



Balmer Lawrie & Co. Ltd. (बामर लॉरी एंड कंपनी लिमिटेड)
(A Government of India Enterprise) (भारत सरकार का एक उद्यम)
Engineering & Projects (इंजीनियरिंग और परियोजनाएं)
21, Netaji Subhas Road (21, नेताजी सुभाष रोड)
Kolkata - 700 001 (कोलकाता – 700 001)

**Design, Supply, Erection, Testing and Commissioning
of Refrigeration System for Temperature Controlled
Warehouse** (तापमान नियंत्रित गोदाम के लिए प्रशीतन प्रणाली
की डिजाइन, आपूर्ति, निर्माण, परीक्षण और कमीशन)

at (पर)

Industrial Estate, Chhatabar, Dist-Khurda, Odisha
(इंडस्ट्रियल एस्टेट, छतबार, डिस्ट्रिक्ट – खुर्दा, ओडिशा)

Tender No. EP / TCW / BHU / REF / 08

Tender Date: 06.01. 2020 (निविदा तारीख: 06.01.2020)

Due Date: 27.01.2020, 16:00 Hrs (नियत तारीख: 27.01.2020 को 16:00 बजे)

UN-PRICED PART (PART-I)

TENDERER'S CHECKLIST POINTS

Tenderer shall require filling in the table below appropriately:

Sl No.	Submission of Document	Bidder's Confirmation /Submission (Yes / No)
1	Earnest Money Deposit	
2	120 days validity of the offer confirmation	
3	Audited Annual Reports (for past three years)	
4	Copy of Work Order and Completion Certificates for similar job as per Pre-qualification Criteria	
5	Power of Attorney of the Signatory	
6	PAN	
7	Provident Fund Registration	
8	GSTIN Registration	
9	Valid MSE or NSIC certificate as per tender if applicable	
10	Compliance of Company's HSE policy	
11	Price Schedule in Un-priced Bid duly blanked out and signed	
12	Tender Document (along with addendum if any) duly signed and stamped on all pages	
13	Price quoted strictly as per Tender price schedule	
14	Payment Terms in compliance to tender requirement	
15	Completion Period in compliance to tender requirement	
16	LD clause in compliance to tender requirement	
17	Warranties and Guarantee in compliance to tender requirement	
18	Electrical load list as per Attachment VIII of GCC	
19	Filled up Technical Schedule	
20	All others Technical & Commercial Terms & Conditions shall remain unaltered as per Tender document	

Hard copies of the above confirmatory documents must be sent before due date of submission of online tenders

Bidder's Information

Sl no.	Description	Details to be filled up by Bidder
1	Name1 (max. 35 char.)	
2	Name2 (max. 40 char.)	
3	Street/House No. (max. 50 char.)	
4	Street1 (max. 40 char.)	
5	Street2 (max. 40 char.)	
6	PIN Code (Postal Index No. e.g. "700001") (max. 6 char.)	
7	City/Place (e.g. "Kolkata" or "Dehradun") (max. 40 char.) or as the name of the city	
8	Country ("India" or "England" or as the name of country be)	
9	State (Name the state from where the office of Bidder operates)	
10	First Tel. No. (With STD Code): (e.g. 033-22225280 or 022-66552814) (max. 30 char.)	
11	First Fax No. (with STD Code)	
12	Contact Person	
13	First Mobile No.	
14	E-mail Address) (max. 40 char.)	
15	PAN No. :	
16	GSTIN Registration No. :	
17	GSP Name (GST Suvidha Provider)	
18	Bank Name (max. 60 char.)	
19	Street (max. 35 char.)	
20	City (max. 35 char.)	
21	Branch (max. 40 char.)	
22	IFSC Code	
23	MICR Code	
24	Account No.	
25	Type of Account (Current, Savings, etc.)	

LIST OF CONTENT:

UN-PRICED PART (PART I)

- 1. NOTICE INVITING TENDER**
- 2. GENERAL CONDITIONS OF CONTRACT**
- 3. SPECIAL CONDITIONS OF CONTRACT**
- 4. TECHNICAL PARTICULARS**

PRICED PART (PART II)

- 1. PRICE SCHEDULE**

NOTICE INVITING TENDER
Tender No. EP / TCW / BHU / REF/ 08

- 1.0 Balmer Lawrie & Co. Ltd. (BL) invite **ONLINE BIDS** from experienced, competent and resourceful Contractors with sound technical and financial capabilities for Design, Supply, Erection, Testing & Commissioning of Refrigeration System for proposed Temperature Controlled Warehouse being set up at IDCO Industrial Estate, Chhattabar, Dist-Khorda, Odisha.

2.0 **SCOPE OF WORK**

The scope of the tender covers design, engineering, manufacture, assembly, testing at manufacturer's works, packing & delivery including transportation & transit insurance, unloading at site, site shifting as required, erection, trial run & commissioning of a fully functional ammonia based Refrigeration System with all auxiliaries, accessories for Temperature Controlled Warehouse being set up at IDCO Industrial Estate, Chhattabar, Dist-Khorda, Odisha as mentioned in Schedule of Work, General Conditions of Contract, Special Conditions of Contract, Technical Specification and Drawings.

It is mandatory to quote against all the items of Bill of Quantity/ Price Schedule. However, if any item is technically not required for the refrigeration system offered by bidder, the bidder shall specifically indicate the same in their unpriced bid and quote NIL against that in the price bid. Bidders shall go through the Notes to Price Schedule (PART-II) carefully before submitting their price bid.

Optional items may be included in the work order to be issued for Design, Supply, Erection, Testing & Commissioning of refrigeration system.

Separate Work Order for Plant Operation and Maintenance will be placed separately after completion of the project.

3.0 **COMPLETION PERIOD**

Time is the essence of the contract. The time schedule for total work according to the contract shall be **Six (6) Calendar Months** from the date of placement of order or **Two (2) Calendar Months** from the date of formal handing over of site whichever is later.

4.0 **EARNEST MONEY DEPOSIT**

Unpriced Part of the Bid should be accompanied by a Demand Draft or Bank Guarantee of **Rs 1,85,000.00 (Rupees One Lakh and Eighty Five Thousand Only)** towards Earnest Money Deposit (EMD) executed by any scheduled bank drawn in favour of M/s Balmer Lawrie & Co. Ltd. payable at Kolkata as per format enclosed. EMD submitted by way of Bank Guarantee should be valid for a minimum period of 120 days after the due date of tender submission.

Earnest Money deposit (EMD) is exempted for agencies registered under NSIC or coming under the definition of Micro and Small Industries and holding valid registration certificates covering the tendered items/services. Declaration of Udyog

Aadhar Memorandum (UAM) by the MSE parties on Central Public Procurement Portal (CPPP) shall be mandatory.

- 4.1 For the successful bidder, the EMD will be refunded only after receipt of required initial security deposit. No interest shall be payable towards EMD amount.
- 4.2 For the unsuccessful bidders, the EMD will be refunded only after the successful bidder has accepted the work order and the acknowledgment of the same has been received by the owner.
- 4.3 EMD is liable to forfeiture in the event of:
 - a) Withdrawal of offers during validity period of the offer
 - b) Non-acceptance of orders by the bidder within the stipulated time after placement of order.
 - c) Any unilateral revision made by the bidder during the validity period of the offer.
 - d) Non-performance of the bidder during the tenure of work.
 - e) Bidders submitting false/fabricated/bogus documents in support of their credentials

5.0 PRE-QUALIFICATION CRITERIA

5.1 Average Annual Turnover

Average annual turnover of the tenderer shall be minimum of **Rs 222 Lakhs** during last three financial years ending 31st March, 2019.

5.2 Past Work experience

- The tenderer should have successfully executed at least one work for ammonia refrigeration system of total headload of **minimum 400 KW** capacity for Temperature Controlled Warehouse of multiple product application with minimum temperature of at least **minus 10 deg.** Centigrade during past 7 years.
- The tenderer should have successfully executed the work of ammonia based refrigeration system past seven years ending last day of month previous to the one in which tenders are invited:
 - a. 3 jobs each of value not less than **Rs 148 lakhs** or
 - b. 2 jobs each of value not less than **Rs 185 lakhs** or
 - c. 1 job of value not less than **Rs 296 lakhs**

Copy of work orders and completion certificates / commissioning report from the owner/ consultant should be enclosed as supportive documents. Order copy issued by the owner to the consultant shall also be furnished if the completion certificate is issued by the consultant on behalf of the owner.

5.3 PAN, GST Registration, PF Registration & ESIC registration

Tenderers are required to submit copy of PAN, GST Registration and PF registration and ESIC registration along with Un-priced part of their offer, failing which their offer may be liable to be rejected.

5.4 Compliance with HSE Standards

Tenderers are required to comply HSE standards as mentioned in **Appendix – A & Appendix – B** of this tender document. Compliance of HSE shall be considered as one of the pre-qualification criteria of the bidder.

5.5 Power of Attorney

The Power of Attorney or authorisation letter or any other document consisting of adequate proof of the ability of the signatory to bind the bidder, in original, when the Power of Attorney or authorisation or any other document is issued relating to the specific tender of Balmer Lawrie & Co. Ltd only. However, a notarized true copy of the 'Power of Attorney' shall also be accepted in lieu of the original, if the Power of Attorney is a general "Power of Attorney". But photocopy of such notarized true copy shall not be accepted.

6.0 TENDER DOCUMENTS

Tender Documents comprises two parts viz. Part-I (Un-priced) and Part-II (Priced). The Un-priced Part consists of Notice Inviting Tender, General Conditions of Contract, Special Conditions of Contract, Technical Specification and Drawings. The Priced Part consists of Priced Schedule. Bidders are requested to download the tender document and read all the terms and conditions mentioned in the tender document and seek clarification if any, from **Sk Abu Jafor, Manager**. Any clause defining offline bid submission in the tender document shall not be considered.

7.0 TENDER SUBMISSION

The intending tenderers shall be deemed to have visited the site and familiarise themselves thoroughly with the prevailing site conditions before submission of the tender. Non-familiarity with the site conditions will not be considered reason either for extra claim or for not carrying out the work in strict conformity with the drawing, specification and time schedule.

The tenderer is required to register on the e-procurement site <https://balmerlawrie.eproc.in> and submit their bids online.

For registration and online bid submission tenderer may contact the following officials at the HELP DESK of M/s C1 India on browsing to the website <https://balmerlawrie.eproc.in> during business hours (10:00 a.m. to 06:30 p.m.) from Monday to Friday (Excluding holidays of the Company):

Dedicated Helpdesk for Balmer Lawrie			
<u>Contact Person</u>	<u>E-Mail ID</u>	<u>Tel. No.</u>	<u>Days</u>
1. Mr. Tirtha Das (Kolkata)	tirtha.das@c1india.com	+91-9163254290	MON - FRI
2. Mr. CH. Mani Sankar (Chennai)	chikkavarapu.manisankar@c1india.com	+91-6374241783	MON - SAT
3. Ms. Ujwala Shimpi (Mumbai)	ujwala.shimpi@c1india.com	+91-22-66865608	MON - FRI

4. Helpdesk Support (Kolkata)	blsupport@c1india.com	+91-8017272644	MON - SAT
Escalation Level 1			
Mr. Tuhin Ghosh	tuhin.ghosh@c1india.com	+91-8981165071	
Escalation Level 2			
Mr. Sandeep Bhandari	sandeep.bhandari@c1india.com	+91-8826814007	
Escalation Level 3			
Mr. Achal Garg	achal.garg@c1india.com		
In case, you are unable to get in touch with any of the Technical Support Associates, kindly drop a mail at blsupport@c1india.com mentioning your Name and Mobile No. One of C1 India's associates will get back shortly.			

The tenderer shall authenticate the bid with his Digital Certificate for submitting the bid electronically on e-procurement platform and the bids not authenticated by digital certificate of the tenderer will not be accepted on the e-procurement platform.

All the tenderers who do not have digital certificates need to obtain Digital Certificate **(with both Signing and Encryption Components)**. They may contact help desk of M/s C1 India.

The tenderer shall furnish the original Demand Draft /BG for EMD to the tender inviting authority so as to reach on or before the due date and time of the Tender either personally or through courier or by post and the receipt of the same within the stipulated time shall be the responsibility of tenderer. The Company shall not take any responsibility for any delay or non-receipt. If any of the documents furnished by the tenderer is found to be false/fabricated/bogus, the tenderer is liable for blacklisting, forfeiture of the EMD, cancellation of work and criminal prosecution. The tenderer is requested to get a confirmed acknowledgement from the Tender Inviting Authority as a proof of Hardcopies submission to avoid any discrepancy.

The bidders found defaulting in submission of hard copies of original Demand Draft / BG for EMD and other documents to the Tender Inviting Authority on or before the stipulated time in the Tender will not be permitted to participate in the Tender.

The bidder is requested to read all the terms and conditions mentioned in the tender Document and seek clarification if any from if in doubt.

The bidder should keep track of any Addendum / Corrigendum / Amendment issued by the Tender Inviting Authority on time-to-time basis in Company's website ([www. Balmerlawrie.com](http://www.Balmerlawrie.com)) and e-procurement site (<https://balmerlawrie.eproc.in>). No separate newspaper advertisement shall be published for such Addendum / Corrigendum / Amendment etc. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.

The tenderer should complete all the processes and steps required for bid submission. The successful bid submission can be ascertained once acknowledgement is given by

the system through bid submission number after completing all the process and steps. M/s C1 India is not responsible for incomplete bid submission by users. Tenderers may also note that the incomplete bids will not be saved by the system and are not available for the Tender Inviting Authority for processing.

Neither the Company (Balmer Lawrie & Co. Ltd.) nor the service provider (M/s C1 India) is responsible for any failure or non-submission of bids due to failure of internet or other connectivity problems or reasons thereof.

The hardcopies of the Bid Documents as explained above and also defined in relevant clause General Conditions of Contract under sealed envelope should reach the office of **Head (Engg. & Projects), Balmer Lawrie & Co Ltd, Engineering & Projects Department, 21 Netaji Subhas Road, Kolkata 700001**, on or before the due date of submission of tender. The Bidders who are submitting the Bids in person are requested to drop the same in our tender box located at the entrance of 2nd floor at the above address.

8.0 **SUPPLY OF MATERIAL**

All materials required for the work shall be supplied by the Tenderer.

9.0 **TAXES & DUTIES**

Rates shall be inclusive of all taxes & duties other than GST. GST shall be quoted separately as per Price Schedule.

10.0 **NON-CONFORMANCE**

Tenders not conforming to the abovementioned requirements are liable to be rejected.

11.0 **VALIDITY OF OFFER**

Tendered shall keep their offer valid for a period of **120 days** from the date of opening of Unpriced bid.

12.0 **FIRM PRICE**

The price should be firm and irrevocable and not subject to any change till the completion of Scope of Work.

13.0 **DEVIATION**

It is expected that bidders will submit their bid strictly based on the terms and conditions and specifications contained in the bidding documents and will not stipulate any deviations. Should it, however, become unavoidable, deviations (in the form of Deviation Sheet-Attachment-X) should be submitted along with the Bid. Deviations mentioned in any other place shall not be taken into account by BL.

14.0 **BASIS OF EVALUATION**

Bidders will be selected through evaluation of their Unpriced Bids based on fulfilment of pre-qualification criteria i.e. submission of all required PQ documents and other required documents, EMD/MSE Certificate as per the instructions contained in the

tender document. Price Bids will be opened only for the bidders whose Unpriced Bids (Part-I) are found to be acceptable. It is mandatory to quote for all the items. However, if any item is technically not required for the refrigeration system offered by bidder, the bidder shall specifically indicate the same in unpriced bid and quote 0 (Nil) against that in priced bid. L1 Bidder will be determined based on total basic amount comprising of all items covered upto sl. no 3 [i.e. all items from item no 1.1.1 till item 3.24] excluding Optional Items (Items under sl. no 4) and Plant Operation & Annual Maintenance Contract (Items under sl. no 5).

15.0 RIGHT TO ACCEPT OR REJECT TENDER

15.1 M/s Balmer Lawrie & Co Ltd reserves the right to accept or reject any or every tender without assigning any reason whatsoever / or to negotiate with the tenderer (s) in the manner it considers suitable. In the event of receipt of lowest price from more than one (1) bidders, fresh price bids shall be invited from the lowest bidders only to determine final lowest bidder for placement of order.

15.2 Bids of any tenderer may be rejected if a conflict of interest between the bidder and Company (Balmer Lawrie) is detected at any stage.

15.3 All the bids will be evaluated based on Pre-qualification and other criteria as mentioned in this NIT. Tenders of those bidders who are not meeting the pre-qualification criteria will not be considered for commercial evaluation.

15.4 Tender if submitted through e-mail or fax shall be summarily rejected.

15.5 Hard copy of Price Bid should not be submitted in the envelope containing Un-priced documents failing which the bid will be summarily rejected.

15.6 Clarifications /exceptions / deviations to the tender terms & conditions and specifications:

Balmer Lawrie & Co. Ltd. expects Tenderers to confirm compliance to tender terms & conditions and specifications, failing which the Tenderers are liable to be rejected. Hence all Tenderers in their own interest are advised to submit their bids in all respects confirming to all terms & conditions of the bid document.

Bids shall be evaluated based on the information / documents available in the bid. Hence Tenderers are advised to ensure that they submit appropriate and relevant supporting documentation alongwith their proposal in the first instance itself. Bids not complying the requirements of bid documents will be rejected without any further opportunity.

For any Technical clarifications / queries Tenderers are requested to contacts Sk Abu Jafor, Manager, Mob (7893422855) (from 10.00AM to 06.00PM, Monday - Friday).

for Balmer Lawrie & Co Ltd

(G C Saha)

Head (Engineering & Projects)

GENERAL CONDITIONS OF CONTRACT

I N D E X**Article I****DEFINITIONS****Article II****INTERPRETATION OF GENERAL CONDITIONS OF CONTRACT**

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- 2.01 Discrepancy in Tender Document
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- 3.03 Complete & Competitive Offer
- 3.04 Submission of tender
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- 4.02 Construction water
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ARTICLE – I**DEFINITIONS****1.00 GENERAL**

The following expressions hereunder and elsewhere in the contract documents used shall have the following meanings hereunder respectively assigned to them except where the context otherwise requires:

- 1.01 The "Owner / "Employer" shall mean M/s Balmer Lawrie & Co. Ltd. (BL), a company incorporated in India and having its registered office at 21, Netaji Subhas Road, Kolkata - 700 001 and shall include its successors and assigns.
- 1.02 "Tenderers" or "Bidders" shall mean such parties who have been issued Tender Document by the Owner and those parties who have submitted these offers to the Owner in response to the Tender Document issued to them.
- 1.03 "Tender Document" shall mean the Tender Documents comprising Part I (Un-priced Bid) –Notice inviting tender, General Conditions of contract, Special Conditions of Contract, Technical Specification, Schedule of Quantities, Drawings / Sketches, Data Sheets, Addenda / Corrigenda to the tender document issued by the Owner, Form of Tender and Part II (Priced Bid) - Price Schedule.
- 1.04 The "Contractor / Successful tenderer/Supplier" shall mean the tenderer selected by the Owner for the performance of the work and shall include the successors and Owner permitted assigns of the Contractor.
- 1.05 The "Sub-contractor" shall mean any person or firm or company (other than the Contractor) to whom any part of work has been entrusted by the Contractor with the written consent of the Engineer-in-Charge, and the legal representatives, Successors and permitted assigns of such person, firm or company.
- 1.06 **The "Project" shall mean Design, Supply, Erection & Commissioning of Refrigeration System for Temperature Controlled Warehouse at IDCO Industrial Estate, Chhatarbar, Dist-Khurda, ODISHA".**
- 1.07 The "Project Manager" shall mean the Officer nominated by Owner to co-ordinate and supervise all the activities connected with the implementation of project on their behalf. "Project Manager" may at his discretion depute Owner's officers to co-ordinate / supervise the work of Contractor / Consultants at site.

- 1.08 The "Engineer-in-Charge" shall mean the Engineer/Agency authorised by the Owner for the purpose of the Contract for overall supervision and co-ordination of site activity and certification of billing.
- 1.09 "Site" shall mean all such land, waters and other places on, under, in or through which the works for the Project are to be performed under the Contract.
- 1.10 The "Site Engineer" shall mean the Engineer(s) for the time being deputed by the Engineer-in-Charge as Site Engineer for the work to be performed by the Contractor at any and/or all job sites and to co-ordinate all activities of all parties at site.
- 1.11 "Inspecting Authority" means Third Party Inspection Agency (TPIA) as specified by the Owner/Consultant or Owner's authorised representative or Consultant's representative.
- 1.12 The "Work" and "Scope of Work" shall mean the totality of the work by expression or implication envisaged in the contract and shall include all material, equipment and labour required for or relative or incidental to or in connection with the commencement, performance or completion of any work and/or for incorporation in the work.
- 1.13 The "Works" shall mean the product(s) of the work and shall include all extras, additions, alterations or substitution as required for the purpose of the contract.
- 1.14 The "Works Contract" or "Contract" shall mean the totality of the agreements between the parties as derived from the Contract Documents for the entire work.
- 1.15 The "Contract Documents" shall mean collectively Tender Documents and the Contract Documents as laid out in the Owner's Standard Contract Format which is based on the General & Special Conditions of Contract.
- 1.16 The "Specification(s)" shall mean the various specifications as set out in the specifications forming part of the tender documents and as referred to and derived from the contract and any order(s) or instruction(s) thereunder, and the absence of any specifications as aforesaid covering any particular work or part of portion thereof, shall mean the relevant Indian Standard Institution Specifications for or relative to the particular work or part thereof, and in the absence of any Indian Standard Institution Specifications covering the relative work or part or portion thereof, shall mean the standards or specifications of any other country applied in India as a matter of standard engineering practice and approved in writing by the Engineer-in-Charge or Site Engineer with or without modifications.
- 1.17 "Order" and "Instruction" shall respectively mean any written Order or Instruction given by the Engineer-in-Charge or Site Engineer within the scope of their respective

powers in terms of the Contract and shall include alteration / variation order to effect additions to or deletion from and / or alteration in the work detailed in the contract.

- 1.18 "Plans" and "Drawings" shall mean maps, plans, drawings, sketches, tracings and prints forming part of the tender documents and any details or working drawings, amendments and/or modifications thereof approved in writing by the Engineer-in-Charge, Site Engineer or any agency notified by the Engineer-in-Charge to the Contractor for the purpose and shall include any other drawings or plans in connection with the work as may from time to time be furnished by or approved in writing by the Engineer-in-Charge or Site Engineer or any other agency nominated by the Engineer-in-Charge on his behalf in connection with the work.
- 1.19 "Temporary Work" / "Enabling Work" shall mean all such works which are required in or about the execution, completion or maintenance of the work and if not provided for specifically in the Schedule of rates shall be deemed to be done by the Contractor at his own cost in fulfilment of the contract.
- 1.20 "Constructional Plant" shall mean all such Plant & Machineries, appliances, aids or things of whatsoever nature other than materials intended to form part of the permanent works which are required in or about the execution, completion for maintenance of temporary and permanent work.
- 1.21 "Completion Certificate" shall mean the Certificate to be issued by the Engineer-in-Charge after the work has been completed to his satisfaction.
- 1.22 "The Final Certificate" in relation to the work shall mean the certificate to be issued after the period of liability is over by the Owner regarding satisfactory compliance of various provisions of the contract by the contractor.
- 1.23 "Period of Liability" or "Defect Liability Period" refers to the specified period from the date of completion of the entire work as indicated in the completion certificate up to the date of issue of Final Certificate during which the contractor is responsible for rectifying all defects "free of cost" to the satisfaction of Owner.
- 1.24 "Schedule of Rates"/ "Schedule of Quantities" shall mean the schedule of rates incorporated in the contract and shall also include supply rates for labour, material etc. as well as payments for all such work determined in accordance with the contract conditions.
- 1.25 "Running Account Bill" shall mean a Bill for the payment of "On Account" to the Contractor.
- 1.26 "Agreed Variation" shall mean the statement of Agreed Variation annexed to the Acceptance of Tender or a further Amendment to the Contract forming part thereof.

- 1.27 "Acceptance of Tender" shall mean the Acceptance of Tender issued by the Owner to the Contractor.
- 1.28 The "Total Contract Value" shall up to calculation of the entire remuneration due to the Contractor in terms of the Contract, on successful completion of the works means the total contract value as specified in the Acceptance of Tender and after calculation of the entire remuneration due to the Contractor under the contract, on successful completion of the works shall mean the totality of such remuneration.
- 1.29 "Written Notice" or "Notice" in writing shall mean all hand written, typed / printed /e-mail form sent (unless delivered personally) or proved to have been received by registered post to the last known address / private / business or registered office, of the contractor and shall be deemed to have been received in the ordinary course of post it would have been delivered.
- 1.30 "Letter of Intent" shall mean intimation by a letter to the successful tenderer that the tender has been accepted in accordance with the provisions contained therein.
- 1.31 "Progress Schedule" shall mean the time schedule of Progress of Work.
- 1.32 The "Alteration Order or Variation Order" means Order given in writing by the Owner to effect additions to or deletions from and alterations in the work.
- 1.33 "Measurement book(s) / Sheet(s)" shall mean the register/sheet (hand written or printed computerised copy) preserved by the Engineer-in-Charge, where all measurements taken at site are neatly recorded by the Engineer-in-Charge or his authorised representative and signed in token of acceptance by the Contractor or his authorised representative.

ARTICLE - II**INTERPRETATION OF GENERAL CONDITIONS OF CONTRACT****2.00 GENERAL**

The following general conditions shall be read in conjunction with the other conditions of contract, special conditions of contract, Technical Specifications etc. and shall be considered as an extension and not in limitation of the obligations of the Contractor. In case of discrepancy, if any, between these conditions the precedence shall be as stated elsewhere in the special conditions of contract.

2.01 DISCREPANCY IN TENDER DOCUMENT

Should there be any discrepancy, inconsistency, error or omission in the Tender Documents, the Tenderer shall bring it to the notice of the Owner / Engineer-in-Charge for necessary clarification / action. In the event such matters are referred to later the decision of the Owner / Engineer-in-Charge directing the manner in which the work is to be carried out shall be final & conclusive and the contractor shall carry out work in accordance with this decision.

