the supply of cranes. The contractor shall also provide O&M manual on a CD for reference. These manual shall be supplied 15 days before commencement of training schedule and commissioning of the equipment at employer's site. The O & M manuals shall consist following;

.1 A fully detailed as constructed manufacturing specification of the crane and equipment including, without limitation:

- Drawings and diagrams where appropriate including electrical diagrams and hydraulic schematics.
- All materials and component parts test certificates
- A schedule of third party supplied components.
- A schedule of spare parts provided under the contract.

.2 A fully detailed as constructed performance specification of the crane and equipment including, without limitation:

- Wheel loading
- Operating speeds and limitations
- Commissioning test results including current readings
- Statutory test certificates

.3 A fully detailed operating and maintenance manual for the crane, equipment and component parts including without limitation:

- Setting up and testing procedures
- Operational duties and restrictions
- Maintenance and replacement schedules.

Signature & Seal of the Tenderer

SCHEDULE 10 – B

Maintenance Tools

The Following Tools are required to be supplied along with each Crane and cost of which is inclusive in CIF value of each equipments.

a) Electrical power screw driver set 230 V AC : 2 Nos.

b) Electrical powered grease gun with 25 m hose & 20 kg reservoir : 01 per crane

c) Portable grease gun : 01 per crane

d) Set of spanners for maintenance of equipment : 01 per crane

e) Industrial vacuum cleaner : 01 Nos.

f) Pneumatic compressor installed in machinery room & power wrench with suitable head wrench and torque output : 01 Nos. per crane.

g) **Cargo beam (Bromma make) for handling General Cargo under the crane hook** : 01 Nos.

Signature & seal of the Tenderer

SCHEDULE - 11 i.e. Format of PRICE SCHEDULE-Part I
(Tender No. IPGL/RMQC/2020)

Name of Work: Design, Manufacture, Erection, Supply, installation, Testing, Commissioning, Training and Guaranteeing the performance of **04 Nos. New RMQC of 65 MT capacity Post Panamax**, as per Principal Technical Parameter, specified in Tender clause 1.6 (volume-II of the tender document) at Container Terminal, IPGL in accordance with the Contract.

Sl. No	Description (Part I)	Price Quoted for new RMQCs (Euro / INR)	
		In Figures	In Words
1.	**Equipment**		
	A) CIF price for Design, Manufacture, Transportation and Supply of **4 units of RMQCs of 65 MT capacity Post Panamax** to IPGL, Shahid Beheshti Port, Chabahar including Transit / Marine Insurance etc as prescribed in the tender document and including all other taxes, duties, levies if any, payable at country of origin.		
2.	**Service component**		
	A) Price for Training fee for imparting operational & maintenance training, as per the Tender document and as per training schedule provided as Schedule 4 and 4A. B) Price for providing 06 sets of operation and Maintenance manuals (prepared in accordance with the relevant Schedule 10 A) and "As-built" drawings and spare parts catalogue as per tender conditions. C) Price for providing 04 sets of Training manuals.		
3.	**Price for rendering warranty support as per tender conditions**		
	TOTAL OF 1 T0 3-: TOTAL Landed Cost of 4 units of RMQCs (PRICE SCHEDULE-11 PART-1)		

Note: Tenderer shall submit their offer for the entire work. Partial offer by any tenderer shall be rejected.

Name, Designation and Signature of Tenderer with company seal & date.

Name Signature of witness

PRICE SCHEDULE 11 Part –II

For Supply of Spares

(Tender No. IPGL/RMQC/2020)

A complete list of spare parts as per list attached at Schedule –10 required for operation of the cranes with quantity, unit price and total amount to be paid by the employer shall be given in the following format.

A) Spare Parts

Sl. No.	Description	Qty	Manufacturer' s Name and Model Number	Country Of Origin	CIF price (In EURO/INR)			
					Unit rate quoted		Total amount quoted	
					In Figures	In Words	In Figures	In Words
1.								
Grand Total (Price Schedule II)								

Note: It shall be mandatory for the contractor to fill in this schedule. However, the same shall NOT TO BE TAKEN FOR EVALUATION OF THE BID. However, the prices shall remain binding for two years from date of Final Acceptance.

Name and Signature of Tenderer

Name and Signature of Witness

SCHEDULE 12

INTEGRITY AGREEMENT

Between

"India Ports Global Limited, (IPGL) hereinafter referred to as **"The Principal"**

And

…… hereinafter referred to as **"The Bidder/Contractor"**

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for **"**Design, Manufacture, Supply, Installation, Testing, Commissioning and Guaranteeing the performance of 04 Nos. of New RAIL MOUNTED QUAY CRANES (RMQCs) of 65 MT capacity, Post Panamax at Shahid Beheshti Port, Chabahar,.

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

Section 1 – Commitments of the Principal

(1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles;

a. No employee of the Principal, personally or through family members will be in connection with the tender for, or the execution of a contract, demand, take a promise for or accept for self or third person, any material or immaterial benefit which the person is not legally entitled to.
b. The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

c. The Principal will exclude from the process all known prejudiced persons.

(2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there will be a substantive suspicious in this regard, the Principal will inform the Chief Vigilance Officer and in addition can be initiate disciplinary action.

Section 2 - Commitments of the Bidder(s)/Contractor(s)

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

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

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

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

(d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agent/Representatives in India, if any. Similarly the Bidder(s)/Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agent of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy

of the "Guidelines on Indian Agent of Foreign Supplier" is annexed and marked as Annex-"A".

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

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

Section 3- Disqualification from tender process and exclusion from future contracts.

If the Bidder(s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or take appropriate action.

Section 4 – Compensation for Damages

(1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.

(2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amounts equivalents to Performance Bank Guarantee.

Section 5- Previous transgression

(1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any Country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his execution from the tender process.

(2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or appropriate action can be taken.

Section 6-Equal treatment of all Bidders / Contractors / Subcontractors

(1) The Bidder(s)/ Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.

(2) The Principal will enter into agreement with identical conditions as this one with all Bidders, Contractors and Subcontractors.

(3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7- Criminal charges against violating Bidder(s) / Contractor(s) / Subcontractor(s)

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the relevant vigilance authorities.

Section 8- Pact Durations

This Pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.

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

Section 9 - Other provisions

(1) This agreement is subject to Indian Law, Place or Performance and Jurisdiction is the Registered Office of the Principal, i.e., Mumbai.

(2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

(3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

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

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

(Office seal) **(Office seal)**

Place……..

Date……..

Witness 1: …….

(Name & Address) ……

Witness 2: …….

SCHEDULE 13
CHECK LIST

INDIA PORTS GLOBAL LIMITED
Tender: No. IPGL/RMQC/2020

CHECK LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH TECHNICAL BID.

All the pages of the document submitted under this tender shall be properly and neatly numbered in serial, and same shall be reflected in the summary to be submitted as check list to the offer in the following manner for easy identification of the documents during evaluation.

Sl. No.	**DETAILS OF DOCUMENTS TO BE SUBMITTED**
1.	A covering letter along with check list giving details of the documents being submitted with tender confirming validity of bid for 180 days and submission of Earnest Money Deposit- **Envelope-1 so super scribed with the contents therein.**
2.	Earnest Money Deposit as per tender condition- **Envelope-2 so super scribed with the contents therein.**
3.	The tender document is issued in two sets, one being marked as **"ORIGINAL"** and other as **"TENDERER'S COPY"**. Original tender copy shall be returned along with the offer (Technical Bid), with each page of it duly signed by the authorised person and stamped with company's seal in token of having been read and accepted the tender conditions along with Letter of application cum Tender form duly signed by the person / persons who is/are competent to sign (Annex III of Vol.I of this tender document) and **TECHNICAL BID**. - **Envelope 3 so super scribed with the contents therein.**
4.	**Price Bid As per Schedule 11 (Volume-I) - Envelope-4 so super scribed with the contents therein**
5.	One Duplicate Copy of technical bid(clearly marked) of the offer shall be submitted along with the original offer in the same envelope i.e. **Envelope -3.**
6.	**Schedule 11** Schedule of Prices is in Part 1, 2, 3. All the 3 Parts duly filled in **shall** be kept in **Envelope 4.**
7.	Particulars of the Tenderers as specified in the **Schedule 1 (Volume-I)** of this tender document.

8.	Technical data of the crane as per **(Volume-II)** of this tender document
9.	Work Schedule as per **Schedule 3 (Volume-I)** of this tender document:
10.	Details of the training programme of various categories of IPGL/Associates employees as per **Schedule 4 (Volume-I) and Schedule 4A** of this tender document
11.	Quality Assurance Plan indicating all activities steps by step at various stage of project as per **Schedule 5 (Volume-I)** and details of instruments for Testing & quality control as per **Schedule 6 (Volume-I)** of this tender document
12.	Details of bought out items and its quality certification plan
13.	Details of Sub Contractor involved in the various activities according to **Schedule 7 (Volume-I)** of this tender document.
14.	Detailed drawings of various arrangements of the crane as per this tender document.
15.	Arrangement for importing spare parts, tie up with local firms for supply of spare parts, if any and arrangement for after sales service. Tenderer shall submit the information as per **Schedule 8 (volume-I)** of the Tender
	Document.
16.	Statements of deviations as per **Schedule 9 (Volume – I**) of tender document.
17.	List of spare parts as per **Schedule 10.(Volume – I)**
18.	Information regarding any current litigation.
19.	Details of Warranty Support programme as per Contract Conditions.
20.	MOU/Agreement entered in technical collaboration (if applicable)
21.	Undertaking to ensure integrity as per Clause 2.15.16.i.e. **Schedule 12 of volume I.**
22.	Any other details, which shall establish the technical competency and any deviation from technical specification.
23.	**Non Disclosure Agreement Schedule 14.**
24.	Details of organisation showing hierarchy and key personnel as per **Schedule 15** of this tender document.
25.	Details of current commitments indicating order value, period etc as per **Schedule 16** of this tender document.
26.	Experience in having executed similar Works completed in Past along with Contract value and other related details as per **Schedule 17** of this tender document.
27.	**EXPERIENCE IN SIMILAR WORKS Schedule 18.**

SCHEDULE – 14 Non Disclosure Agreement

THIS AGREEMENT is made this _____ day of _____ _, 202_

Between

Board of Directors of India Global Ports Limited, incorporated under the Companies Act (hereinafter called the 'Board' which expression shall, unless excluded by, or repugnant to the context, be deemed to include the Board of Directors of India Global Ports Limited, its successors and assigns) of the ONE PART

AND.

M/s_____, a Company incorporated in _____ (Country) under the _____ and having its office at _____

(hereinafter" referred to as "Contractor" which expression shall include its successors and assigns) of the part:

WHEREAS:

(1) By Tender No _____ (the "Tender"), offers were invited from Contractors to for the work of _____ for India Global Ports Limited) the "Project"):

(2) M/S _____ made an offer to act the Contractor as per the terms and conditions of the tender: and

(3) After evaluation of the proposals / offers received, the Board has engaged M/s _____ as the Agency for carrying out _____ (Work Title), subject to signing of the Confidentiality Agreement between the Board and the Contractor and conveyed to the Contractor by its _____ (Work Order signatory) vide Work Order No. dated.__/__/202_ which was duly accepted by the Contractor vide its letter dated __/__/202_.

NOW, THEREFORE, in consideration of the mutual agreements contained herein, the Contractor covenants with the Board as follows:

1. All business, financial, operational and other information and data, of whatever kind and in whatever form, relating to the Board, which is disclosed or made known or

comes to the knowledge of the Contractor (including but not limited to its representatives, professional advisors, employees and agents) by the Board or on the Board's behalf (including but not limited to its representatives, advisors, employees and agents) (collectively referred to as "Confidential Information") will be held in complete confidence and will not be used for any purpose other than directly in connection with the scope of services described in the tender.

- The Contractor will not, without the prior written consent of the Board or its authorised person/s, disclose or otherwise make available whole or any part of the Confidential Information to any third party except in accordance with the terms of this Agreement.

  The Contractor will be entitled to copy and circulate the Confidential Information to its only such directors, officers and employees and to such of its professional advisors who are directly concerned with fulfilment of the scope of services as per the terms and conditions of the tender and to whom knowledge of such information is necessary for such purpose. All persons to whom any Confidential Information is disclosed shall treat the same as confidential and use the same solely for due discharge of its obligations under the Scope of Services stated in the tender. The Contractor will be responsible for procuring their compliance with the terms of this Agreement as if they were subject to the same obligations to the Company as the Contractor is subject to hereunder.

  The restrictions, obligations and liabilities contained in this Agreement shall not apply to any information which:

a) Was already in the public domain at the time of its disclosure to the Contractor by the Board; or subsequently becomes part of the public domain through no breach by the Contractor of its obligation under the Agreement.

b) is generally available to or accessible by, the public or, after such disclosure, becomes generally available to, or accessible by the public, other than by reason of a breach of any undertaking by the Contractor contained in this Agreement; or

c) is required to be disclosed by the Contractor by applicable law or regulation or judicial authority, provided that the Contractor agrees, to notify, the Board in writing,

duly signed by an authorised signatory, as soon as possible, upon becoming aware of any such requirement and confirming the necessity of the disclosure prior to such disclosure; The Contractor shall promptly notify the Board in writing if any confidential information is required to be disclosed by law or other regulation and will co-operate with the Board regarding the timing and content of such disclosure or any action which the Board may elect to take to challenge the validity of such requirement unless such cooperation exposes the Contractor to claims, losses, damages or other liability for which the Contractor does not receive indemnification from the Board, and the Contractor undertake that any such disclosure shall be the minimum required by the relevant law or regulation in order for the Contractor to comply with its obligations thereunder.

The Contractor will not make, or permit its officers, directors, employees and professional advisors to make or procure or solicit or assist any other persons to make, any announcement or disclosure of the Confidential Information without the Board's prior written consent.

The Contractor and the Board shall individually keep a record of the Confidential Information provided by the Board to it in writing ("Confidential Information"). The Contractor shall, forthwith upon receipt of a written request from the Company or completion of the assignment as per the tender or if the Contractor ceases to act as the Agency for ……..(Work Title) of the Board:

a) Return to the Board any Confidential Information in the Contractor's possession or control of, or in the possession or control of, any of its employees, agents or professional advisors, together with all copies thereof, and

b) Expunge all Confidential Information from any computer, word processor or similar device into which it has been programmed by the Contractor or its professional advisors on its behalf.

c) Not make use of the information, contained in the confidential information for any of its business operations.

The Contractor acknowledges that neither the return of any Confidential Information nor the expunging of any Confidential Information from its records shall release it from its obligations under this Agreement.

7. The obligations contained in this Agreement are continuing and, in particular, shall survive the completion of the project.

6. The Contractor agrees and acknowledges that the Board may be irreparably harmed by the breach of the terms hereof and damages may not be an adequate remedy and that injunctive relief is an appropriate remedy to protect the rights of a party with respect to its Confidential Information. The Contractor shall be responsible for the breach of any of its covenants and obligations in this Agreement and will indemnify the Board from and against any claims, costs, expenses, losses or damages (including reasonable attorneys' fees) that are actually incurred by the Board and that are directly and solely attributable to the breach by the Contractor of its covenants and obligations in this Agreement. The Contractor further confirms that it is acting in this matter as principal and not as agent for any other person.

7. The rights, powers and remedies provided in this Agreement shall be in addition to, and not in substitution for, any other rights, powers and remedies provided by law. No failure or delay in exercising any right, power or privilege hereunder will operate as a waiver thereof nor will any single or partial exercise of any right, power or privilege preclude any further exercise thereof or the exercise of any other right, power or privilege hereunder. The terms of this Agreement and the Contractor's obligations hereunder may only be amended or modified by written agreement between the Contractor and the Board.'

8. This Agreement shall be governed by and construed in accordance with Indian law. The parties hereby agree to submit to the jurisdiction of the courts of Mumbai.

9. If at any time any term or provision in this Agreement shall be held to be illegal, invalid or unenforceable, in whole or in part, under any rule of law or enactment, such term or provision or part shall to that extent be deemed not to form part of this Agreement, but the enforceability of the remainder of this Agreement shall not be affected.

10. This Agreement shall be freely assigned by the Board, with prior written notice to the Contractor, to any person or persons who are substituted in all in the interests or rights or obligations of the Board for the development of the Project.

11. All questions, disputes and differences arising under or in relation to this Agreement shall be referred to …… (Work Order signatory) of The Board for consideration. The decision of …… (Work Order signatory) shall be final, conclusive and binding on all the parties to the Agreement.

IN WITNESS WHEREOF, the parties have caused this Non-Disclosure Agreement to be executed by their respective duly authorised officers as of the day and year first hereinabove written.

Authorized Signatory
For M/s. ……

In Present Of

……

……

……
Managing Director on Behalf of the
Board of Directors of
India Ports Global Limited

In Present Of

……

……

……

SCHEDULE 15

DETAILS OF KEY PERSONNEL

Details of key personnel involved in administration and execution of the subject work till completion, are to be furnished. The information in this regard should be submitted in below mentioned format and separate sheets may be used to furnish necessary details, if required.