2.02 HEADINGS / TITLES

All headings & Titles/Notices to the clauses, specifications /drawings are solely for the purpose of indicative reference and not as summary of the contents and thus shall not be deemed to be part of the clauses of the contract.

2.03 SINGULAR AND PLURAL

Unless otherwise stated or repugnant to the context the singular shall include plural and vice-versa.

ARTICLE - III**GENERAL INSTRUCTIONS TO TENDERERS****3.01 NON-TRANSFERABILITY OF TENDER DOCUMENTS**

Tender documents shall remain the property of the Owner and if obtained by one intending tenderer, shall not be utilisable by another without the consent of the Owner.

3.02 TENDERERS RESPONSIBILITY TO COLLECT ALL REQUIRED DATA

- (i) The tenderer should study all tender documents, carefully, understand the condition / drawing / specification etc. before quoting. If there are any doubts about tender conditions he should obtain clarification from **Sk Abu Jafor, Manager, email: Jafor.a@balmerlawrie.com** (from 10.00 a.m. to 06.30 PM Monday – Friday). This shall not be the justification for late submission or extension, compensating date or time to the tender. All tender documents shall govern the contract, shall form part of the contract and shall be binding during the execution till completion of work.
- (ii) The tenderer should visit the site and acquaint himself with the site conditions, all factors which are likely to be relevant for the works, availability and rates for various things including construction materials as per specification, shelter for staff etc. since these are to be provided / arranged by the tenderer (unless otherwise specified) at his own cost. In any case it will be deemed that tenderer as done so and no claim whatsoever will be entertained on the plea of ignorance of any factor or difficulties involved in fulfilling the tender conditions.
- (iii) Under no circumstances, Tenders may be withdrawn or modified after it's submission to the Owner. Negligence on the part of the Tenderer in preparing his tender confers no right for withdrawal or modification of his tender after the tender has been opened.

3.03 COMPLETE & COMPETITIVE OFFER

- (i) Tenderers are required to make the lowest offer for the work as per the enclosed specification and details available therein. The estimated quantities given in the schedule of Quantities are approximate. As the work progresses, it is possible that there are variations & omission of items.
- (ii) The rates quoted should be inclusive of all materials, labour, incidental expenses, equipment, Tools / Tackles, Transportation of materials and Labour, Taxes & Duties, CESS, Customs, Octroi Duty, as applicable except Goods & Service Tax. GST shall be quoted separately as per given format. All materials are to be supplied by the Tenderer unless otherwise stated.

- (iii) Incomplete / Conditional tender quotation or those received late and / or not conforming to the terms and conditions in the tender documents will be liable to get rejected.
- (iv) It is in the Tenderer's interest to adhere to the Owner's tender conditions, specifications and Tender Schedule. However, if the tenderer considers it unavoidable, deviations should be clearly spelt out with reference to tender conditions. Owner reserves the right to determine / evaluate financial implication of such deviations without any reference to the tenderer or at his discretion consider such tenders liable for disqualification.
- (v) After "Un-priced" bids are evaluated, tenderers whose bids are found acceptable may be invited for discussions for exchange of clarifications, if any, required. At that stage, depending on the merits of the case, opportunity may be given to amend the "Priced" bids already received along with the un-priced bids, but not opened until then. Such amendments or revisions would need to be submitted in similar sealed envelopes generally not later than 7 days after the date of such discussions. Tenders indicating counter proposals or deviations are liable to be rejected.
- (vi) Tenderers are expected to quote rate for each item after careful analysis of cost involved for the performance of the completed item considering all Specifications and conditions of Contract. This will avoid loss of profit or gain in case of curtailment or change of Specification for any item. In case it is noticed that the rates quoted by the Tenderer for any item are unusually high or unusually low it will be sufficient cause for the rejection of the Tender unless the Owner is convinced about the reasonableness of the rates on scrutiny of the analysis for such rate to be furnished by the Tenderer on demand.

3.04 SUBMISSION OF TENDER

The mode of tender submission shall be strictly as defined in the Notice Inviting Tender.

3.05 DETAILS TO BE SUBMITTED ALONG WITH THE TENDER

The tenderer shall submit the following along with the following:

- (i) Hard copy of Un-priced Tender Document duly filled in, stamped and signed by the Tenderer as prescribed in different clauses of Tender documents. **No hard copy of priced bid shall be submitted.** The price bid file in .xls format shall be downloaded from the website, bidder to fill in their item-wise rates, print, stamp, sign, scan and upload the same in 'Uploading Price Bid' under Bid Common Form. Bidders shall indicate Total price with GST [(Supply +Erection) without optional items, Plant Operation & Maintenance] in 'Project Contract Total' while submitting the price bid.

- (ii) Stipulated Earnest Money Deposit of MSE certificate for exemption of EMD
- (iii) The Power of Attorney or authorisation letter or any other document consisting of adequate proof of the ability of the signatory to bind the bidder, in original, when the Power of Attorney or authorisation or any other document is issued relating to the specific tender of Balmer Lawrie & Co. Ltd only. However, a notarized true copy of the 'Power of Attorney' shall also be accepted in lieu of the original, if the Power of Attorney is a general "Power of Attorney". But photocopy of such notarized true copy shall not be accepted.
- (iv) Details in proforma wherever prescribed regarding the following:
 - a) Similar work done in past seven years by the tenderer.
 - b) Work in progress and booked along with details of original schedule of completion progress status, likely completion etc.
 - e) PF, PAN, ESI, GST registration, Audited Annual Reports for the last 3 years, etc.
 - f) Detailed work schedule / bar chart establishing compliance with the time of completion.
 - g) Any other documents required in terms of this tender.

3.06 RATES AND OTHER ENTRIES

- (i) The tenderer should quote for all items in the Schedule of Rates. If there is any discrepancy between unit rate and total amount, the unit rate will prevail.
- (ii) The rates should be quoted in the same units as mentioned in the tender schedule of quantities.
- (iii) All entries in the tender documents should be in ink / typed Corrections if any should be attested by full signature of the tenderer.
- (iv) Every page of the tender document including annexure / enclosures shall be stamped and signed by the tenderer or his authorised representative thereby indicating that each and every page has been read and the points noted.

3.07 RIGHT TO ACCEPT OR REJECT TENDER

The Owner reserves the right to accept or reject any or every tender without assigning any reason whatsoever / or to negotiate with the tenderer(s) in the manner the Owner considers suitable. The work may be split up amongst two or more tenderers if considered expedient.

3.08 CONTRACT AGREEMENT

Clause deleted.

3.09 EARNEST MONEY DEPOSIT

- (i) The Tenderer shall be required to submit an Earnest Money of **specified value as mentioned in NIT** along with the un-priced part of the tender and the same shall be returned to the unsuccessful tenderers after acceptance of order by the successful tenderer. Earnest money of successful bidder shall be released after submission of initial security deposit by them

The permissible forms of deposit are:

- a) Bank draft drawn in favour of Balmer Lawrie & Co. Ltd. on a Kolkata branch of any Scheduled Bank
- b) Bank Guarantee executed by any Scheduled Bank as per proforma enclosed.
- (ii) If the successful tenderer is unable to accept or execute orders when placed upon him or fails to deposit the Initial Security Deposit or withdraws / revises his quoted prices and quantities offered, within the validity period of the tender or after placement of the Order / Letter of Acceptance, the Earnest Money Deposit shall be forfeited.
- (iii) No interest is payable against Earnest Money Deposit.

3.10 SECURITY DEPOSIT

- (i) On acceptance of the Bid, Contractor shall within **fifteen (15) days**, deposit with Owner an initial Security Deposit of **2% of the basic contract value** and the same shall be in any of the following:
- a) Bank draft drawn on a Kolkata Branch of any Schedule Bank in favour of Balmer Lawrie & Co Ltd.
 - b) Bank Guarantee executed by any Scheduled Bank as per proforma enclosed and shall be valid throughout the contract period.
- (ii) If Contractor fails to provide the Security Deposit within the period specified, such failure will constitute a breach of the Contract and Owner shall be entitled to award the Work elsewhere at Contractor's risk and cost. The EMD of the bidder to whom Contract was awarded shall be forfeited.
- (iii) No interest shall be payable against Security Deposit.
- (iv) Security Deposit will be returned /refunded after completion of work.

3.11 VALIDITY OF OFFER

The validity of the tender shall be **120 days** from the date of opening of Un-priced tender or any date later than it that may be proposed by the Owner and agreed to by the tenderer. During this period, tenderer shall not be entitled to modify, revoke or cancel his tender without the consent of Owner in writing. In case of successful tenderer only, validity shall be until the work is completed to the satisfaction of the Owner and so certified in writing by the Owner or their accredited representative.

3.12 TIME FOR COMPLETION OF WORK

Time is the essence of the contract. The tenderer shall submit their plan to complete the whole work according to the overall time allowed for the execution of work as given in the Tender Documents and NIT.

- 3.12.1 The contractor shall complete in all respects in accordance with the Contract, the entire work at each job site within the time specified in this behalf in the Time Schedule.
- 3.12.2 If the Owner so requires, the Progress Schedule in the form of bar chart, giving the latest dates of starting and latest dates of finishing of various operations comprising the work as also the activities in the critical path and latest dates for achievement of specific milestones in respect of the work so as to complete in all respects the works (including testing and consequential operations) within the time provided in the Time Schedule. This Progress Schedule should also indicate the interlinking of the various activities and bring to light the specific/ critical items on which the inputs from the owner/ Engineer-in-Charge/ Consultant or other agencies, if any, would be required, to ensure adherence to the schedule.
- 3.12.3 It is the contractor's responsibility to prepare and submit to the Owner / EIC, a Progress Schedule as envisaged above (the dates of progress as fixed by the Engineer-in-Charge being final and binding upon the contractor except as herein otherwise expressed provided) and shall then be the Approved Progress Schedule and all the provisions of clauses 3.12.2 shall apply relative thereto.
- 3.12.4 Any reference in the Contract Documents to the Approved Progress Schedule" or to the "Progress schedule" shall mean the "Approved Progress Schedule" specified in clause 3.12.2 & 3.12.3 above. In the absence of such approved Progress Schedule, the Progress Schedule prepared by the Contractor (with incorporation of the Owner's / Engineer-in-Charge's comments thereon if any), shall until such approved Progress Schedule comes into existence, be deemed to be the Progress Schedule for the purpose of the contract.
- 3.12.5 Within 7(seven) days of the occurrence of any act, event or omission which, in the opinion of the Contractor, is likely to lead to delay in the commencement or completion of any particular work(s or operaton(s) or the entire work at any job site(s) and in such as would entitle the Contractor to an extension of the time specified in

this behalf in the Progress Schedule(s), the Contractor shall inform the site engineer and the Engineer-in-Charge in writing of the occurrence of the act, event or omission and the date of commencement of such occurrence. Thereafter, if even upon the cessation of such act or event or the fulfilment of the omission, the Contractor in his opinion that an extension of the time specified in the Progress Schedule relative to the particular operation(s) or item(s) or work or the entire work at the job site(s) is necessary, the Contractor shall within 7 (seven) days after the cessation or fulfilment as aforesaid make a written request to the Engineer-in-Charge for extension of the relative time specified in the Progress Schedule and the Engineer-in-Charge may at any time prior to completion of the work extend the relative time of completion in the Progress Schedule for such period(s) as he considers necessary, if he is of opinion that such act, event or omission constitutes a ground for extension of time in terms of the Contract and that such act, event or omission has in fact resulted in insurmountable delay to the Contractor.

3.12.5.1 The application for extension of time made by the Contractor to the Engineer-in-Charge should contain full details of-

- a) The notice under clause 3.12.5 with a copy each of the notice sent to the Engineer-in-Charge and Site Engineer.
- b) The activity for the Progress Schedule affected.
- c) The bottleneck(s) or obstruction(s) perceived/ experienced, and the reason(s) therefor,
- d) Extension required/ necessitated on account of c) above
- e) Extension required/ necessitated on account of reasons attributable to the Owner,
- f) Extension required/ necessitated on account of force majeure reasons, and
- g) The total extension of time (if any) required/ necessitated for completion, taking the above into account and after eliminating all overlaps.

3.12.5.2 The opinion/ decision of the Engineer-in-Charge in this behalf and as to the extension of time necessary shall, subject to the provisions of clause 3.12.6 hereof, be final and binding upon the Contractor.

3.12.6 Notwithstanding the provisions of clause 3.12.5 hereof, the Owner may at any time at the request of the Contractor made by way of appeal either against the decision of the Engineer-in-Charge taken under clause 3.12.5 or against the Engineer-in-Charge's refusal to take a decision under the said clause. If satisfied of the work or any item or operation thereof such period(s) as the Owner may consider necessary, and the decision of the Owner as to the existence or otherwise of any grounds justifying the extension and to the period(s) of extension necessary shall be final and binding upon the Contractor.

3.12.7 Subject as elsewhere herein or in the contract documents expressly provided, only the existence of force majeure circumstances as defined in 3.12.8 hereof shall afford the Contractor a ground for extension of time for completion of the work or any part of the work or any operation(s) involved therein, and specifically without prejudice to the generality of the foregoing, inclement weather, strike, shutdown, third party

breach, delay in supply of material(s) or commercial hardship shall not afford the Contractor a ground for extension of time or relieve the Contractor of his/its full obligations under the Contract, nor will any forced shutdown or idleness or other impediment in progress or completion of the work due to any reason whatsoever afford the Contractor a ground for extension of time or relieve the Contractor of his/its full obligations under the Contract except and to the extent otherwise elsewhere herein specifically provided, nor shall any shut down or idle time charges be payable by the Owner to the Contractor for delay in the commencement, progress or completion of the work due to any reason whatsoever, including due to the existence of force majeure circumstances.

- 3.12.8 The term "Force Majeure" as employed in this contract shall mean wars (declared or undeclared) or revolutions, civil wars, tidal waves, fires, major floods, earthquakes, epidemics, quarantine restrictions and freight embargoes and transporters strikes affecting the country as a whole.
- 3.12.9 Upon an extension of the time for completion of the work or any part of the work or any operation(s) involved therein pursuant to clause 3.12.5 or clause 3.12.6 hereof, the extended date/time of completion shall be deemed to be the relative date of completion in the Progress Schedule, and such extension shall constitute the sole remedy of the Contractor for and/or arising out of such delays, and the Contractor hereby waives any and all contrary rights.
- 3.12.10 The mere fact that the Owner shall not have terminated the contract or that the Owner or Engineer-in-Charge has permitted the Contractor, for the time being to continue with the work for its completion shall not prejudice the full rights and remedies available to the Owner under the contract arising out of the delayed completion, including the right of Liquidated Damages and/or termination. Such permission(s) shall unless specifically stated to be an extension of time under clause 3.12.5 or 3.12.6, as the case may be, not be construed as extension(s) of time extension under clause 3.12.5 or 3.12.6 hereof, and shall merely constitute an indication or intimation, as the case may be, of the Owner's willingness, for the time being, to accept the delayed completion, subject to its rights under the contract.
- 3.12.11 No assurance, representation, promise or other statement by any personnel, engineer or representative of the Owner in relation to extension of time for commencement or completion of any work(s) or operation thereof or of the entire works under the contract shall be binding upon the Owner or shall constitute an extension of time for commencement or completion of the entire works or any part or operation thereof within the provisions of clause 3.12.5 or 3.12.6 hereof, unless the same has been communicated to the Contractor in writing by the Engineer-in-Charge under clause 3.12.5 or by the General Manager under clause 3.12.6 and in writing specifically states that it embodies an extension of time within the provisions of clause 3.12.5 or clause 3.12.6 as the case may be, and without prejudice to the foregoing, the mere agreement or prescription or signing of a Progress Schedule by the site engineer or any site representative of the Owner at variance of the progress schedule, as the case may be, referred to in clauses 3.12.2, 3.12.3 and/or 3.12.4 hereof or

containing an extended time of commencement or completion in respect of the entire work(s) or any part or operation thereof shall not anyway constitute an extension of time in the terms of the Contract so as to bind the Owner or relieve the Contractor of all or any of his liabilities under the Contract, nor shall constitute a promise on behalf of the owner or a waiver by the Owner of any of its rights in terms of the contract relative to the performance of the contract within the time specified or otherwise, but shall be deemed only(at the most) as a guidance to the Contractor for better organising his work on a recognition that the Contractor has failed to organise his work and/or perform the same within the time specified in the Progress Schedule established within the provisions of clause 3.12.2 or clause 3.12.3 or clause 3.12.4 hereof, as the case may be.

ARTICLE - IV**GENERAL INFORMATION****4.01 SITE INFORMATION, CLIMATIC CONDITION ETC.**

The details relating to above are given separately to the best of Owners knowledge. The tenderer shall be deemed to have satisfied themselves regarding site condition, access, communication facilities, local conditions, climatic conditions including wind, monsoon period, rainfall, temperatures etc. and shall be deemed to have included the impact of these factors within their quoted rates.

Contractor should visit the site and familiarise themselves thoroughly before submitting the tender.

4.02 CONSTRUCTION WATER

The contractor has to make his own arrangement for both construction water and drinking water. The Owner does not undertake to supply water to the contractor.

All temporary arrangements for distribution of construction water shall be removed forthwith after completion of the work or if there is any hindrance caused to the other works, the contractor will re-route or remove the temporary lines at his own cost in a manner so as to continue his (contractor's) work in an uninterrupted manner.

4.03 CONSTRUCTION POWER

Construction power as available at site would be made from the substation/distribution boards situated near the work site free of cost at single point for general lighting only. Further arrangement for power distribution will be made by contractor depending upon the construction power requirement at his own cost as per Electricity Act and Rules framed there under and approved by Engineer-in-Charge. No power shall be provided for structural fabrication/ erection/ welding work at site. DG if required for the work shall be arranged by the contractor at his own cost.

The temporary line will be removed forthwith after the completion of the work or if there is any hindrance caused to the other works due to the alignment of these lines, the contractor will re-route or remove the temporary lines at his own cost.

4.04 ACCOMMODATION FOR LABOUR & SUPERVISORY STAFF

The Contractor shall make his own arrangements for accommodation of his labour and supervisory personnel. No accommodation for labour & supervisory staff shall be provided within the site premises.

4.05 CONTRACTOR'S FIELD OFFICE, GODOWN AND WORKSHOP

Owner will at his own discretion and convenience and for the duration of the execution of the work make available near the Site, land for construction of Contractor's field office, godowns, stores, workshops and assembly yard required for the execution of the Contract. The Contractor shall at his own cost construct all

temporary buildings and provide suitable water supply and sanitary arrangement approved by the Engineer-in-Charge.

ARTICLE – V

GENERAL OBLIGATION & PERFORMANCE OF WORK

5.01 EXECUTION OF WORK

All the work shall be executed in strict conformity with the provisions of the Contract Document and with such explanatory detailed Drawings, Specifications and Instructions as may be furnished from time to time to the Contractor by the Engineer-in-Charge, whether mentioned in the Contract or not. The Contractor shall be responsible for ensuring that Work throughout are executed in the most substantial proper and workmanlike manner with the quality of material and workmanship in strict accordance with the Specifications and to the entire satisfaction of the Engineer-in-Charge.

5.02 CO-ORDINATION AND INSPECTION OF WORK

- (i) The co-ordination and inspection of the day-to-day Work under the Contract shall be the responsibility of the Engineer-in-Charge but this will not detract the contractor's full responsibility. The written instructions regarding any particular work will normally be passed by the Engineer-in-Charge or his Authorised Representative. A work order book will be maintained by the Contractor for each sector in which the aforesaid written instructions will be entered. These will be signed by the Contractor or his authorised representative by way of acknowledgement within Twelve (12) hours. The pages in the work order book shall be machine numbered.
- (ii) The Engineer-in-Charge will have full power and authority to inspect the Work at any time wherever in progress either on the Site or at the Contractor's Premises / Workshops wherever situated, Premises / Workshops of any person, firm or corporation where work in connection with the Contract may be in hand or where materials are being or are to be supplied, and Contractor shall afford or procure for the Engineer-in-Charge, every facility and assistance to carry out such inspection. Contractor shall, at all time during the usual working hours and all other times at which reasonable notice of the intention of the Engineer-in-Charge or his representative to visit the Work shall have been given to Contractor, either himself be present to receive orders and instructions, or have a responsible agent duly accredited in writing present for the purpose.

5.03 GENERAL CONDITIONS FOR CONSTRUCTION WORK

- (i) The working time is forty-eight (48) hours per week. Overtime of work is permitted in cases of need and the Contractor will compensate the same. Shift working at two (2) or three shifts per day will become necessary and the contractor should take this aspect into consideration for formulating his rates for quotation. No extra claims will be entertained by the Owner on this account.

- (ii) For carrying out work on Sundays, and Holidays, the Contractor will approach the Engineer-in-Charge or representative at least two (2) days in advance and obtain permission in writing.
- (iii) The Contractor must arrange for the placement of workers in such a way that the delayed completion of the Work or any part thereof for any reason whatsoever will not affect their proper employment. The Owner will not entertain any claim for idle labour payment whatsoever.
- (iv) The Contractor shall submit to the Owner reports at regular intervals regarding the state and progress of work. The details and proforma of the report will mutually be agreed after the award of Contract.
- (v) The Contractor shall arrange for required number of competent Engineer Supervisor to be present at site at all times during the progress of the work, who shall be duly authorised to take instructions and execute them on his behalf.

5.04 **WORK IN MONSOON**

The completion of the work may entail working in the monsoon also. The Contractor must maintain a minimum labour force as may be required for the Work and plan and execute the construction and erection according to the prescribed schedule. No extra payment will be considered for such work in monsoon.

During monsoon and other period, it shall be the responsibility of the Contractor to keep the construction work site free from water at his own cost.

5.05 **DRAWING TO BE SUPPLIED BY THE OWNER**

- (i) Where drawings are attached with Tender, these shall be for the general guidance of the Contractor to enable him to visualise the type of Work contemplated and Scope of Work involved. The Contractor will be deemed to have studied the Drawings and formed an idea about the work involved.
- (ii) Detailed working drawings on the basis of which actual execution of work is to proceed, shall be prepared by the contractor and same shall be approved by the Owner. Contractor shall be deemed to have gone through the Drawings supplied to him thoroughly and carefully and in conjunction with all other connected drawings and bring to the notice of the Engineer-in-Charge, discrepancies if any, therein before actually carrying out the work.
- (iii) Copies of all detailed working drawing relating to Work shall be kept at the Contractor's office at the Site and shall be made available to the Engineer-in-Charge at any time during the Contract. The drawings and other documents issued by the Owner shall be returned to the Owner on completion of the Work.

5.06 DRAWINGS TO BE SUPPLIED BY THE CONTRACTOR

- (i) Where drawings/Data are to be furnished by the Contractor, they shall be as enumerated in the special conditions of the Contract, and shall be furnished within the specified time.
- (ii) Where approval of Drawings for Manufacture/Construction/ Fabrication has been specified, it shall be Contractor's responsibility to have these drawings prepared as per the directions of Engineer-in-Charge and got approved before proceeding with Manufacture/Construction/Fabrication as the case may be. Any changes that may have become necessary in these drawings during the execution of work shall have to be carried out by the Contractor to the satisfaction of Engineer-in-Charge at no extra cost. All final drawings shall bear certification stamp as duly signed by the Engineer-in-Charge.

5.07 SETTING OUT WORK

- (i) Engineer-in-Charge will establish and clearly mark a reference base line at the site and will establish reference bench mark from which Contractor shall establish such other points, lines, elevations, etc. as he may require for the proper execution of the work.
- (ii) Contractor shall be responsible for the true and proper setting out of the works and for the correctness of the positions, levels, dimensions and alignments of all the parts of the works and for the provisions of all necessary instruments, appliances and labour in connection therewith. If at any time during the progress of the works, any error appears or arises in the position, levels, dimensions or alignments of any part of the works, Contractor, on being required to do so by Engineer-in-Charge, shall, at his own expense, rectify such error to the satisfaction of Engineer-in-Charge unless such error is based on incorrect data supplied in writing by Engineer-in-Charge / Owner. The checking of any setting out or any line or level by Engineer-in-Charge shall not in any way relieve Contractor of his responsibility for the correctness thereof and Contractor shall carefully protect and preserve all the bench marks, side rails, pegs and other things used in setting out of the work.

5.08 REPORTS AND RECORDS

- (i) Within fifteen (15) days of the Award, Contractor shall submit to Engineer-in-Charge the detailed programme, the content and form of which shall be satisfactory to Engineer-in-Charge showing the order to procedure and method in which he proposes to carry out the work and the time limit and sequence of carrying out the work and shall, whenever required by Engineer-in-Charge, furnish for his information particulars in writing of Contractor's arrangements for the carrying out of the work and of constructional plant and temporary works which contractor intends to supply, use or construct as the case may be. The approval by Engineer-in-Charge of such programme or the

furnishing of such particulars shall not relieve Contractor of any of his duties or responsibilities under this Contract.

- (ii) Contractor shall submit to Engineer-in-Charge by the fifth (5th) day of each month for each part of his work under this Contract and in summary.
 - a) A month by month forecast and a historical record up to completion of his requirements and actual use of:
 - Manpower by craft, type and position or other description.
 - Materials and supplies including quantity on hand and delivery status.
 - Construction equipment and plant furnished by Contractor.
 - b) A month by month forecast up to completion of the amount of Work done and the amount remaining to be completed and all historical record of the Work performed.
 - c) Such other reports as Engineer-in-Charge may from time to time specify.

5.09 **ISSUE OF MATERIALS**

- (i) All materials required for the work shall be supplied by the contractor. Payment shall be made against finished items of work as specified in the schedule.
- (ii) All material, as required to complete the work in all respects according to the contract rates shall be inclusive of all freights, sales tax and other taxes, duties, royalties, loading, unloading, transporting, handling and storage charges etc.
- (iii) Contractor shall bear all incidental charges for the storage and safe custody of materials at Site.
- (iv) Contractor shall construct suitable godowns at Site for storing his own materials, safe against damage by rain, dampness, fire, theft etc. He shall also employ necessary watch and ward establishment for the purpose.
- (v) It shall be responsibility of Contractor to arrange in time all materials required for Work. If, however, in the opinion of the Engineer-in-Charge the execution of Work is likely to be delayed due to Contractor's inability to make arrangements for supply of materials which normally he has to arrange for, the Engineer-in-Charge shall have the right at his own discretion to issue such materials if available with Owner or procure the materials from the market or elsewhere and Contractor will be bound to take such materials at the rates decided by the Engineer-in-Charge. This, however, does not in any way absolve Contractor from his responsibility of making arrangements for the supply of such materials in part or in full should such a situation occur nor shall this constitute reason for the delay in the execution of Work.