No.	Name in full	Designation	Qualification	Experience
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Signature & Seal of the Tenderer

SCHEDULE 16

CURRENT COMMITMENTS IN HAND

Tenderer should provide necessary information about their current commitments on all Contracts that have been awarded, or for which a 'Letter of Intent' is placed or 'Letter of Acceptance' has been received or for Contracts approaching towards completion and full completion certificate has yet to be issued. The information in this regard should be submitted in below mentioned format and separate sheets can be used to furnish necessary details.

In support of submitted information, it is very essential to submit copies of orders in hand or copies of 'Letter of Intent' / work orders as the case may be.

	Name of the Client	**Order number / Reference number & Date**	**Order value**	**Date of Completion as per the Order**	**Estimated date of Completion**
1.					
2.					
3.					
4.					

Signature & Seal of the Tenderer

SCHEDULE 17

DETAILS OF WORKS COMPLETED IN PAST

Tenderer should provide necessary information about Works completed during last 03 years for which completion certificate or performance certificate is already issued by the Client. The information in this regard should be submitted in below mentioned format and separate sheets can be used to furnish necessary details**.**

In support of submitted information, it is very essential to submit copies of orders executed in past along with satisfactory performance certificates issued by Clients.

No	Name of the Client	Order number or Reference number & Date	Order value	Date of Completion as per the Order	Actual date of Completion
1.					
2.					
3.					
4.					

Signature & Seal of the Tenderer

SCHEDULE 18

EXPERIENCE IN SIMILAR WORKS

Reference: -1

The information about experience in similar Works should be submitted in below mentioned format and separate sheets must be used for each reference.

You are advised to furnish details about similar works as stipulated in the Tender. In support of submitted information, it is very essential to submit copies of order/s executed along with satisfactory performance certificate issued by Client/s.

1.	**Client's Name:**	
2.	**Contract / Order number and Date**	
3.	**Name of the Contract:**	
4.	**Client's Address in full:**	
5.	**Name of Client's Contact person:**	
6.	**Client's Telephone Number/s**	
7.	**Client's fax number**	
8.	**Contract / Order value**	
9.	**Completion period as per Contract / Order**	
10.	**Date of Actual completion Of Contact / Order**	
11.	**Brief details of Contract/Order**	

Signature & Seal of the Tenderer

SCHEDULE 18

EXPERIENCE IN SIMILAR WORKS

Reference: -2 (if any)

1.	**Client's Name:**	
2.	**Contract / Order number and Date**	
	Name of the Contract:	
4.	**Client's Address in full:**	
5.	**Name of Client's Contact person:**	
6.	**Client's Telephone Number/s**	
7.	**Client's fax number**	
8.	**Contract / Order value**	
9.	**Completion period as per Contract / Order**	
10.	**Date of Actual completion of Contact / Order**	
11.	**Brief details of Contract/Order**	

Signature & Seal of the Tenderer

Ship to Shore Container Gantry Crane

(Four units for Shahid Beheshti Port Chabahar)

Technical Specification Volume - II

August, 2020

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PART 1 - GENERAL

1.1 Introduction

This Specification is for the design, manufacture, delivery, installation, commissioning and testing of four units of Ship to Shore Container Handling Cranes for Shahid Beheshti Port (Chabahar). . The cranes shall be electrically powered and will be used for the loading and unloading of container vessels, approximately 8,600 TEU capacity.

1.2 Sub-Contractors and Suppliers

Any Sub-Contractor proposed for the crane structure fabrication work shall be subject to Buyer approval.

The name of proposed manufacturers of major component items shall be stated in the Technical Specification with regard to the attached List Of Manufacturers (LOM).

Approved Sub-Contractors and suppliers shall not be changed following award of the Contract without the Buyer's approval.

1.3 Materials

Shahid Beheshti Port (Chabahar) is located in a highly corrosive marine environment. Due consideration shall be given to the design and selection of materials used for the crane and its component parts.

Where stainless steel is used in an exposed location, it shall be grade 316S16 or equivalent. Grades with less resistance to corrosion shall not be used without explicit approval from the Buyer.

1.4 Environmental Conditions

The port equipment will be exposed to an extremely corrosive marine atmosphere with particularly high salinity, high temperatures and humidity. In addition, these regions of the Persian Gulf and Oman sea are subjected to frequent dust and haze storms and periodic seismic activity.

The Manufacture shall design and construct the cranes to ensure reliable operation under the following site conditions: -

1.4.1 Temperatures (measured in shade)

Ambient Air Temperatures:	Maximum	50°C
	Minimum	0°C

1.4.2 Relative Humidity

Maximum relative humidity (RH)	99%

1.4.3 Rainfall

Mean annual (17 years)	171mm
Max annual (1976)	494mm
Minimum Annual (1962)	1 mm
Intensity	20 mm/ 20 min

1.4.4 Winds

Wind strength and direction variable through the seasons:

Maximum operating wind speed	20m/s
Maximum storm winds	44m/s (gust)

1.4.5 Seismic

Seismic Design Data (minimum values):

Horizontal acceleration (50 year)	0.34g
Vertical (50% x horizontal)	0.17g

Vibration period of quay:
X direction: 0.33 s
Y direction: 0.45 s
The design criteria is to protect both structure and the rails.

1.5 Description of the Crane

The crane shall be a post-panamax, rail mounted ship-to-shore container handling crane with an elevating boom that can be raised to clear a ship's structure and travel clear along the berth. The boom shall be raised and locked in a nearly vertical position for storage. The crane shall be electrically powered from a 20 kV, 50HZ mains supply. The trolley shall be self- driven. The crane shall be capable of working with the boom in the raised or lowered positions, at reduced speed not less than 20% of rated speed.

The crane shall be capable of handling 20ft, 40ft, and 45ft containers (9ft 6inches high) up to 65 tons under spreader (twin lift conditions).

Each crane shall be equipped with a separating twin lift spreader, capable of handling two 20ft containers end to end with various standard gaps, or single ISO containers as indicated above.

The Manufacturer shall also supply one set of spare single lift telescopic spreaders suitable for handling above containers, one unit 85t heavy lift cargo beams incorporating ram shorn hook with safety catches and one unit telescopic over height frames (TOF).

The crane shall under normal operation be capable of simultaneous movements e.g. hoist & trolley travel at the same time or gantry travel & trolley travel at the same time. Simultaneous operation of all movements i.e. hoist, trolley and gantry shall also be possible but at reduced speed. The crane shall be fitted with an anti-sway system and be able to trim, list and skew containers. The crane shall also be equipped with a hydraulic snag load protection system and incorporate anti-lift devices to prevent the trolley from leaving the track and falling from the crane.

The crane structure and mechanisms shall be based upon designs that have been proven in service. The crane electrical drive systems and equipment shall be of proven design for use with high speed container handling cranes, and obtained from a Sub-Contractor who has an extensive track record in the crane industry.

The crane shall be capable of manual and semi-automatic control, and provided with a computerized crane diagnostics monitoring system.

1.6	**Principal Dimensions and Loads**	
	Portal clearance height	13.0 metres minimum
	Height of lift above top surface of gantry rails (to underside of spreader)	35 metres
	Depth of lower below top surface of gantry Rails	18 metres
	Outreach (seaside rail to centre of trolley)	50 metres(to suit 18 box wide ships)
	Backreach (land-side rail to centre of trolley)	24.0 metres
	Gantry rail span	35 metres
	Overall crane length (along track).	Minimum consistent with good stability
	Safe working load under spreader (Twin lift)	65 tonnes
	Safe working load under heavy lift hook.	85 tonnes(restricted outreach &speed accepted)
	Maximum hoisting speed (with 65t load)	90.0 m/ minute
	Maximum hoisting speed (empty spreader)	180.0 m/ minute
	Maximum trolley travel speed	210.0 m/ minute
	Maximum gantry travel speed	45.0 m/ minute
	Time for one complete boom hoisting or lowering cycle	6 minutes maximum

1.7 Standards

The major design standards to be used for the design of the crane shall be: -

British Standards:

BS 2573: Rules for the design of cranes: Part 1: Specification for classification, stress calculations and design criteria for structures

BS 2573: Part 2: Permissible stresses in cranes and design rules: Mechanisms

OR

Federation Europeenne De La Manutention (FEM) - Rules for the design of hoisting appliances

Seismic qualification of cranes shall be in accordance with the latest Japanese standards.

The materials, workmanship and component standards to be used shall be British Standards or DIN standards or other equivalent standards specified or approved at the time of placement of the order for the cranes.

1.8 Classification

The crane shall be designed to work continuously, up to a maximum of 24 hours a day at peak, and to work in a service design wind speed of 20m/sec as defined in the BS 2573.

Structures shall be classified to BS 2573 as follows:

i)	Class of Utilization	-	U8 (4 million loading cycles)
ii)	State of loading	-	Q3
iii)	Group Classification	-	A8
iv)	Impact factor	-	1.4
v)	Duty factor	-	0.9

The details of the load and load cycle to be used in the fatigue check shall be submitted at the time of tendering.

Mechanisms shall be classified to BS 2573 as follows:

Mechanisms	Class of Utilization	State of Loading	Group Classification
Hoist	T8	L3	M8
Traverse (Trolley)	T8	L3	M8
Travel (Gantry)	T5	L4	M7
Boom Hoist	T3	L4	M5

1.9 Interfaces with Civil Works

The rails shall be of type A 120 DIN 536 and the supply of them is excluded from the scope of this tender.

Quay edge to seaside rail shall be 3m. Fender width shall be 1.5m approx. (to be confirmed by Buyer prior to Contract award).

- Mean of Higher High Water: MHHW +2.53 mCD
- Mean of Lower High Water: MLHW +1.93 mCD
- Mean Sea Level : MSL +1.61 mCD
- Mean of Higher Low Waters MHLW +1.28 mCD
- Mean of Lower Low Waters MHLW +0.69 mCD
- Quay and yard :
- New quay level: +5.00 mCD The theoretical weight and maximum wheel loads for the crane shall be declared by the tenderer.

The design value for the vertical uniformly distributed load allowed on the rails is 65t/m with a maximum vertical point load of 80t. The design lateral load on the rails is a UDL of 5t/m.

The theoretical weight and maximum wheel loads for the crane shall be entered in the Technical Questionnaire.

The crane shall be supplied complete with end of track buffers, storm anchor sockets and cable connection pit equipment such as funnel, anchor drum, cable joint box and accessories. Cable connection pit equipment shall be in stainless steel unless otherwise approved.

The cable slot shall be adjacent to the seaward rail and the cable reel shall be at high level in a location where the possibility of collision damage is minimized.

The length of cable provided with the crane shall be sufficient for up to 300 metres (to be confirmed prior to Contract award) of crane travel to either side of the cable turn over pit.

1.10 Documents and Drawings for Approval

The Manufacturer shall submit the following documents and drawings to the Buyer for approval. Unless otherwise agreed by the Buyer, documents and drawings shall be supplied in four (4) full size paper copies (sizes A0, A1, A2, A3 or A4 as appropriate) plus electronic format (Microsoft office or AutoCAD as necessary). The Buyer shall reply with review / approval comments within a period of four (4) weeks from receipt of paper copies unless otherwise stated in the Contract. Where information submitted to the Buyer is found to be incomplete, the 4 weeks approval period shall commence upon receipt by the Buyer of the additional drawings and documents requested. Where no submission dates are stated below, these shall be in accordance with dates agreed by the Buyer and indicated in the Manufacturer's Work Schedule: -

- Within 5 days from Contract award the Manufacturer shall submit for the Buyer's approval a comprehensive Work Schedule (programme) in the form of a Gantt chart listing all major milestones and detailing all design, manufacturing, testing, delivery, erection and commissioning activities.

- Within two weeks from Contract award the Manufacturer shall submit for the Buyer's approval a preliminary Contract Quality Plan, outlining QA procedures covering all project management, design, manufacturing and testing processes, including those undertaken by the Sub-Contractors and major suppliers. The Manufacturer shall confirm contact names of the project manager and others who will communicate with the Buyer or the Buyer's Representatives on matters relating to technical or commercial aspects of the Contract.

- The Manufacturer shall submit proposed arrangement and detail drawings. These shall include the crane GA with overall dimensions, main structure, spreaders, headblock, access-ways, mechanisms, anti sway system, TLS system cylinders and locations, anti-collision system, machinery house including all machinery layouts, re-reeving system and maintenance crane hook approach, trolley arrangement including motors and locations, gantry drives including motors and locations, rail clamps, electric room, operator's cabin, control consoles, layout of controls, checker's cabin, passenger lift, lighting, electrical schematic and single line diagrams.

- The Manufacturer shall submit calculations in sufficient detail to allow a complete review of the design to be carried out. As a minimum, this shall include calculations for structure, stability, wheel loading, mechanisms, gear reducers, buffers, storm anchors, motor power, and power demand.

- Procurement specifications defining all technical aspects of major proprietary items as agreed within the Contract Quality Plan.

- Painting specifications for structure and machinery.

- Detailed manufacturing inspections plans for all major assemblies and items agreed within the Contract Quality Plan. These shall list all relevant inspection activities including welding acceptance and NDT standards applicable.

- Preliminary packing specification, delivery and erection schedules are to be submitted a minimum of four weeks prior to manufacture commencing.

- Steel mill certificates showing source, grade, composition and strength.

- Works test and inspection reports for welding and painting etc.

- Overload test certificates for lifting components such as spreaders, wire ropes, twistlock pins, hook block etc.

- Operating and Maintenance Manuals including brochures/catalogues for the mechanical and electrical components.

- Test certificates for motors, hydraulic components etc.

- Training plan.

- Site erection and testing procedure.

Documents and drawings shall be produced specifically for this project and shall be suitably titled as agreed by the Buyer prior to Contract award.

1.11 Inspection and Testing During Manufacture

The Manufacturer shall submit for the Buyer's approval, four weeks prior to commencing manufacture, full details of their proposed inspection and test programme(QC Plan including Tests, witness and hold points). This shall include all tests to be carried out prior to delivery by the Manufacturer and Sub-Contractors as specified in the Contract and any further tests proposed by the Manufacturer. The scope of inspections to be carried out by a third party inspector to be appointed by the Buyer shall include, but not necessarily be limited to the following: -

- Conduct visual checks on the quality of incoming materials, which include structural steel, motors, reducers, hydraulic components and other items deemed necessary by the Buyer.
- ITP (Inspection & Test Plan) and QC Plan shall be approved by the buyer.

- Verification and identification of steel material, including witness of fracture test against mill sheets for major structural items. Review system for material tracing with random witness of identification transfer.

- Check welders test certificates and welding procedures to ensure that only qualified welders are being used and that correct welding procedures are followed.

- Check material preparation, cutting, fit-up and welding to ensure that they are in compliance with drawings.

- Review qualifications of non-destructive examination operators and procedures. Witness non-destructive examinations of ultrasonic, magnetic particle and liquid penetrant testing as required. Review radiographs.

- Conduct visual inspections pertaining to the quality of structural welding.

- Witness low-pressure testing of fabricated box sections to confirm that air tight structures are produced.

- Compare assembly and mounting of mechanisms with recognized engineering practices.

- Check material surface preparation and coating of paint. Check proper application of paint to meet specifications. Check ambient conditions and/or records during blasting and painting.

- Check electrical wiring for proper installation and termination. Witness high voltage withstand and insulation resistance tests.

- Witness shop test of motors, reducers, hydraulic systems and subassemblies.

- Witness overload test for brakes.

- Review Dynamic load test reports for motors.

• Witness tests on the crane and spreaders prior to shipment. Witness tests on control panel and drive systems.

- Conduct final checks on the quality of welds, painting, installation of substructures, sea-fastenings, etc. before the crane is shipped out to the site.

Costs associated with Buyer's Representatives, including accommodation and travel expenses shall be paid by the Tenderer. The Tenderer shall make provision for a specified number of separate inspection visits, each with a specified duration and attended by a specified number of Buyer's representatives (for tests outside Destination country). For tests inside Destination country, date and duration of each test shall be defined by the Buyer.Further to the above. All the related costs associated with full time inspection of a specified number of Buyers engineers (supervisors) from the beginning of the Manufacturing stage to the end of commissioning and test stages at the workshop or site shall be paid by the Manufacturer (Tenderer). All the required facilities such as proper office with related desk and cabinets, air conditioning, direct telephone line, fax service, PC and internet shall be provided for the said Buyer's Representatives.The number of supervisors and inspection periods are specified in the commercial part of the contract documents.

1.12 Training

Training shall be provided to the crane operators and maintenance staff by competent instructors in the Farsi language / English language by help of expert translators, unless otherwise agreed and approved by the Buyer. The program for training at the Manufacturers works and at site shall be drawn up by the Manufacturer and approved by the Buyer

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1.12.1 Crane Operator Training

Crane operator training of a specified number of people shall be undertaken at site, and shall cover, but not necessarily be limited to the following: -

- Familiarization with controls, operating systems, instrumentation, equipment and fittings.
- Daily routine maintenance.
- Understanding the crane's capability, safety features and operational techniques.
- Practical instruction on an operating crane.