- (vi) Materials / Equipment supplied by Owner shall not be utilised for other purpose(s) than issued for.

5.10 STORAGE

Contractor shall provide or cause to be provided all storage yards, transit sheds and warehouses necessary for the performance of his work at locations approved by Engineer-in- Charge. Material supplies, equipment and plant stored by Contractor shall be effectively protected against pilferage and against damage by the elements. Contractor shall adopt all procedures, maintain all personnel and keep all records so that, at all times Contractor can account for

- Stores receipt
- Storage locations
- Inventories
- Disbursements
- Final destinations of all stored items received for Contractor's Work on the Project or any portion thereof.

5.11 AUDIT

- (i) Contractor's accounts, related to the Project or any portion thereof, shall be available for audit by designated representatives of Owner at all reasonable times.
- (ii) Such representatives shall at all times be afforded proper facilities for inspection of Contractor's accounts and shall have access to Contractor's premises, work and materials, records, ledgers and vouchers of every description pertaining to Contractor's performance of this Agreement.

5.12 PACKING, MARKING AND DESPATCH INSTRUCTIONS

- (i) Packing / Marking:
All fragile and all exposed parts shall be packed with care and the packages shall bear the words "WITH CARE" both in English and Hindi.

All manufactured surfaces shall be painted with rust proof paint.

All small pieces shall be packed in cases.

The contractor shall be held liable for all damage or breakage to the goods due to the defective or insufficient packing as well as for corrosion due to insufficient protections.

On three sides of the packages the following marks shall appear clearly visible and indelible painted at Contractor's care and expense –

FROM:

FOR: M/S BALMER LAWIRE & CO LTD.

PO/WO NO.	ITEM NO.	NET WT.
GROSS WT.	DIMENSIONS	
CASE NO.	OF TOTAL	CASES

5.13 DAMAGE TO PROPERTY

- (i) Contractor shall be responsible for making good to the satisfaction of Owner any loss of and any damage to all structures and properties belonging to Owner or being executed or procured or being procured by Owner/Owner or of other Agencies within the premises of all Work of Owner/Owner if such loss or damage is due to fault and / or the negligence or wilful acts or omission of Contractor, his employees, agents, representatives or Sub-Contractors.
- (ii) Contractor shall indemnify and keeps Owner harmless of all claims for damage to property other than Owner's property arising under or by reason of this agreement if such claims result from the fault and/or negligence or wilful acts or omissions of Contractor, his employees, agents, representative or Sub-Contractors.

5.14 ARTICLES OF VALUE FOUND

All gold, silver and other minerals of any description and all precious stones, coin, treasure, relics-antiquities and other similar things which shall be found in, under or upon Site, shall be the property of Owner and Contractor shall duly preserve the same to the satisfaction of the Engineer-in-Charge and shall from time to time deliver the same to such person or persons indicated by Owner.

5.15 DISCREPANCIES BETWEEN INSTRUCTIONS

Should any discrepancy occur between the various instructions furnished to Contractor, his agents or staff or any doubt arise as to the meaning of any such instructions or should there be any misunderstanding between Contractor's staff and the Engineer-in-Charge's staff, Contractor shall refer the matter immediately in writing to the Engineer-in-Charge whose decision thereon shall be final and conclusive and no claim for losses alleged to have been caused by such discrepancies between instructions, doubts, or misunderstanding shall in any event be admissible.

5.16 LIQUIDATED DAMAGE

- i) If the contractor is unable to complete the jobs specified in the scope of work within the period specified in NIT, it may request owner for extension of the time with unconditionally agreeing for payment of Liquidated Damage (LD). Upon receipt of such a request, owner may at its discretion extend the period of completion and shall recover from the contractor's running account bill, as an ascertained and agreed Liquidated Damages, a sum equivalent to **0.5% of**

basic contract value for each week of delay or part thereof. The LD shall be limited to **5% of basic contract value**.

The parties agree that the sum specified above is not a penalty but a genuine pre-estimate of the loss/ damage which will be suffered by the owner on account of delay/ breach on the part of the CONTRACTOR and the said amount will be payable without proof of actual loss or damage caused by such delay/breach.

- (ii) Notwithstanding what is stated in Clause above, the Owner shall have the right to employ any other agency to complete the remaining work at the risk and cost of the Contractor, in the event of his failing to complete the work within the stipulated time or in the even progress of Contractor's work is behind schedule, as judged by the engineer-in-charge.
- (iii) Then the Engineer-in-Charge upon receiving necessary approval from competent Authority may in writing make a fair and reasonable extension of time for completion of the works as per provision of clause no. 3.12, provided further that the Contractor shall constantly use his best endeavour to the satisfaction of the Engineer-In-Charge to proceed with the works. Nothing herein shall prejudice the rights of the Contractor under clause herein above.
- (iv) The contractor may seek time extension for delay or anticipated delay as per clause no. 3.12.5 for reasons not attributable to them and in such case time extension may be given without imposition of LD.

5.17 **FORCE MAJEURE**

Any delay in or failure of the performance of either party hereto shall not constitute default hereunder or give rise to any claims for damages, if any, to the extent such delays failure of performance is caused by occurrences such as Acts of God or the public enemy expropriation or confiscation of facilities by Government Authorities, compliance with any order or request of any Governmental Authorities, was fires, floods, riots or illegal strikes

5.18 **PERIOD OF LIABILITY**

- (i) Contractor shall maintain the installation Work for a period of Twelve (12) months from the date of issue of completion certificate without any extra cost. Any damage or defect that may arise or lie undiscovered at the time of issue of completion certificate, connected in any way with the Equipment or materials supplied by him or in the workmanship shall be rectified or replaced by Contractor at his own expense as deemed necessary by the Engineer-in-Charge or in default, the Engineer-in-Charge may cause the same to be made good by other workmen and deduct expenses (of which the certificate of Engineer-in-Charge shall be final) from any sums that may be then or at any time thereafter, become due to Contractor or from his Security Deposit, or the proceeds of sale thereof, or of a sufficient portion thereof.

- (ii) If Contractor feels that any variation in work or in quality of materials or proportions would be beneficial or necessary to fulfil guarantees called for, he shall bring this to the notice of the Engineer-in-Charge in writing.
- (iii) From the commencement of completion of Work, Contractor shall take full responsibility for the care for Work including all temporary work and in case any damages, loss or injury shall happen to Work or to any part thereof or to any temporary work from any cause whatsoever, shall at his own cost repair and make good the same so that at completion Work shall be in good order and in conformity, in every respects, with the requirements of Contract and the Engineer-in-Charge's instructions.
- (iv) If at any time, before Work is taken over, the Engineer-in-Charge shall: -
 - a) Decide that any work done or materials used by Contractor or any Sub-Contractor is defective or not in accordance with Contract, or that Work or any portion thereof are defective, or do not fulfil the requirements of Contract (all such materials being hereinafter, called 'Defects' in this clause), and as soon as reasonably practicable gives to Contractor notice in writing of the said decision, specifying particulars of the defects alleged to exist or to have occurred, then Contractor shall at his own expenses and with all speed make good the defects so specified.

In the case Contractor shall fail to do so, Owner may take, at the cost of Contractor, such steps as may in all circumstances, be reasonable to make good such defects. The expenditure so incurred by Owner will be recovered from the amount due to Contractor. The decision of the Engineer-in-Charge with regard to the amount to be recovered from Contractor will be final and binding on Contractor.

As soon as Work have been completed in accordance with Contract (except in minor respects that do not effect their use for the purpose for which they are intended and except for maintenance thereof provided in the General Conditions of the Contract) and have passed the tests on completion, the Engineer-in-Charge shall issue a certificate (hereinafter called Completion Certificate) in which he shall certify the date on which Work have been so completed and have passed the said tests and Owner shall be deemed to have taken over Work on the date so certified. If Work has been divided into various groups in Contract, Owner shall be entitled to take over any group or groups before the other or others and thereupon the Engineer-in-Charge shall issue a Completion Certificate which will, however, be for such group or groups so taken over only.

- b) In order that Contractor could obtain a completion Certificate he shall make good, with all possible speed any defect arising from the

defective materials supplied by Contractor or workmanship or any act or omission of Contract that may have been noticed or developed, after the Work or group of Works has been taken over, the period allowed for carrying out such Work will be normally one (1) month. If any defect be not remedied within a reasonable time. Owner may proceed to do Work at Contractor's risk and expense and deduct from the Final Bill such amount as may be decided by Owner.

If by reason of any default on the part of Contractor a completion Certificate has not been issued in respect of every portion of Work within one (1) month after the date fixed by Contract for the completion of Work, Owner shall be at liberty to use Work or any portion thereof in respect of which a Completion Certificate has been issued, provided that Work of the portion thereof so used as aforesaid shall be afforded reasonable opportunity for completing these Work for the issue of Completion Certificate.

5.19 RIGHT OF OWNER TO TERMINATE THE CONTRACT

- (i) If the Contractor being an individual or a firm commits any 'Act of Insolvency' or shall be adjudged as insolvent or being an Incorporated Company shall have an order for compulsory winding up made against it, or pass an effective resolution for winding up voluntarily or subject to the supervision of the Court or shall be unable to carry out and fulfil the contract and to give security therefore, is so required by the Engineer-in-Charge.

Or if the Contractor (whether an individual, firm or incorporated company) shall suffer execution to be issued.

Or shall suffer any payment under this Contract to be attached by or on behalf of any of the creditors of the contractor.

Or shall assign or charge, encumber or sublet this contract without the consent in writing of the Engineer-in-Charge first obtained.

Or shall charge or encumber this contract or any payments due or which may become due to the Contractor thereunder.

Or if the Engineer-in-Charge shall certify in writing to the Owner that the Contractor -

- a) has abandoned the Contract or
- b) has failed to commence the works, or has without any lawful excuse under these conditions, suspended the progress of the works for 7 days after receiving from the Engineer-in-Charge written notice to proceed or

- c) has failed to proceed with the works with such due diligence and failed to make such due progress as would enable the works to be completed within the time agreed upon or
- d) has failed to remove materials from the site or to pull down and replace work for seven days after receiving materials or work were condemned and rejected by the Engineer-in-Charge under these conditions or
- e) has used sub-standard or inferior material or materials not conforming to the specifications or has employed inferior workmanship in carrying out the works or part thereof or has not exercised due diligence in execution of the said work, or

has neglected or failed persistently to observe and perform all or any of the acts, deeds, matters or things by this Contract to be observed and performed by the Contractor requiring the Contractor to observe or perform the same, or

- f) has to the detriment of good workmanship or in defiance of the Engineer-in-Charge's instructions to the contrary, sub-let or sub-contracted any part of the contract, or
- g) has failed to comply with the Engineer-in-Charge's instructions, or
- h) has in the opinion of the Engineer-in-Charge committed any breach of this Contract, then and in any of the said cases the Owner with the written consent of the Engineer-in-Charge may notwithstanding any previous waiver, after giving seven days' notice in writing to the Contractor terminate the Contract, but without hereby affecting the right of the Owner of the powers of the Engineer-in-Charge or the obligations and liabilities of the Contractor in respect of work, the contract shall continue enforce as fully as if the contract has not been so determined and the obligations of the contractor in respect of work subsequently executed shall continue as if the works subsequently executed has been executed by or on behalf of the Contractor. And further, the Owner by its agents or servants shall be entitled forthwith to enter upon and take possession of the works and all plants, tools, scaffoldings, sheds, machinery, steam and other power implements, machinery equipment and materials lying upon the site or the adjoining lands or roads and use the same as its own property and to employ the same by means of its own servants and workmen in carrying on and completing the work or by employing any other contractor and the Contractor shall not in any way interrupt or do any act, matter or things to prevent, intimidate or hinder such other contractor or other person or persons employed for completing and finishing or using the materials and plant for the work. When the works shall be completed or as soon thereafter as convenient, the Engineer-in-Charge shall give a notice in writing to the Contractor to remove his surplus materials

and plant and should the Contractor fail to do so within the period of 7 days after receipt thereof by him, the Owner shall sell the same either by public auction or a private sale and shall be given credit to the contractor for the amount realised. The Engineer-in-Charge shall thereafter ascertain and certify in writing under this hand what (if anything) shall be due or payable to or by the owner, the expense or loss which the owner shall have been put to in procuring the works to be completed and the amount, if any, owing to the contractor and the amount which shall be so certified, shall thereupon be paid by the owner to the Contractor or by the Contractor to the Owner, as the case may be and the Certificate of the Engineer-in-Charge shall be final and conclusive and binding on the parties hereto. In the event of termination under this Clause, the Owner shall not be bound by any provision of this Contract to make any further payment to the Contractor until the said works are completed.

- (ii) Owner shall, at any time, be entitled to determine and terminate the Contract, if in the opinion of the Owner the cessation of the Work becomes necessary owing to paucity of funds or for any other cause whatsoever, in which case the cost of approved materials at the Site at current market rates as verified and approved by Engineer-in-Charge and of the value of the Work done to date by the Contractor shall be paid for in full at the specified in the Contract. A notice in writing from the Owner to the Contractor of such determination and termination and the reason therefore shall be the conclusive proof of the fact that the Contract has been so determined and terminated by the Owner.
- (iii) Should the Contract be determined under sub-clause of this clause and the Contractor claims payment to compensate expenditure incurred by him in the expectation of completing the Work, the Owner shall consider and admit such claim as are deemed fair and reasonable and are supported by the vouchers to the satisfaction of the Engineer-in-Charge. The Owner's decision on the necessity and propriety of such expenditure shall be final and conclusive and binding on the Contractor.

5.20 SUB-LETTING OF WORK

- (i) No part of the Contract nor any share or interest therein shall in any manner or degree be transferred, assigned or sublet by the Contractor directly or indirectly to any person, firm, or corporation whatsoever except as provided for in the succeeding sub-clause, without the consent in writing, of the Owner.
- (ii) The Owner may give written consent to sub-contract for the execution of any part of the Work at the Site, being entered into by the Contractor provided each individual sub-contract is submitted to the Engineer-in-Charge before being entered into and is approved by him.

- (iii) Notwithstanding any sub-letting with such approval as aforesaid and notwithstanding that the Engineer-in-Charge shall have received copies of any sub-contracts, the Contractor shall be and shall remain solely responsible for the quality and proper and expeditious execution of the WORK and the performance of all the conditions of the Contract in all respects as if such sub-letting or sub-contracting had not taken place, and as if such Work had been done directly by the Contractor.
- (iv) If any Sub-Contractor engaged upon the Work at the Site executes any Work which in the opinion of the Engineer-in-Charge is not in accordance with the Contract Document, the Owner may by written notice to the Contractor request him to terminate such contract and the Contractor upon the receipt of such notice shall terminate such sub-contract and dismiss the Sub-Contractors and the latter shall forthwith leave the Work failing which the Owner shall have the right to remove such sub-contractors from the Site.
- (iv) No action taken by the Owner under the clause shall relieve the Contractor of any of his liabilities under the Contract or give rise to any right to compensation, extension of time or otherwise.

5.21 PATENTS AND ROYALTIES

Contractor, if licensed under any patent covering, Equipment, Machinery, Materials or compositions of matter to be used or supplied or methods and process to be practiced or employed in the performance of this Contract, agrees to pay all royalties and license fees which may be due with respect thereto. If any Equipment, Machinery, Materials, Composition matters, to be used or supplied or methods and process to be practiced or employed in the performance of this Contract, is covered by a patent under which the Contractor is not licensed then the Contractor before supplying or using the Equipment, Machinery, Materials, compositions method or processes shall obtain such licenses, and pay such royalties and license fees as may be necessary for performance of the Contract. In the event the Contractor fails to pay any such royalty or obtain any such license any suit for infringement of such patents which is brought against the Contractor or the Owner as a result of such failure will be defended by the Contractor at his own expense and the Contractor will pay any damages and costs awarded in such suit.

5.22 PERFORMANCE GUARANTEE & WARRANTY

- (i) Performance Guarantee:
 - a) The contractor shall guarantee that the material of construction and workmanship of work done and any fittings designed / manufactured / supplied by him are as specified in the tender schedule and wherever there is nothing specifically mentioned shall correspond to the best available grade and quality as required for the application.

- b) The contractor shall also guarantee that the work done and any fittings designed, manufactured, supplied, erected shall be as per prevailing relevant standard, codes and statutory practices / stipulations.
 - c) The contractor shall guarantee the work done and any fittings designed, manufactured, supplied, erected and tested by him against defective materials, poor workmanship, improper design, operation inadequacies & problems and failure from normal usage, for a period of 12 (twelve) calendar months after final acceptance of the work by the Owner.
- (ii) **Warranty:**
The Contractor will repair and/or replace all defective parts, components / fittings, accessories etc. which shall be notified to him in writing within the Defect Liability Period provided that such defective parts, components, fittings, accessories etc. are promptly rectified and replaced by him free of cost. The contractor will provide similar warranty on the parts, components, fittings, accessories etc. repaired and/or replaced.

5.23 **CONTRACTOR'S RESPONSIBILITY WITH OTHER AGENCIES**

Without repugnance to any other condition, it shall be the responsibility of the Contractor to work in close co-operation and co-ordinate the work with the Civil, Mechanical, Electrical, Air-conditioning and Intercommunication Contractors and other Agencies or their authorised representatives in providing the necessary grooves, recesses, cuts and opening etc., in walls, slabs, beams and columns etc. and making good the same to the desired finish as per Specifications, for the placement of Electrical, Intercommunication cables, Conduits, Air-conditioning inlet and outlet grills and other Equipment etc. where required. For at the above said requirements in the false ceiling and other partitions, the Contractor before starting up the works shall in consultation with the Electrical, Mechanical, Intercommunication, Air-conditioning Contractors, and other Agencies prepare and put up a joint scheme, showing the necessary openings, grooves, recesses, cuts, the methods of fixing required for the work of the aforesaid, and the finishes therein, to the Engineer-in-Charge and get the approval. The Engineer-in-Charge, before communicating his approval to the scheme, with any required modifications, shall get the final agreement of all the Agencies, which shall be binding. No claim shall be entertained on account of the above.

5.24 **ARBITRATION**

Any dispute or difference arising under this Contract shall be referred under jurisdiction of Kolkata to a sole arbitrator to be appointed by the Chairman & Managing Director, Balmer Lawrie & Co. Limited and the provisions of Arbitration and Conciliation (Amendment) Act, 2015 including any statutory modifications or enactment thereof shall apply to the Arbitration proceedings. The fees of the arbitrator, if any, shall be shared equally by both the parties. The award shall be a speaking award stating reason therefor and is final & binding on the parties. The proceeding shall be conducted in English language and courts at Kolkata will have exclusive jurisdiction to settle any dispute arising out of this contract.

ARTICLE - VI**INSPECTION, CERTIFICATION AND PAYMENT****6.01 INSPECTION & TESTING**

- (i) All materials required for the execution of the work should conform to the standard specification and approved by the Engineer-in-Charge before actually put to use. Commencement of work without prior approval shall be entirely at the risk and cost of the Contractor. No delay due to non-availability of the Materials, tools, equipment etc. will be entertained by the Owner. In the case of certain Machinery / Equipment, the Engineer-in-Charge may inspect the item for approval, before they are brought to site.
- (ii) The Owner shall be entitled at all times at the risk of the Contractor to inspect and / or test by themselves or through any independent person(s) or agency (ies) appointed by the owner and/or to direct the contractor to inspect and/or test all material(s), items and components whatsoever supplied or proposed for supply, for incorporation in the work inclusive, during the course of manufacture or fabrication by the Contractor and/or at the Contractors work or otherwise, such materials or items or components. The inspection and/or test shall be conducted at the expense of the Contractor and if conducted by the Contractor may be directed by the Owner to be conducted by agency (ies) nominated by Owner and/or in the presence of witness (ess) nominated by the Owner.
- (iii) The Contractor shall furnish to the Engineer-in-Charge for approval when requested or as required by the specification or other contract documents, adequate samples of material intended for incorporation in the works. Such samples to be submitted before the work are commenced permitting sufficient time for tests, examination(s) thereto by the Engineer-in-Charge. All materials furnished and incorporated in the work shall conform to the sample(s) in all respects.
- (iv) The Engineer-in-Charge shall be entitled to reject at any time any defective materials, item or components, (including special manufactured or fabricated items or components) supplied by the Contractor for incorporation in the works.
- (v) The Contractor shall at all times ensure highest standard of workmanship, relating to the work to the satisfaction of the Engineer-in-Charge. The Engineer-in-Charge shall have the power to inspect the work as also to test or instruct the contractor to test the works or any structure, material or component thereto at the risk and cost of the Contractor, either by the Contractor or by any agency(ies) nominated by the Engineer-in-Charge or Site Engineer on his behalf.

- (vi) The Contractor shall provide all facilities, instruments material / labour and accommodation required for testing the works (including checking the set time out of work) and shall provide Engineer-in-Charge all assistance necessary to conduct the test whenever and wherever required.
- (vii) The Engineer-in-Charge on inspection or test be not satisfied with the quality or workmanship of any work, structure, material, component (decision of the Engineer-in-Charge being final in this behalf), the Contractor shall re-perform, replace, re-install and / or re-erect as the case may be such work, structure material or component, as no such rejected work, structure, material, item or component shall be re-used without the prior permission of Engineer-in-Charge.
- (viii) Notwithstanding any provided in the foregoing clauses hereto and notwithstanding the Engineer-in-Charge/ or his representative has inspected tested and/or approved any particular work, structure, material or component, such inspection, test or approval shall not absolve the Contractor of his full responsibilities under the contract inclusive or relative to the specification, performance guarantee. The said inspection and test procedure being intended basically for satisfaction of the Owner / prima-facie erection and/or material and equipment supplied for incorporation in the work is in order.
- (ix) On no account shall the Contractor proceed with the concreting or other work in foundations and superstructure by covering up or otherwise placing beyond reach of inspection or measurement any work before necessary inspection, entries are filled in the Site Inspection Register by the Engineer-in-Charge or his authorised representative. Should the contractor do so the same shall be uncovered at the contractor's risk and expense for carrying out the inspection and measurement.
- (x) If any tests are required to be carried out in connection with the work or materials or workmanship not supplied by the Contractor, such tests shall be carried out by the Contractor as per the instructions of Engineer-in-Charge and cost of such tests shall be reimbursed by the Owner.

6.02 SCHEDULE OF RATES AND PAYMENTS

- (i) The price to be paid by Owner to Contractor for the work to be done and for the performance of all the obligations undertaken by Contractor under Contract shall be ascertained by the application of the respective Schedule of Rates (there of application but not of limitation, with the succeeding sub-clause of this clause) and payment to be made accordingly for the work actually executed and approved by the Engineer-in-Charge. The sum so ascertained shall (excepting only as and to the extent expressly provided herein) constitute the sole and inclusive remuneration of Contractor under Contract and no further or other payment whatsoever shall be or become due or payable to the Contractor under Contract.

- (ii) The prices/rates quoted by Contractor shall remain firm till the issue of final certificate and shall not be subject to escalation. Schedule of Rates shall be deemed to include and cover all costs, expenses and liabilities of every description and all risks of every kind to be taken in executing, completing and handing over Work to Owner by Contractor. Contractor shall be deemed to have known the nature, scope, magnitude and the extent of Work and materials required though Contract Document may not fully and precisely furnish them. He shall make such provision in the Schedule of Rates as he may consider necessary to cover the cost of such items of Work and materials as may be reasonable and necessary to complete the Work. The opinion of the Engineer-in-Charge as to the items of work which are necessary and reasonable for completion of Work shall be final and binding on Contractor, although the same may not be shown on or described specifically in Contract Document.

Generality of this present provision shall not be deemed to cut down or limit in any way Contractor's obligation under the Contract, because in certain cases it may and in other cases it may not be expressly stated that Contractor shall do or perform a work or supply articles or perform, services at his own cost or without additional payment or without extra charge or work to the same effect or that it may be stated or not stated that the same are included in and covered by the Schedule of Rates.

- (iii) Without in any way limited the provisions of the preceding sub-clause the Schedule of Rates shall be deemed to include and cover the cost of all Constructional Plant and Equipment, Temporary Work (except as provided for herein), Pumps, Materials, Labour, Insurance, Fuel, Stores, and Appliances to be supplied by Contractor and all other matters in connection with each item in the Schedule of Rates and the execution of Work or any portion thereof finished, complete in every respect and maintained as shown described in the Contract Document or as may be ordered in writing during the continuance of Contract.
- (iv) Unless specifically mentioned otherwise in the contract, all payments shall be made against finished items of work only as defined and included in the schedule of rates. However, Engineer-in-Charge may grant part payment, in certain cases, against partially completed work at his own discretion after proper checking and measurement of the portion of the work completed by the contractor. All such payment shall be regarded merely as an advance payment against the amounts due to the contractor in terms of the contract and any such payment shall not be regarded as an acceptance of any work paid for.
- (v) For Work under Unit Rate Basis, no alteration will be allowed in the Schedule of Rates by reason of Work or any part of them being modified, altered, extended, diminished or omitted. The Schedule of Rates are fully inclusive

rates which have been fixed by Contractor and agreed to by Owner and cannot be altered.

6.03 PROCEDURE FOR MEASUREMENT / BILLING OF WORK IN PROGRESS

As mentioned in Special Conditions of Contract.

6.04 SECURED ADVANCE

No secured advance is payable.

6.05 NOTICE OF CLAIM FOR ADDITIONAL PAYMENT

Should Contractor consider that he is entitled to any extra payment or compensation or to make any claims whatsoever in respect of Work he shall forthwith give notice in writing to the Engineer-in-Charge that he claims extra payment and/or compensation. Such notice shall be given to the Engineer-in-Charge within ten (10) days from the ordering of any Work or happening of any event upon which Contractor bases such claims and such notice shall contain full particulars of the nature of such claim with full details and amount claimed. Failure on the part of Contractor to put forward any claim with necessary particulars as above within the time above specified shall be an absolute waiver thereof. No omission by Owner to reject any such claim and no delay in dealing therewith shall be waiver by Owner of any rights in respect thereof.

6.06 COMPLETION CERTIFICATE

When Contractor fulfils his obligation under clauses he shall be eligible to apply for Completion Certificate.

The Engineer-in-Charge shall normally issue to Contractor the Completion Certificate within one(1) month after receiving an application therefore from Contractor after verifying from the completion documents, as-built drawings etc. as mentioned in Technical Specification and satisfying himself that work has been completed in accordance with and as set out in the construction and erection drawings, and the Contract Document/ work order and rectification of defects if any. Contractor, after obtaining the Completion Certificate, is eligible to present the Final Bill for Work executed by him under the terms of Contract.

6.07 FINAL CERTIFICATE

Upon expire of the period of liability and subject to the Engineer-in-Charge being satisfied that work have been duly maintained by Contractor, during such period as hereinbefore mentioned and that Contract has in all respect duly made up any subsidence and performed all his obligations under Contract, the Engineer-in-Charge shall (without prejudice to the rights of Owner to retain the provisions of relevant clause hereof) otherwise give a certificate herein referred to as the final certificate to that effect and Contractor shall not be considered to have fulfilled the whole of his obligations until Final Certificate shall have been given by the Engineer-in-Charge notwithstanding any previous entry upon Work and taking possession, working or using of the same or any part thereof by Owner. Contractor shall provide Owner with a certified satisfactory to both that all privileges, liens, claims, obligations and

liabilities against or chargeable to the Owner have been fully paid, satisfied and released and that Contractor has no claim(s) against Owner.

6.8 CERTIFICATE AND PAYMENTS ON EVIDENCE OF COMPLETION

Except the final certificates no other certificate or payments against a certificate or on general account shall be taken to be an admission by Owner of the due performance of Contract or any part thereof or occupancy or validity of any claim by Contractor.

ARTICLE - VII**RULES, REGULATIONS & INSURANCE COVERAGE****7.01 OBSERVANCE OF RULES/ ACTS IN FORCE**

- (i) The successful tenderer and his man shall abide by all rules/regulations in force at a location and the laws, by-laws and statutes of Government / Semi-Government and other local authorities such as requirements / liability under enactments, Contract Labour Act etc. and the Company shall stand indemnified against by claims on these scores.
- (ii) The Contractor shall conform to the provisions of Acts, rules, orders or notifications of any Governments, Municipal or local authority for the time being in force affecting the work undertaken by him and will give all necessary notices to and obtain requisite sanction and permits of and from the Municipal and any other authority in respect of the said work or the materials to be used there at and generally will comply with the building and other regulations of such authorities and will keep the Company indemnified against all claims, penalties and losses that may be incurred by it by reason of any breach by the Contractor of any statutes by-laws, rules, regulations, notifications etc.
- (iii) The Contractor and sub-contractor(s) of the Contractor shall obtain authority (ies) designated in this behalf under any applicable laws, rule or regulation (including) but not limited to Contract Labour (in so far as applicable) any and all such license(s) consent(s), registration(s) and/or other authorisation(s) as shall from time to time be or become necessary for or relative to the execution of the work or any part or portion thereof or the storage or supply or any material(s) or otherwise in connection with the performance of the contract and shall at all times observe and ensure due observance by the sub-contractors, servants and agents of all terms and conditions of the said license(s) consent(s) regulation(s) and other authorisation(s) and laws, rules and regulations applicable thereto.
- (iv) The Contractor undertakes to ensure due and complete compliance with all laws, regulations, rules, etc., applicable to the workmen employed or whose services are otherwise availed of by the Contractor, whether in connection with the construction work at the site or otherwise. The Owner shall have the right to inspect the records maintained by the contractor, Contractor shall whenever required by the Owner/Owner, produce such records and as and when the Owner/Owner may call upon the Contractor, ascertain whether or not the requirements of all such laws, regulations, rules etc. coming to light whether as a result of such inspection or otherwise, the Owner shall have the right to require the contractor to effect such compliance within such time, as the Owner may prescribe in that behalf and in the event of the Contractor failing to effect such compliance within the time prescribed by the Owner, then the Owner shall without prejudice to his other rights, be entitled to withhold

from the amount payable to the workmen under any such laws, regulations or rules and to make payment thereof to the workmen. The Owner shall also have in that event the right to terminate the contract with immediate effect and to exercise powers reserved to the Owner under the contract as a result of termination.

7.02 **LABOUR LAWS**

- (i) No Labour below the age of eighteen (18) years shall be employed on Work. In case female workers are engaged, requisite provisions shall be made as per the statute.
- (ii) Contractor shall not pay less than what is provided under law to labourers engaged by him on Work.
- (iii) Contractor shall at his expense comply with all labour laws and keep Owner indemnified in respect thereof.
- (iv) In addition to above, rules and regulations as contained in Contract Labour (Regulation and Abolition) Act, 1970 will also be applicable for this contract. For the purpose of registration as per the above Act, Contractor may contact Owner for further details.
- (v) Contractor shall secure full safety of the workers / employees engaged by him in the Site premises and shall take at his own cost, insurances and such other safety regulations for the said purpose.

7.03 **IMPLEMENTATION OF APPRENTICES ACT 1964**

Contractor shall comply with the provisions of the Apprentices Act, 1964 and the Rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of Contract and the Engineer-in-Charge may, at his discretion, cancel Contract. Contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provision of the Act.

7.04 **INSURANCE**

Contractor shall at his own expense carry out and maintain insurance with reputable companies to the satisfaction of the Owner as follows:

- (i) **Workmen's Compensation and Employees' Liability Insurance:**
Insurance shall effect for all contractors' employees engaged in the performance of this Contract and shall remain valid for the tenure of the work. If any of the work is sublet, after necessary approval by the Owner, the contractor shall require the Sub-contractor to provide Workmen's Compensation and Employees' Liability Insurance for the Sub-contractor's employees, if such employees are not covered under the Contractor's Insurance.

(ii) **Contractors All Risk Insurance:**

Contractor shall take out an All Risk Insurance policy in the Joint names of the Owner and the Contractor (owner as the first beneficiary) including third party liability, against loss or damage from any cause covering the work executed to the estimated current contract value together with the material for incorporation in the work. Such insurance shall be in such a manner that Owner and the Contractor are covered from the date of commencement of work.

The contractor shall indemnify the Owner against all losses and claims in respect of injuries or damage to any person, including any employee of the Owner, material or physical damage to any property whatsoever including that of the owner arising out of the execution of the works or in the carrying out of the contract, and shall insure against his liability with an insurer until the completion of this contract in terms approved by the owner. Whenever required, the contractor shall produce the insurance policy and the current premium receipts to the Owner.

In addition to what it is stipulated above the successful contractor shall execute Indemnity Bond to indemnify and hold harmless the Owner for complying with the provision of the following:

- i) Provident Fund Act for P.F. Scheme for labourers engaged by the Contractor / Subcontractors.
- ii) Interstate Migrant Workmen ("Regulation of Employment and Conditions of Services) Act - 1979.
- iii) Minimum Wages Act - 1948.
- iv) Equal Remuneration Act - 1976.
- v) Workman's Compensation Act - 1923.
- vi) Contract Labour (Regulation & Abolition) Act - 1970.

ARTICLE - VIII**SAFETY CODES & PRACTICES****8.01 GENERAL**

The Contractor shall adhere to safe construction practice and guard against hazardous and unsafe working conditions and shall comply with Owner's safety rules as set forth herein.

8.02 FIRST AID AND INDUSTRIAL INJURIES

Contractor shall maintain first aid facilities for its employees and those of its sub-contractors -

- (i) Contractor shall make outside arrangements for ambulance or suitable service and for the treatment of industrial injuries. Names of those providing these services shall be furnished to Engineer-in-Charge prior to start of construction, and their telephone numbers shall prominently be posted in Contractor's field office.
- (ii) All critical industrial injuries shall be reported promptly to Engineer-in-Charge, and a copy of Contractor's report covering each personal injury requiring the attention of a physician shall be furnished to Owner.

8.03 GENERAL RULES

Carrying/Striking of matches, lighters and smokers inside the hazardous areas is strictly prohibited. Violations of "No SMOKING" rules will be discharged immediately. Within the operation area, no hot work shall be permitted without valid gas/safety/fire permits issued by Owner.

8.04 CONTRACTORS BARRICADES

- (i) Contractor shall erect and maintain barricades required in connection with his operations to guard or protect:
 - a) Excavations
 - b) Hoisting Areas
 - c) Areas adjudged by Contractor or Owner's inspectors.
 - d) Owner's existing property liable to damage by contractor's operations, in the opinion of Engineer-in-Charge.
- (ii) Contractor's employees and those of its sub-contractors shall become acquainted with Owner's barricading practice and shall respect the provisions thereof.
- (iii) Barricades and hazardous areas shall be marked by red falser lanterns at nights.

8.05 SAFETY EQUIPMENT

- (i) All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be made available for the use to the persons employed at the site and maintained in a condition suitable for immediate use, and the Contractor should take adequate steps to ensure proper use of equipment by those concerned.
- (ii) Workers engaged in white washing and mixing or stacking of cement bags or any materials, which are injurious to the eyes, shall be provided with protective goggles.
- (ii) Those engaged in welding and cutting works shall be provided with protective face & eye-shields, hand gloves etc.
- (iii) To ensure that workers use Personnel Protective equipment like safety helmet, safety shoes, gloves etc.
- (iv) When workers are employed in sewers and manholes, which are in use, the Contractor shall ensure that the manhole covers are opened and are ventilated at least for an hour before the workers are allowed to get into the manholes, and manholes, so opened, shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accidents to the public.
- (v) The Contractor shall not employ men below the age of 18 years and women on the work of painting or products containing lead in any form. Wherever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken.
 - a) No paint containing lead product shall be used, except in the form of paste or ready-made paint.
 - b) Suitable facemasks shall be supplied for use by the workers when paint is applied in the form of spray on a surface having lead paint dry, rubbed and scrapped.
- (vi) Hot work should be carried out only in the areas earmarked for the purpose after required safety precautions have been taken and only after obtaining written permission from the Engineer-in-Charge. Any provision required to be made e.g. windscreens of G.I sheets etc. to make the area safe for hot work, will be made by the successful tenderer at his own cost.

8.06 HOISTING EQUIPMENT

- (i) Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following standards or conditions.
 - a) These shall be of good mechanical construction, sound materials, adequate strength and free from patent defect and shall be kept in good condition and in good working order.
 - b) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding, winch or indicating signals to the operator.
- (ii) In case of Owner's machine, the safe working load shall be notified by the Engineer-in-Charge. As regards Contractor's machines, the Contractor shall notify the safe working load of the machine to the Engineer-in-Charge, whenever he brings any machinery to site of work and get it verified by the Engineer-in-Charge, concerned.

8.07 ELECTRICAL EQUIPMENT

Motors, Gear Transmission, Electric Wiring and other dangerous parts of hoisting appliances shall be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load; adequate precautions shall be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energised, insulating mats, wearing apparel, such as gloves and boots as may be necessary shall be provided.

ATTACHMENT – I**BANK GUARANTEE VERIFICATION CHECK LIST****CHECK LIST**

	<u>YES</u>	<u>NO</u>
I. Does bank guarantee compare verbatim with standard Balmer Lawrie & Co Ltd proforma for BG	_____	_____
II. a. Has the executing officer of the BG indicated his name, designation & power of attorney No./ Signing Power No. etc. on BG	_____	_____
b. Is each page of BG duly signed/initialled by the executant & last page is signed with full particulars as required in the Balmer Lawrie's standard proforma of BG & under the seal of the Bank.	_____	_____
c. Does the last page of the BG carry the signature of two witnesses along side the signature of the executing Bank Manager	_____	_____
III. a. Does the non judicial stamp paper for BG purchase in the name of BG issuing Bank	_____	_____
b. Is the BG on non-judicial Stamp paper of value Rs. 100/- (Rupees One Hundred only)	_____	_____
c. Is the date of sale of non-judicial stamp paper shown on the BG and the stamp paper is issued not more than six months prior to date of execution of BG	_____	_____
IV. a. Are the factual details such as bid specifications No., LOI No., Contract price etc. correct.	_____	_____
b. Whether over-writing/ cutting, if any on the BG authenticated under signature and seal of executant	_____	_____
V. a. Is the amount of BG in line with contract provisions/agreement/tender	_____	_____
b. Is the validity of BG in line with contract provisions/agreement/tender	_____	_____
VI. Covering letter from bank enclosed with the BG	_____	_____
VII. BG shall be from a Nationalised/ Scheduled Bank only	_____	_____

ATTACHMENT – II**PROFORMA OF BANK GUARANTEE FOR EARNEST MONEY DEPOSIT**

(ON NON-JUDICIAL PAPER OF APPROPRIATE VALUE)

To
Balmer Lawrie & Co. Ltd.
21, Netaji Subhas Road
Kolkata – 700 001

Whereas (Name of the bidder) (hereinafter called “the Bidder”) has submitted its bid for the (purpose) (hereinafter called “the Bid”) against Tender reference No. dated M/S. BALMER LAWRIE & CO. LTD., 21 Netaji Subhas Road, Kolkata – 700 001.

The conditions of Tender provide that the Bidder shall pay a sum of Rs..... (Rupees only) (hereinafter called “the said amount”) as full Earnest Money Deposit in the forms therein mentioned. The forms of payment of Earnest Money Deposit include guarantee to be executed by a Scheduled Bank.

The said (name and address of the Bidder) have approached us and at their request and in consideration of the premises we, (Name of the Bank) having our office at(address of the Bank) have agreed to give such guarantee as herein after mentioned.

Know All Men by these presents, we,(name of the Bank) of(address of the Bank) having our office, inter alia, at (hereinafter called “the Bank”) are bound unto BALMER LAWRIE & CO. LTD.....(address) (hereinafter called “the Purchaser”) in the sum of Rs. (Rupees only) for which payment will truly be made to the Purchaser, the Bank binds itself, its successors and assigns by these presents this day of

THE CONDITIONS of this obligation are :

a) If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the bid form; or

b) If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity;

fails or refuses to execute the Contract Form if required;
or fails or refuses to furnish the Performance Security, in accordance with the instructions to Bidders.

We undertake to pay the Purchaser up to the said amount upon receipt of its first written demand, without the Purchaser having to substantiate their demand, provided that in their demand the Purchaser shall mention that the amount claimed by them is due owing to the occurrence of one or both of the two conditions. This guarantee will remain in force upto (date of expiry) including the days after the period of the bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

Notwithstanding anything contained herein :

i) Our liability under the Bank Guarantee shall not exceed Rs.
(Rupees only)

ii) This Bank Guarantee shall be valid upto

iii) We are liable to pay the guaranteed amount or pay part thereof under this Bank Guarantee only if you serve upon us a written claim or demand on or before (last date of validity)

We, (name of the Bank) undertake not to revoke this guarantee during its currency except with your previous consent in writing.

We have power to issue this guarantee in your favour under our Memorandum and Articles of Association and the undersigned has full power to do and execute this Guarantee under the Power of Attorney dated day of granted to him by the Bank.

Your faithfully,

(Specimen Signature)

ATTACHMENT - III**BANK GUARANTEE AGAINST PERFORMANCE**

(ON NON-JUDICIAL PAPER OF APPROPRIATE VALUE)

Letter of Guarantee No.

Dated : the day of

THE GUARANTEE is executed at Kolkata on the day of by (set out full name and address of the Bank)

(hereinafter referred to as "the Bank" which expression shall unless expressly executed or repugnant to the context or meaning thereof mean and include its successors and assigns).

WHEREAS Balmer Lawrie & Co. Ltd. (local address), an existing company within the meaning of the Companies Act, 1956 and having its Registered Office at 21, Netaji Subhas Road, Kolkata – 700 001 (hereinafter referred to as "the Company") issued a Tender being No. dated (hereinafter referred to as "the said Tender")

for (set out purpose of the job) and pursuant thereto Messrs/ Mr. (set out full name and address of the Contractor)

(hereinafter referred to as "the Contractor" which term or expression wherever the context so requires shall mean and include the partner or partners of the Contractor for the time being/his/its heirs, executors, administrators, successors and assigns) (delete which are not applicable) has accepted the said Tender and field its quotation.

AND WHEREAS the quotation of the Contractor had been accepted by the Company and in pursuance thereof an Order being No. dated (hereinafter referred to as "the said Order") has been placed by the Company on the Contractor for (set out purpose of the job).

AND WHEREAS under the terms of the said Order the Contractor is required to furnish the Company at their/his/its own costs and expenses a Bank Guarantee for Rs. (Rupees only) as performance guarantee for the fulfilment of the terms and conditions of the said Tender and to do execute and perform the obligations of the Contractor under the Agreement dated the day of (hereinafter referred to as "the Agreement") entered into by and between the Company of the one part and the Contractor of the other part, the terms of the said Tender and the terms contained in the said Order which expression shall include all amendments and/or modifications/or variation thereto.

AND WHEREAS the Contractor had agreed to provide to the Company a Bank Guarantee as security for the due performance of their/his/its obligations truly and faithfully as hereinbefore mentioned.

NOW THIS GUARANTEE WITNESSETH as follows :

1. In consideration of the aforesaid premises at the request of the Contractor, we (set out the full name of the Bank) the Bankers of the Contractor shall perform fully and faithfully their/his/its contractual obligations under the Agreement dated the day of entered into by and between the Company of the one part and the Contractor of the other part, the terms and conditions of the said Tender and the said Order

2. We, (set out full name of the Bank) do hereby undertake to pay to the Company without any deduction whatsoever a sum not exceeding Rs..... (Rupees only) without any protest, demur or proof or condition on receipt of a written demand from the Company stating that the amount claimed is due by way of loss and damage caused to or would be caused to or suffered by the Company due to bad workmanship or by reason of breach of any of the terms and conditions of the Agreement, the said Tender and the said Order hereinbefore mentioned.

3. The Guarantee is issued as security against due performance of the obligations of the Contractor or under the Agreement aforesaid and the said Tender and the said Order hereinbefore mentioned and subject to the conditions that our liabilities under this Guarantee is limited to a maximum sum of Rs..... (Rupees only) or the amount of loss or damage suffered or to be suffered by the Company in its opinion at any period of time, whichever is lower.

4. We, (set out full name of the Bank) further agree that the undertaking herein contained shall remain in full force for a period of months from the date of the satisfactory execution of the Contract.

1. This Guarantee shall not be affected by any amendment or change in the Agreement or change in the constitution of the Bank and/or the Company and/or the Contractor.

2. We (set out full name of the Bank) undertake not to revoke this Agreement during its currency except with the previous consent of the Company in writing.

3. All claim under this Guarantee must be presented to us within the time stipulated after which date the Company's claim/right under this Guarantee shall be forfeited and we,(set out full name of the Bank) shall be released and discharged from all liabilities hereunder.

4. This instrument shall be returned upon its expiry or settlement of claim(s) if any, thereunder.

5. Notwithstanding anything contained hereinbefore our total liabilities under this Guarantee shall not exceed a sum of Rs..... (Rupees only) and unless a demand or claim in writing under this Guarantee reaches us on or before the date of (last date of claim) and if no claim is received by us by that date all rights and claims of the Company under this Guarantee shall be forfeited and we,(set out full name of the Bank) shall be released and discharged of all our liabilities under this Guarantee thereafter.

6. We have power to issue this guarantee in your favour under our Memorandum and Articles of Association and the undersigned has full power to execute this Guarantee under Power of Attorney dated the day of granted to him by the Bank.

Place :

Date :

ATTACHMENT – IV**PROFORMA OF BANK GUARANTEE FOR SECURITY DEPOSIT**

Balmer Lawrie & Co. Ltd.

21, Netaji Subhas Road

Kolkata – 700 001

Dear Sir,

That Messrs/Mr.(set out full name and address and constitution of the Contractor) (hereinafter referred to as “the Contractor”) filed their/his/its quotation against your Tender being Tender No. dated (hereinafter referred to as “the said Tender”) for the work (set out the purpose of the job) and in pursuance thereto an Order being No. dated (hereinafter to as “the Order”) was issued by you to the Contractor.

The conditions of the said Tender, inter alia, requires that the Contractor shall pay a sum of Rs..... only) as full security deposit (hereinafter referred to as “the security deposit”) in the form therein mentioned. The form of payment of security deposit includes a guarantee to be executed by a Scheduled Bank.

The said Messrs/Mr. (set out full name of the Contractor) have/has approached us and at their/his/its request and in consideration of the premises We (set out full name of the Bank) having our office, inter alia at (state the address of the Bank) have agreed to give such guarantee in the manner following :

1. We, (set out full name of the Bank), hereby undertake with you if default is made by Messrs/Mr. (set out full name of the Contractor) in performing any of the terms and conditions of the Tender and/or in payment of the security deposit or any other or in payment of money payable to you. We, (set out full name of the Bank) shall merely on demand from you without demur or protest shall pay you the said amount of Rs..... (Rupees only) or such portion thereof not exceeding the said sum as you may demand from time to time.

2. We, (set out full name of the Bank), further agree with you that you hereunder to adopt any mode for realisation of your dues from the Contractor and/or to vary any of the Terms and Conditions of your Contract with the said Messrs/Mr. (set out full name of the Contractor), or to extend time of performance by Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by you against Contractor and to forbear or enforce any of the terms and conditions relating to the Contract and we, (set out full name of the Bank) shall not be relieved from our liability by reason of any such variation, or any indulgence to be given by you to the Contractor or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so releasing us.

3. Your right to recover the said sum of Rs..... (Rupees only) from us in the manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes is/are pending before any Officer, tribunal, court or any other authority or authorities.

4. The guarantee herein contained shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the said Messrs/Mr. (set out the full name of the Contractors), but shall in all respect, and for all purposes be binding and operative until payment of all the money due to you in respect of such liabilities is paid,

5. Our liability under this guarantee is restricted to Rs. (Rupees only).

6. Our guarantee shall remain in force and effect until (set out the date of expiry) and unless a claim or demand in writing is made against us under this guarantee before the expiry of six months from the aforesaid date i.e. (set out last date of Claim period), the said Guarantee all your rights under this guarantee shall be forfeited and we, (set out full name of the Bank) shall be relieved and discharged from all liabilities thereunder.

a) We , (set out full name of the Bank) undertake not to revoke this Guarantee during its currency except with your previous consent in writing.

b) We, (set out full name of the Bank) have power to issue this Guarantee in your favour under our Memorandum and Articles of Association and the undersigned has full power to execute/sign this Guarantee under the Power of the Attorney dated the day of granted by the Bank.

Yours faithfully,

Dated : (Place)

(Signature of Officer on

.....(Date) behalf of)

(Set out name of the Bank)

ATTACHMENT - V**INFORMATION ABOUT TENDERER****A. IN CASE OF INDIVIDUAL**

- (i) Name of Business: His age and Father's name:
- (ii) Whether his business is registered:
- (iii) Date of commencement of business:
- (iv) Whether he pays Income Tax over Rs. 10,000/- per year:

B. IN CASE OF PARTNERSHIP

- (i) Name of Partners:
- (ii) Whether the partnership is registered:
- (iii) Date of establishment of firm:
- (iv) If each of the partners of the firm pays Income Tax over Rs. 10,000/- a year and if not which of them pays the same:
- (v) Copies of partnership deed, if any:

**C. IN CASE OF COMPANY LIMITED BY SHARES OR
COMPANY LIMITED BY GUARANTEE**

- (i) Amount of paid up Capital:
- (ii) Names of Directors:
- (iii) Date of Registration of Company:
- (iv) Copies of the last two (2) years balance sheet of the company:
- (v) Certified copies of Memorandum and Articles of Association of Company:

(SIGNATURE OF TENDERER)

ATTACHMENT - VI**DETAILS OF EXPERIENCE**

Tenderer shall give information of similar Works done during past seven (7) years strictly as per the proforma given below.

Sl.No	Full particulars of similar work carried out by the Contractor	Value of Contract	Completion time as stated in Tender (Months)	Actual Completion time (Months) with date of commencement of work	Year of completion	Name & Postal address of Client with Telex / Telephone No.
1	2	3	4	5	6	7

Certified that the above information is correct.

SIGNATURE OF TENDERER

ATTACHMENT - VII**CONCURRENT COMMITMENTS**

Tenderer shall give information about his present commitments as per proforma.

S. No.	Full Postal Address of Client & Name of Officer-in-Charge with Telex/Telephone No	Description of the Work	Value of Contract	Date of commencement of Work	Schedule of completion period (months)	% age completion as on date	Expected date of completion	Remark if any

Certified that the above information is correct.

SIGNATURE OF TENDERER

ATTACHMENT-VIII**ELECTRICAL LOAD LIST OF REFRIGERATION SYSTEM**

S.No	Description	Working Qty	HP/Qty	Total HP
A	Frozen Chambers			
1	Compressor for Freezer rooms	3		
2	EVAP. Condenser Fan (1 Unit x 4 fans/Unit)	4		
3	EVAP. Condenser Pump (2 Pump/Unit)	2		
4	Ammonia Pump	2		
5	Air Cooling Unit (57 KW) - Freezer Rooms- 3 X 3 fans	9		
6	Air Cooling Unit (49 KW)- Freezer Rooms 4 unit X 3 fans	12		
7	Air Cooling Unit- Docking & Ante Room 4 unit X 2 fans	8		
B	Potato Chambers			
8	Compressor for Potato Storage Rooms	2		
9	EVAP. Condenser Fan (1 Unit x 4 fans/Unit)	4		
10	EVAP. Condenser Pump (2 Pump/Unit)	2		
11	Ammonia Pump	1		
12	Air Cooling Unit (6 Unit x 3 Fans/Unit)	18		
13	Oil Pump for all Compressors	4		
14	Defrosting Pump	1		
15	Humidifier Pump	1		
16	CO2 Extraction Fan	1		
17	Cooling Tower Water Pump	1		
18	Bidder to add (if any)			
	Total Connected Load (in HP)			
	Operating Load Factor	70%		
	Total Operating Load in KW considering load factor			
	Power Factor	0.95		
	Proposed Contract Demand in KVA			

Note: The bidder shall fill the above table with due care and shall change the indicated nos/figures, operating load factor etc. as required. Based on the above list, capacity/rating of owner's substation will be designed.