1.12.2 Maintenance Staff Training

The Training Plan shall include training at the Manufacturer's or Sub-Contractor's works of a specified number of people appointed by the Buyer and training at site in accordance with programme approved by the Buyer.

Accommodation, subsistence and travel expenses for works training of the following number of Buyer's engineers shall be paid by the Manufacturer: -

B) Training of a specified number of mechanical and hydraulic engineers at the Manufacturers works, each for a specified period.

- Training of a specified number of electrical engineers at the Manufactures works each for a specified period.
- Training of a specified number of electronic engineers at the Manufacturers works each for a specified period.

Maintenance staff shall be trained to use fault diagnostic aids, special tools, jigs, instruments and wear gauges to calibrate crane components and to carry out major repairs and maintenance jobs.

The training shall cover, but not necessarily be limited to the following:

a. Familiarisation with main components and systems comprising:

- mechanical system
- drive system
- electrical system
- spreaders
- diagnostics systems

b. Routine maintenance program

- Periodic checks and servicing
- Lubrication program

c. Trouble shooting, special adjustments and repairs

d. Familiarization with manuals and parts book.

The number of trainees and training periods are specified in the commercial part of the contract documents.

1.13 Maintenance Tools and Equipment

The crane shall be supplied complete with all necessary maintenance tools and equipment including the following:

- Wear gauges to indicate the limits of wear on rope sheaves, rope drums, trolley wheels, etc.
- Two high voltage testers, multimeter and tong ammeter.
- One control panel to test spreader operation in the workshop during maintenance. The panel shall incorporate push buttons, selector switches, indicator lamps, programmable logic controllers, input/output devices, spreader multi-pin plug with cable, and all parts necessary to operate and confirm proper operation of all spreader functions. Power supply cable of at least 20 metres shall be provided with the panel.
- Two infra-red non-contact thermometers for checking the operating temperatures of equipment. The infra-red thermometers shall be equipped with laser sighting to accurately pinpoint the target where temperature measurements are required.
- Two complete sets of mechanical tools including ring spanners, sockets, hammer, adjustable spanners, screw drivers, pliers etc., complete with tool box.
- Two pressure gauges complete with hoses and quick-action couplings for checking the pressure of hydraulic systems.
- Two hydraulic oil flow meters to check and calibrate the flow of hydraulic systems.
- One hydraulically operated high torque set complete, for loosening nuts and bolts.
- Mobile equipment complete for jacking-up the crane.

The Manufacturer shall include for any necessary training to be given to the maintenance staff on the use of the above equipment in his Training Plan.

1.14 Drawings and Documents for Maintenance

Copies of the following shall be submitted to the Buyer for approval in advance of training the operators and maintenance staff: -

- Crane operators' manual.

- Maintenance and repair manual. The documentation shall include relevant software for preventative maintenance.
- Complete set of as-constructed drawings covering all aspects of the structural, mechanical, electrical, and hydraulic parts of the crane.
- Complete set of electrical and electronic circuit diagrams. Computer hardware layout schematics and detailed circuit diagrams to be illustrated in sufficient detail to enable them to be used for repair and maintenance.
- Computer software documentation.
- Spare parts manual and drawings. Spares used on the crane shall be indicated in the spare parts manual with drawings. These shall include the Manufacturer's and the original component Sub-Contractor's part numbers and descriptions.

Note:The quantity of above mentioned items should be clarified in the contract.

1.15 Packing for Transportation

The Manufacturer shall submit for the Buyer's approval at least four weeks prior to commencing manufacture, the proposed packing specification, together with preliminary delivery / shipping and erection schedules. Delivery and erection schedules shall include details of programmed dates for all activities as derived from the Manufacturer's approved Work Schedule. At least four weeks before shipment of each consignment, the Manufacturer shall inform the Buyer of final packing lists including all details specified in the Contract.

Plant likely to deteriorate due to the weather shall be suitably protected during the programme of the works and particularly during transit and site erection.

Before delivery, plant shall be properly packed and prepared for export. Plant shall be thoroughly dried and cleaned internally. External unpainted ferrous parts and machined surfaces shall be protected by an approved proprietary preservative, all openings shall be covered and all screwed connections shall be protected unless otherwise agreed.

Where moisture absorbent materials have been used for protection against corrosion during storage or transit, adequate information of their location and warning as to their removal shall be clearly indicated.

Adequate precautions shall be taken in the packing of plant that has ball or roller bearings so as to eliminate the risk of damage to such bearings during transit.

1.16 Labelling

Labels and nameplates shall be permanently engraved or embossed, in English, on phenolic plastic or non-ferrous, rust proof plates and mounted securely by corrosion resistance fasteners at easily visible locations. Nameplates and labels shall not be easily removable.

Warning signs and safety notices shall be in both Farsi and English and shall conform to the associated EU regulations. The translated text in Farsi shall be subject to the Buyer's prior approval.

Layout and content of Crane nameplates shall be subject to Buyer's approval. For major components such as motors, reducers and the like, nameplates from the original equipment manufacturer shall be attached to the components. Nameplates shall bear the model and serial numbers, year andplace of manufacture, ratings, ratios, bearing identification number, safety warnings, maintenance limits and any other information critical to the components.

Nameplates indicating the function or service of contactors, circuit breakers, hydraulic valves, limit switches, etc. shall be provided. Plates showing hydraulic circuit diagrams shall be provided on all hydraulic units. Electrical panels and junction boxes shall be provided with

electrical connection diagrams with functional descriptions corresponding to the wire/cable numbering for easy troubleshooting.

A plate showing principal dimensions, speeds and capacity of the crane shall be fitted in the operator's cab.

1.17 Dangerous Materials

The crane shall be free from any parts and components made of or containing asbestos.

The crane shall not contain any flammable parts and components except for lubricants.

The crane shall be free from any substances that are to be phased out as stipulated by the Montreal Protocol of 1987, e.g. CFC (Chlorofluorocarbon).

1.18 Inspection and Testing at Site

Inspection and testing shall be in accordance with procedures approved by the Buyer. The Manufacturer shall submit details of proposed site inspections for approval at least four weeks before erection commences. Where proposed tests are not acceptable to the Buyer, the Manufacture shall modify the test procedures in accordance with the Buyer's requirements. Inspection shall be undertaken before testing. The inspection shall include visual inspection of the completed installations and protective painting systems.

1.18.1 Acceptance Testing

The Manufacturer shall submit a detailed test procedure for approval at least four weeks before testing is due to commence. The Manufacturer shall provide the testing facilities including power supply, instruments, tools and test container. If any of the tests fail, the Manufacturer shall, in accordance with the Contract, remedy the defects and repeat the test to the satisfaction of the Buyer.

The tests shall include no load and full load tests on the mechanisms to check the performance characteristics are in conformance with the Contract specifications. Measurement of noise levels, lighting levels, structural deflections, anti-sway system performance, harmonic disturbances etc. shall also be carried out.

Vibration tests of the structure, operator cabin and trolley shall be carried out and results recorded at the complete range of operating speeds and loads. Consideration shall be given to the requirements of BS 6841: 1987 – 'Guide to the measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock' for which a certificate, confirming compliance shall be provided. The vibration test must be according to ISO 2631 or equivalent to international standards.

The crane shall be tested in accordance with FEM standard, including no load, the safe working load and dynamic 110% overload in that order before the following durability test. In addition, a static overload test of 125% shall be applied at mid span with the structural deflections recorded.

1.18.2 Durability Test

Upon completion of the inspections and acceptance tests, the crane shall be subjected to a durability test in accordance with procedures approved by the Buyer. The test shall include putting the crane into intensive use in actual container operation for a period of 48 hours, or subjecting the crane to continuous simulated container operation with the rated load at 30 lifting cycles per hour up to a minimum of 600 cycles. The test shall be performed by the Manufacturer with his own crane operator or with buyer crane operator.

During the first 10 hours of durability test, failures are allowed provided the time for one single failure does not exceed 15 minutes. If the permitted single failure time is exceeded, the test shall be restarted. Where the sum of failure times reaches one hour, the testing time shall be extended by an hour.

Between the 11th and 24th hour of testing, short interruptions of up to 5 minutes each are allowed but where the sum of interruptions reaches 30 minutes, the testing time shall be extended by one hour. During that hour, no further interruptions are allowed.

The final 24 hours of testing shall be performed without interruption. In the event an interruption due to crane malfunction occurs, the test shall be continued until 24 hours of interruption free operation is achieved.

When final 24 hours of the durability test has been successfully performed, the Manufacturer's commissioning engineer shall ensure that faults have been eliminated and any necessary repairs carried out to the satisfaction of the Buyer.

There shall be separate durability tests for gantry travel and boom hoist. The boom hoist test shall comprise five complete cycles in 1 hour maximum.

1.19 Compliance with Technical Specification

This specification does not cover all details of the crane and nothing written or implied in this specification shall release the Manufacturer from providing a complete working crane that is fully operational, safe and suitable for the purposes of container handling.

1.20 Spares

Spare parts shall be excluded from the Contract price; however, a comprehensive list of all spares parts complete with prices shall be submitted with the tender.

A priced list of spare parts recommended by the Manufacturer to cover 12000 running hours shall also be submitted with the tender. The parts shall includeconsumable parts that require frequent replacement and electrical components such as fuses, lamps, relays, contacts, coils etc shall also be identified.

Spares shall be indicated in the spare parts manual with drawings as necessary. These shall include the Manufacturer's, and the original component Sub-Contractor's part numbers complete with descriptions and the quantities fitted to each crane.

PART 2 – STRUCTURAL

2.1 General

Structural steel shall be to BS EN10113 Grades S275N or S355N or equivalent. Steel shall be supplied with mill certificates for mechanical properties and chemical analysis. The Manufacture shall provide additional verification of quality requirements, including supplementary NDT and destructive tests as approved by the Buyer.

The structure shall be of the rigid type to minimize swaying. Pin joints in the main frames shall not be used, and where used elsewhere, shall not promote rocking of the structure.

The crane structure shall be designed to withstand earthquake loads in accordance with the Japanese Building Code for seismic zone applicable to the site. The code shall be used for determining the seismic acceleration.

The crane structure shall be designed for working on out of tolerance rails as follows: -

- Across track (between rails) +/- 10mm.
- Along track accuracy of each rail relative to datum +/- 5mm.
- Level accuracy of each rail relative to datum +/- 25mm.

The crane structure shall be designed to avoid water being trapped in corners, recesses or pockets. Splice joints shall be avoided and counterweights will not be approved.

The design of the boom hinge pins, bogie pins, bracing pins, stay pins, tension bar pins etc., shall be such that the pins shall last the whole life of the crane. The allowable bearing stress of pins shall not exceed 0.3 times the yield stress of the material. At the operating condition, the indicated bearing stress will be applied. But at the overload condition, the allowable bearing stress will be increased as per stress increase factor. Pin joint bearing surfaces shall be enlarged to minimize wear on the pins and bearing surfaces.

Means shall be provided on the boom, girder, top of mast and back reach for the lifting of rope sheaves and other associated mechanism components.

2.2 Stairs, Ladders, Walkways and Platforms

Stairs, ladders, walkways and platforms shall be designed and constructed in accordance with, BS 5395 Part 3. Stairs are preferred over ladders and shall be utilized wherever practicable. Ladders however may be incorporated into the cranes where stairs cannot be accommodated and subject to prior approval by the Buyer.

No part of the stairs shall protrude into the area of container handling and transport under the portal between the crane legs. Stairs for safe access to the operator's cabin and machinery house shall be mounted landside of the landside legs. Walkways along the boom and girder shall be unobstructed and as far as possible be at the same level. Walkways shall be provided around the machinery house.

Hot dip galvanized gratings shall be used for the walkways and platforms used for inspection purposes, together with all exposed access stairs, ladders and hand railing. Provision shall be made for the gratings to be easily removable. Chequer plate shall not be used for stair treads.

Chequred plates of at least 4.5 mm thick shall be used for platforms where maintenance works are undertaken. Design load for walkways and platforms shall be 5.0 kN/m2 uniformly distributed load (UDL).

Access ways and permanent platforms shall be provided at areas on the structural frame that require regular or periodic inspection. Platforms shall also be provided on the trolley to

facilitate inspection of the boom and girder structures. Platform/s shall be provided at the end of the back span for cleaning and maintenance around the exterior of the operator's cabin.

2.3 Welding

Welding shall be undertaken in accordance with BS EN 1011-2:2001 Recommendation for welding of metallic materials. Alternative internationally recognized standards such as AWS D1.1 shall be employed, subject to prior approval by the Buyer.

Welding shall be undertaken by welders who are certified according to BS EN 287-1:1992 requirements AWS requirements. Welding procedure qualification tests shall be carried out for all welding positions employed in the fabrication process, according to BS EN 288-3:1992. Valid welder's qualification certificates and all welding procedures shall be reviewed and approved. Reports of such test and welder's certificates shall be submitted for review prior to fabrication.

As far as possible, welding shall be carried out by automatic or semiautomatic process. Electrodes used for the main structures shall have tensile strength greater than that of the steel material.

Precise details and extent of proposed non-destructive tests and the standards of acceptance shall be submitted for the Buyer's approval.

Weld testing shall be in accordance with the following standards or approved equivalent to AWS standards.

BS EN 970: Visual Inspection
BS 6072: Magnetic Particle flaw Testing BS EN 1714: Ultrasonic Testing.
BS EN 1435: Radiographic Testing. Shall be done for minimum 30 % welds of critical joints.

All fabricated box sections shall be air tight and Nitrogen Gas to be inserted to prevent ingress of water and subsequent corrosion. Low-pressure tests shall be carried out to ensure that this is achieved.

2.4 Painting and Protective Treatments

The recommendations of BS 5493 Code of Practice for "Protective Coating of Iron and Steel Structures against Corrosion" and BS EN ISO 12944 shall be followed: Protective system shall be compatible with C5 – M corrosion category, suitable for coastal and offshore areas with high salinity.

Protective systems shall be compatible with C5-M corrosivity category, suitable for coastal and offshore areas with high salinity. Unless otherwise stated all protective coating systems shall have a life to first major maintenance of 15 years. Details of the proposed paint system shall be submitted for the Buyer's approval.

Minimum blast cleaning standard shall be SA2.5, and minimum paint thickness 270 microns dft. The paint system shall be applied in a minimum of three coats by the air-less sprays method and be overcoatable. Internal surfaces of non-sealed, accessible box sections shall be suitably protected from corrosion. Typically, this may be a similar paint system to the external surfaces, with a thicker intermediate coat but excluding the final decorative coat.

Blast cleaning and painting shall be undertaken in a dedicated under roof facility where the environment shall be controlled and recorded. Paint shall not be applied when the temperature is below 5° Celsius or the relative humidity over 75%. Work not undertaken under suitable conditions of temperature and relative humidity will be rejected. Grit blast material shall be regularly checked and replaced with new to ensure correct profile height for subsequent paint key.

Steelwork for stairs, access ladders, handrailing, platforms etc., shall be hot dip galvanized. Due to the extremely corrosive nature of the atmosphere, a thicker coating than normal is

required. This shall be achieved by batch hot dip galvanizing by a member of Galvanizes Association to BS EN ISO 1461: 1999 after grit blasting to SA2.5 with G24 chilled angular iron grit to achieve a nominal thickness of 120 microns for steel thickness greater than 6mm.

Except where otherwise approved, all steel shall be galvanized after sawing, shearing, drilling, punching and machining work has been completed. The zinc coating shall be smooth, clean, of uniform thickness and free from defects.

Finished colours and details of the Port or Terminal Operator's Logo will be advised after the award of Contract

Capacity signs showing the safe working load of the crane shall be fitted to both sides of the gantry structure and shall be clearly legible from ground level.

After erection, the Manufacturer shall repair to the original standards all paint works damaged during the course of shipment and erection.

PART 3 - MECHANICAL

3.1 Main Hoist

The main hoist mechanism shall be located in a machinery house and shall include electric motor(s) driving wire rope drum(s), two sets of fail-safe brakes, emergency brakes and a single totally enclosed gear reducer. In the event of failure of one motor (twin motor hoist arrangements) it shall be possible to continue operating the main hoist at reduced speed.

Duplicate sets of fail-safe brake assemblies shall be fitted on the drive. The braking torque for each set of brakes shall be at least 150 % of rated load torque. Container handling operation with loads up to the rated capacity shall be possible with only one set of brakes. Rated load shall be taken as 65t under the spreader (twin lift) and 95t on the ropes. Minimum acceptable load on the ropes shall be 90 Tons. Shall be possible to remove the motors without disturbing the brakes.

In addition, each hoist drum shall be equipped with fail safe emergency brakes operating directly on the drum end plates, capable of stopping a runaway load without assistance from the motor or main brake(s). The emergency brakes shall be applied at any operating position, when over speed condition is detected by the drum over speed sensors.