SIGNATURE OF TENDERER

ATTACHMENT-IX**DETAILS OF PROPOSED SUB-CONTRACTORS/ ASSOCIATES**

SL NO.	WORK TO BE SUB- CONTRACTED	NAME & ADDRESS OF SUB-CONTRACTOR	PAST EXPERIENCE (IN BRIEF) OF SIMILAR NATURE OF WORK EXECUTED DURING LAST 7 YEARS

Note: Relevant documents in support of past experience of sub-contractor may please be submitted along with the Tender.

SIGNATURE OF TENDERER

ATTACHMENT – X**DEVIATION STATEMENT (IF ANY)**

Please list clearly all Techno-commercial tender clauses against which a deviation / exception sought failing which it shall be deemed that the vendor has accepted the tender clause.

SL. NO.	TENDER REFERENCE (Page no., Clause No., Paragraph)	SUBJECT	DEVIATION / EXCEPTION PROPOSED

SPECIAL CONDITIONS OF CONTRACT

I N D E X

Clause 1.00	GENERAL
Clause 2.00	LOCATION OF SITE
Clause 3.00	SITE PARTICULARS
Clause 4.00	SCOPE OF WORK
Clause 5.00	VALIDITY OF TENDER
Clause 6.00	STIPULATION AND DEVIATIONS TO TENDER CLAUSES
Clause 7.00	TAXES & DUTIES
Clause 8.00	ALTERATIONS IN SPECIFICATIONS AND DESIGN
Clause 9.00	DRAWINGS VIS-A-VIS SCHEDULE OF WORK / BILL OF QUANTITIES
Clause 10.00	TIME OF COMPLETION
Clause 11.00	SUPPLY OF MATERIAL
Clause 12.00	SCRAP AND SERVICEABLE MATERIAL
Clause 13.00	TESTS & TEST PROCEDURES FOR MATERIALS SUPPLIED BY CONTRACTOR
Clause 14.00	MEASUREMENTS AND BILL OF WORK
Clause 15.00	ON ACCOUNT PAYMENTS
Clause 16.00	TERMS OF PAYMENT
Clause 17.00	SCHEDULES OF RATES
Clause 18.00	EXTRA ITEMS OF WORK

SPECIAL CONDITIONS OF CONTRACT**1.00 GENERAL**

- 1.01 Special conditions of contract shall be read in conjunction with the General Conditions of Contract, Specifications of work, Drawings and any other document forming part of this contract wherever the contract so requires.
- 1.02 Notwithstanding the sub-division of the document into three separate sections, every part of each shall be deemed to be supplementary of every other part and shall be read with and into the contract as far as it may be practicable to do so.
- 1.03 Where any portion of the General Conditions of Contract is repugnant to or at variance with any provision of the Special Conditions of Contract, then unless different intention appears, the provision of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract only to the extent of such repugnancy or variations in the Special Conditions of Contract are not possible of being reconciled with the provisions of General Conditions of Contract.
- 1.04 Whenever it is mentioned in the specifications that the contractor shall perform certain work or provide certain facilities, it is understood that the contractor shall do so at his own cost.
- 1.05 The materials, design and workmanship shall satisfy the relevant Indian Standards, the job specifications contained herein and codes referred to. Where the job specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied. In the absence of any standards/specifications / code(s) of practice for any part of the work covered in this tender, the instructions/directions of Engineer-in-Charge will be binding on the contractor.
- 1.06 In case of contradictions between Indian Standards, specifications, General Conditions of Contract, Special conditions of Contract, drawings, Schedule of Rates, the following shall be the order of precedence: -
- a) Detailed Letter of Intent along with statement of agreed variations and its enclosures.
 - b) Fax no., e_mail address, mobile no. of Intent.
 - c) Special Conditions of Contract
 - d) Drawings
 - e) General Conditions of Contract & its Annexure.
 - f) Indian Standards / Technical Specifications.

- g) Schedule of quantities and rates.

2.00 LOCATION OF SITE

Project site is located at plot nos. 5 & 13(P) of combined area 1.5acres at Chhatabar, District–Khorda, Odisha inside the premises of IDCO Industrial Estate. It is approximately 1.5KM from Khorda- Chandraka road.

3.00 SITE PARTICULARS

The intending tenderers shall be deemed to have visited the site and familiarised themselves thoroughly with the site conditions before submitting the tender. Non-familiarity with the site conditions will not be considered reason either for extra claims or for not carrying out the work in strict conformity with the drawings and specifications.

Address of Contact Person:

Temperature Controlled Warehouse

Balmer Lawrie & Co. Ltd.

Chhatabar, Dist-Khorda, Odisha, India

Contact Person for Site Visit: Mr Purnendu Das, Manager (Mob 6289 090838 / 9836809371)

4.00 SCOPE OF WORK

As per Notice Inviting Tender, Schedule of work, Technical Particulars and as required for refrigeration system offered by the tenderer.

5.00 VALIDITY OF TENDER

Tender submitted by a tenderer shall remain valid for acceptance for a period of **120** days from the date of opening of tender and will continue thereafter to be valid until specifically revised or permitted by giving **seven (7) days'** notice in writing to the Owner by the tenderer. Tenderers shall not be entitled during the said period, without the consent of the Owner in writing, to revoke or cancel his tender or change the tender offer given or any terms thereof.

In case of tenderer revoking or cancelling the tender changing any terms in regard thereof without written consent as stated above, the Owner shall forfeit the Earnest Money deposited by him along with the tender. No escalation to this effect will be accepted by the owner.

6.00 STIPULATIONS AND DEVIATIONS TO TENDER CLAUSES

Tenderers are advised to submit quotations strictly based on the terms, conditions and specifications contained in the Tender Document and not stipulate any deviations. However, if it becomes unavoidable, deviations should be stipulated with reference to the clause

number, para and page number of the Tender Document. Owner reserve the right to evaluate offers containing deviations having financial implications after adding cost of such deviations as determined by the Owner.

7.00 TAXES & DUTIES

The quoted rates shall be inclusive of all taxes, duties, levies except GST. GST shall be quoted as per provided Price Schedule.

8.00 ALTERATION IN SPECIFICATIONS AND DESIGN

During the execution of the work, the Engineer-in-Charge may desire to make any alterations in, omission from, additions to or substitutions from the original specifications, Drawings, Designs and Instructions that may appear to him to be necessary or advisable during the progress of work and contractor shall be bound to carry out such altered extra/new items of work in accordance with any instruction which may be given to him in writing by the Engineer-in-Charge and such alterations, omissions, additions or substitutions shall not invalidate the contract and any such altered additional or substituted work shall be carried out by the contractor on the same conditions on which he agreed to do the work.

9.00 DRAWINGS VIS-A-VIS SCHEDULE OF WORK

All drawings herein enclosed are for the purpose of furnishing basic information to the tenderers so as to enable them to quote their price. Upon receiving order, contractor shall design and prepare all working drawings and get approval from the Engineer. However, such approval does not relieve the contractor from his responsibility of correctness and safety of the work. Contractor shall remain responsible to submit the design and drawings for obtaining necessary approval from the statutory bodies.

10.00 TIME OF COMPLETION

The time schedule for total work according to the contract shall be for a period as mentioned in the Notice Inviting Tender. The contractor shall strictly adhere to the work break-down schedule in line with contractual completion period, to be developed and jointly agreed upon on award of contract, by deploying adequate personnel and construction tools and tackle. The time period mentioned includes the time required for mobilisation, testing, rectification if any, cleaning of site and completing in all respect to the satisfaction of the Engineer-in-Charge. In all matters concerning the extent of targets set out in the weekly and monthly programs and in the degree of achievement, the decision of Engineer-in-Charge will be final and binding.

The contractor shall require working in coordination with other contractors to be mobilised during interim period of execution. Proper co-ordinations and cordial relationships shall be maintained throughout the tenure of the project.

11.00 SUPPLY OF MATERIAL

All materials required for the work shall be supplied by the contractor. Payment shall be made based on payment terms furnished elsewhere in the tender.

All materials, as required to complete the work in all respects according to the contract rates shall be inclusive of all freights, CESS, Octroi and other taxes, duties, royalties, loading, unloading, transporting, handling and storage charges etc. Only GST shall be quoted separately.

12.00 SCRAP AND SERVICEABLE MATERIAL

Scrap materials and wastage will not be accepted back by the Owner and shall be considered as a property of the contractor. The Contractor shall take away all such materials, wastage and remove them from the site to the satisfaction of the Engineer-in-Charge.

13.00 TESTS & TEST PROCEDURES FOR MATERIALS SUPPLIED BY CONTRACTOR

Contractor shall submit Quality Assurance Plan mentioning frequency of testing to the owner for their review and approval. Only on approved QAP work the panels shall be manufactured. BL may carry out the inspection on their own or through their appointed Third Party inspection Agency.

Before starting of installation work, the contractor shall submit methodology / Standard Operating Procedure for erection of insulation panels for acceptance of owner.

14.00 MEASUREMENT & BILLING OF WORK

SUPPLY

Payment for Supply shall be made based on Delivery Challan/Packing List of the materials received at site.

ERECTION

Payment shall be made as per actual executed quantity. As most of the items which generally requires field measurement such as pipes, valves, insulation, cable etc. are in LOT in Schedule of Work, any such field measurement is not required except for steel work which will be paid per MT basis.

15.00 ON ACCOUNT PAYMENTS

- 15.01 Running Bill(s) shall be made and / or certified for a basic value of not less than **Rs 40,00,000/- (Rupees Forty Lakh)** [applicable for supply bill only]
- 15.03 All on account payments shall be subjected to deduction therefrom of all dues to the Owner, advance, retention money and other money deductible within the provisions of this contract and as per Section 194-C of Income Tax Act, or any other Law, Rule or Regulation for the time being in force along with the recovery towards the adjustment of secured advance if any.
- 15.04 All lawful payments as provided under ESI Act, Workmen's Compensation Act, PF Act etc. not made by the Contractor / Sub-contractor, Owner reserves the right to deduct from the Contractor's bills and remitted to the concerned Authority / Department or Body on Contractor's /Sub-contractor's behalf until sufficient proof is furnished by the Contractor / Sub-Contractor to the contrary.
- 15.05 All "On Account" Payments shall be regarded merely as an advance payment against the amounts due to the Contractor in terms of the contract and any such payments shall not be regarded as an acceptance or completion of any works paid for.
- 15.06 The payment shall be made within 30 days from the receipt of certified bills in the accounts department.

16.00 TERMS OF PAYMENT**16.01 SUPPLY**

- a) **75%** on pro-rata basis along with 100% taxes towards supply of materials/equipment progressively etc. upon receiving of materials in good condition and duly inspected and certified by the Engineer-in-Charge.
- b) **15%** after completion of erection, testing, trial and commissioning of the refrigeration system upon verification and certification by the Engineer- in-Charge.
- c) **10%** will be withheld as retention money for a period of 12 months from the date of issue of Completion Certificate. The Contractor may claim the retention money after issuance of Completion certificate submitting Performance Bank Guarantee of equivalent amount valid for a period of 12 months from the date of issue of Completion Certificate. Initial security deposit of 2% of basic contract value shall be returned after completion of work.

16.02 ERECTION

- a) **75%** on completion of erection after verification and certification by the Engineer- in- charge.
- b) **15%** after completion testing, trial and commissioning of the refrigeration system upon verification and certification by the Engineer- in-Charge.
- c) **10%** will be withheld as retention money for a period of 12 months from the date of issue of Completion Certificate. The Contract may claim the retention money after issuance of Completion certificate submitting Performance Bank Guarantee of equivalent amount valid for a period of 12 months from the date of issue of Completion Certificate.

16.03 PLANT OPERATION & MAINTENANCE

- a) Charges for Plant Operation will be paid on monthly basis.
- b) AMC charge will be paid prorata basis based on monthly invoices raised after completing the inspection/maintenance calls and submitting the inspection report duly verified by the Operation-in-Charge.

Security Deposit, Liquidated Damage & Performance Guarantee clauses are not applicable for Plant Operation & Maintenance.

17.00 SCHEDULE OF RATES

All the items of work mentioned in the Schedule of Rates and covered by the Contract shall be carried out as per the Drawings, Specifications and directions of Engineer-in-Charge and shall include all labour, materials, tools, plants, tackle, testing, if any, with Contractor's testing appliance etc. required to complete the work.

18.00 EXTRA ITEMS OF WORK

During the course of execution of the work, should the contractor come across items of work which are not covered under the Schedule of Rate or not included therein, the Contractor shall draw the attention of the Owner / Engineer-in-Charge to the same and such items of work shall be treated as extra only with the prior approval of Engineer-in-Charge in writing. Contractor shall submit a quotation along with the rate analysis for approval of EIC for such accepted extra items before he commences work or purchases the materials in connection with such items.

For extra items, rates shall be derived from similar item rates included in the schedule of work. Where there is no such similar item available in the schedule, rate shall be analysed as follows:

Rate for extra item = Cost of material (a) + cost of labour inclusive of all necessary tools, tackles, equipment, machinery and consumable (b) required to carry out the work + 15% of (a+b) towards profit and overhead + taxes, duties etc. as applicable.

IN RESPECT OF HSE REQUIREMENTS, CONTRACTORS ARE REQUIRED TO FULFIL THE FOLLOWING**Appendix-A****Pre-Qualification Questionnaire for Contractor****Guidelines for Completion of Questionnaire**

- i) The potential bidder is to ensure that the answers provided are focussed against the activities indicated in the pre-tender document.
- ii) The information is supplied in the same format and sequence in which they appear in the questionnaire. A minimum of 12 has to be obtained in the HSE pre-qualification questionnaire.
- iii) Failure to supply information that accurately and fully covers the material requested may result in an individual Contractor failing to meet minimum expectations and therefore being disqualified.
- iv) Contractor shall provide information that is authentic and documentary evidence.
- v) Even after getting pre-qualified, if it comes to the notice that non-authentic documents are provided, the Contractor may be disqualified and if any Contract is in place, it may be terminated immediately.
- vi) BL shall have right to audit Contractors records to verify the authenticity of the documents, during any phase of the Contract.

Questionnaire for HSE Pre-Qualifications of contractors:

Contractor Details	
Company Name	
Contact Person for HSE	
Name	
Telephone Number	
E-Mail Address	

	Question	Response		Evidence Required at bidding Stage	Weightage if complied
		Yes	No		
1	Do you have a signed and dated HSE Policy?			Attach HSE Policy	1
2	Do you confirm that you will comply with HSE Policy as per Appendix in as much as it is applicable to your scope of work?			None	1
3	Do you have a Health and Safety System certified by an accredited body to a recognized standard? (Eg : OHSAS 18001)			Provide Current Certificate	3
4	Do you have an Environmental Management System Certified by an accredited body to a recognized standard? (Eg : ISO 14001)			Provide Current Certificate	3
5	Have you identified, documented and maintained your Health and Safety risk assessment of your activities?			None	3
6	Have you identified, documented and maintained your Environmental Impact Assessment of your activities?			None	3
7	If you use subcontractors, will you assess them in terms of HSE?			None	2
8	Have you produced project/contract HSE plans for recently completed work?			None	2
9	Is HSE Covered in your company's organization chart?			Provide Current Org Chart.	2
10	Have HSE roles and responsibilities been defined in your company?			None	2

	Question	Response		Evidence Required at bidding Stage	Weightage if complied
		Yes	No		
11	Have your employees received documented HSE training appropriate to the task they will undertake?			None	2
12	Do you identify and monitor compliance with HSE Legislation?			None	2
13	Do you carry out regular medical examination for your employees?			None	1
14	Is your company free from any charges or notices served by the regulatory authorities in relation to HSE in the last 3 years?			None	1
15	Do you have any procedure of reporting HSE Incident and investigation?			None	2

	Please provide your accident data for the current year and the last 2 calendar years Note: this must include the data of any contractors working for your organization.	Current Year	Current Year -1	Current Year -2	Period Average (Three years average)
16	Number of Fatalities				
17	Number of Environmental Incidents reported to Pollution Control Board				
18	Number of accidents with 2 or more days lost time.(LTI)				
19	Man Days Lost				
20	Total Hours Worked				

I confirm that the above information is correct and that further evidence to support this will be provided to BL on request.				
Name	Position	Company	Date	Signature

Appendix-B

HSE REQUIREMENTS BY CONTRACTORS (To be a part of contract documents)

a) Housekeeping

Contractors shall ensure that their work area is kept clean tidy and free from debris. The work areas must be cleaned on a daily basis. Any disposal of waste shall be done by the Contractor.

All equipment, materials and vehicles shall be stored in an orderly manner. Access to emergency equipment, exits, telephones, safety showers, eye washes, fire extinguishers, pull boxes, fire hoses, etc. shall not be blocked or disturbed.

b) Confined Space

Before commencing Work in a confined space the Contractor must obtain from Owner a Permit to Work, the Permit to Work will define the requirements to be followed.

As minimum Contractors must ensure the following:

- i) Confined spaces are kept identified and marked by a sign near the entrance(s).
- ii) Adequate ventilation is provided
- iii) Adequate emergency provisions are in place
- iv) Appropriate air monitoring is performed to ensure oxygen is above 20%.
- v) Persons are provided with Confined Space training.
- vi) All necessary equipment and support personnel required to enter a Confined Space is provided.

c) Tools, Equipment and Machinery

The Contractor must ensure that all tools & equipment provided for use during the Work is:

- i) suitable for its intended use;
- ii) safe for use, maintained in a safe condition and where necessary inspected to ensure this remains the case (any inspection must be carried out by a competent person and records shall be available);

- iii) Used only by people who have received adequate information, instruction and training to use the tool or equipment.
- iv) Provided with Earth leakage circuit breaker (ELCBs) at all times when using electric power cords. Use of electrical tape for temporary repairs is prohibited.

d) Working at Height

Any Work undertaken where there is a risk of fall and injury is considered to be working at height.

For any Contractor Personnel working at height, Contractors shall provide fall prevention whenever possible and fall protection only when fall prevention is not practicable. Before commencing Work in a height the Contractor must obtain from Owner a Permit to Work, the Permit to Work will define the requirements to be followed. Supervisor must be present at all point of time, to ensure no deviation occur during the course of work.

Fall Prevention System

Fall prevention systems (e.g. fixed guardrails, scaffolds, elevated work platforms) must provide protection for areas with open sides, including exposed floor openings.

Fall Protection Systems

Where fall protection systems are used then the Contractor must ensure the following is applied:

- i) Only approved full body harness and two shock-absorbing lanyards are used,
- ii) Prior establishment of a rescue plan for the immediate rescue of an employee in the event they experience a fall while using the system,
- iii) Anchorage points must be at waist level or higher; and capable of supporting at least the attached weight,
- iv) Lifeline systems must be approved by Owner before use.
- v) Use of ISI marked industrial helmet at all point of time.

d) Scaffolding

All scaffolds shall subject to a documented inspection by a competent person and clearly marked prior to use. The footings or anchorage for scaffolds shall be sound, rigid and capable of carrying the maximum intended load without settling or displacement. All scaffolding materials should be of MS tubular type.

Guardrails and toe-boards shall be installed on all open sides and ends of scaffold platforms. Scaffolds shall be provided with an access ladder or equivalent safe access. Contractor Personnel shall not climb or work from scaffold handrails, mid-rails or brace members.

e) Stairways and Ladders

Ladders should only be used for light duty, short-term work or access in line with the below and the Site Requirements.

- i) Fabricated ladders are prohibited.
- ii) Ladders will be secured to keep them from shifting, slipping, being knocked or blown over.
- iii) Ladders will never be tied to facility services piping, conduits, or ventilation ducting.
- iv) Ladders will be lowered and securely stored at the end of each workday.
- v) Ladders shall be maintained free of oil, grease and other slipping hazards
- vi) Ladders will be visually inspected by a competent person and approved for use before being put into service. Each user shall inspect ladders visually before using.
- vii) Ladders with structural defects shall be tagged "Do Not Use," immediately taken out of service, and removed from the Site by the end of the day.

f) Lifting Operations

7.1 Cranes and Hoisting Equipment

Contractors shall operate and maintain cranes and hoisting equipment in accordance with manufacturer's specifications and legal requirements.

Only Contractor Personnel trained in the use of cranes and hoists are permitted to use them.

7.2 Lifting Equipment and Accessories

All lifting equipment / accessories e.g., slings, chains, webbing, chain blocks, winches, jacks etc shall be indicated with their safe working load have an identification number visible on the unit and be inspected and tested in accordance with legal requirements.

Damaged equipment / accessories and equipment shall be tagged "out of use" and immediately removed from Site

g) **Lockout Tag out (“LOTO”)**

Prior to performing work on machines or equipment, the Contractor shall ensure that it is familiar with LOTO and Permit to Work procedures and that all of its affected Contractor Personnel receive the necessary training.

h) **Barricades**

Floor openings, stairwells, platforms and walkways, and trenching where a person can fall any distance shall be adequately barricaded and where necessary, well lit. Where there is a risk of injury from a fall then rigid barriers must be used.

Barricades must also be used to prevent personnel entering an area where risk of injury is high e.g., during overhead work activity or electrical testing etc. Such barricading must provide clear visual warning.

i) **Compressed Gas Cylinders**

Gas cylinder shall be securely stored and transported, and identified and used in line with the local requirements. Hose lines shall be inspected and tested for leaks in line with local requirements. Flash Back arrestor to be used to prevent any explosion due to back fire.

j) **Electrical Safety**

Prior to undertaking any work on live electrical equipment the Contractor must obtain a Permit to Work from Owner. Where ever possible live work should be avoided. Any control measures highlighted shall be implemented prior to work commencing.

The below measures will be taken:

- i) Work practices must protect against direct or indirect body contact by means of tools or materials and be suitable for work conditions and the exposed voltage level.
- ii) Energized panels will be closed after normal working hours and whenever they are unattended. Temporary wiring will be de-energized when not in use.
- iii) Only qualified electrical Contractor Personnel may enter substations and/or transformer and only after being specifically authorized by Owner.

k) **Hot Works**

A Permit to Work must be obtained from Owner prior to any hot works (welding, grinding, open flame work). Suitable fire extinguishing equipment shall be immediately available. Objects to be welded, cut or heated shall be moved to a designated safe location, or, if they cannot be readily moved, all

movable fire hazards in the vicinity shall be taken to a safe place. Personnel working around or below the hot works shall be protected from falling or flying objects.

Prior to the use of temporary propane or resistance heating devices approval must be obtained from Owner.

l) Trenching, Excavating, Drilling and Concreting

A Permit to Work must be obtained from Owner and all underground lines, equipment and electrical cables shall be identified and located prior to beginning the work. The Contractor shall assign a competent Contractor Personnel to all trenching and excavation work.

Safe means of access and egress shall be located in trench excavations. Daily inspections shall be conducted by a competent Contractor Personnel for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems or other hazardous conditions.

Physical barriers shall be placed around or over trenches and excavations. Flashing light barriers shall be provided at night.

m) Environmental Requirements

14.1 Waste Management

The Contractor is responsible to remove any waste generated by the work being done on the Site. The Contractor must dispose of the waste in line with the relevant local legislative requirements. The waste disposal route shall be documented and made available for Owner to review at any time and may be subject to BL's prior approval.

Wastes (includes rinse from washing of equipment, PPE, tools, etc) are not to be poured into sinks, drains, toilets, or storm sewers, or onto the ground. Solid or liquid wastes that are hazardous or regulated in any way are not to be disposed of in general site waste receptacles.

14.2 Spills

The Contractor is responsible for the provision of adequate spill kits/protection and the clean up and disposal costs arising from such spills.

14.3 Emissions

The Contractor shall identify and quantify any emission sources associated with the Works. The control measures associated with these emission shall be subject to the approval of Owner. Emissions include but are not limited to noise, dust, fumes, vapours.

TECHNICAL PARTICULARS

- a) Design Basis**
- b) Technical Specification & Scope of Work**
- c) Codes and Standards**
- d) List of Approved Makes**
- e) Technical Schedule**
- f) Drawings**

Basis of Design																						
Maximum Ambient Temperature: 42 Deg C															Place :Industrial Estate, Plot nos. 5&13(p), Chhattabar, Dist-khurda, Odisha							
a) Temperate Controlled Warehouse (Chambers with Racking System for Storing Palletised cargo)																						
Sl. No.	Room Number	Room Name / Item Description	External		Storage Capacity, MT	Wall &		Floor		Details of Opening			Min Room Storage Temp in °C	Max Room Storage Temp in °C	Machinery W, MHE & ACU fans	Product Loading (Kgs/day)	Product Inlet temp in °C	Product Final temp in °C	Pull Down Time Hrs	No of running Hrs of Compressors	Calculated Refrigerant	
			L, m	W, m		H, m	Insulation Type	Insulation Thk (mm)	Door size(WXH)m	Door Type	Automation	Qty										
1	FC-1	Frozen Cold Chamber 1	21.85	7.19	12.9	252	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	25200	-10	-22	18	12	51
2	FC-2	Frozen Cold Chamber 2	21.85	8.15	12.9	336	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	33600	-10	-22	18	12	57
3	FC-3	Frozen Cold Chamber 3	21.85	8.15	12.9	336	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	33600	-10	-22	18	12	57
4	FC-4	Frozen Cold Chamber 4	21.85	8.15	12.9	336	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	33600	-10	-22	18	12	57
5	FC-5	Frozen Cold Chamber 5	16.9	7.19	12.9	198	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	19800	-10	-22	18	12	44
											1.5 X 2.1	Sliding	No									
6	FC-6	Frozen Cold Chamber 6	16.9	8.15	12.9	264	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	26400	-10	-22	18	12	49
7	FC-7	Frozen Cold Chamber 7	16.9	8.15	12.9	264	PIR	150	PUFF	100	2.2 X 4.5	Sliding	YES	1	-20	10000	26400	-10	-22	18	12	49
																					365	
9	AR	Ante Room	31.08	5.3	6.08		PIR	80	PUFF	100	2 X 4.5	Sliding	No	1	6	5000			8	18	12	17
											1.5 X 2.1	Sliding	No	1								
10	DA	Docking Area	27	7.8	6.8		PIR	80	PUFF	0	2 X 4.5	OSD	YES	1	6	5000			8	18	12	25
											2.4 X 3	OSD	YES	4	6							
Total Capacity in MT						1986	Anteroom & Docking area shall be connected with Freezer chambers										Total Load in KW frozen rooms (A)					406
b) Potato Storage with Racks with Humidity Control (RH to be maintained at 90-95%), Storage Life- 5-10 months																						
Product: Table Potato																						
Total Capacity: 3000 MT																						
Construction Type: Cold Store with Steel Structure and Steel mezzanine floors																						
Humidity Control: Automatic Type shall be provided to maintain RH of 90-95%																						
Ventilation requirement: 2 to 6 air changes per day to maintain CO 2 less than 4000 ppm																						
Mechanical CO2 Monitoring and Extractor along with energy recovery system shall be installed.																						
Pull Down Time: 15 °C in 24 Hrs followed by 0.5 °C per day till holding temperature 3° C +/- 1																						
Compressor running hours: 20 hrs/day during pull down																						
Sl. No.	Room Number	Room Name / Item Description	Internal		Storage Capacity, MT	Wall &		Floor		Details of Opening			Min. Room Storage Temp in °C	Max Room Storage Temp in °C	Machinery W, MHE & ACU fans	Product Loading (Kgs/day)	Product Inlet temp in Deg C	Product Final temp in Deg C	Specific Heat of Potato (KJ/Kg Deg K)	Heat of Respiration (mW/kg)	Calculated Ref. Load (KW)	
			L, m	W, m		H, m	Insulation Type	Insulation Thk (mm)	Door size(WXH)m	Door Type	Automation	Qty										
10	PC-1	Potato Chamber-1	22.2	21.395	13.7	1500	PIR	150	PUFF	50	1.5 X 2.5	Swing	No	2	2	4	10000	60000	27	3	3.433	18
11	PC-2	Potato Chamber-2	22.2	21.395	13.7	1500	PIR	150	PUFF	50	1.5 X 2.5	Swing	No	2	2	4	10000	60000	27	3	3.433	18
Total Load in KW for Potato (B)																			247.8			
Total Refrigeration Load in KW (A+B)																			654			
Note: 10 % Safety factor shall be taken on the estimated loads.																						

TECHNICAL SPECIFICATION & SCOPE OF WORK

1.0 INTENT OF SPECIFICATION

This specification is intended to cover the design, engineering, manufacture, assembly, testing at manufacturer's works, packing, supply including transportation & transit insurance, complete with all auxiliaries and accessories for efficient and trouble-free operation in a manner acceptable to Owner.

The specification includes all enabling works, installation of the system in a safe and acceptable manner as per good engineering practice, testing as per approved Quality Assurance Plan, commissioning, putting into successful commercial operation of the system and trouble free operation & maintenance of the system as specified in the tender to be installed at Temperature Controlled Warehouse proposed at Industrial Estate, Chhatabar, Dist-Khurda, Odisha.

1.01 Codes and Standards

All equipment and materials shall be designed, manufactured and tested in accordance with the latest applicable Indian/International Standards as applicable except where modified and/or supplemented by this specification.

2.00 SCOPE OF WORK:

The scope of work covers design, engineering, manufacture, assembly, testing at manufacturer's works, packing, supply & delivery at site including transportation & transit insurance, unloading at site, safe custody of plant and material at site, installation of the system in a safe and acceptable manner as per good engineering practice, testing as per approved Quality Assurance Plan, commissioning, putting into successful commercial operation of the system and trouble free operation & maintenance of the system as specified in various section of this tender.

All the materials and work other than those specifically mentioned to be in owner's scope required to make the plant functionally complete are included in the scope of this tender. The detailed scope would include but not limited to the following:

2.01 Design Engineering:

2.01.01 Plant Capacity & Design Basis:

The refrigeration system for cold stores shall basically comprise the following –

- i) Reciprocating/ Screw ammonia Compressors, high pressure receivers, low pressure receivers, ammonia liquid pumps, Air Cooling Units (ACU)/Evaporators, Evaporative Condensers, Oil Coolers and Oil Separators.
- ii) Other Accessories, Piping, Valves, pumps, Fittings, Electricals, Controls and PLC automation with internet accessibility and Data logging for each room etc.

The detailed layout plan with relevant sections are enclosed with this tender. Various parameters regarding the Frozen Chambers, Potato Storage Chambers and other temperature controlled areas are tabulated and enclosed in the Design Basis. Estimated heat loads for all such rooms are also provided in the design basis as a guideline to the bidders. Since the bidders need to undertake performance guarantee of the system, it is mandatory for them to check and make them satisfied for the same before making their equipment selection.

Tentative equipment capacity and their estimated quantities are enclosed in the Technical Schedule. However here also bidders need to check the same and satisfy themselves before submission of their bids. **Both the Design Basis and the Technical Schedule, capacity of equipment mentioned in the schedule should be treated as a MINIMUM ACCEPTABLE PARAMETERS by the owner.** Ammonia based refrigeration system has been considered for the plant.

2.02.01 Supply of Equipment & other ancillary materials:

All equipment and materials other than those mentioned to be in owner's scope would be supplied by the bidder. The scope of supply would consist but not limited to the following:

1. Compressor packages with suitable motors, controls, lubrication system and other associated items.
2. High Pressure Cylinders and Low Pressure Accumulators with pumps, motors, piping and other accessories.
3. Evaporative condensers with condensing coils, pumps, motors, piping etc.
4. Cooling Tower for compressor cooling with pumps, motors, piping etc.
5. Air Cooling Units with control system for all the rooms/areas wherever specified.
6. BL will free-issue the Air Cooling Units for Potato Storage Chambers. However, Transportation, pressure testing, installation & commissioning of those Air Cooling Units are under the scope of bidder.
7. Main MCC with VFD, Local control panels, local start/stop arrangement, cables & earthing materials etc.
8. Reputed make Desk Top PC, UPS, printer, PLC automation with internet accessibility, Data loggers for the entire system.
9. First Charge of Refrigerant, Oil and subsequent top up till handing over of the plant
11. All other materials required to make functionally complete is in the scope of the bidder.

2.02.02 The following engineering deliverables would be submitted by the bidder:

1. Basics of system design and write up of Plant operation, All Technical Literature, Heat Load Calculation, Machine Selection chart for all the major equipment need to be submitted along with the Technical Bid.
2. The capacity & make of the equipment offered would be furnished in the Technical Schedule enclosed with this tender along with Guaranteed Power and Water consumption of the plant along with this tender. Electrical load list as per attached format shall be submitted.
3. Concurrent commitment list, Organogram for execution of the job shall be furnished with the Technical Bid.
4. P&I Diagram, Plant Layout, Equipment Foundation details, ACU Installation details, Piping Arrangement, SLD and Control Circuit Drawings, PLC Control Schematic Drawings and detailed Quality Assurance Plan shall be furnished and need to be approved by the owner during detailed engineering stage.
5. Bidder shall furnish necessary completion schedule along with their Technical bid.
6. Detailed Spare Part list with part number, Installation, Trouble Shooting, Maintenance Manual, As Built drawings, & Data Sheets, Inspection Reports, Material Test Certificates, Hydro Test/Pneumatic Test Certificates , Guarantee/Warranty Certificates, Calibration certificates of sensors etc. would be submitted along with the handing over document (2 sets hardcopy in hardcover file/folder with index + softcopy in a CD).
7. Any other document required by the owner shall be furnished by the bidder.

2.02.03 Scope of the owner:

1. All Civil work e.g. equipment foundations for compressors, pumps including grouting, cable trench in the plant room, structural pipe corridor, walkway etc. inside cold chambers.
2. LT Power and water for plant operation in one single point each shall be given by the owner. However, no Construction water & power shall be provided by the owner.
3. Providing GI Main earthing grid near Panel. Further distribution for earthing of panels, equipment shall be under the scope of bidder.
4. Illumination system in cold rooms and machine room.
5. Ventilation system of Machine Room
6. Racking for storage of material both in freezer & chiller chambers including pallets
7. Insulation Panels for cold chambers, Door, strip curtains, pressure release valves for freezer chambers.
8. Material Handling Equipment
9. Supply of 8 Set of Air Cooling Units (refer enclosed drawing) out of which 6 set to be tested, installed and commissioned by the bidders in potato chambers. Necessary GI suspenders for ACUs shall be in the scope of the contractor.

2.02.04 Installation & Commissioning of the equipment:**1. Mobilization:**

The bidder would make proper arrangement of safe custody of their equipment and material at site till the handing over of the plant and equipment. Owner would only allot necessary space for this purpose.

2. Installation:

Installation of entire plant and equipment would be done by experienced skilled manpower under the direct supervision of the Construction Engineer of the Bidder. No work would be permitted without direct supervision of the bidder's representatives. The scope of installation will generally cover but not limited to followings:

- a) General installation i.e. positioning and installing all the processing, miscellaneous and service equipment as per approved layout drawings and as per the contract.
- b) Supply and installation of structural supports/ platforms /access ladders.
- c) Supply and installation of service and product piping including ancillary items.
- d) Insulation and cladding of piping and equipment including supply of materials.
- e) Interconnections of services and electrical with equipment.
- f) Clean up of work site.
- g) Testing, commissioning and start-up.
- h) Painting including supply of paints as per standard codes.
- i) Training of personnel.

3. Testing, Commissioning and Start-up:

- a) The contractor shall operate, maintain and give satisfactory trial run of the plant in such manner and for such periods as has been specified. Following are the pre-commissioning activities to be carried out by refrigeration contractor before commissioning of the plant.

A. Pressure Test

Test should be carried out for a minimum of 24 hours to identify the leakages in the system. The refrigerant system and the circuit shall be pressure tested with nitrogen gas / air to test pressure of 21 kg/cm² on high side & of 12 kg/cm² on low side. Subsequent to completion of the test, a proper Test Certificate should be furnished.

B. Vacuum Test

After pressure testing, the refrigeration system should be tested for vacuum at 600mm before charging the oil and refrigerant.

The system should then be kept under vacuum for 6 hours. If any loss in vacuum in the system after 6 hours period, it means there is a leakage in the system.

C. Electrical Tests

- i. Check motor nameplate voltage.

- ii. Check motor rotation and speed, prior to connection of the driven equipment.
- iii. Check for starting current & no load current of each motor.
- iv. Check the earth continuity loop resistance for every motor starter.
- v. Check the insulation to earth resistance for every motor starter taken with 500V “Megger” tester.
- vi. Test the full load current taken by all motors on each phase. (Only after commissioning)
- vii. Test the tripping time of starter overloads set to 10% above the motor nameplate rating.
- viii. Test the function of controls of each compressor unit. (E.g. selector switches correctly wired, high or low circuit cut-out operates, level switches correctly operating etc.)
- ix. Check motor temperature by running the motor for 4 hours on no load.

D. Air Flow in Cold Chambers

Airflow tests shall commence as soon as fans are wired up. The quantity of air can be checked with the help of anemometer & air throw can also be checked.

- b) The commissioning shall also include the following for each equipment:
 - i. Field disassembly and assembly of equipment, instruments and controls where required for access to fixing or adjustment.
 - ii. Clean out of lubrication system including chemical cleaning wherever required.
 - iii. Circulation of lubricant to check flow.
 - iv. Clean out and check out or all the service lines.
 - v. Check out and commissioning of instruments, equipment and plants, they shall attain the required properties/standards, specified tests in this regard must be carried out by approved authorities and their satisfactory reports submitted to the owner before start-up.
 - vi. Recharging or make-up filling of lubricant oil up to the desired level in the lubrication system of individual machine.
 - vii. Operation in empty condition to check general operation details wherever required and wherever possible.
 - viii. Closed loop dynamic testing with water wherever required.
 - ix. Operation under load and gradual load increase to attain maximum rated output.
 - x. Trouble shooting during the trial period.
- c) The contractor shall demonstrate proper working of all mechanical and electrical controls; safety and protective device, in presence of the owner’s engineer and the same should be duly recorded.
- d) Commissioning of automation system:
 - i. The contractor should provide a detailed schedule of testing all automation and control systems. All controlled or monitoring devices on the plant should be tested from the relevant control center and recorded to be operating as designed, including feedback detection.

- ii. A log of these operations is to be maintained, and each completed group of tests to be signed by the contractor's commissioning engineer.
 - iii. The purchaser reserves the right to witness as much of these test procedures, as he may feel necessary. Testing procedures and commissioning period will be as specified.
3. Bidder shall furnish Weekly and monthly Progress Report to the Engineer-in-Charge of the owner for his review. A monthly review meeting would be held in every month where the Project Manager/Senior representatives of the bidder would be required to be present.
 4. The entire installation job would be carried out as per approved SOP/Erection manual and in a safe manner as specified in this document and followed in good engineering practice.

2.02.05 Operation & Maintenance of the Plant:

1. The plant would be operated by the representatives of the bidder as specified in the Technical schedule.
2. The plant would be covered under maintenance contract without spares and consumables. This period would be affected after one year of Defect Liability period. The Defect Liability period would also have the same scope of the AMC.

3.01.01 Specific Technical Details:

1. Freezer Room

- a) Freezer Room to be maintained at -22 Deg C (-18 Deg to -24 Deg C)
- b) Product to be stored: Multi Commodity on Pallets in 6 High Rack System
- c) Capacity: 252 MT+ @336 MT X 3+ 198 MT + @264 MT X2
- d) Tentative Room dimension (Refer Tender Drawing and Basis of Design.)
- e) No of Chambers – 7
- f) 150 mm PIR Panels for Outer wall and Ceiling, 120 mm PIR Panel for Partition Wall
- g) 100 mm PUF Slab is considered for floor, above PUF Slab 150 mm thick RCC Floor
- h) Evaporating Temp minus 28 Deg C and Condensing temp 40 Deg C
- i) ACU should have fan ring heater.
- j) ACU should be with at least 2 fans with Air-throw of at least 30 m and 27000CMH
- k) ACU should be with SS304 Coils and Aluminum Fins having minimum 7 mm spacing
- l) Defrost should be Hot Gas for coil for cold room ACU.
- m) Drain Pan should have hot gas defrost
- n) Each Room should have Digital Temperature Controller placed near the door with 2 inch display with RS 485 port to be connected to central monitoring and data logging system and monitoring shall be done through PLC.
- o) Drawing for electrical panels should be submitted

- p) Compressor type –2 stage Reciprocation Compressor/ Twin Screw Open Type Screw Compressor (Optional)
- q) No of Compressor -4 Nos. Each 33%, (3 nos working + 1 nos standby)-for Reciprocating type
- r) Total cooling load – approx. 410 KW (Refer Annexure 1 – Basis of Design) including load of Docking and Anteroom
- s) Each Compressor to have minimum capacity 137 kW
- t) Refrigeration System Type -Pump feed Ammonia system

1.1 Docking & Ante Room

- a) Rooms are to be maintained at +8 Deg C (+6 to +10 Deg C)
- b) Docking Area-1
- c) Ante Room -1
- d) 80 mm Panel for Wall and Ceiling
- e) Ante room-100 mm PUF, 150 mm RCC VDF floor above that
- f) ACU should be with SS304 Coils and Aluminum Fins having 4 mm spacing
- g) ACU should be with at least 2 fans with Air-throw of at least 30 m and 27000CMH for chill rooms
- h) The ACU shall be connected with compressors of freezer rooms. As the temperature of these area are above 0 Deg C, necessary valves, fittings, controls shall be provided to connect with subzero system.

2. Potato Storage Room

- a) Chiller Room to be maintained at +3 Deg C (+2 to +4 Deg C)
- b) Capacity: @1500 MT X 2
- c) Product: Designed for potato storage in 50 Kg bags on mezzanine floor structure
- d) Tentative Room dimension (Refer Tender Drawing and Basis of Design.)
- e) No of Chill Rooms – 2 Nos
- f) 150 mm PIR Panels for Outer wall and Ceiling, 120 mm PIR Panel for Partition Wall
- g) 100 mm PUF Slab is considered for floor, above PUF Slab 150 mm thick RCC Floor
- h) Evaporating Temp minus 6 Deg C and Condensing temp 40 Deg C
- i) 8 nos of ACU are available at our existing plant located at Temperature Controlled Warehouse, RAI Plot No. 1924, 1924-A, Rai Industrial Area, HSIIDC Haryana. The successful bidder shall transport all 8 units (including loading at our existing plant) to our project site at TCW Bhubaneswar, do pressure testing, installation and commissioning. Out of those 8 units, 6 nos to be installed in 2 potato storage chambers, balance 2 units shall be kept at suitable place. GI Rods for hanging these units shall be under the scope of the tender.

- j) ACU should be with SS304 Coils and Aluminum Fins having 4 mm spacing .ACU should be with at least 2 fans with Air-throw of at least 30 m and 27000CMH.(Applicable for Optional Item 4.2).
 - k) Drawing for electrical panels should be submitted
 - l) Water defrosting shall be provided
 - m) Humidifier to maintain the RH should be provided along with RH Controller all rooms
 - n) Humidifier should be pump based system fogger type. Wetting of Potato due to humidification shall be avoided.
 - o) RO water quantity required for humidifier should be mentioned in the technical bid
 - p) Each Room should have Digital Temperature and RH Controller placed near the door with 2 inch display with RS 485 port to be connected to central monitoring and data logging system
 - q) Compressor type – Twin Screw Open Type Screw Compressor/Reciprocation Compressor
 - r) No of Compressor – 3 nos (2 working and 1 standby)- Each Compressor-50%
 - s) Each Compressor to have minimum capacity 125 kW.
 - t) Total cooling load – 250 kW (Refer – Basis of Design)
 - u) Refrigeration System Type -Pump feed Ammonia system
3. The compressors shall have the necessities safety devices and accessories as,
- For 2 stage Reciprocating Compressors**
- a) Drive set with Motor, coupling, coupling guard
 - b) Instrument cum cutout panel with impulse tubing and fitting
 - c) LP and HP control switch
 - d) Unloading Solenoid valves
 - e) Crankcase heater
 - f) Base frame with mounting bolt and belt tension adjustment
 - g) Suction & discharge stop valve
 - h) Discharge check valve
 - i) Suction scale trap with strainer
 - j) Oil separator with float and oil return
 - k) Electric heater with thermostat in oil separator
 - l) Inter stage cooling system for 2 stage compressor
 - m) Lubricating system with oil pump
 - n) Dual oil filters of 15 microns
 - o) Suitable oil cooler complete with fittings, if required
 - p) Dual safety valve
 - q) TEFC 4 pole , IE3, VFD compatible sq. cage induction motor for 415 V, 3ph, 50 Hz supply

- r) Danfoss/Allen Bradley/Siemens/ ABB make VFD
- s) Motor winding thermal relay
- t) Motor current, voltage, phase protection devices
- u) PLC control panel indicating suction, discharge pressures and temperatures and interlocks.
- v) All controls shall be Danfoss/Manik make only
- w) Base frame with foundation bolts

For Single Stage Screw Compressors (Optional for Frozen Chambers)

- a) Total 3 nos (2 working +1 Stand By): Minimum capacity of each 205 KW for Freezer
 - b) Suction & discharge stop valve
 - c) Discharge check valve
 - d) Suction scale trap with strainer
 - e) Horizontal Oil separator with coalesce filter
 - f) Bypass Arrangement
 - g) Oil Level Switch in Oil Reservoir
 - h) Electric heater with thermostat in oil separator
 - i) Lubricating system with oil pump
 - j) Dual oil filters
 - k) Automatic Capacity Control
 - l) Unloading Starting
 - m) Dual safety valve
 - n) TEFC 4 pole , IE3, VFD compatible sq. cage induction motor for 415 V, 3ph, 50 Hz supply
 - o) Danfoss/Allen Bradley/Siemens/ ABB make VFD
 - p) Motor coupling with coupling guard
 - q) Motor winding thermal relay
 - r) Motor current, voltage, phase protection devices
 - s) Horizontal Shell and Tube Flooded Economizer of suitable capacity with necessary controls
 - t) Horizontal Shell and Tube Thermosyphon oil cooler fitted with inlet/outlet connections, valves and fittings
 - u) PLC control panel indicating suction, discharge pressures and temperatures and interlocks.
 - v) All controls shall be Danfoss/Manik make only
 - w) Base frame with foundation bolts
- The bidders shall quote for screw compressor package also for frozen chambers as mentioned under optional items (4.1.1, 4.1.2, 4.1.3 & 4.1.4 of Schedule) along with

- reciprocating compressor package. It may be executed in place of reciprocating compressor package while placing order. However, the quoted amount for screw compressor package will not form part of price evaluation. If any bidder does not quote for reciprocating compressor package and quotes for Screw compressor package only, this will be taken into price evaluation in place of reciprocating package.
- However, for potato storage chambers, bidders may quote either for reciprocating or screw compressor package as per their choice against item no 2.1.1 & 2.1.2, 2.1.3, 2.1.4.
4. Compressors are to be placed at ground level with vertical difference more than 10 m from Evaporator and horizontal distance as shown in the drawing for the plant room. The piping is to be considered from plant room to individual air cooling units as lumpsum.
5. **Low Pressure Receiver (LPR):** Horizontal ammonia accumulators for the liquid pump circulation system. The accumulator shall be suitable for the specified plant capacity. However, minimum capacity shall be as mentioned in Schedule. The successful bidder shall submit the capacity calculation for owner's approval during engineering. The low pressure receiver of suitable capacity fabricated of MS shell and dished ends of suitable thickness. The vessel shall be designed as per ASME Sec VIII with spot radiography and fabricated of IS2002/ SA516 plates. Necessary inlet, outlet nozzles shall be provided with suitable flange for operating pressure rating. Vessel shall be sized suitably to separation of ammonia liquid and vapour at full capacity at minus 30 deg C. Vessel should be hydro tested at 15 kg/sq. cm pressure.

Following should be provided:

- a) Liquid outlet and gas inlet connections.
- b) Liquid in feed connection.
- c) Inlet valve, liquid outlet valve to pump, and complete with std accessories
- d) Stand pipe of minimum 200 mm dia x 300 mm long or as required with connections for liquid level control etc., with provision for fitting isolating valves.
- e) Oil sump with oil drain connection, at the bottom of stand pipe size 200 dia x 500 mm long
- f) Dual Safety Valve, purge / pressure gauge connections
- g) Reflex Type Level Gauge
- h) Pressure Gauge
- i) Supporting structural framework for mounting receiver and ammonia pumps with operational platform and access ladder.

Following controls shall be provided in LPR.

- a. Liquid line solenoid valve (feedback shall be provided in PLC & SCADA)
- b. Liquid level controller
- c. Differential Pressure switch
- d. Frost free gauge glass

6. Ammonia Liquid Pumps: The ammonia liquid pumps to feed at rate of 4X re-circulation of liquid ammonia at evaporating temperatures of minus 30 degree C for cold store evaporators. The pump shall be canned or mechanical seal type or with SS304 suitable material for continuous trouble free operation. It should be suitable for pressure variation and even small flow of ammonia liquid. The pump system to have the following parts:

- a. Counter flanges for all connections
- b. Stop valves
- c. Strainer having suitable meshed filter (cleanable type)
- d. Non return valve cum stop valve on discharge side
- e. Pressure gauge on discharge side of 6 inch size dial
- f. Mechanical seal
- g. Bearings (pump and motor ends)
- h. Impellers
- i. Couplings
- j. Low and high flow nozzle and return arrangement
- k. A provision on the discharge side should be provided to evacuate the pump with a pressure gauge.
- l. Pump headers and suction connection is such way to avoid vortex formation at all operating conditions.

7. Gas & Liquid Cooler (For 2 stage reciprocating System only): The gas and liquid cooler of suitable size shall be considered. The successful bidder shall submit the capacity calculation for owner's approval during engineering. Vessel shall be designed as per ASME Sec VIII with spot radiography and fabricated of IS2002/ SA516 plates. Necessary inlet, outlet nozzles shall be provided with suitable flange for operating pressure rating. Vessel shall be provided with dual safety relief valve, pressure gauge, reflex type level gauge, vent and oil pot with drain valve. Vessel shall be sized suitably to sub cool liquid and separation of ammonia liquid and vapour at full capacity at minus 10deg C. Vessel should be hydro tested at 24 kg/sq. cm pressure.

8. Evaporators/Air Cooling Units:

- a) Unit Type – Ceiling suspended type, as specified, designed for continuous operation and for ammonia refrigerant. The unit shall be generally made in three sections complete with coil section, blower section and insulated drain pan.

- b) The casing is made of GI sheet / Powder coated GI Sheet. The blower section shall comprise of high efficient axial flow fan directly driven by suitable TEFC Squirrel Cage Induction Motor.
- c) ACU shall be complete with HOT GAS DEFROST in coils and hot Gas coils in drain tray. :
- d) Flooded over feed Evaporators
- e) Unit casing -- made from 1.6 mm thick. Powder coated G.S. sheet. Drain pan --1.6 mm S.S. / 2mm M.S sheets duly galvanized & powder coated.
- f) The pan shall be suitably insulated and provided with hot gas defrosting in case of sub-zero application. The Drain Pan shall have proper slope with liberally sized drain outlets.
- g) S.S. 304 tubes with aluminum plate type fins (having 3 Fins Per Inch) fitted with proper bonding mechanism.
- h) The GI rod used for hanging of evaporator shall have necessary coating of insulation material.
- i) The coils shall be pneumatically pressure tested at 21 kg / sq. cm.
- j) Fans -- Made of cast aluminum / S.S / G.R.P / P.I.G adjustable blades in aerofoil design with variable pitch. The fans shall be statically and dynamically balanced and shall have adjustable vertical louvers or fan guards in SS Construction. The fan motors shall be SIMENS/ KIRLOSKAR or equivalent Approved Make, TEFC squirrel cage type with Class 'F' insulation, suitable for operation on 415 volts, 50 C/s A.C supply. The motor shall be suitable low temperature application as specified. Fan peripheral heaters to be provided in case of sub-zero temperature application.
- k) Defrosting -- Defrosting system shall be water (for potato storage) / hot gas (for frozen chambers)/ or electric as specified. Water defrosting system shall have a tray made of 1.6 mm G.S sheet over the coil with rows of 6 mm holes over the coil rows. The water supply header of G.I. 'B' class pipe with nipples for uniform distribution of water shall be provided.
- l) Suitable control system like hand expansion valve, strainer , liquid line solenoid valve with necessary piping and hanging support from Warehouse structure and fitting to be provided.

9. Oil Separator: Shall be of suitable capacity for separating oil from the discharge gas at high pressure and temperature. It should have float assembly at the bottom with drain with valve.