The wire rope reeving arrangement and sheaves shall be designed such that the ropes do not dislodge from the sheaves under any operating conditions. Slack rope detection with over-ride for rope changing at slow hoist speed shall be provided. A control switch for operating the mechanism at slow speed shall be provided near the rope drum. Slack rope condition shall be detected by the load sensor system as well as the slack rope limit switch.

Cargo hook beam and Telescopic Over height Frame (TOF) shall be considered as dead weights for the slack rope detection system. Special considerations shall be taken for load sensor with empty spreader, cargo hook beam and TOF equipment in Extended Speed Range (ESR) of hoisting operation.

Slow down and stop limits shall be provided to stop the spreader at the upper and lower limits of working when it is over a ship or quay. In addition, a weight operated limit switch shall be provided as an emergency over-hoist precaution to ensure that the head block/spreader/container cannot rise to a level where it can strike the trolley or driver’s cabin.

The main hoist shall be equipped with an emergency drive which can be connected manually by suitable means, in the event of failure to main hoist system. The power to the emergency drive shall be taken from the 400V 3 phase emergency power supply. The drive to the main hoist shall be interlocked preventing operation when the emergency drive is engaged.
The arrangement for connecting to diesel generator shall be provided.

3.2 Trolley Travel

The trolley shall be self-driven, mounted on rails. The design of the trolley shall be subject to approval from the Buyer. Four double flanged wheels shall support the trolley. The trolley travel mechanism shall include motor(s), fail safe brake(s), flexible geared coupling(s) and gearbox/speed reducer(s). It shall be possible to remove the motors without disturbing the brakes. Rain covers shall be provided for motors and brakes when these are mounted outside of machinery house.

The trolley shall be designed such that it will not fall from the girder or boom structure in the event of a wheel/axle failure and shall incorporate anti-lift features to prevent the trolley from leaving the rails in the event of a seismic event or main hoist rope failure. Jacking of the trolley shall be possible at any position along the boom and girder to facilitate replacement of the wheels, axles and bearings.

The trolley shall be fitted with emergency hydraulic buffers at each end. The buffers shall be capable of absorbing and dissipating the impact of collision of the trolley travelling at full speed and with the rated load. Compatible buffers or striking pads shall be provided as necessary at the extreme ends of the trolley runway.

Two step slow down and stop limit switches shall be provided at each end of the trolley runway to prevent buffer impact under normal operating conditions.

Trolley travel over limited distance shall be possible when the boom is in the raised position.

Buffers or striking pads and slow down/stop limits shall also be provided to prevent the trolley from over-running the girder when the boom is raised.

Trolley rails shall be of a type with head width not being less than 65mm and shall be attached using an approved proprietary rail clip system.

Trolley rail joints between ends of adjoining sections shall be welded using enclosed arc welding or Aluminothermy process. The welded portions of the rails shall be machine-ground smooth. Trolley rail joints at the boom-girder hinge joint shall be of shock free configuration (L-type Joint is preferred). This shock free rail joint shall be rigid and supported to ensure smooth transition of the trolley from the girder to the boom and vice versa. The tips of the rails at the joint shall be surface-hardened and ground smooth to ensure long service life. In case it is not possible to harden tips of the rail joints, certainly the joint part is to be designed narrow or L-type joints are also acceptable. Purpose made reinforced rubber pads, Gantrail type or equal, shall be installed under the entire length of the trolley rails, unless otherwise approved, except at the boom-girder hinge joint.

Stow pin(s) shall be provided on the trolley for parking under storm wind conditions. The pins shall be manually inserted and interlocked with the drive.

The trolley shall be equipped with an emergency drive, which can be connected manually by suitable means, in the event of failure to main drive system. The power to the emergency drive shall be taken from the 400V 3 phase emergency power supply. The drive to the trolley shall be interlocked preventing operation when the emergency drive is engaged.

3.3 Gantry Travel

At least 50% of the total number of wheels at each corner shall be driven and braked, with an equal number located on both sea and landside rails. The wheels shall be double flanged and not less than 650mm diameter. The drives shall be direct coupled, installed outside of the rail span for ease of maintenance, with motors mounted horizontally. Rain covers shall be provided for motors and brakes.

Substantial steel sections shall be used to protect the gantry travel machinery against damage caused by collision with swinging containers or secondary container handling vehicles.

Rail scrapers/sweepers shall be provided to clear the track of any debris.

A lifebuoy that is accessible from ground level shall be mounted on the sea side of the gantry travel sill beam.

The jack-up locations on each crane shall be clearly identified and mobile jacking equipment shall be provided under the Contract.

Hydraulic buffers shall be provided at the four corners of each crane and at the track ends. The buffers shall be capable of absorbing and dissipating the impact of the crane moving at full speed and colliding with the stationary bumpers. End of track limits shall be provided.

Automatic hydraulically operated rail clamps and rail brakes with the capability of holding the crane under a wind speed of at least 20m/s shall be provided. They shall be applied to both seaward and landside rails (At least two sets shall be considered for each land side and seaward rails. The brakes condition & operation cycles should be monitored via crane management system) and shall be activated automatically when the gantry motion stops and released when the gantry is to be moved. Indication lamps to show activation and deactivation of the rail clamps shall be provided in the operator’s cabin. Alternately, a pad wear limit switch would be possible for monitoring.

Devices for manually releasing the rail clamps shall be provided and installed on every rail clamp. In case of failure of the rail clamp, they shall be easily removed and replaced without having to dismantle the complete rail clamp assembly.

The crane shall be equipped with manually inserted, interlocked storm anchors capable of holding the crane in out-of -service storm conditions as specified under BS 2573. The mechanism shall be designed to minimize the operating force and shall be subject to Buyer approval. Anchor sockets shall be provided with the crane. Anchor socket for storm anchor shall be supplied by IPGL being a civil work. Travel inching control station shall be provided at quay level for precise alignment of the crane with the storm anchors. The inching station shall also be used when it is required to move the crane for gangway positioning to the ship. Inching station controls shall be of the dead man type.

The crane shall also be equipped with tie downs to ensure stability against overturning when stowed in storm conditions. Storm tie down loadings and their directions shall be in accordance with the port specification.

3.4 Boom Hoist

Boom raise operation and automatic latching of the boom when it is completely raised shall be activated through one joystick inside boom operator's cabin. The said joystick also shall automatically operate the unlatching and lowering of the boom. Boom raise and automatic latching operation shall be visible from the boom operator cabin.

Two independent wire ropes, each with a factor of safety of not less than 6 shall be used. The ropes shall be equalized. Each of the two independent rope systems shall be capable of emergency hoisting and lowering the boom in the case of failure of the other rope.

The boom hoist mechanism shall be in the machinery house and shall include motor(s) capable of operating without any overheating for at least six boom raise and lower cycles within an hour (each cycle is defined as a complete up plus down motion). Compliance with this requirement shall be tested during the acceptance testing and commissioning of each crane.

Fail safe brake/s that can effectively hold the boom at any inclination angle shall be provided. Provision shall be made so that the motor can be removed without disturbing the brakes. Emergency brake/s operating directly on the drum end plates shall also be provided, and be capable of holding the boom at any inclination in the event of failure of the normal brake/s. All brake/s shall activate automatically when the speed exceeds 115% of the rated speed. The braking torque for each set of brake/s shall be at least 150% of rated load torque. Design of the brakes shall ensure that the boom raise or lower operation is safe with the application of just one set of brakes. A physical brake release detecting device, which is electrically interlocked with the boom drive, system shall be provided.

Interlock systems shall be provided to ensure that the main hoist, trolley travel and gantry travel cannot operate during boom raising and lowering operations. Also, it shall not be possible to raise the boom with the trolley placed on the boom joints.

The boom latch shall be hydraulically operated and automatic in operation. The latch shall be duplicated. Bumpers shall be provided to cushion the load of the boom when entering the stowed position. In the stowed position the wire ropes shall be kept with no tension. Slack rope condition shall be detected by the load sensor system as well as the slack rope limit switch device.

Slack rope detection of the boom hoist mechanism with its relevant load sensor shall be used for monitoring and other related safety systems after boom latching or lowering.

When the boom is in the operating position, no load shall be supported by the boom hoist ropes. In the operating position, the boom shall be supported by at least two suitably hinged stays. All pin joints shall be grease lubricated. Provision shall be made for easy access to the pins for lubrication and inspection.

The boom hoist shall be equipped with an emergency drive, which can be connected manually by suitable means, in the event of failure to main system. The power to the emergency drive shall be taken from the 400V 3 phase emergency power supply. The drive to the boom hoist shall be interlocked preventing operation when the emergency drive is engaged.

3.5 Head Block, Spreaders &Hookblock

The design shall be for intensive and continuous use (24 hours a day) under all weather conditions, with a fatigue life of four (4) million lifts.

The spreader shall be a separating twin lift design of proven performance and supplied by a manufacturer approved by the Buyer.

The spreader shall be designed to handle single 20ft, 40ft and 45ft containers at 9' 6" high and up to 32 t in weight and two 20ft containers upto 65 t in weight. The spreader shall also be capable of handling two end to end 20ft containers of 30t each, with centre spread adjustment up to 1.60m. Retraction to 19' 6" position shall be considered to avoid jamming. Related controls shall be furnished in the operator's cab.

The spreader shall be fitted with a monitoring and diagnostics package that feeds information to the operator's cabin and electrical room for operation, maintenance and fault finding purposes. The spreader shall also be fitted with roller corner.

The head block shall be coupled to the spreader by four (4) twistlock pins. Coupling and uncoupling of the head block and spreader shall be done manually. A minimum of two safety electrical interlock devices shall be provided to prevent hoisting if any twistlock is not fully locked into, or fully unlocked from the spreader connection. The fully engaged and fully disengaged conditions shall be detected by separate proximity switches. Guides shall be provided on the head block and spreader to facilitate the coupling process. Horizontal float between the spreader and head block shall not be more than 5 mm. Bearing surfaces on the spreaders shall be such that wear of the connection pin hole surfaces will not occur during the life of the spreader.

The spreader cable shall be wound on a motorized cable reel fixed on the trolley. Alternatively, the Buyer will consider a cable basket instead of cable reel provided that the Manufacturer guarantees reliable operation over the full hoist travel and speed range.

The spreader cable shall have 20% spare conductors and all spare conductors shall be labelled and terminated at terminal blocks in junction boxes. The connection and isolation of the electrical supply to the spreader shall be done manually. All electrical lines supplying power to solenoids on the spreader shall be protected by vibration proof circuit breakers at the operator's cabin. There shall be one circuit breaker for every solenoid. The circuit breakers shall prevent damage to in/out devices in case of short circuit occurring.

The load bearing surfaces on the spreader, where connected by twistlocks to the head block, shall be heat treated with minimum hardness of 320 BHN to ensure there is minimal wear on the bearing surfaces. The sliding pads of telescopic spreader shall be easily replaceable. Wearing of sliding pads within an acceptable range shall not cause damage to the spreader.

Head block, spreaders, twist locks, cargo hook and other lifting devices shall be proof-load tested and certificated prior to shipment to the site.

Limit switches to detect the various container lengths shall be installed on the main frame adjacent to the telescopic beams. Provision shall be made in the system for flexibility that allows small changes in spreader length when handling distorted containers. Sliding pads that can withstand the impact transmitted to the telescopic beams during container handling operations shall guide the telescopic beams. Means to adjust the clearance between the sliding pads and the telescopic beams shall be provided. The telescopic frames shall be mechanically locked to prevent sliding motion when the telescopic motion is not activated. Stoppers to limit the telescopic action at the various container length positions shall also be provided.

Lifting lugs and slings shall be provided for handling damaged containers that cannot be lifted by the twistlocks, one at each corner of the telescopic spreader. The diameter of the hole these lugs shall be 50mm. Each lug shall be rated for a 13 tonnes safe working load.

The twistlocks, flippers and telescopic (extend/retract) motions shall be hydraulically operated. The telescoping and twistlock mechanisms shall also be hand operated and access to twistlocks shall be possible even in ships' cells. The hydraulic system shall be capable of continuous operation without overheating. The hydraulic system working pressure shall not exceed 70 bar unless otherwise approved in writing. Tapping points with shut off valves and quick action couplings shall be provided at all pressure and flow setting points for measurement of the line pressure and flow rate. Flexible hydraulic hoses shall be used throughout the spreader. Hydraulic hoses shall be protected from abrasion and impact damage.

Compartments and junction boxes shall be generously sized and easily accessible from the side of the spreader when coupled to the headblock to enable maintenance and trouble-shooting of cable connections. Hinged doors shall be provided on the compartments and junction boxes. These doors shall be hinged at the top to prevent rain entry if the door is left open. Hydraulic line and electrical schematic drawings shall be permanently mounted on the inside of compartments and junction boxes. The compartments and junction boxes shall be IP66 rated and mounted using shock dampers to withstand the vibration and impact during container handling operations.
Flipper assembly shall be designed and constructed such that when it is in the raised position, there is a minimum clearance of 150 mm between any part of the flipper and the ship's cell guides or walls. There shall be a minimum clearance of 100 mm between a raised flipper and the head block rope sheave, including when the spreader is trimmed or listed to maximum angle. Flippers shall be constructed in such a way that any part can be easily mounted and removed from the spreader. Operation of flippers individually or all at the same time shall be possible from the operator's cabin.

ISO floating type twistlocks shall be provided. The float shall be + 8 mm. Twistlock pins for 40t spreaders shall be proof-load tested to 20 tonnes. Electrical as well as mechanical interlocks shall be provided to prevent operation of the twistlock while the container is suspended under the spreader and to immobilize the hoisting system if any of the twistlocks are not securely engaged in the container/hatch cover corner casting. Positive and absolute detection of the twistlock status by limit switches shall be provided.

Top of container (spreader landed onto container) detectors at all four corners of the spreader shall be provided to detect the following:

- full landing of spreader squarely onto container/hatch-cover,
- no container/hatch-cover under spreader, and
- container/hatch cover suspended under spreader

The above detectors shall be positioned such that they will function on the corner castings of ISO containers and hatch covers as well as on those non-ISO type containers found on some vessels.

Spreader limit switches shall be easily accessible for maintenance and shall be protected from impact damage. Limit switches shall be electromagnetic type.

Capacity signs showing the safe working load of the spreader shall be fitted on both sides of the spreader.

A specified number of 85t safe working load heavy lift cargo beam(s) incorporating ramshorn hook with safety catches shall be provided in accordance with the Buyer's requirement (Later announced).

A specified number of spreader stand/s and heavy lift hook beam stand/s shall be provided for ease of maintenance and for transportation by tractor/trailer.

A specified number of telescopic equipment/frames shall be provided for occasional lifting of open top containers that are over height. TOF equipment frame shall be hydraulically operated in vertical and horizontal directions and of robust design submitted for Buyer approval.

3.6 Spreader List, Trim and Skew

The crane shall be equipped with trim adjustment of at least ± 5 degrees with rated load; list adjustment of at least ±5degrees with rated load and skew adjustment of ±5degrees with rated load. Sufficient clearance shall be maintained between any part of the spreader (with flipper at raised position) with crane structures (e.g. walkway leading to operator cabin) especially when trolley travelling and spreader is trimmed, listed or skewed to maximum.

The trim and list mechanisms shall be capable of operating from one extreme to the other in less than 30 seconds with the spreader carrying the maximum load.

Operation of trim and list motions shall be possible from the operator's console. In addition to a trim and list lever switch, a push button switch shall be provided in the operator's cabin to enable the operator to automatically correct the spreader to a 'zero trim, zero list' position. Push button switches on the operator's console shall operate skewing adjustment.

3.7 Anti-Sway System

The anti-sway system shall be capable of damping the sway of the spreader, with rated load at a height above ground and beneath the spreader of 4.5 metres, bringing it to rest within + 50 mm displacement in less than five seconds after the trolley is brought to a halt from full speed. The Test procedure will be finalised at least four weeks before testing is due to commence.

3.8 Operator's Cabin

The operator's cabin shall be secured to the trolley in a fail safe manner. Safe and easy escape from the cabin at any trolley position shall be made possible for emergency purposes without having to move the trolley back to the parking position.

There shall be a safety clearance between the cabin and spreader at all working positions.

Rear view mirrors shall be provided to enhance visibility during trolley backward motion. A convex mirror (not smaller than 500 mm x 60 mm) shall be provided and fitted in such a manner that the operator is able to view the seaward side of the spreader with container, at any position of the spreader.

In addition, TV cameras shall be mounted on the back side of the operator's cabin to view landside operations and at the far end of the trolley to view the seaside of the spreader, and shall be remotely operated for direction and zoom from the operators cab console. The LCD type monitors shall be colour and mounted forward of the driver. Design and arrangement of the TV cameras and related equipment shall be submitted for Buyers approval.

A warning system shall be installed in the cabin to inform the operator of the approach of a tractor/trailer unit. The warning system shall activate when the tractor/trailer unit is within 15m radius of the crane. The warning shall be audible and visual with the facility to cancel the audible warning.

The cabin shall be equipped with a split type air-conditioner and shall incorporate a double skin roof, insulated against heat and noise. The noise level inside the cab shall not be more than 75dBA. The temperature and relative humidity shall be maintained at 20°C to 24°C and 50% to 60% respectively for specified range of ambient conditions. The design of the supports and mounting shall facilitate easy removal of the air-conditioner using the machinery house maintenance hoist. The air-conditioner shall be of a make that is available locally to the port. Power supply for the air-conditioner shall be 220V, 50 Hz, single phase.

Scratch resistant safety glass that meets the requirements of BS6206, Class A safety glass shall be used on the windscreen and windows of the operator's cabin. The glass shall have sufficient strength to withstand the impact of an 80 kg operator being thrown against it when the trolley is suddenly stopped.

Shields shall be fitted above the windscreen to prevent wire-rope lubricants from splashing onto the glass. The upper portion (above eye level) shall be tinted to reduce glare. The bottom window shall be at least 900mm width and shall offer optimum visibility to the crane operator. For this purpose, safety floor glass shall be used on which the operator can safely walk. Grills and bars shall be provided at the windows only where necessary for safety reasons.

All windscreens and windows shall be fitted such that they can be manually cleaned as well as have glass replaced from within the cabin. Dedicated proper platform shall be provided in order to make the cleaning of all operator cab possible from the outside. The platform shall not obstruct any of container handling operations. In addition, the front window shall be equipped with a windscreen wiper and forced water spray washer system.

There shall be sufficient space to the front of the operator's console for mounting a monitor and keyboard for the crane monitoring system.

The operator's chair shall be designed for horizontal, vertical and tilt adjustments, and shall be able to rotate a minimum of 270 degrees. The chair shall incorporate lumbar support, headrest, seat belt, and a U-cut seat for good visibility when viewing between legs. The chair shall be fitted with a high back that can be reclined 180 degrees to enable the operator to lie back whilst taking a rest.

The seat of the chair shall be upholstered in hard wearing vinyl material and shall be easily detachable for replacement.

The operator control consoles and layout of controls shall be ergonomically designed for fast operation and details submitted to Buyer for approval. The additional crane controls such as pushbuttons and joystick needed for operating the future expandable headblock / twin lift spreader arrangement shall be incorporated into the layout design and shall be supplied and fitted by the Manufacturer.

A foldable wall mounted seat complete with self-retractable safety seat belts shall be provided in the cabin for an instructor.

Electronic type spreader height and load indicators with digital read outs shall be provided in the cabin. The indicators shall be installed within view of the operator sitting in the normal operating position. An audible alarm for overloaded containers shall be provided.

An anemometer with an audible alarm shall be provided in the cabin to indicate the wind speed. The audible alarm shall be activated when the wind speed exceeds the condition for safe operation of the crane.

The following indications shall be provided on a suitably sized high definition touch screen type MMI (Man Machine Interface) panel mounted inside the cabin at an approved position:

- Spreader squarely landed on top-of-container (Graphic indication).
- Spreader position in graphical form (Mimic Diagram)
- Twist lock in locked position (Graphic indication).
- Twist lock in unlocked position (Graphic indication).
- Flipper in raised position (Graphic indication).
- Wind speed
- Spreader height
- Ambient temperature
- Weight of load

The operators cabin shall be equipped with a refrigerator, fire alarm and extinguishers as described elsewhere.

An emergency escape device with test certificate shall be provided in the operator's cabin.

3.9 Checker's Cabin

The checker's cabin shall be weatherproof, lockable, installed under the land side sill beam and fitted with a built-in steel counter/desk with drawers, shelves and a rotary chair. The cabin shall be a single step level above ground.

The cabin shall be air-conditioned and insulated against heat gain. The air conditioner shall be a split type that is locally available. The noise level inside the cab shall not be more than 75dBA. The temperature and relative humidity shall be maintained at 20°C to 24°C and 50% to 60% respectively for specified range of ambient conditions.

The cabin shall be fitted with interior lights giving a minimum luminance level measured at the cabin floor of 300 lux.

Tinted safety glass windows shall be fitted on the front and rear of the checker's cabin. The front glass windows (facing the area between the crane legs) shall be of light tint whereas the rear glass windows shall be of dark tint.

3.10 Boom Operator's Cabin

The cabin shall be weatherproof, lockable and fitted with tinted safety glass as appropriate. The cabin shall be fitted with an interior light giving a minimum luminance level measured at the cabin floor 300 lux.

The cabin shall be equipped with an adjustable ventilation fan with a minimum capacity of 6 air changes per hour. The cabin shall incorporate a console of ergonomic design, with controls for boom hoist by self-returning joystick or push buttons requiring operator to stay in the cabin during boom hoist and lower operations. The layout of the cabin and console shall be subject to Buyer approval.

3.11 Machinery House

The machinery house shall have sufficient vertical height to allow lifting and movement of components by the maintenance hoist within the confines of the machinery house. The walls and roof shall be made of galvanized steel corrugated plates, securely fastened to the frame by an approved fixing method. Self tapping screws for fastening the steel plates are unacceptable. The wall and roof plates shall be coated with a paint protective treatment. The inner surfaces of the walls and ceiling shall be coated with noise absorbing material prior to application of the finish coat of paint.

A fire detection system with suitable audible and visual alarms shall be provided within the machinery house, together with appropriate quantities and sizes of fire extinguishers.

Means to allow natural light to penetrate into the machinery house shall be provided. In addition, the machinery house shall be fitted with interior lights giving a minimum luminance level measured at the floor of 300 lux.

At least two entrances with vertical clearance of at least 2 metres and width of at least 1 metre shall be provided. Standard half -glass doors of rigid construction and complete with closer shall be provided for each entrance.

A forced ventilation system with air filters installed at the air intake shall be provided for ventilation in the machinery house. The ventilation system shall be designed to ensure low noise level. Air filters shall be easily accessible and easily replaceable. In addition, four industrial grade wall mounted fan units shall be provided for comfort of technicians during maintenance works.The machinery house to be completely insulated to protect from excessive heat.

The layout showing the arrangement of equipment in the machinery house shall be subject to approval by the Buyer. There shall be adequate maintenance space (minimum of 1 metre)

around each item of machinery to cater for its adjustment, inspection and replacement. Removable railings shall be installed around all machinery for the safety of maintenance personnel.

The holes in the machinery house walls shall be lined with wear pads to protect it from damage caused by wire ropes. The holes shall be arranged to avoid ingress of rain water and dust.

A hatch of sufficient size shall be provided in the floor of the machinery house to permit easy removal, in a horizontal position, of the largest piece or component in the machinery house to ground level without having to dismantle any parts from it or remove any other components in the machinery house. The hatch shall be provided with flush attachments for lifting. Space for placing the removed hatch cover shall be provided.

A hatch with hinged cover shall be provided for lifting tools and equipment into the machinery house. Suitable hatches to facilitate replacement of trolley wheels and drives using the maintenance hoist shall be provided. Removable railings with 200 mm high toe boards shall be provided around the hatches. The railings shall be mounted in sockets which are flush with the floor.

A minimum of two (2) Interlocks shall be provided to inhibit movement of the crane when any of the hatches are open. It shall however be possible for maintenance staff to override the interlocks with appropriate key switches where necessary.

An overhead maintenance hoist of sufficient capacity to lift the heaviest component in the machinery house to ground level shall be provided. Crane class shall be 1AM according to FEM. or equivalent international standard. The hook approach shall be minimized to ensure that all necessary equipment can be safely handled. All crane motions shall be motorized and control shall be by remote pendant. Two variable frequency RF control transmitters shall be supplied to permit operation from two separate locations. Fast hoisting speed shall be a minimum of 10 m/min. Slow inching speedoperation shall be possible. A lockable isolator switch for the maintenance crane shall be provided at a suitably accessible location. A Certificate of Test & Examination for the maintenance hoist shall be provided.

All of devices like transformers, compressor, drums, etc. in the machinery house shall be easily accessible with maintenance crane hook.

A winch shall be provided and mounted on the machinery house floor. The rope of the winch shall be long enough for lowering the boom rope sheave on the top of the mast to ground level. Pulley blocks or other equipment for use with the winch shall be provided as necessary for lowering the sheaves.

A steelwork bench with drawers and fitted with a 100 mm vice shall be provided.

One chain block of 3 tonnes capacity, one lever operated pulling machine of 2 tonnes capacity, two pulley blocks and two lengths of 2 metres long wire-rope slings of 3 tonnes safe working load shall be provided for maintenance purposes. A free standing extendible aluminium ladder shall be provided for changing of light bulbs and fittings on the ceiling of the machinery house.

A combination storage unit, fitted with lockable drawers and shelves shall be provided. The unit shall have sufficient space for storing lubricants and greases, consumable spare parts, tools, instruments, drawings, etc. The height and depth of the unit shall be approximately 2,000 mm and 600 mm respectively.

3.12 Electric Room

An electric room shall be incorporated in the machinery house but isolated from the main machinery area. The room shall be double panelled, insulated from sound and heat, and air-conditioned. The floor of the electric room shall be covered suitable anti-static, insulated rubber matting.

A fire detection system, with both heat and smoke detectors and with suitable audible and visual alarms shall be provided within the electric room together with appropriate quantities and sizes of fire extinguishers.

A glass panel shall be provided on the wall facing the main machinery so that a view of the operation of the machinery is possible from inside the electric room. The entrance to the electric room shall be from the inside of the machinery house and the door shall be sliding type fitted with a glass panel of suitable size. Transformers and other electro-magnetic devices shall not be installed on the roof of the electric room.

The temperature inside the room shall be maintained nominally at 20° Celsius and the relative humidity of 65% - 75% during operation. The air-conditioner units (2 minimum) shall be of the split type, each capable of maintaining the required temperature and humidity when operating alone. Manual on/off switching of each unit shall be provided. In addition, provision shall be made to operate air conditioning units using remote controller. Air conditioners shall be of a make that is locally available. The air conditioning system shall be interlocked with the fire alarm system such that the air conditioning system is disabled when a fire alarm is initiated.

Exhaust heat from the electrical panels and frequency converters shall be ducted directly from the panels, out of the electrical room and discharged to atmosphere. The IP54 enclosure rating of the panels shall be maintained.

A steel office table with drawers, a steel computer table for the computer terminal, a cushioned chair with height and backrest adjustments and a lockable steel filing cabinet complete with shelves shall be provided inside the electric room. The electric room shall have adequate space to house all control cubicles, electronic devices and the above furniture.

The doors of the electrical cubicles shall be removable and shall have built-in common master key type locks. There shall be sufficient space in front of the cubicles for the cubicle doors to be fully opened and for a person to walk past the open door.

Noise level in the room shall not exceed 75dBA during crane operation. Noise level from the reactors used in the thyristor drives shall be kept below 75dBA measured at 1 metre from the reactor panel during operation.

Transformers, reactors and other devices that produce heavy magnetic field shall be installed away from the room or compartments where the computer equipment is installed.

Illumination measured at floor level in the electric room shall be at least 300 lux.

3.13 Personnel Lift

A personnel lift shall be installed adjacent to the inclined access stairs on one of the land side legs. In the event of lift failure, persons trapped in the lift shall be able to escape via the stairs. The drive system shall be of the rack and pinion type.

The car structure shall be of steel sections with roof, walls and floor made of aluminium alloy plates. Steel sections and components shall be hot dipped galvanized. Insulation shall be provided between steel and aluminium components to avoid galvanic corrosion. The lift shall be adequately illuminated and shall incorporate emergency lighting, operated in the event of power failure.

The power supply shall be separate from the crane drive systems power supply so that the lift operation shall not be affected in the event of a fault in the drive systems. The contactor for the power supply to the personnel lift shall reset automatically when the power supply to the crane is returned after a power failure or other interruption.

Duplicate controls to operate the lift from the top of the lift car shall be provided for maintenance/inspection purposes.

The lift shall have a capacity for 2/3 persons with tools and equipment (400 kg) and travelling speed of 40 m/min.

A safety over speed device to stop the lift ascending or lowering in case the normal travelling speed is exceeded shall be provided. Provision shall be made using a hand release lever for bringing the lift car to the ground by gravity at normal speed without actuating the safety device.

Three boarding places shall be provided, one at ground level, one leading to the operator's cabin and one at machinery house level. The ground level boarding shall be located at a position clear from secondary container handling traffic. Doors at the boarding places shall be of the sliding type.

The lift car shall be protected from rain, and shall have a minimum floor area of 1.2 metres x 1.0 metres. It shall return automatically from the top landings to the ground after an inactive time of 5 minutes. Glass panels of about 300 mm x 300 mm shall be provided in the walls and door of the lift car.

Lift car doors shall be of the sliding type. Louvers shall be provided on the walls for ventilation purposes. An exhaust fan with capacity to replace air in the lift car at 6 air changes per hour shall be provided. The fan shall operate automatically when the lift car is ascending or descending. Rungs of rounded steel bars shall be welded at intervals of 300 mm along the whole length of the rack for emergency escape through the top of the lift car.

The roof of the lift shall be equipped with railings and access to the roof shall be provided. A cantilever support on top of the crane leg for a rope rescue system shall also be provided. In the event of breakdown of the lift, a warning alarm at ground level shall automatically be activated.

A 400V 3 phase emergency shore power supply socket shall be provided at the crane leg to enable the lift to be operated in the event of power failure.

A control panel shall be provided at ground level to by-pass the interlocks on the lift and to remotely bring the lift car to the lowest landing in case the car stops between stations with no person in the car.

A Certificate of Test and Examination for the lift shall be issued by the Manufacturer upon completion of the prescribed load tests, safety checks and inspections.

3.14 Fire Extinguishers

Fire extinguishers as approved by the Local Fire Authority (NFPA) shall be installed in the following locations on the crane: -
Machinery House Operator's Cabin Electric Room Checker's Cabin

3.15 Rope Drums

Rope drums shall be made of high strength steel and shall have accurately machined grooves to suit the wire ropes. Each drum unless otherwise approved shall have sufficient capacity to carry the required length of the ropes in a single layer. Drums shall be statically balanced and stress relieved. Drum grooves shall have sufficient depth to ensure minimum wear on wire ropes. End plates and drum construction shall be capable when used in conjunction with emergency calliper brakes of stopping the maximum rated free falling load. Emergency braking shall be initiated by monitoring the drum speed using an absolute shaft speed encoder, when an over speed is detected the emergency brake shall be applied automatically. The system shall be fail safe.

The pitch diameter of the rope drums shall not be less than 30 times the wire rope diameter.

There shall be at least four dead turns of wire ropes remaining on the main hoist and boom hoist drums when the spreader or boom is lowered to the lowest position. Guide rollers for wire ropes on the rope drums shall be provided to prevent wire ropes from jumping groves during operations. Guide rollers shall be easily removable for replacement of wire ropes.

The maximum fleet angle of wire rope leading to the drum shall not exceed 3 degrees.

The unpainted surfaces of rope drums and shafts shall be protected against corrosion.

Suitable splash guards shall be provided to ensure that brakes are protected from potential grease contamination during hoisting operations.

Drum bearings shall be anti-friction in accordance with specification and shall be accessibly mounted to ensure ease of maintenance. Lubrication shall be performed by automatic lubrication system.

3.16 Wire Ropes

Steel lifting wire ropes shall be at least of 6 x 36 construction, independent wire rope core (IWRC), unless otherwise approved. Ropes shall be suitably protected against corrosion, noting the particularly aggressive nature of this marine environment. The minimum safety factor for wire ropes shall be according to the table T.4.2.2.1.2, book let 4 of the FEM 1.001 standard, last edition.

Main hoist ropes are to be reeved symmetrically, and supplied as left hand and right hand lay to avoid torque-induced rotation of the load. Boom hoist ropes and trolley ropes (if supplied) shall be right hand lay only (shall be in compliance with the related drum groove).

The design shall be such that the moving ropes do not come into contact with any part of the structure during use. Reverse bends in wire ropes shall be avoided.

A motorized re-reeving system shall be provided to facilitate the changing of main hoist and boom hoist ropes including the related extra drums. The reeving system shall be designed to enable the main hoist wire ropes to be changed when the boom is in the raised position. The design shall be submitted for Buyers approval.

Feeding of the replacement ropes shall be from the top of the respective drum.

Under normal operating conditions, the expected life span of wire ropes shall not be shorter than the following:

- 70,000 load cycles for the main hoist ropes
- the life time of the crane for the boom hoist ropes

Drip trays shall be provided to collect wire rope lubricant spillage or dripping under rope drums, at the exit of wire ropes from the machinery house and under rope sheaves. Drip trays shall be removable for cleaning.

All necessary rope reel stands and equipment shall be provided under the Contract for changing the wire ropes.

3.17 Sheaves

The pitch diameter of wire rope sheaves shall not be less than 30 times the wire rope diameter for main hoist system and at least 24 times for the boom hoist system unless otherwise approved. Grooves of sheaves shall be appropriately hardened.