10. High Pressure Receiver: The receiver shall be size to hold full liquid during pump down of system with 20% buffer gas volume. However, minimum capacity shall be as mentioned in Schedule. The successful bidder shall submit the capacity calculation for owner's approval during engineering. Vessel shall be designed as per ASME Sec VIII with spot radiography and fabricated of IS2002/ SA516 plates. Necessary inlet, outlet nozzles shall be provided with suitable flange for operating

pressure rating. Vessel should be hydro tested at 24 kg/sq. cm pressure. The receiver shall be complete with the following:

- a) Liquid inlet and outlet connection.
- b) Dual Safety valve connection with safety valve.
- c) Purge valve connection.
- d) Pressure gauge connection.
- e) Reflex type level gauge.
- f) Oil, drain connection with oil sump.
- g) Water spray system with ball valve shall be provided above receivers.
- h) Stand as required for HP Receivers

11. Ammonia Evaporative Condenser: The condenser shall be of induced draft type/ forced draft type as, as specified below, suitable for ammonia and designed for continuous heavy duty operation. The Condenser shall be of suitable capacity for heat rejection with all compressors running minus 28 deg C and condensing at 40 deg C wet bulb temperature plus 2 deg must be considered for the design. Condenser shall be with SS304 coil with blow through centrifugal fans, water spray pump, sump, drift eliminator, water level float. Necessary water inlet, drain nozzles shall be provided. The condenser shall be complete with SS water sump tank as specified below:

- a) Max 20 / 25 mm OD x min 1 mm thick MS Hot dip galvanized tube shall be provided as coil. The vertical spacing in the pipes shall be such that adequate clearance (around 50mm) is available for cleaning of the pipes manually.
- b) Fan section with 2/3 Nos. tube axial type fans with cast aluminum or S.S. / GRP impellers in aerofoil design. The fan motors shall be KIRLOSKAR/ CROMPTON/SIEMENS/BHARAT BIJLI/ABB EQVT MAKE, TEFC squirrel cage with class 'F' insulation and IP 55 Protection and suitable for hot and humid air stream. The motors shall be suitable for 415 V, 3 phase, 50 C/s, A.C. supply. The fans shall be provided with guards made of S.S. material.
- c) The water sump tank shall be made of 2 mm S.S 304 Sheets duly coated with two coats of epoxy paints as specified. The tank shall be provided with water outlet connection, quick fill and make up connection, drain and overflow connection. The water spray arrangement shall incorporate G.I. 'B' class/ PVC water spray header and nozzles of synthetic material designed for Heavy duty operation. Eliminators of efficient design made of 0.8 mm G.I or PVC fill shall be incorporated in the fan section. Air inlet section shall be provided with removable louvers made of G.S. sheet / PVC.
- d) The unit casing shall have removable panels made from 1.6 mm G.S sheet and the structural steel shall be hot dip/ spray galvanized. The unit shall be finally painted with two coats of zinc rich / aluminum paint. The casing shall be designed for leak proof operation. Openable

type inspection windows shall be provided on two longer sides with rubber gaskets between the water header and the coil section.

- e) Ancillary items such as float valve for make-up water, removable strainer for water outlet etc.
- f) Cleaning brushes for the condenser tubes cleaning (2 sets for each condenser) shall be provided.

12. Ammonia Piping Fittings and valves:

- a) Ammonia (refrigerant) piping, fittings and valves shall be provided as per the drawings approved by owner and as per the quantities required as given in tender.
- b) All the piping shall be as per following specifications:
 - Up to 40 NB : Carbon Steel conforming to ASTM A-106 Schedule 80, Grade B Seamless
 - 50 NB & larger :Carbon Steel conforming to ASTM A-53 Schedule 40, Grade B – Seamless
- c) JOINTS:
 - Up to 20 NB: May be serviced with proper jointing compound.
 - 20 NB & larger: Welded joints made by certified welders for pressure piping systems.
 - Flanged joints shall be used where necessary for normal maintenance & where required to isolate equipment.
- d) Flanges & fittings shall be standard Refrigerant fittings / wrought (forged) carbon steel. All flanges, elbows, bends, tees, or other pipe fittings shall be included as a part of left piping.
- e) All material required for supporting non insulated & insulated Refrigerant piping shall be enclosed in the scope of Refrigerant piping.
- f) The valves up to 15 NB size shall be screwed type provided with weldable flanges and counter flanges of approved make. The strainers shall have steel body with removable SS screen.
- g) All the refrigeration piping shall be thoroughly cleaned internally before installation.
- h) All the pipe supports shall be of M.S construction duly painted with anti-corrosive paint. Extra support shall be provided for supporting valves and other heavy fittings. Suitable clamps with rubber pads shall be provided with vertical risers. For pipe passing through walls. Suitable larger sized sleeves shall be provided. All the piping shall be pressure tested pneumatically at pr. 21 Kg/cm².
- i) All the M.S piping and valves etc. shall be painted as per the std. color codes. Fittings of accessories such as gauge, thermometer shall be included in the scope of work.
- j) Line valves will be “Y” type or Angle type Globe.
The valves should have following features
 - i. full port opening
 - ii. compact design
 - iii. Body should be of carbon steel / Seamless pipe

- iv. Provision of Gland packing replacement under pressure.
- v. valve spindle should be of SS410
- vi. Provision for back seat arrangement.
- vii. Replaceable Teflon valve seat.
- viii. Non-Rotating Valve disc thus increasing seat life.
- ix. Provision of direct welding of valve body to pipe line reducing number of joints

13. Water Piping, Fittings and Valves:

- a) All the piping up to 50mm shall be G.I. 'B' class as per relevant IS specification and from 65mm onwards 'C' class. M.S. pipe as per IS-1239 specifications.
- b) Adequate number of flanges/ unions shall be provided in the piping for proper maintenance.
- c) The valves shall be Butterfly type and have cast iron construction body and disc. These valves shall be flanged type. The check valves shall be of swing type and shall have cast iron body and disc. The valves would be of approved make.
- d) All the pipe supports shall be of M.S construction duly painted anti-corrosive paint. Extra supports shall be provided for supporting valves and other fittings. Suitable clamps with rubber pads shall be provided with vertical risers. For pipes passing through walls suitable larger sized sleeves shall be provided wherever necessary.
- e) The piping shall be pressure tested. Hydraulically at a pressure of 7 Kg/cm² or 1.5 times the maximum pressure whichever is higher for 24 hours.
- f) The M.S. / G.I. pipes shall painted as per standard color code.
- g) Condensers/ Cooling Tower on terrace of plant room at a distance of not more than 12M from the plant/machine room.

14. Structures: Equipment Support, Pipe Support

- a) MS stand and structure to support equipment in scope of supply. Especially platform with handrails, stairs, for operation and maintenance around LP Receiver, Priority vessels, Air Purger, Evaporative Condensers shall be in the scope.
- b) Pipe support (wherever required including hanging of ACU) fabricated of suitable size MS Channels and angels with anti-rust and anti-corrosive paint.
- c) Spacing of pipe supports shall not exceed the following:

Pipe sizes	Spacing between supports
Up to 12mm	1.5m
15 to 25mm	2.0m
30 to 150mm	2.0m
Over 150mm	2.5m

- d) All steel structures, Pipe lines shall be cleaned with wire brush then painted with two coats of epoxy based primer followed by two coats of finished epoxy-based paints of approved shade and make. Pipe marking with paint shall be done to identify the use, contents and flow direction of pipes.

- e) All the equipment shall be marked with paint indicating equipment no, capacity etc.

15. Thermal Insulation for Piping, Vessels etc. :

- a) PUF section Insulation materials for low temperature suction line, sub cooled line, inter-cooler suction and where the operating temperature is below 18C. Insulation shall be complete with surface preparation, bitumen and finishing with polythene sheet vapour barrier, 22G / 24G Al sheets with S.S. bands with necessary screws and hardware.
- b) Insulation of accumulators / intercoolers / other vessels with PUF or equivalent material
- c) Ammonia pumps, Valves, strainers other fittings shall be insulated with nitrile rubber to prevent formation of frost.
- d) Insulation of small pipes, fittings and valves with 50 / 25 mm thick Nitrile Rubber / EPDM insulation
- e) Insulation of Refrigeration Valve with flexible material with suitable cladding with proper holding to the valve body. The insulation shall be suitable for removable & refitting during maintenance.
- f) Insulation of drain pipes with Nitrile Rubber / EPDM insulation with factory fitted Al foil cladding. Heat tracers for the pipe portion inside the chamber shall be provided.

16. Electrical Work for Refrigeration System:

- a) **MCC:** Electrical panel of free standing type cubical construction fabricated of MS powder coated of suitable sheet thickness to enclose starter Y/D for compressor motor, starter for evaporators, condenser fan, pumps. Panel to have IP 52 rating with RAL 7035 Colour and have required control and should comply with local Statutory Acts, Rules, Standards and Safety Codes. Main incoming supply 415 V / 3 PH/ 50 hz will be provided in the plant room to the electrical panel.

The switchboard shall be indoor, floor mounted, self-supporting, front open able, cubical type made up of vertical panels arrangement to form a continuous line up of uniform height. Front door and cable alleys cover shall be hinged type & bus bar alley shall be bolted type. Switchboard shall be extensible at both the ends by addition of vertical section. Aluminium bus bar of suitable rating shall be provided.

The Panel shall be complete with bus-bar, Incoming & Outgoing Feeder, current transformer, switch fuse unit, set of starters, and overload relay, ammeters, volt meter & Push buttons.

- Motors of 12kW shall be suitable for Y/D starting
- Compressor motor to have start to start to delay and per hour start counter with limit setting
- The MCC panel shall have Energy meter installed to measure the electrical power consumption by the refrigeration system.

- Motors (such as Water pumps, condenser fans etc) installed open to atmosphere shall have canopy for weather protection.

b) Local Control Station:

All outdoor panels, local control stations shall be of outdoor duty (i.e. with IP65 protection) only.

c) Power & Control Cabling:

- KV grade PVC insulated , PVC sheathed, Al / Cu conductor, armored cables as per IS : 1554 , to be laid in excavated trenches , readymade cable trenches, cable trays, on wall / structure with necessary dressing clamping, cleating, tagging etc. including termination.
- Cable selection as per good engineering practices, generally as per, but not limited to the following sizes:
 - a) 3C x 70 sq. mm - Aluminium
 - b) 3C x 50 sq. mm - Aluminium
 - c) 3C x 35 sq. mm - Aluminium
 - d) 4C x 4 sq.mm - copper
 - e) 3C x 2.5 sq.mm - copper
 - f) 4C x 2.5 sq.mm - copper
 - g) 2C x 1.5 sq.mm - copper
 - h) 3C x 1.5 sq.mm - copper
 - i) 4C x 1.5 sq.mm – copper

d) LT cable termination:

LT cable termination using heavy duty tinned copper lugs, brass nickel plated double compression cable glands, PVC tape, PVC sleeves etc. selection as per good engineering practices, generally as per, but not limited to the following sizes :

- a) 3C x 70 sq. mm - Aluminium
- b) 3C x 50 sq. mm - Aluminium
- c) 3C x 35 sq. mm - Aluminium
- d) 4C x 4 sq.mm - copper
- e) 3C x 2.5 sq.mm - copper
- f) 4C x 2.5 sq.mm - copper
- g) 2C x 1.5 sq.mm - copper
- h) 3C x 1.5 sq.mm – copper
- i) 4C x 1.5 sq.mm – copper

e) Cable Trays:

14 gauge GI perforated trays with galvanizing as per IS: 2629, IS: 4759 etc. to be mounted in trenches, wall, beam, structure etc. including steel supports as per site conditions.

- a) 300 mm,
- b) 200 mm,
- c) 100 mm,
- d) 50 mm

f) Earthing:

- Earthing as per IS : 3043 using conductors of following sizes inclusive of brazing, welding, jointing, clamping, hardware, bituminous paint at joints, connection to equipment and all required material, to be laid in trench, trays or on floor / wall / ceiling / roof / structure etc. with clamping at 500mm intervals.
- All electrical panels, , metal piping, conduits, cable trays etc. shall be earthed at two ladders, handrails etc. shall be earthed using single earth conductor bonded to each component with ends connected to two different points of the earth grid , Metallic sheaths , screens, armour of cables. Neutral connections and metallic conduits / pipes shall not be used for equipment earthing, generally as per, but not limited to the following sizes :
 - a) 40 x 6 GI strip,
 - b) 32 x 6 GI strip
 - c) 25 x 6 GI strip
 - d) 25 x 3 GI strip
 - e) 4 SWG GI wire
 - f) 8 SWG GI wire
 - g) 12 SWG GI wire
 - h) 14 SWG GI wire

17. PLC

- a) Siemens/ Allen Bradly / Equivalent make PLC having 512KB micro memory which shall be configured for following approximate inputs depending on system configuration, Redundancy required only for power supply units(CPU and communication Redundancy not required)
- Digital Input
 - Digital Output
 - Analog Input
 - Analog Output
 - PLC & SCADA software
 - PC with 19" LCD Monitor for SCADA (configuration of the PC shall be as per recommendation by SCADA software package contractor)

- b) PLC is for control & monitoring of entire Refrigeration plant with Graphical HMI. PLC shall be with Analogue/Digital Input, output cards as specified above.
- c) PLC shall view all process parameters viz. compressor suction/discharge/oil pressures, pressures of HP Receivers, LP Receivers, ammonia pumps, Inlet Outlet temperatures of condenser, Potato Chambers, frozen room and other area, RH, action of all solenoid valves etc.
- d) PLC shall control following but not limited to: Room temperature with provision of suitable temperature sensors (Adequate nos. of temp. sensors shall be provided in each chamber)
- e) It shall also control Liquid Level of LP Receivers (Accumulator) and Defrost control. HMI shall indicate status of all motors, Real time process parameters, alarms etc.
- f) Control system to have following features as Compressor on/off status, run hours recording, evaporator fan status, defrost status etc., shall be display with plant layout mimic on the PC screen.
- g) PLC and SCADA shall control the automatic control of CO2 extraction system
- h) Automatic Air purger shall have the option of operating from SCADA/PLC
- i) It shall have provision for Alarm History of last one month.
- j) Provision shall be made to operate the Refrigeration plant manually or automatically.
- k) PLC panel shall be made out of 14/16G CRCA sheet. It shall have suitable rating redundant PSU/MCB/Relays/Terminals etc.
- l) Adequate nos of temperature sensors shall be provide for measurement and control of temperature. At least 2 nos each in 7 frozen chambers, atleast 7 nos each in 2 potato storage chambers. Feedback from all the sensors shall be provided in PLC and SCADA. Provision shall be there in PLC and SCADA to add more nos sensors in future.
- m) The cost should include related power & control wiring. Internal wiring shall be of 1.5mm² for control and 2.5mm² for power. Cable entry shall be from top. It shall have provision for external earthing with one Cu/Al electrical and one electronic bus bar.
- n) Computer Configuration i5 processor, 4GB RAM, 1TB hard disk, 23.5" or higher TFT Monitor with Windows 10 and vendor's required software preinstalled.
- o) Necessary Officejet printer compatible with the installed software and SCADA software for both Chiller chamber & Frozen Chamber PLC Panel.
- p) Power Backup /Ups with 2 Hrs Backup shall also be provided.

System Integration

All compressors, ammonia pumps, evaporative condensers, pumps and ammonia safety systems to be connected to main plc with control and data acquisition.

Safety plc system connected to all pressure relief valves, ppm sensors, with pressure ventilation systems to be incorporated for accident control.

18. Cooling Tower: Approved Make Cooling Tower of required capacity with condenser water pumps (1W +1 S/B) and fan of suitable capacity for Compressor head cooling.

19. 4 Point Automatic Air Purger: Approved make Fully automatic air purger shall be provided to vent out non-condensable gases efficiently and automatically to help in maintaining condensing temperature at nearly optimum operating conditions and reducing the concentration of non-condensable gases to a negligible percentage.

20. Ammonia Leak Detection: Features of the system shall be as mentioned.

Single point and multipoint Alarm Units Operates on 230VAC, 50Hz, with inbuilt power supply for Ammonia Transmitters In-built Alarm Hooter LED Indication for Each Channel Contamination, Early Warning and Alarm Status Robust case for long life in harsh environments Continuous monitoring Low zero point drift Poisoning stable Long life sensor Easy maintenance / calibration Reverse polarity protected Overload protected. The sensors shall be located in cold room atleast 1 sensor for each room, total atleast 5 sensors within machine room, atleast 10 sensors in pipe corridor area. The panel shall be powered with UPS supply.

21. Trap Alarm: Trap Alarm for all cold room with emergency illuminated push buttons shall be provided. Push Buttons shall be provided for all cold chambers (frozen chambers, potato storage chambers & Ante room). Main Panel with Indicating lamps for each chambers shall be located near office area. At least 3 hooters (Docking area, office are and machine room) shall be provided. Trap alarm system shall be connected from UPS supply.

22. Air Circulation for Potato Storage: Minimum 50 CFM/MT of Potato Storage (85 CMH/ MT of Potato) during the loading and pull-down period. However, during the holding period fan power shall be optimized by fan speed reduced to almost 70% by VFD control and thereafter automatic control will maintain temperature variation within each chamber at less than +/- 1 °C throughout the storage period.

23. Ventilation requirements in Potato storage: Generally, it may range between 2 to 6 air changes per day to maintain CO₂ less than 4000 ppm. The fan shall have the capacity to reduce and maintain CO₂ level below 2000 ppm for French fry varieties of potatoes. Mechanical CO₂ extractor with energy recovery system (minimum 70% recovery) shall be installed. It shall be complete with axial flow/inline duct fans cleanable inlet filters, G.S sheets / Aluminium ducting up to cold chambers and ducting for exhaust from cold chambers to outside. Duct mouthpieces with GS sheet to be provided on each fan outlet for uniform distribution of air at the top most level.

24. Common specification and requirement:

- a) All pressure vessels after pressure test shall be drained, dried and coated with 2 coats of anti-rust primer followed by two coats of paint of approved shade.
- b) Evaporative Condenser to be placed on the ground or at the roof of plant room (as per suitability of layout) with vertical difference more than 6 m from compressor.
- c) Refrigeration piping to be taken above the Cold Chambers at about +13.5 mtr height from FFL and evaporator will be hung at about +12 m level below the PIR panel ceiling and plant room is at FFL. Adequate care shall be taken to avoid dropping of water from the piping on the insulation panel.
- d) Two separate pipe corridor shall be formed for Frozen Chambers and Potato Storage Chambers.
- e) Piping corridor along with maintenance platform shall be planned/designed during detail engineering to facilitate ease of maintenance, cleaning etc. Approach/Stair required to reach piping corridor shall be clearly specified in the layout.
- f) Drain piping to be insulated and heated for freezer room and with U trap outside the cold and should be terminated near the plant room, (pipes running above the ante room from all cold room to outside near plant room area).
- g) Pressure test, radiography test, material test Certificates, Calibration certificate of all sensors shall be submitted for record.
- h) Supplier to include first charge of oil, lubricant, Refrigerant gas and top up during trial run and till stabilization of the system.
- i) Bidder shall indicate the quality of water required for evaporative condenser along with their Unpriced Bid.
- j) All the stand by equipment such as compressors, pumps etc. shall also be installed so that those can be operated as working units as and when required. Only spare items need not to be installed at site. Bidders shall quote zero for installation against those items.
- k) During commissioning of cold chambers, all the openings done by the refrigeration contractor for pipes, cables, erection purpose etc. within cold room shall be thoroughly checked for any leakage. Same shall be plugged with chemical/foam and/or silicon.
- l) The supplier / contractor is responsible for obtaining necessary import licence, payment of duties and securing release of the imported materials from the Indian Customs.
- m) The entire system shall be guaranteed for trouble free operation for a period of **12 months** from the date of commissioning. During that period, any replacement or maintenance of any system component, spares etc. are the responsibility of the supplier. The same shall be

supplied and carried out free of charge. In case of loss of gas or oil due to leakages from pipes, components or equipment the same shall be supplied free of charge during guarantee period.

CODES & STANDARDS

a) Safety in Mechanical Refrigeration

1.	Safety Code for Mechanical Refrigeration	IS 660 – 1963 (Revised) / ASHRAE 15 - 2001
2.	Equipment Design and Installation of Ammonia Mechanical refrigeration Systems	ANSI / IIAR 2 - 2014
3.	Ammonia Compressor Units	ANSI/ARI 510 - 1993

b) Piping Systems / Equipments

1.	Refrigeration Piping	ASME/ANSI B 31.5 – 1992/ IIAR 2 - 2014
2.	Copper Tubes for Refrigeration & Air-conditioning	IS 10773
3.	Mild Steel Tubes and fittings	IS 1239
4.	Seamless Carbon Steel Pipes	ASTM A106
5.	Seamless & Welded Black / Hot dip zinc coated pipes.	ASTM A53
6.	Seamless & Welded Steel pipe for low temperature services	ASTM A333

c) Pressure Vessels

1.	Refrigerant Liquid Receivers	ANSI / ARI 495- 1999
2.	Water-cooled Condensers	ARI 450 – 2007
3.	Air-cooled Condensers	ARI 460 – 2005
4.	Evaporative Condensers	ARI 490 – 2003
5.	Unit coolers (ACUs) for Refrigeration	ARI 420 – 2000

LIST OF APPROVED MAKE

Sl. No	Equipment/Item	Approved Make
1	Compressor	Kirloskar / Frick / Superfreeze /Bitzer/Gram/York/SABRO/MYCOM
2	Compressor Motor	Siemens / Crompton / Kirloskar/ABB
3	VFD	Danfoss / Schnider/ ABB/ Siemens/Allen Bradley/Yaskawa
4	ACU	Guntner / THERMOFIN/ LUVE / /Frick/Star Coolers /Blue Star
6	Water Pump	KBL / Grundfoss /Beacon/KSB
7	Evaporative condenser	Star cooler / EVAPCO / BAC/DESCA/ Frick
8	Refrigeration Control	Danfoss Room controller and Computerised Data Logger with PLC control – Carel / Dixel /Danfoss/Honeywell/Allen Bradly
9	Canned NH3 pumpset	Hydrodyne/Frick/Hermetic / Witt
10	Valves	Danfoss / Dhiren/Parker
11	Electric motor	CGL/ KEC/ Siemens/ Bharat Bijlee / Kirloskar / ABB
12	Switch Fuse Units/MCCB	L& T / Siemens
13	Control fuses	L& T / Siemens
14	Terminals	Elmex/Connectwell
15	Cable lugs	Dowells/ Connectwell
16	Cable glands	Comet/ Electromeg/Flexpro
17	Pipes	TATA / Jindal / MSL
18	Centrifugal pumpset	Grundfoss / KSB
19	LT Cables / Wires	CCI/ Gloster/ Polycab/Havells/ Finolex/ Mescab/RR/RPG
20	LT Panel Components	L&T/ Schneider/Legrand/Siemens/ABB
21	Lighting / Power DBs	Legrand / Siemens
22	Meters	AE/IMP/MECO/Rishab/L&T/Secure/ /Jayco/Siemens/Conserv
23	CT/PT	Jyoti / C&S/ Kappa /L&T /Pragati/ Precise
24	Switch/Receptacle	Panasonic / Northwest / Havells / Clipsal/MK
25	Termination Kit	Raychem / M-sea
26	Conduit Pipe	EGA / Clipsal / National / ELPRO
27	DOL / SD – starters / Aux. contactors / Timers	L& T / Siemens
28	Change-over relays	OEN / PLA
29	PB / Indication lamps (LED type)	Teknik / L& T / Siemens
30	Selector switches	Kaycee / Salzer

31	Cooling Tower	Paharpur/Advanced
32	Desktop Computer	DELL/ HP
33	Printer	HP/ RICOH
34	UPS	Consul Newatt /Numeric
35	Hot Gas defrost control	Danfoss & Parker
36	Heat Exchanger for energy recovery in Potato	Alfa Laval/DRI
37	Fresh Air Induction Fan	Marathan
38	Ammonia Leak Detection	Manik/Sensidyne or any other approved
39	Trap Alarm	Manik or any other approved

Besides above make, equivalent **approved** make can also be used.

For make and rating of any other major electrical item not mentioned above, contractor to take prior approval from Engineer-in-Charge before procurement of the same.