All sheaves (except for the boom hoist system) shall be mounted independently on individual shafts such that if one sheave is removed, the others will not be affected.

Mounting of rope sheaves shall wherever possible be on split type brackets that enable easy and rapid removal and replacement of the rope sheaves, bearings and shafts. Sufficient working space shall be provided for safe and easy repair and replacement of sheaves. Rope sheaves shall be mounted such that the sheaves, covers, shafts and bearings can be accessed from above.

Provision shall be made on the sheaves (such as holes) for ease of handling during removal and installation. All sheaves shall be statically balanced.

Suitable rollers or guards shall be provided to prevent the wire rope from coming out of the sheave groove.

Covers to prevent splashing of wire-rope lubricant shall be provided for all sheaves (except for the boom hoist system). Covers shall enclose the entire sheave and be fitted with inspection doors and waste lubricant drainage collectors. Design and construction of the covers shall facilitate easy removal for maintenance of the sheaves.

Rope sheaves shall be standardized and interchangeable as far as possible within each system. Sheaves shall rotate on cylindrical roller bearings to transmit efficiently the radial and axial loads.

Rope sheaves mounted on the back reach or on the trolley shall be lubricated by automatic lubrication system.

3.18 Hydraulic Systems

Hydraulic system working pressures shall not exceed 140 bar. Hydraulic pumps shall be mounted in a position that provides positive suction head.

Hydraulic pipe shall be used on rigid structures but not on the spreader.
Hydraulic pipe and hoses shall be securely clamped at appropriate intervals.
Criss-crossing of hoses and pipe shall be avoided.

Solenoids shall be earthed. Solenoids shall have means of manual operation.

Hydraulic schematic drawings shall be prominently displayed on each hydraulic unit. The drawings shall be framed and permanently mounted.

Hydraulic units shall be fitted with moisture absorbent breathers. Hydraulic cylinders shall be of high corrosion resistance materials and protected where feasible with bellows covers.

3.19 Gear Reducers

All bearings and gears in reducers shall be lubricated by oil bath and splash method.

Large gearbox casings shall be split horizontally and arranged such that the top half can be easily removed for maintenance without affecting the position and alignment of the gears and bearings Gearbox casings shall be fabricated from high quality steel and suitably stress relieved, whilst internal shafts and gears shall be from allow steel of suitable hardness and mechanical properties. Oil-tight inspection covers shall be provided on the top half of large casings to facilitate inspection of the gears without having to remove the top casing.

A side glass oil level indicator shall be provided on every gear reducer. In addition to these indicators, the vibration levels, ~~oil levels~~ and temperature of the gear reducers for the main hoist, boom hoist and trolley travel systems shall be continuously monitored by the computerized crane management system as specified elsewhere in this Specification. Vibration levels shall be monitored in both the horizontal and vertical directions at the input and output shafts of the above reducers, unless otherwise must be vibration free.

Drainage outlets with valves shall be provided for all reducers inside the machinery house. The drainage outlets shall be routed to a suitable and accessible location underneath the machinery house for convenient draining of the oil. Drainage outlets shall be protected from accidental damage. A platform shall be provided for supporting a waste oil collection drum beneath the centralized drainage outlet. The platform shall be positioned such that it is accessible to the maintenance hoist in the machinery house.

The noise level measured at 1 metre away from any reducer shall not exceed 75dBA at the maximum operating speed during factory test.

3.20 Bearings

Bearings, except for pin connections, shall be of anti-friction type with lubricant retaining seals, and shall have a life compatible with the service life of the mechanism. Pre-lubricated plain bearings shall not be used for major components (e.g. motors, wheels, sheaves, reducers

etc.). Manufacturer shall ensure that designs incorporate standard, readily available bearing sizes wherever possible.

3.21 Castings

Cast iron and cast steel shall be of good quality, close grained type, appropriate to the relevant duty and standard.

All surfaces of castings, which are not machined, shall be smooth and shall be carefully fettled to remove all foundry irregularities.

Castings shall be free from non-metallic inclusions and other defects. Castings with defects or repaired castings other than cosmetic dressing will not be accepted.

3.22 Bolts and Nuts

Bolts (including hexagonal cap screws) and nuts used shall be of ISO metric screw threads and dimensions. Bolts and nuts, which are subjected to vibration or frequent changes in state of loading, shall be secured by effective methods. Tack welding on bolts and nuts is not allowed.

Bolts shall have at least two threads protruding from the nuts after the nuts are securely fastened.

Manufacturer shall pay particular attention to the corrosion resistance of all exposed fasteners, and shall ensure the same level of protection as the main structure components is achieved. All fasteners larger than M12 shall be hot dipped galvanized in accordance with BS 7531: Part 6: 1998.

All fasteners M12 and under shall be stainless steel. Bolts for securing covers, which require frequent removal, shall be of stainless steel. Bolts and nuts for installation of all lights, telephones, electrical socket outlets, limit switches and junction boxes shall also be of stainless steel. High tensile steel galvanized bolts and nuts shall be used for installation of stairs, ladders, platforms and covers for rope sheaves.

3.23 Grease Lubrication Systems

Sets of Localized lubrication systems shall be provided, with one set each installed on the trolley platform to lubricate the bearings, on the trolley platform to lubricate the wire ropes, top of the mast, end of the girder, at each of the four gantry corners, inside the machinery house and on the bogies. The Manufacturer shall specify other sets (if any).

Each localized lubrication system shall be automatic and provided with a reservoir of sufficient capacity for at least for 2 months operation, weather proof electrical motor driven pump(s) (except for bogie), strainers, safety valves, divider valves, metering valves, flow direction valves, etc. and connected to all (except on rotating parts, electric motors, reducers and brakes) lubricating points.

Grease level in the reservoir(s) shall be monitored continuously by the computerized Crane Management System. Design of the Localized lubrication system shall accommodate quick replenishment of grease into the reservoir.

The electrical motor driven pump(s) shall have the capacity for delivering at least 35 cubic centimetres of grease per minute and shall be activated automatically at intervals of pre-set numbers of containers handled by the crane or at the pre-set time intervals, whichever occur first. There shall be means to override the computerized lubricating system.

All lubrication points on the gantry wheels and rocker beams shall be grouped and linked by piping, divider valves and metering valves to four centralized lubrication points located at the four corners of the crane. Each centralized lubrication System for the gantry wheels shall be provided with a manual operated pump. Provision shall be made on the gantry wheels lubrication system to install an automatically operated pump.

Grease distribution lines schematic diagrams shall be prominently displayed for each centralized lubrication systems. The diagrams shall be engraved and mounted near each lubrication system.

All grease fittings shall be brass type standard button head grease nipples.
Each lubrication point shall be painted red or easy identification.

All other lubrication points that are in difficult to reach positions, shall be routed by tubing and grouped together at convenient, accessible locations for easy application of grease.

Details of the above proposed systems shall be submitted during the design stage. The final design and installation of the systems shall be subjected to approval.

3.24 Crane Wash Down System

The crane shall be equipped with a suitable clean water wash down system incorporating storage tank, pumps, fixed pipes, valves and hoses. The storage capacity of the tank and pressure / flow provided at the discharge points shall be sized to ensure thorough cleaning of the crane structural surfaces can be achieved during routine maintenance shutdowns.

3.25 Couplings

Flexible couplings or geared couplings shall be used between motors and gearboxes to dampen shock loads and compensate offset and angular misalignment. Driving member shall be keyed to the motor drive shaft and driven member shall be bolted directly to the main hoist brake. The couplings shall be fail safe type with internal gear and have removable hub cover at the motor side to allow access to the coupling seals without displacement of any of the other drive equipment. The couplings shall be maintenance free type. Output/input shafts and couplings shall be designed for high number of starts and in compliance with the cranes group of classifications and theoretical expected life time. All of the shafts and couplings shall be designed according to the direct online generated starting torque and not the limited start and nominal torque by the frequency inverter.

PART 4 - ELECTRICAL

4.1 Power Supply

Site power supply will be 20kV, 3 phase, 50Hz with the star point directly earthed (to be confirmed).

The power supply cable will be 3 wire + separate earth, underground from a HV sub-station to the cable turn over pit. There will also be a fibre optic link installed between the central control room and each pit (supplied and installed by others).

The flexible power cable from the crane to the cable turn over pit shall be installed and connected at the pit by the Manufacturer. The flexible cable shall be a composite cable incorporating power conductors and a minimum of 6 strands of multi-modefibre optic cable to be allocated; 2 for data transmission between the crane and plant, 2 for telecommunications and 2 for spares.

The Manufacturer shall supply and install all hardware in the pit including anchor drums, cable funnel and IP67 connection boxes. Details of the arrangement shall be developed and approved during manufacture of the crane.

The composite cable shall be separated into power and optical fibre cables for termination in separate junction boxes, at the turn over pit and the cable reel on the crane.

The incoming power supply to the crane shall be terminated on the crane at an indoor Vacuum Circuit Breaker (VCB). Circuit breakers shall be withdraw able type with a front access cable and vacuum test facility. The circuit breaker shall conform to IEC 62271-100, 60255 and 60256 as applicable.

The Manufacturer shall ensure that the fault level of the switchgear is suitable for the prospective fault level of the distribution network but shall not be less than 25kA rated breaking capacity. The Basic Impulse Level (BIL) shall be not less than 125kV.

The VCB shall be equipped with solid state protection relays to provide discrimination with the supply network. The relays shall include under-voltage, over-current and earth fault protection. Details of the supply network will be given to the Manufacturer when available.

The design of the crane electrical systems and selection of frequency converter types shall be such that the generation of harmonics in the electrical supply is minimized across the full range of crane operation. Active Front End (AFE) drives are preferred. The harmonic currents generated by the crane when referred to the 20kV level at the point of common coupling (defined as the point of connection of the crane trailing cable to the port 20kV network) shall not exceed the limits stated in the following Table (values are to be confirmed by local electricity supply company): -

Odd Harmonics			
Order	Relative Voltage %	Order	Relative Voltage
3	5	15	0.5
5	6	17	2
7	5	19	1.5
9	1.5	21	0.5
11	3.5	23	1.5
13	3	25	1.5
Total Harmonic Distortion Shall be no more than 8%			

Harmonic suppressers and filters shall be provided on the crane as required. Harmonic suppression, filtering and power factor correction circuits on the crane shall normally be automatically disconnected from the power supply when the incoming mains circuit breaker is open but with the option to switch off manually when the incoming mains circuit breaker is closed.

Power factor control or correction shall be provided to ensure that the power factor at the point of common coupling is between 0.9 lagging and unity under all operating conditions.

Input choke for frequency inverters (or filters in case of common DC bus drives) shall be considered. Output filter shall be used at the output of trolley drives because of high cable length from related frequency inverter to the trolley motors.

4.2 Low Voltage Switchboards and Motor Control Centres

Low voltage switchboards and motor control centres (MCC's) shall comply with BS EN 60439 Form 4 Type 1 as a minimum. They shall be manufactured from sheet steel, and shall be of uniform height and rigid construction to BS EN 60947/BS EN 60439 providing an enclosure to IP 54 as defined in BS EN 50102.

Internal components shall be fitted on mounting plates. These plates shall be fitted at the back of the individual sections on standoff pillars if required, to provide easy access for maintenance.

Busbars shall be of tinned, hard drawn, high conductivity copper. They shall be insulated throughout their lengths by means of phase coloursleeving to comply with BS 159. The busbar assemblies and joints shall be in accordance with the manufacturers/suppliers recommendations.

Each panel compartment shall be fitted with an anti-condensation heater with easily accessible on/off switch controlled via a thermostat. The switch shall be fitted inside the compartment. Heaters supply voltage shall be 220 V, AC.

Panels located in electric house shall be arranged with suitable air path for efficient heat exchange of heat sink. The devices shall be installed in a way that, their heat sink is located outside of the panel enclosure with special cool air flow path such that the IP rating of the panel is not reduced.

Internal wiring shall be PVC insulated conforming to BS 6231, 600 V grade or equivalent international standards such as confirming to IEC or CE.

The wires shall have stranded copper conductors. The minimum conductor size shall be 1.0 mm^2. The maximum conductor size for door mounted
equipment shall be 2.5 mm^2; wiring subject to flexing or movement shall be multi-stranded.

4.3 Electrical Installation Standard

Electrical installations shall comply with BS 7671 (Institution of Electrical Engineers, UK, Wiring Regulations). Installations shall be made with due regard to the safety of persons in the proximity of exposed terminals. Exposed terminals shall be shielded with perspex to a minimum of IP20 protection. IP rating of equipment enclosures shall be for indoor or outdoor installation as appropriate.

Electrical and electronic equipment shall be protected from multiple transients voltage damage caused by transients in power supply, lightning, etc. The protection system shall include high quality transient voltage surge suppression (TVSS) devices, capable of withstanding, without degradation, continuous application according to IEEE 587, ANSI C 62.41, 43 and 45.

All of cable trays should be in accessible locations on the crane legs and cranes steel structure.

4.4 Earthing and Bonding

Electrical equipment shall be earthed in accordance with BS 7671. Motors and electrical enclosures shall be externally earthed to the body of the crane. Motors shall also be connected to the earth bar within the converter or starter panel via the supply cable.

Hinged or bolted joints in the crane structure shall be provided with earth continuity connections using flexible copper conductors.

The structure of the crane shall be electrically earthed to the rail. The crane shoes used for earthing purposes shall be of corrosion resistant material.

The crane structure shall be protected from lightning strikes by suitable located lightning arrestors; these arrestors shall be directly connected to earth via the rails and shall not rely on the structure of the crane as a current path.

4.5 Wiring

Wiring and cabling shall be manufactured and sized in accordance with IEC standards (preferred) or BS 7671. The identification of cables shall be documented and shall be consistent and easy to interpret.

Cable glands shall be of good quality suitable for the site environmental condition. Cable glands shall provide necessary IP degree for each device, panel or junction box.

Cable sizing calculations, including earth loop impedance, shall be provided for power supply and distribution cables

Cables shall be installed in one length from terminal point to terminal point. Cables shall be terminated in connectors and not loose wired. Cable bends

shall be strictly in accordance with the manufacturer's recommendations. Conductors shall be of copper and multi-stranded. Cabling for 380/415V shall be 600/1000V grade XLPE/~~SWA~~/PVC cable. Single core cabling shall be PVC insulated of not less than 1.5mm^2, and shall be run in conduit outside of panels. Metal conduit shall be earthed.

Communications cables forming the data bus around the crane shall be installed such that it maintains at least 600mm clearance from power cables. Connections onto control or communications devices shall be made using connectors specifically designed for the task.

Cables and cable cores shall be identified at both ends by means of sleeve bands indelibly marked with the cable/core reference numbers. This information shall be shown on drawings bound into the O & M Manuals. The outer protective covering of multi- core cables shall extend into the switch or panel. Cable support/glands shall be provided at the cable entry point to all switches, panels and like equipment. A minimum of 20% or one pair, whichever is the greatest, of spare cores shall be provided in each control or signal cable, spare cores shall be marked and terminated at spare connectors or terminal blocks.

Terminals shall be suitably sized for the conductors being terminated; only one wire shall be terminated in each terminal. Terminals blocks shall be identified by labels and each terminal shall be numbered. Terminal and wire numbers shall correspond with those detailed in the drawings and it shall be possible to use the drawings to trace any circuit connection over its complete length.

Spare terminals, connectors and space shall be provided inside the junction boxes and panels.

4.6 Cabling to Trolley

Cabling running between the main body of the crane and the trolley shall be supported in a single chain type mechanism, located to prevent accidental collision during unloading / loading operations. The chain system shall be a proprietary item specifically designed for the purpose and shall be suitable for the full range of operating speeds.

The materials used shall be suitable for the climatic conditions at the site and the construction shall be suitable for continuous operation in an atmosphere laden with a high level of abrasive dust. To ensure that differential expansion is minimized the chain components shall all be constructed from the same type material. The chain shall be design to minimize the energy required to move the chain and reduce the friction between the chain and the trough and between the layers of chain itself.

The chain shall be sized to carry all cables with sufficient spare capacity to run an additional 10% of cables. Multi core cables shall have a minimum of 10% spare cores.

The chain shall run in a stainless steel (grade 316L) trough, the trough shall be designed such that it minimizes the retention of dust and solid particles and of sufficient depth to ensure stability of the chain at all times. The troughshall be hinged where it crosses the hinge point on the boom. Cabling shall be specifically designed for use in chain support systems with a bending radius to match operation of the chain. The outer sheath shall be UV and oil resistant. The material of the sheath shall be low friction and highly abrasive resistant. Cables shall have an earthed metallic sheath under the outer sheath to provide electrical safety and EMC protection. Cabling shall be retained within the chain using stainless steel clamps. The cables running within the chain shall be sized and spaced to allow continuous operation of the drives at full load in the maximum ambient temperatures. The design, spacing and grouping of cables shall be such as to minimize electrical interference between circuits.

4.7 Trailing Cable Reel System

The cable reel system shall be mono-spiral, bi-directional and constant cable tension, heavy-duty type specifically designed for container crane duty.

The cable reel shall be driven by a torque controlled variable speed frequency inverter and AC motor with compact brake.

The motor shall be equipped with rain cover, thermistor for thermal protection and internal compact thermostat–heater. The drive system shall be designed to minimize abrupt starting, braking and excessive slacking of the cable as the crane passes the cable turn over pit. The drive shall be interlocked with the gantry motion to prevent travel beyond the last dead turn and when the reel drive is not energized. Round form cable shall be used for the trailing cable.

The slip ring enclosure shall be manufactured to an IP66 enclosure standard and provided with anti-condensation heaters, automatically controlled by thermostats. Supply voltage of the heater shall be 220 V, AC. Provision shall be made within the slip ring enclosure for the termination/connection of the fibre optic cores running within the power cable.

The cable reeling system shall be suitable for working with the trailing cable laid in a “Panzerbelt” cable channel. “Panzerbelt” lifting device) shall be provided on the crane.

In addition to the crane anti collision system, cable reel limit switch shall be used as end stop limit switch.

The reel shall be made of stainless steel and shall be earthed. The reel shall be installed at a safe working height, in a location where the risk of damage is minimized and no part of the system shall protrude into the container handling operation paths or protrude beyond the gantry buffers. The reel shall be able to coil and uncoil automatically and be synchronized with the crane gantry travel. To minimize torsion build-up, a bi-directional multi-roller radiused cable guide shall be provided and mounted on the crane at quay level near the cable slot so that the cable can be retrieved from either direction parallel to the cable slot. Another multi-roller, radiused cable guide shall be mounted adjacent to the reel to lead the cable from the reel. The minimum internal width of the guide shall be at least 1.12 times the cable outer diameter. The radius of cable guides shall not be less than 20 times the outer diameter of the cable.

Cable over-tension and under-tension detection devices shall be provided.

Upon detection of over- tension or under-tension of the cable, gantry travel in either direction shall be prohibited. The cable is considered as over-tensioned when the tension in the cable exceeds 85% of the safe working cable tension recommended by the cable manufacturer.

The length of cable shall be sufficient for the crane travel 300m (to be confirmed) to either side of the cable turn over pit plus three dead turns on the reel.

The cable shall be connected to the incoming supply cable in the cable turn over pit inside a suitably rated junction box. Connection of the cable shall be the responsibility of the Manufacturer. The incoming supply cable to the pit will be supplied and installed by others.

The gantry travel drive system shall be interlocked with the cable reel system such that the gantry travel shall slow down before the crane reaches the turnover pit and the crane shall resume normal gantry travel speed after crossing the pit.

4.8 Limit Switches

Limit switches shall be heavy duty type conforming to requirements of NEMA (National Electrical Manufacturer's Association) or other equivalent international standard. Proximity sensors and magnetic switches which have no moving parts and require no maintenance shall be used for all non-critical applications. Proximity sensors and magnetic switches shall conform to IP67 protection requirements.

Mechanical limit switches for sensing the end of travel/final stop for trolley and boom motions shall have a mechanical life of not less than 10 million cycles. Geared limit switches and over-speed control switches shall be connected via a flexible coupling. Chain drives are not allowed. Geared limit switch units for main and boom hoist shall have two spare limit switches. Electro-magnetic limit switches are preferred to mechanical types. Drives including hoist, trolley, gantry and boom hoist shall have stop and emergency stop limits.

Cables for limit switches shall be connected at terminal blocks in junction boxes to IP67 for ease of maintenance and troubleshooting. Limit switches and circuits used for emergency and safety purposes shall be of the fail-safe type.

4.9 Fuses

The use of fuses shall be minimized by using thermal magnetic circuit breakers wherever practical. Where fuses are used they shall comply with BS 88 and approved by the Buyer. Fuses shall be equipped withtrip indicators.

4.10 Motors

Motor construction shall meet the requirements of BS 4999 and IEC 72.
Drives shall use suitably rated AC motors.

All motors shall be 400 V, AC, 50 Hz type, i.e. in nominal speed and nominal load (for hoist nominal load under spreader), the voltage shall be 400V and the frequency shall be 50 Hz.

Motors shall be tropicalised, suitable for intensive use and continuous operation in the local environment with minimum maintenance requirements. Motors installed indoors shall be drip proof type, motors mounted outdoors shall be totally enclosed.

All of trolley, hoist and boom hoist motors shall be equipped with separated cooling system controlled by thermostat of motor stator frame and timer to continue cooling the motor at least 5 minutes after stopping.

Main drive motors shall be compatible with AC variable frequency drives, maintenance free, and shall be suitably rated for the duty (min. class S3, S5 preferred, duty type 80%). Main hoist, gantry and trolley travel motors shall be designed for high number of starts per hour and in compliance with the cranes group of classification and lifetime

Variable speed drives shall be force ventilated using ventilation fans driven independently at constant speed. The ventilation fans of the boom hoist motor shall be controlled by a thermostat mounted on the stator and shall continue to cool the motor after boom hoisting or lowering operation is completed. Motors shall use Class F winding insulation with temperature rises to class B limits. i.e. 80°C above a 40°C ambient

Terminal boxes shall be provided on the motors for connecting the power cables. Motors mounted indoors shall be IP54,(Hoist motors could be at least IP23 only where it is installed in environment controlled E-Room) whilst motors exposed to outdoor conditions shall be totally enclosed to IP65 protection complete with drain plugs and breathers, as per manufacturer's recommendation. For the main hoist, boom hoist and trolley travel motors, thermocouples or alternative approved temperature sensing devices shall be provided to measure the temperatures of the windings. The thermocouple readings shall be input to the

crane management system and shall warn the driver of high motor temperatures. In addition, motors shall be fitted with high temperature cutouts.

Anti-condensation heating elements with 220 V supply voltage shall be provided inside motors to prevent condensation when the motor is not in operation. Notices shall be fitted to motor anti-condensation terminal boxes warning of the heater supply and the need to isolate the supply.Each of hoist motors, the boom hoist motor, one of trolley motors and one of gantry motors shall be fitted with an encoder for speed feedback and to prevent motor over speed and provide control information to the drive systems. In addition to incremental encoders, absolute encoders shall be provided for main hoist, boom hoist and trolley traversing mechanisms for monitoring.

Adequate space shall be provided above motor inspection plates to allow internal inspection.

4.11 Variable Speed Drives and Control Systems

The crane shall be semi automatically controlled with the ability for the operator to switch between manual and semi-automatic control and vice versa at any time. Once selected, the semi-automatic facility shall control the movements of the container (via main hoist and trolley drives) along preset optimized transfer paths to the vicinity of the target position. Initiation and completion of each operational cycle shall always be a manual function.

The variable speed drives and control shall be integrated systems whereby the drives, the motors, the programmable logical circuit (PLC) and relevant control software are fully compatible and have a proven track record of reliable operation.

Variable speed drives shall be high efficiency digital type drive systems for AC motors. Each drive shall be rated for continuous operation at 110% of its motor nameplate rating.

The variable speed drives shall be able to operate with two modes of control, i.e. Closed Loop Flux Vector Control (FVC) with speed feed back encoder and Sensorless Open Loop Vector Control (SVC) in case of speed feedback loss (caused by failure of encoder, encoder interface card or wiring). Change over of inverter program from FVC mode of control to SVC shall be easily possible by a switch in the E-room (accessible only by authorized maintenance staff). SVC control mode is the high torque control mode. Load free falling is not accepted in this mode of control.

In addition to setting of drive parameters to achieve the optimum control against load free falling during lowering or re-lifting the suspended load, emergency drum brake and over speed switches shall be engaged in case of load free falling.

When multiple drives are used, there shall be complete synchronization of the timings for the signals such that no discrepancies in timings shall occur between incoming, outgoing or feedback signals from two or more drives.

It shall be possible to make adjustment to the control settings and reconfiguration of the drives from the PLC/PC. The parameter settings shall be retained during a power failure.

In addition adjustments of settings for the drives shall be possible through the graphical interface on the flat screen display (Man Machine Interface – MMI). The facility to allow electrical and control line diagrams for appropriate systems to be displayed on screen shall be provided on each MMI.

Diagnostic system shall include indications for failure of dynamic braking circuitry, I/O cards, speed feedback, encoder and also over speed condition, drive internal faults and all other faults.

All drives shall be equipped with capabilities to protect the control circuitry. Thermal and magnetic back-up protection for the drive system shall be provided by circuit breakers external to the drives. No fuses shall be used for back-up protection.

Drives shall be incorporated with full protection against fault conditions inclusive of field loss, feedback loss, phase loss, over current (electronic fuseless sub-cycle trip), sustained overload, over temperature, over voltage, processor scan failure (watchdog timer), internal power supplies out-of-range, power circuit discontinuous and overload capacity of 150% rated current for 30 seconds.

Circuit boards shall be rack mounted type for ease of maintenance. Circuit boards shall function when the environment in the enclosed panels reaches a temperature of 50 degree Celsius with a humidity of 100%. The circuit boards shall be able to function under these conditions in the event of failure of the air conditioner.

The power supply to each drive shall run directly from a switchboard or distribution board and shall incorporate harmonic filters if appropriate. Power wiring shall be separated from control wiring, and on long cable runs, separated by earthed shields within the trunking. Control or signal-carrying wires shall always be individually screened cables. The screens of the cables shall be terminated at one end only, and this point shall be common termination point for all screens. This point shall become the central earth point (CEP) for the system, and is the connection to which the incoming earth must be bonded. Feed back or input signal to the drive shall be properly filtered against electrically induced noise.

All electronic components, devices, circuit boards and control systems shall be properly shielded against the influence of radio frequency interference (RFI) and electromagnetic interference (EMI). The suppression levels are to be in complete compliance with that stated in the directive EEC 82/449.

Filters or a filtering system shall be incorporated into the input and output of all the drives to suppress the amount of RFI to within the specified levels.

Each panel compartment shall be fitted with an anti-condensation heater with easily accessible on/off switch controlled via a thermostat. The switch shall be fitted inside the compartment.

Hoist load-speed characteristics shall be in a way that, the speed varies with the rated load up to the rated speed with constant torque but for speeds more than nominal speed (with empty spreader) the drive works at constant power. The speeds of main hoist, gantry travel and trolley travel drives, shall be stepless and continuously variable from low to full speed. The boom hoist drive shall have two pre-set speeds.

In the event of a loss of speed feed back signal the associated drive shall be automatically inhibited. A manually operated by-pass switch (located in the electrical room) shall be provided to allow this interlock to be bypassed and to enable the drive to operate under manual open loop control.

Gantry drives shall be arranged such that they are capable of operating with one motor per side out of service. In this condition the performance of the gantry drives will be limited to keep within the capacity of the remaining operational drives.

Accelerations and deceleration for drives shall be linear and shall have provisions for limitations of acceleration or deceleration to pre-set values even if an excessive fast controller action is being applied. Deceleration shall be accomplished electrically and regeneratively with the brakes applied only when the motion has slowed down to essentially stopped condition.

Master controllers in the operator's cabin shall be used for the Main Hoist, Trolley and Gantry operation. The controllers shall be notched throughout their range of use for easy recognition of speed. The controllers shall be digital type. They shall be spring returned, positively indented at zero notch and released by push- down interlock catch (deadman's handle) incorporated into the master controller. Off position interlocks shall be provided for the master controllers so that they have to be returned to the off position for re-starting of crane drives after unintentional stopping.

Variable speed drives shall be forced ventilated using ventilation fans driven independently at constant speed. They shall also be able to work at 50ºC.

4.12 Transformers

Transformers shall be of the air-cooled vacuum cast resin with reduced losses type and shall be installed in the machinery house. Power transformers shall comply with the requirements of BS 171, and IEC 60076. The insulation grade shall be class F with temperature rises limited to class B
i.e. 80^0C above a 40^0C ambient. Transformers shall comply with the Harmonization Document HD 464 S1:1988 in the following classes:-

- Climatic - Class C1
- Environmental – Class E2
- Fire Behaviour – Class F1

Power step down transformers shall be fitted with manual off load tap changers providing taps of ± 2.5% and ± 5%. Transformers shall be continuously rated at 125 percent of maximum load.
Power for auxiliary supplies shall be derived from dedicated transformers, totally separate electrically and physically from the drive transformers. Access to the drive transformers shall not require isolation of the auxiliary transformers.

Anti-condensation heaters, automatically controlled by thermostats, shall be provided for each power transformer.

Protective enclosures to IP31 standard, with locked access shall be provided around the transformers. Large warning notices shall be placed at prominent locations. -
Isolation transformers shall be provided for the control circuits.

4.13 Sequence Control

Sequencing and inter-locking functions for drives, except emergency protection functions, shall be performed by Programmable Logic Controller (PLC). PLC shall be protected from multiple transient voltage surges. Power failure protection shall be provided to ensure fail-safe operation.

PLC shall be provided with interactive programming and monitoring facilities for maintenance and future development.

There shall be provision for logging of fault data.

The storage device shall be sized to provide 30% spare capacity above the requirements of the delivered system.

PLC shall have self diagnostic capability during power on and continuously in operation. Faults detected shall be clearly identified by audible alarm and visual displays.

PLC shall be capable of detecting the following categories of faults:

- out-of-sequence faults
- under time faults
- over time faults

A full colour printer located within a suitable enclosure shall be provided within the electrical house. The printer shall be connected and configured to allow the print out of event and fault logs from the crane management system on demand by the maintenance staff. A cabinet shall also be provided for the storage of printer paper and ink cartridges. The system shall be supplied with three spare ink cartridges.

4.14 Interlock and Safety Devices

Interlock and safety devices to ensure the safe operation of the crane shall be provided. Safety functions shall be hardwired and able to function without a PLC.
An anti-collision device shall be provided to prevent the crane contacting a ship super structure. The system shall be fail safe and shall operate efficiently at the full range of boom deflections.

Sensors, mounted within IP65 enclosure, shall be provided at the four corners of each crane to detect obstructions to the gantry travel motion. Sensors shall operate using a RF system to detect obstructions, including other cranes. The system shall provide visual indication to the crane driver of distance to an obstruction as soon as it enters the detection range. At a pre-determined distance the cranes travel speed in the direction of the obstruction shall be automatically reduced and at a second pre-determined distance travel in the direction of the obstruction shall be inhibited. The detection range and predetermined distances shall be adjustable between 0 and 25m. Operation of the system shall not require reflectors to be fitted to the obstructions being detected. A switch shall be provided to allow the anti-collision system to be bypassed. A warning shall be initiated when gantry travel is initiated with the anti-collision system bypassed.

Working frequency range and propagation power shall be approved by the Buyer for radio devices.

Devices shall be provided with the system to adjust the transmission or communication frequency by means of PC software or DIP switches.

An interlock shall be provided to prohibit gantry travel when the boom is neither in the raised nor lowered position.

A key switch to by-pass the interlock on the spreader to allow hoisting operation shall be provided at the operator's console. The by-pass will be controlled by the operator or technicians after checking to ensure that the twistlocks are fully locked or unlocked.

Braking systems shall be provided with a brake lining wear monitoring system. The system shall raise an alarm when the wear on any set of brakes linings exceeds a preset amount. The monitoring system shall identify which brake system has initiated the alarm.

A series of infra-red sensors shall be provided in the operator's cabin to ensure that the crane is operational only when a person is seated in the operator's seat. A bypass switch shall be provided in the operator's cabin to allow the operation of the crane gantry drive from the quay level travel inching control station.

4.15 Instrumentation

The following instruments shall be provided: -

- Non resettable type electro-mechanical hours run meters with at least 7digits display to log the operating hours of the main hoist motor, trolley travel motor, boom hoist motor, gantry travel motor and crane operating hours
-
- Four nos. of 7 digits non re-settable type Electro-Mechanical counters to register the number of containers handled by spreader mechanism for following type of containers shall be provided.
  i. Total TEUs.
  ii. 20' containers.
  iii. 40'/45' containers.
  iv. Twin 20' moves.
- Volt and ampere meters to monitor incoming power supply and the input and output of the electrical supply for hoist, trolley, boom and gantry systems.

4.16 Telecommunication

The Manufacturer shall provide the on board equipment for the data transmission to the central control room, communications between various locations on the crane and a public address system. Details of the systems shall be developed and approved during manufacture of the crane.

Data for transmission between the crane and the central control room shall include details of the status of each drive and system, electrical loadings and power consumption for each drive and system, pre-alarm, alarm and fault data, crane operation and container handling data. Telephone and data communication systems shall be digital and energized via a UPS system. The UPS system shall be sized to provide a minimum of 8 hours back up in the event of a mains failure.

Telephone/intercom type communications shall be provided at the following locations: -

- Operator's cabin (hands free type)
- Operator's cabin (Fixed station)
- Boom operator's cabin (hands free type)
- Checker's cabin (Fixed station)
- Gantry legs at ground level (Fixed stations for land side and seaward)
- Machinery house (Fixed station and plug-ins)
- Electric room (Fixed station and plug-ins)
- Boom end (plug-in)
- Boom hinge (plug-in)
- Cable reel drum platform (plug-in)
- Girder end (plug-in)
- Top of trolley platform (plug-in)
- Top of mast (plug-in)
- Passenger lift (fixed station and plug-in)
- Energy chain junction box (if exist) (plug-in)
- Energy chain service platform near to TLS system (if exist) (plug-in)

Telephones installed outdoors and in the machinery house shall be built to an IP56 enclosure standard.
A public address system consisting of an amplifier with a hands free microphone shall be installed in the operator's cabin. Two loudspeakers of IP56 construction shall be provided on the trolley frame for annunciation to the workers on the quay and ship, one on the portal frame and weather- proof loudspeakers at every telephone location. The crane telephone system shall be linked to the public address system such that paging can be made through any of the telephones.

4.17 Electrical Supply Outlets

Single phase, 16amp socket outlets with switches conforming to BS 4343 and CEE17 as appropriate, supplied from double pole miniature circuit breakers shall be installed at the following locations:

Machinery house	6 units	(one unit shall be near the work bench)
Electric Control room	6 units	
Top of mast	1 unit	
Boom end	1 unit	
Cable reel drum platform	1 unit	
Girder end	1 unit	
Along the boom and girder	3 units	
Sea side leg	1 unit	
Land side leg	1 unit	
Checker's cabin	2 units	
Operator's cabin	4 unit	
Boom operator's cabin	2 units	
Computer room	5 units	

Three phase, 63A, 4 wire socket outlets with switches for welding purposes shall be installed at the following areas:-

On trolley platform	1 unit
Machinery house	1 unit
Near boom girder joint	1 unit
Sea side leg	1 unit
Land side leg	1 unit
Boom end	1 unit
Girder end	1 unit
Cable reel drum platform	1 unit

Power socket outlets shall be industrial grade and IP67 type.

At least 3 spare single-phase outlets shall be provided in the E-room auxiliary service panel.

4.18 Safety Warning Devices/Emergency Stop Push Buttons

One pair of aircraft warning lights shall be installed on top of the mast. Another pair shall be installed at the tip of the boom. The warning lights shall be 60W mercury vapour type bulbs. The aviation lights shall be backed up by separate sets of battery operated lights. The lights shall be automatically turned on in the event of a power failure. The batteries shall be continuously charged when they are not in use.

Red strobe type warning lights and an audible warning unit shall be fitted at all four corners of the crane gantry bogies. The lights and audible unit shall be automatically activated when gantry motion is selected.

A siren shall be installed on the trolley. It shall be activated by a knee switch located on the operator's console. The motor siren shall face the sea. The sound level produced by the motor siren shall be sufficient to serve as a warning to the people on the quay.

Red and green warning lights shall be mounted on the crane portals to indicate trolley movements. Red lights shall illuminate when the trolley moves away from the ship towards the working area and green lights shall illuminate when the trolley moves away from the working area towards the ship.

Emergency stop push buttons shall be installed at the following locations on the crane: -

- 1 unit inside the operator's cabin
- 1 unit inside the boom operator's cabin
- 2 units inside the machinery house
- 4 units, one at each corner of the crane to be easily accessible to ground operation personnel
- 1 unit at the boom end
- 1 unit at each of the girder end
- 2 units in the electrical room
- 1 unit near the cable reel drum.

Emergency stop buttons shall be recessed to prevent accidental or unintentional use.

Messages showing that the emergency switches are activated shall be displayed in the operator's cabin as well as in the electrical control room. Resetting of control circuits after an emergency button is activated shall be possible only in the electric room.

4.19 Lighting

The power supply for all lighting inclusive of control cubicle lighting shall be 220V, single phase, derived from a dedicated step down transformer. The power supply shall be separated from the drive power supply. The lighting system shall provide illumination to all work areas of the crane, including penetration into the ship's cell, on-board ship lashing operation, platforms, walkways, personnel lift, control cubicles, machinery house, checker's cabin, boom operator's cabin and operator's cabin.

Floodlights shall be vibration proof and have individual power factor correction. The floodlight design shall enable changing of the bulb without removing the reflector or glass. Metal halide lamps for the floodlights shall be of the 'screw on', outdoor type fitted with spring loaded anti-vibration bulb sockets. Ballast for the floodlights shall be installed inside the machinery house and labelled according to the identification of the floodlights.

Sufficient numbers of floodlights shall be provided at the outer periphery of the mid-section of the crane's boom to provide illumination for on-board ship lashing operation. The boom floodlights shall be controlled by separate switches located in the electrical room and checker's cabin.

Floodlights shall be provided on the portal to illuminate the chassis lanes between the crane legs. Floodlights shall be provided at the portal and boom to illuminate the backreach and gantry paths.

Safe access for changing floodlight bulbs shall be provided. Access shall not interfere with the crane motions or container handling operations.

Floodlight controls shall be designed such that failure of one of the control devices shall not disable the entire floodlight network but only disable alternate floodlights. Boom lighting shall automatically be switched off when the boom is in the raised position. A by-pass switch for this circuit shall be available in the electrical room.

Additional lighting with switches shall be provided at strategic locations such as boom end, girder end, top of mast, under the machinery house, top of trolley platform, etc. to enable maintenance of sheaves, motors, hydraulic cylinders and other mechanisms to be carried out at night. Illumination shall be at least 300 lux at the working level.

Floodlights shall be arranged so that illumination at ground level, measured 9 metres from the centreline on either side of the crane shall be as follows:

- Under the boom and girder : at least 80 lux
- Under the trolley : at least 200 lux
- Between the crane legs : at least 200 lux

Illumination measured at floor level in the machinery house and electric room shall be at least 300 lux.

Lighting in the control cubicles shall be fluorescent tubes, switched on and off by the opening and closing of the cubicle doors respectively.

Floodlight fixtures shall be prominently numbered to facilitate easy identification when individual floodlights fail. Switches for floodlights and walkway lights shall be located at the checker's cabin, operator's cabin and machinery house to allow switching from any of these three locations.

Emergency exit lights powered by batteries shall be provided for platforms, walkways, cabins, machinery house, electrical room and escape routes. The Illumination level for emergency lights shall be a minimum of 5 lux. The lights shall be automatically turned on when electric power to the crane is cut off. Battery chargers to keep the batteries in continuously charged condition shall be provided. Duration of the emergency lighting shall be a minimum period of

60 minutes. Rechargeable battery type portable lamps shall be provided in the cabins, machinery house and electrical room.

4.20 Covers, Junction boxes and Enclosures

Covers, pull-boxes, junction boxes and enclosures for motors, hydraulic compartments, etc. shall be made of stainless steel plate with a minimum thickness of 2 mm.

Covers to junction boxes, inspection covers, machinery hoods etc. shall be hinged and secured with corrosion resistant, durable handles with built-in common master key locks or stainless steel wing bolts. Large junction boxes shall have double hinged covers with built-in common master key lock handles. Junction boxes shall be protected from corrosion and mechanical damage and exposed junction boxes shall be constructed to provide a minimum enclosure standard of IP66 when installed and cables connected. Each junction box shall carry a unique identifier. Indoor junction boxes shall be provided with minimum rating of IP54.

4.21 Container Positioning System

Equipment shall be provided to assist the tractor/trailer drivers to position containers on the crane centre line. Accuracy shall be +/- 0.3m. It shall not be necessary to move the crane to locate the spreader on top of a container.

4.22 Emergency Power Supply

Facilities shall be provided such that in the event of the 20kV supply to the crane not being available, a temporary three phase and neutral supply derived from the ports LV system or a standby generator can be connected to the crane. All required arrangements shall be considered to make crane capable for connected to LV System or standby generator.The temporary supply shall be arranged to allow lighting, personnel lift, anti-condensation heaters and communications and PLC systems tooperate. The connection shall be made via a suitably rated plug and socket arrangement and a changeover switch. It shall not be possible to parallel the normal mains derived LV supply with the emergency LV supply.

4.23 Crane Management System (CMS)

A computerized crane diagnostics monitoring and management system complete with switches, sensors and transducers to provide continuous monitoring, diagnostics, and data collection on the crane and spreader operating systems shall be installed on the crane.

This function shall be provided by a bus mounted dedicated PC. This unit shall be linked to the PLC communications module. The status of crane components is constantly monitored by the PLC and any abnormality detected is passed through the bus link to the CMS computer.

Fault information shall then be displayed on the CMS display unit and fault information archived on the PC hard drive for future retrieval and printing in a variety of formats.

The fault monitoring system software shall identify the order of the faults so that in the event of a series of faults occurring, the PC display identifies the sequence in which they occurred and prioritizes the faults. The monitoring system shall be totally independent of the crane control system PLC and loss of the CMS system shall effect the operation of the crane.

The CMS system shall be accessible from remote locations via an internet connection.

Crane Management System (CMS) shall include service module, fault module and information module. In each module related items shall be included. Land side project management shall be included for the cranes.

The CMS of the crane shall have at least the following abilities/facilities:

- Crane management and visualization system with modular structure.
- Connectable to a major PLC types trough OPC interface.
- Service preplanning and reminder.

- Fault monitoring and analyzing.
- Operation and process information visualization.
- Data logging and static evaluations.
- Online and offline working modes.
- Scheduled preventive maintenance with reminder for easy preplanning.
- Drawing viewer with lens and zoom function.
- Fault history.
- Manual and drawing retrieval.
- Linked drawings for quick line tracing.
- Maintenance reports.

4.24 PLC System

Following points shall be provided in the PLC system:

- All PLC I/O cards shall have 10% unused I/O and be expandable.
- 10% of slots in each PLC rack shall be reserved for future.
- All PLC inputs & outputs shall be equipped with LED.
- The PLC program shall perform self-test while starting the system.
- The PLC program shall have a self-diagnostic mode to locate probable faults.
- The PLC system shall have watch dog timer to prevent hanging the processor.
- All critical interlocks & emergency stops shall be hard wired through relays /contractors & switches not through PLC.
- All hard wired interlock results shall be reported to PLC for monitoring the system situation.
- All faults & events of system shall be monitored on operator's monitor and shall be logged or printed in a fault/event history.
- An extra CPU card shall be installed to monitor safety issues.
- Fail safe operation of PLC shall be ensured.
- An UPS shall be provided for PLC to power the system for at least 5 minutes after power failure.
- A safe shut down shall be provided.
- Saving of flags & memory (RAM)/vectors in case of power cut in PLC shall be considered.
- Waiting time & monitoring time in the PLC program shall be considered in all control sequences where it doesn't delay the crane movements.
- All analog signals preferably shall be feed into the PLC in the range of 4-20 mA to be noise immune & ease detection of wire cut. Analog and digital inputs and outputs shall be suitable for cable lengths, and crane application.
- All analog signals shall be hooked up by twisted wires.
- All signal cables shall have at least 10% extra wires as spare.
- All wires in control panels and PLC terminals shall have label at both ends and it shall be unique.
- All PLC cubicles & panels shall have marking plate & label.
- The PLC cubicles shall be suitable for industrial environment to prevent high temperature, dust vibration, humidity and electrical noise. Ingress protection shall be min IP54 for indoor equipment and min IP66 for outdoor equipment.
- Communication between PLC units, touch screen panels, remote I/Os and frequency drives (distributed peripherals in general) shall be accomplished by a bus topology.
- Interface cards for connection of PLC and CMS to radio frequency data transmission system shall be included.
- Interface cards between PLC and crane management system and Service Information System (SIS) should be included.

Following diagrams and documents shall be submitted with other stated documents

- The P & ID (Process & Instrumentation Diagram)
- Single line diagrams & functional diagrams of electrical circuits - Electronic block diagrams, schematic and component layer, which shows the location of each component
- Electronic part list of designed circuits
- All PLC ladder diagrams and statement language

All diagrams (P&ID) shall have legend and all electrical diagrams shall have wire labels and terminal number.

Appendix A

List of Manufacturers (LOM)

List of Manufacturer

Mechanical Parts

DESCRIPTION	MANUFACTURER	COUNTRY
GANTRY, MAIN HOIST,	SEW	GERMANY
	NORD	GERMANY
BOOM HOIST & TROLLEY	FLENDER	GERMANY
GEAR BOXES	P.I.V.	
	SUMITOMO	GERMANY
GANTRY, MAIN HOIST,	BUBENZER	GERMANY
`BOOM HOIST & TROLLEY	SIBRE-SIEGERLAND	GERMANY
	HILLMAR	
BRAKES	ICAN	
BEARINGS	FAG	GERMANY
	SKF	SWEDEN
	TNT	JAPAN
BUFFERS	OLEO	GERMANY/ENGLAND
	WAMPFLER	GERMANY
	LEBEN	GERMANY
	AROS	GERMANY
COUPLINGS	SIBRE-SIEGERLAND	GERMANY
	FLENDER	
	HILLMAR	GERMANY
	NORD	GERMANY
	P.I.V.	GERMANY
SPREADER	BROMMA	SWEDEN/ MALASYSIA
	STINIS	NETHERLAND
	RAM	UK
SPREADER CABLE	LABBKABEL (OLFLEX)	GERMANY
	SIEMENS	GERMANY
	AEG	GERMANY
	PRYSMIAN	
	ELECTROTECK KABLE	

ALL HYDRAULIC PACKAGE AND EQUIPMENT	PARKER REXROTH VICKERS	ENGLAND GERMANY ENGLAND
ALL WIRE ROPES	CASAR CERTEX BRIDON KISWIRE	GERMANY FINLAND
CABLE REEL UNIT	CAVOTEC DELACHAUX STEMMANN	GERMANY FRANCE GERMANY
CABINS	SCANCAB BRIEDA MATEC MERFORD	DENMARK ITALY GERMANY Netherland
AIR CONDITIONER	MITSUBISHI/TOSHIBA LINDE LG O-GENERAL	JAPAN GERMANY KOREA JAPAN
COMPRESSORS	ATLAS COPCO KAESER	GERMANY GERMANY
MAINTENANCE CRANE	SWF STAHL DEMAG	GERMANY GERMANY GERMANY
PERSONNEL LIFT	ALIMAK CHARNOCK	SWEDEN U.K
PAINT	HEMPEL AROSTAL AMERON	DENMARK/GERMANY GERMANY GERMANY/NETHERLANDS

The other brands maybe indicated by the tenderers. However, the acceptance of the same will be confirmed by the tender holder prior to the end of technical evaluation.

List of Manufacturer
Control / Electrical Parts

DESCRIPTION	MANUFACTURER	COUNTRY
GANTRY, MAIN HOIST, BOOM HOIST & TROLLEY MOTORS	NORD LEROY SOMER ABB SIEMENS Wolfer LDW	GERMANY FRANCE GERMANY / SWEDEN GERMANY GERMANY GERMANY
MAIN FEEDING CABLE	AEG SIEMENS /PIRELLI F&G Prysmian	GERMANY GERMANY GERMANY GERMANY
JOYSTICKS & PUSH BUTTONS	SIEMENS ABB SPHON & BURKHARDT GESSMANN	GERMANY GERMANY/ SWEDEN GERMANY GERMANY
CABIN LCD DISPLAY UNITS	SIEMENS ABB SYSTEMTECHNIK	GERMANY GERMANY/SWEDEN GERMANY
LOAD SENSORS	PAT KRUGER BROSA	GERMANY GERMANY GERMANY
ANTI-COLLISION SYSTEM	SIEMENS ABB IFM ELECTRONICS SICK	GERMANY GERMANY/SWEDEN GERMANY GERMANY
SPEED CONTROL SYSTEM (FREQUENCY INVERTER)	ABB SIEMENS	GERMANY/SWEDEN GERMANY
MAIN CIRCUIT BREAKER	SIEMENS ABB TELEMECANIQUE	GERMANY GERMANY/SWEDEN FRANCE
TRANSFORMERS	SIEMENS ABB FRANCE TRANSFO	GERMANY GERMANY/SWEDEN FRANCE
MAIN CONTACTORS, DISCONNECTORS, SWITCHS, PUSH BUTTONS, LINEAR SHAFT ENCODERS	SIEMENS ABB	GERMANY GERMANY/SWEDEN
LIMIT AND PROXIMITY SWITCHES	SIEMENS IFM TELEMECANIQUE SCHMERSAL	GERMANY GERMANY FRANCE GERMANY
ELECTRICAL PACKAGE	SIEMENS	GERMANY

	ABB TELEMECANIQUE	GERMANY / SWEDEN FRANCE
TV AND CAMERAS FOR TRAVELING AND SPREADER	PHILIPS PANASONIC SONY	NETHERLANDS JAPAN JAPAN
PLC	SIEMENS (SIMATIC S7)	GERMANY

The other brands maybe indicated by the tenderers. However, the acceptance of the same will be confirmed by the tender holder prior to the end of technical evaluation.