TECHNICAL SCHEDULE

Project: Temperature Controlled Warehouse at IDCO Industrial Estate, Chhattabar, Dist-Khorda, Odisha
Scope of Work : Design, Supply, Erection, Testing and Commissioning of Refrigeration System
Tender No. EP/TCW/BHU/REF/08

Sl. No.	Description	Unit	Qty	Make	Model	Technical Details/Capacities
1	Refrigeration system for Frozen Chambers, Dock Area & Ante Room as per technical specification and technical schedule					
1.1	Reciprocating Compressor package for Frozen Chambers, Dock Area & Ante Room					
1.1.1	Approved make 2 Stage Reciprocating Compressor : Minimum Capacity: 137 KW @ -28 Deg C Saturated Suction Temperature (SST) and 40 Deg C Saturated Discharge Temperature (SDT) along with standard accessories as per Technical Specification. (3 W + 1 S)	Set	4			
1.1.2	Approved make TEFC squirrel cage induction LT motor , IE3, VFD compatible, suitable on 415 volts, 3 phase, 50 Hz for the above compressor. (3 working +1 stand by)	Nos	4			
1.1.3	Approved make Variable Frequency Drive starter (3 Working + 1 Stand By)	Nos	4			
1.1.4	Ammonia Scrubber type Oil Separator with filter- (3 Set Working + 1 Set Standby), for 2 stage reciprocating compressors, 1st stage and 2nd stage with dedicated oil separators considered as 1 set)	Set	4			
1.1.5	Approved make Liquid & Gas cooler of suitable capacity fitted with inlet / outlet connections with necessary controls.	Nos	1			
1.2	High/Low pressure Receivers					

1.2.1	Approved make Ammonia Receiver (High Pressure) of suitable size complete with liquid inlet and outlet valves, safety valve, purge valve, charging valve etc. complete in all respect .Minimum capacity shall be equivalent to vessel of 30 inch Dia X 16 ft Length.	Nos	1			
1.2.2	Approved make Low pressure liquid accumulator of suitable size. The liquid accumulator is made of SA 516 Gr. 70 with shell thickness of minimum 16mm and dish end thickness of minimum 20mm.Minimum capacity shall be equivalent to vessel of 42 inch Dia X 12 ft Length.	Nos	1			
1.2.3	Controls for the above liquid circulation system complete with a) Liquid level controller. b) Liquid line solenoid valve. c) Differential pressure switch. d) Frost free gauge glass.	Set	1			
1.2.4	Approved make liquid ammonia pump for ammonia re-circulation, motor suitable for operation on 415-V, 50 Cycles and accessories comprising suction strainer, suction and discharge valves, check valves and anti- cavitation cut-out.(2 Working +1 Stand By)	Nos	3			
1.3	Air Cooling Units					
1.3.1	Approved make Evaporator/ Air Cooling Unit for frozen chambers with all accessories as per Technical Specification. Maximum 2 nos for each room permissible for total load of that room. Capacity- 57 KW for each room [for FC1, FC2, FC3 & FC4]	Set	4			
1.3.2	Approved make Evaporator/ Air Cooling Unit for frozen chambers with all accessories as per Technical Specification. Maximum 2 nos for each room permissible for total load of that room. Capacity- 49 KW for each room [for FC5, FC6 & FC7]	Set	3			

1.3.3	Approved make Evaporator/ Air Cooling Unit for Anteroom as per Technical Specification. Capacity of each: 9 KW	Set	2			
1.3.4	Approved make Evaporator/ Air Cooling Unit for Docking Area as per Technical specification. Capacity of each: 12.5 KW	Set	2			
1.3.5	Valves, fittings & Controls for above coils. a) Hand expansion valve - b) Strainer - c) Liquid line solenoid valve - d) Temp Indicator cum controller- 1 no each room /area e) All other controls & valves as required (BPRV as required)	Set	1 1			
1.3.6	Danfoss make Hot Gas defrosting controls with necessary piping and fittings	Set	7			
2	Refrigeration System For Potato Storage Chambers	-	-			
2.1	Compressor package for Potato Storage Chambers as per technical specification and technical schedule	-	-			
2.1.1	Approved make high speed reciprocating compressor or Screw Compressor of suitable model. Capacity 125 KW, -5 Deg C Saturated Suction Temperature (SST) and 40 Deg C Saturated Discharge Temperature (SDT) along with standard accessories as per Technical Specification. (2 Working + 1 Stand by)	Set	3			
2.1.2	Approved make TEFC squirrel cage induction LT motor, IE3, VFD compatible, suitable on 415 volts, 3 phase, 50 Hz for the above compressor. (2 working +1 stand by)	Nos	3			
2.1.3	Approved make Variable Frequency Drive starter (2 Working + 1 Stand By)	Nos	3			
2.1.4	Ammonia Scrubber type Oil Separator (2 Working + 1 Standby)	Nos	3			
2.1.5	Water defrosting system for Air Cooling Unit complete with Pump, valves, pipe line etc.	Lot	1			
2.2	High/Low pressure Receivers					

2.2.1	Approved make High Pressure Ammonia Receiver of suitable size complete with liquid inlet and outlet valves, safety valve, purge valve, charging valve etc. Minimum capacity shall be equivalent to vessel of 30 inch Dia X 16 ft Length .	Nos	1			
2.2.2	Approved make low pressure liquid accumulator of suitable size. The liquid accumulator is made of SA 516 Gr. 70 with shell thickness of MINIMUM 16mm and dish end thickness of MINIMUM 20mm. Minimum capacity shall be equivalent to vessel of 36 inch Dia X 12 ft Length .	Nos	1			
2.2.3	Controls for the above liquid circulation system complete with a) Liquid level controller. b) Liquid line solenoid valve. c) Differential pressure switch. d) Frost free gauge glass.	Set	1			
2.2.4	Approved make liquid ammonia pump for ammonia re-circulation, motor suitable for operation on 415-V, 50 Cycles and accessories comprising suction strainer, suction and discharge valves, check valves and anti- cavitations cutout. (1 Working +1 Stand By)	Nos	2			
2.3	Air Cooling Units					
2.3.1	Evaporator/Air Cooling Unit (Capacity 55KW)- This is free issue material. Bidder shall consider Loading, transportation of existing 8 set ACUs from TCW-Rai plant of Balmer Lawrie to project site & unloading under this item. The contractor shall do cleaning, overhauling, pressure testing, installation, testing and commissioning of 6 ACUs out of total 8 Set.	Set	6			

2.3.2	Valves, fittings & Controls for above coils. a) Hand expansion valve b) Strainer c) Liquid line solenoid valve d) Temp Indicator cum controller e) All other controls & valves as required f) Temp Sensors as per specification	Set	6			
2.3.3	Heat exchanger of suitable capacity to provide the fresh air to the cold storage and removal of CO ₂ with energy recovery of not less than 70% with necessary ducting.	Set	2			
2.3.4	Approved make Fans for the circulation system to circulate fresh air.	Lot	1			
2.3.5	Fogger type external humidification system with 2 to 10 micron particles with automatic regulation with necessary piping, pumps fittings etc. RH sensor, indicator & controller for Potato Storage rooms including necessary wiring. Local Display of RH as well as remote display in SCADA shall be available.	Lot	1			
2.3.6	CO₂ monitoring and control: CO ₂ sensors for regulation of ventilation system shall be provided. Local Display of CO ₂ as well as remote display in SCADA shall be available.	Lot	1			
3	Common Facilities as per technical specification and technical schedule					
3.1	Approved make evaporative type induced draft counter flow design ammonia condenser as per Technical Specification. Capacity: 200TR (Both working), Condensing Temp.: 40 Deg C, WBT: 28 Deg C	No	2			
3.2	Approved make centrifugal pump for Ammonia Condenser with suitable motor with mechanical seal totally enclosed with protective cover. (2 Working + 2 Standby)	No	4			

3.3	Advance/Paharpur Make Cooling Tower of required capacity with condenser water pumps (1W+1SB= 1 Set) and fan of suitable capacity for compressor head cooling.- (To be quoted if applicable)	Set	1			
3.4	Horizontal shell and tube Thermosyphon oil cooler fitted with inlet / outlet connections, Priority Vessel, valves and fittings.- 1 each for compressor (To be quoted if applicable)	LS	1			
3.5	Piping work with approved make CS, Seamless minimum Schedule 40 pipes and forged fittings for the inter connection of all the refrigeration equipment required for fully functional refrigeration system.	Lot	1			
3.6	Approved make ERW GI 'B' class pipes , pipe fittings and valves to circulate water on top of condensers. Condenser drain and bleed line to be terminated near surface drain.	Lot	1			
3.7	Insulation of suitable thickness for the accumulators, suction line with PUF section insulation material and finished with 24 G aluminium cladding. Ammonia pumps, Valves, strainers other fittings shall be insulated with nitrile rubber to prevent formation of frost.	Lot	1			
3.8	Main MCC of approved make as per technical specifications for the entire plant with all necessary feeders for future provisions and spares.	Set	1			
3.9	All local/remote start stop push buttons for the drives	Lot	1			
3.10	Auto air purge system for complete refrigeration system	Lot	1			
3.11	Aluminium armoured conductors for power cable, copper control cables & wiring with necessary cable tray for all the electrical equipment complete with cable glands and junction boxes as per scope of work & Technical Specification.	Lot	1			

3.12	Approved make PLC panel for frozen chambers, potato chambers and other areas with necessary pressure transmitters to measure Suction Pressure, Discharge Pressure, Oil Pressure of various compressors, HP Receivers, LP Receivers, ammonia pumps and temperature transmitters to monitor the temperatures at Inlet Outlet temperatures of condenser, potato cold room, freezer rooms & other area. Please refer the tender specification for details.	Lot	1			
3.13	Approved make Desk Top Computer with UPS, printer etc. and SCADA software for Potato Chambers & Frozen Chambers PLC Panel.	Lot	1			
3.14	Approved make Temperature indicators cum controller with necessary transmitters & wiring for all the potato & freezer rooms. Local display of temperature as well as remote display in SCADA shall be available.	Lot	1			
3.15	Trap Alarm for all potato storage rooms, & freezer rooms with emergency push buttons as per specification	Lot	1			
3.16	Ammonia leak detection system with sensors as per specification	Lot	1			
3.17	Supply, fabrication & erection of Structural steel work as per good engineering practices for all required services for the installation of the plant & equipment. All Structural supports required for hanging evaporators, Pipes, cables, handrail & platforms around receivers, condensers etc. shall be considered in this item. However, saddles, support required for receivers, panel are to be considered in respective items of vessels and shall not be paid under this item.	Kg	1 0 0 0 0			
3.18	Supply & installation of Drain piping system (insulated & heat for freezer) from all the required locations and terminating near the surface drain near the plant. ERW GI 'B' class pipe shall be used for drain piping.	Lot	1			

3.19	First Charge of Ammonia gas, Oil, lubricant including top up during trial run for the complete refrigeration system	Lot	1			
3.20	Supply of Motor of ACU Fan for Freezer -Spare	Nos	1			
3.21	Supply of Motor of ACU Fan for Potato Storage-Spare	Nos	1			
3.22	Supply of Filled up Ammonia gas cylinder -Spare	Nos	4			
3.23	Compressor oil - 210 Ltr Barrel -Spare	Nos	1			
3.24	Safety Gadgets for Plant Room consisting of Ammonia Mask - 2 Nos, Normal Masks - 10 Pairs, Safety Hand Gloves - 2 Pairs, All types of Tool & Tackles of standard company required for the maintenance of various equipment.	Lot	1			
4	OPTIONAL ITEMS -Supply, Installation, Testing and Commissioning of followings:					
4.1	Screw Compressor package for Frozen Chambers, Dock Area & Ante Room [May be executed in place of Item no 1.1]					
4.1.1	Approved make Single Stage Screw Compressor : Minimum Capacity: 205 KW @ -28 Deg C Saturated Suction Temperature (SST) and 40 Deg C Saturated Discharge Temperature (SDT) along with standard accessories as per Technical Specification. (2 W + 1 S)	Set	3			
4.1.2	Approved make TEFC squirrel cage induction LT motor , IE3, VFD compatible, suitable on 415 volts, 3 phase, 50 Hz for the above compressor. (2 working +1 Stand By)	Nos	3			
4.1.3	Approved make Variable Frequency Drive starter (2 Working + 1 Stand By)	Nos	3			
4.1.4	Horizontal Oil separator with filter- (2 Set Working + 1 Set Standby)	Set	3			

4.2	Approved make Evaporator/ Air Cooling Unit for chilled Potato storage chambers with all accessories as per Technical Specification . Minimum Capacity- 55 KW. In Potato storage chambers existing 6 ACU as mentioned above will be used. However, 1 no new unit is kept in the schedule to be considered as optional.	Set	1			
5	Plant Operation & Maintenance					
5.1	Cost of Operator for 2 Years operation of the plant 24 x 7 in 3 shifts with 3 persons & 1 reliever. All employed labour shall be covered under ESIC /PF etc., as per all government rules from time to time.	Month	2 4			
5.2	Annual Maintenance Contract without spares and consumables. The period would be effected after expiry of one year performance guarantee period.	Year	3			

TENDER DRAWING**List of Drawings**

Sl.No.	Title	Drawing No.	Rev	Date	Sheet No
1	LAYOUT OF REFRIGERATION SYSTEM	DRG.NO. EP/TCW/BHU/REF/11	0	03-01-2020	Sheet 1 of 2
2	LAYOUT OF REFRIGERATION SYSTEM	DRG.NO. EP/TCW/BHU/REF/11	0	03-01-2020	Sheet 1 of 2



Balmer Lawrie & Co. Ltd.

(A Government of India Enterprise)

Engineering & Projects

21, Netaji Subhas Road

Kolkata - 700 001

**Design, Supply, Erection & Commissioning of Refrigeration
System for Temperature Controlled Warehouses**

at

IDCO Industrial Estate, Chhattabar, Dist-Khorda, Odisha

Tender No. EP/TCW/BHU/REF/08

PRICED PART (PART-II)

NOTES:

- 1.0 Details of the items under this Schedule shall be read in conjunction with the corresponding Design Basis Specifications, Technical Schedule, Drawings and other Tender Documents.
- 2.0 The work shall be carried out as per approved drawings, Specifications and the description of the items in this Schedule and/or Engineer's instructions. Drawings enclosed with these documents are only for providing some preliminary of the work involved.
- 3.0 Items of work provided in this Schedule but not covered in the Specifications shall be executed strictly as per instructions of the Engineer-In-Charge.
- 4.0 The Quantities of the various items mentioned in the Schedule of Items are approximate and may vary or may be deleted altogether. The Supplier, in his own interest, should get an indication of the probable extent of the work to be executed under any particular item in this Schedule before undertaking any preliminary and enabling work or purchasing bought out components related to the work.
- 6.0 Engineer's decision shall be final and binding on the Supplier regarding clarification of items in this Schedule with respect to the other sections of the Contract.
- 7.0 For extra items, rates shall be derived from similar item rates included in the schedule of work. Where there is no such similar item available in the schedule, rate shall be analyzed as follows:
Rate for extra item = Cost of material including transportation for delivery upto site (a) + cost of labour inclusive of all necessary tools, tackles, equipment, machinery and consumable (b) required to carry out the work + 15% of (a+b) towards profit and overhead + taxes, duties etc. as applicable.
- 8.0 Rate quoted for '**SUPPLY**' shall include Packing and Forwarding, Loading, Transit Insurance Transportation upto site, unloading, safe storage at site, site shifting etc. Rate quoted for '**ERECTION**' shall include cost towards installation, testing, trial run, commissioning and handing over of the fully functional plant to client/owner.
- 9.0 The price bid file in .xls format shall be downloaded from the website, bidder to fill in their item-wise rates, print, stamp, sign, scan and upload the same in 'Uploading Price Bid' under Bid Common Form in e-procurement portal of Balmer Lawrie.
- 10.0 Bidders shall indicate Total price with GST [(Supply +Erection) without optional items, Plant Operation & Maintenance] in 'Project Contract Total' while submitting the price bid.
- 11.0 Status of the bidders will be decided based on '**BASIS OF EVALUATION**' clause of NIT.
- 12.0 Bidder shall check and change rate of GST as required while submitting their bid.

- 13.0 Bidder shall not quote any rate against 'INSTALLATION' for Supply of Spare Items (Item no 3.20 to 3.24).
- 14.0 Bidders shall not quote any rate against 'SUPPLY' for Plant Operation & Maintenance (item no 5.1 & 5.2)
- 15.0 If any bidder does not quote for reciprocating compressor package and quotes for Screw compressor package only, this will be taken into price evaluation.
- 16.0 Bidders shall not tamper the price bid. Bidders shall not change the quantity or unit of the items which may calls for disqualification of the bid.

PRICE SCHEDULE (PART II)
Project: Temperature Controlled Warehouse at IDCO Industrial Estate, Chhattabar, Dist-Khorda, Odisha
Scope of Work : Design, Supply, Erection, Testing and Commissioning of Refrigeration System
Tender No. EP/TCW/BHU/REF/08

Sl no	Description	SUPPLY						INSTALLATION					
		Unit	Qty	Unit rate (Rs)	Amount t (Rs)	GST %	GST (Rs)	Total Amount with GST (Rs)	Unit Rate (Rs.)	Amount (Rs)	GST %	GST Rs.	Total Amount with GST (Rs.)
1	Refrigeration system for Frozen Chambers, Dock Area & Ante Room as per technical specification and technical schedule												
1.1	Reciprocating Compressor package for Frozen Chambers,Dock Area & Ante Room												
1.1.1	Approved make 2 Stage Reciprocating Compressor : Minimum Capacity: 137 KW @ -28 Deg C Saturated Suction Temperature (SST) and 40 Deg C Saturated Discharge Temperature (SDT) along with standard accessories as per Technical Specification. (3 W + 1 S)	Set	4										
1.1.1.2	Approved make TEFC squirrel cage induction LT motor , IE3, VFD compatible, suitable on 415 volts, 3 phase, 50 Hz for the above compressor. (3 working +1 stand by)	Nos	4										
1.1.1.3	Approved make Variable Frequency Drive starter (3 Working + 1 Stand By)	Nos	4										
1.1.1.4	Ammonia Scrubber type Oil Separator with filter- (3 Set Working + 1 Set Standby), for 2 stage reciprocating compressors, 1st stage and 2nd stage with dedicated oil separators considered as 1 set)	Set	4										
1.1.1.5	Approved make Liquid & Gas cooler of suitable capacity fitted with inlet / outlet connections with necessary controls.	Nos	1										
1.2	High/Low pressure Receivers												
1.2.1	Approved make Ammonia Receiver (High Pressure) of suitable size complete with liquid inlet and outlet valves, safety valve, purge valve, charging valve etc. complete in all respect .Minimum capacity shall be equivalent to vessel of 30 inch Dia X 16 ft Length .	Nos	1										
1.2.2	Approved make Low pressure liquid accumulator of suitable size.The liquid accumulator is made of SA 516 Gr. 70 with shell thickness of minimum 16mm and dish end thickness of	Nos	1										

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3.5	Piping work with approved make CS, Seamless minimum Schedule 40 pipes and forged fittings for the inter connection of all the refrigeration equipment required for fully functional refrigeration system.	Lot	1																
3.6	Approved make ERW GI 'B' class pipes , pipe fittings and valves to circulate water on top of condensers. Condenser drain and bleed line to be terminated near surface drain.	Lot	1																
3.7	Insulation of suitable thickness for the accumulators, suction line with PUF section insulation material and finished with 24 G aluminium cladding. Ammonia pumps, Valves, strainers other fittings shall be insulated with nitrile rubber to prevent formation of frost.	Lot	1																
3.8	Main MCC of approved make as per technical specifications for the entire plant with all necessary feeders for future provisions and spares.	Set	1																
3.9	All local/remote start stop push buttons for the drives	Lot	1																
3.10	Auto air purge system for complete refrigeration system	Lot	1																
3.11	Aluminium armoured conductors for power cable, copper control cables & wiring with necessary cable tray for all the electrical equipment's complete with cable glands and junction boxes as per scope of work & Technical Specification.	Lot	1																
3.12	Approved make PLC panel for frozen chambers, potato chambers and other areas with necessary pressure transmitters to measure Suction Pressure, Discharge Pressure, Oil Pressure of various compressors, HP Receivers, LP Receivers, ammonia pumps and temperature transmitters to monitor the temperatures at Inlet Outlet temperatures of condenser, potato cold room, freezer rooms & other area. Please refer the tender specification for details.	Lot	1																
3.13	Approved make Desk Top Computer with UPS, printer etc. and SCADA software for Potato Chambers & Frozen Chambers PLC Panel.	Lot	1																
3.14	Approved make Temperature indicators cum controller with necessary transmitters & wiring for all the potato & freezer rooms. Local display of temperature as well as remote display in SCADA shall be available.	Lot	1																
3.15	Trap Alarm for all potato storage rooms, & freezer rooms with emergency push buttons as per specification	Set	11																

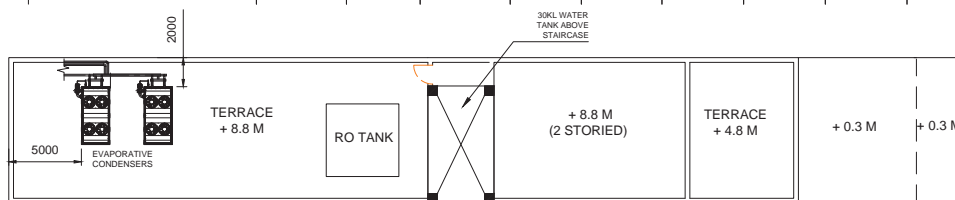
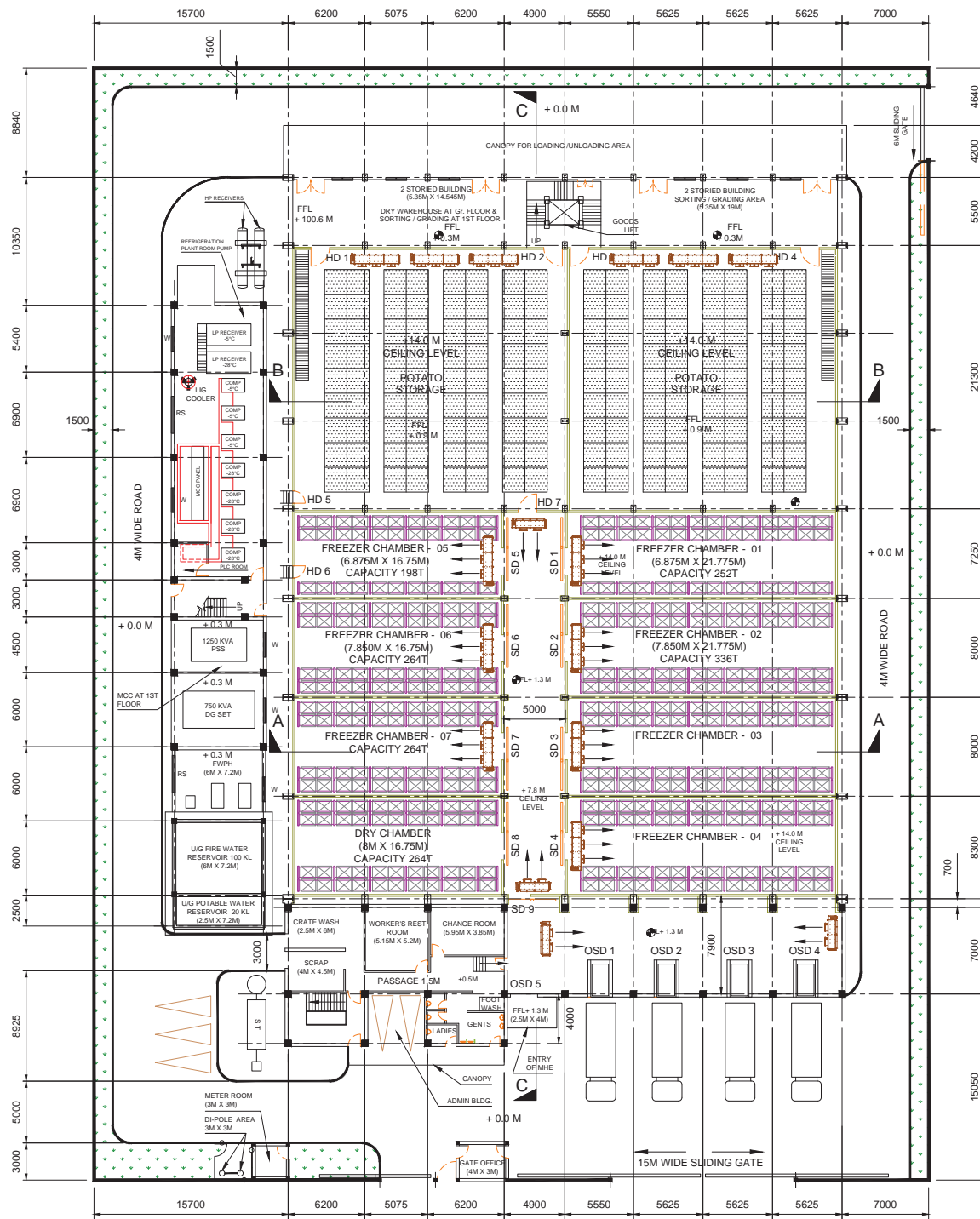
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3.1 6	Ammonia leak detection system with sensors as per specification	Set	16																
3.1 7	Supply, fabrication & erection of Structural steel work as per good engineering practices for all required services for the installation of the plant & equipment. All Structural supports required for hanging evaporators, Pipes, cables, handrail & platforms around receivers, condensers etc. shall be considered in this item. However, saddles, support required for receivers, panel are to be considered in respective items of vessels and shall not be paid under this item.	Kg	12 00 0																
3.1 8	Supply & installation of Drain piping system (insulated & heat for freezer) from all the required locations and terminating near the surface drain near the plant. ERW GI 'B' class pipe shall be used for drain piping.	Lot	1																
3.1 9	First Charge of Ammonia gas, Oil, lubricant including top up during trial run for the complete refrigeration system	Lot	1																
3.2 0	Supply of Motor of ACU Fan for Freezer -Spare	No	1																
3.2 1	Supply of Motor of ACU Fan for Potato Storage-Spare	No	1																
3.2 2	Supply of Filled up Ammonia gas cylinder -Spare	No	4																
3.2 3	Compressor oil - 210 Ltr Barrel -Spare	No	1																
3.2 4	Safety Gadgets for Plant Room consisting of Ammonia Mask - 2 Nos, Normal Masks - 10 Pairs, Safety Hand Gloves - 2 Pairs, All types of Tool & Tackles of standard company required for the maintenance of various equipment.	Lot	1																
	TOTAL FOR SUPPLY																		
	TOTAL FOR INSTALLATION																		
**	TOTAL FOR SUPPLY + INSTALLATION (BASIC)																		
	TOTAL FOR SUPPLY + INSTALLATION (GROSS WITH GST)																		
4	OPTIONAL ITEMS -Supply, Installation, Testing and Commissioning of followings:																		
4.1	Screw Compressor package for Frozen Chambers, Dock Area & Ante Room [May be executed in place of Item no 1.1.]																		
4.1. 1	Approved make Single Stage Screw Compressor : Minimum Capacity: 205 KW @ -28 Deg C Saturated Suction Temperature	Set	3																

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Name of the Bidder _____
 Signature _____
 Seal of the _____
 Company _____
 Date _____



CAPACITY CALCULATION (FOR COLD STORAGE)	
PALLET CAP. (G+5)	= 1986 T
(7 CHAMBERS : FC1 TO FC7)	
DRY WAREHOUSE	= 134 SQM.
POTATO STORAGE	= 3000 T
TOTAL	: 4986 T

SCHEDULE OF OPENING				
DOORS	SIZE (W X H)	THK(MM)	DESCRIPTION	QTY
SD (1-8)	2200 x 4800	120	SLIDING DOORS	08
SD (9)	2200 x 4800	120	SLIDING DOORS	01
OSD (1-4)	2400 x 3000	40	SECTIONAL DOOR	4
OSD (5)	2200 x 5000	40	SECTIONAL DOOR	1
HD (1-4)	1500 x 2600	120	HINGE DOOR	4
HD (5-7)	1000 x 2100	120	HINGE DOOR	3

TERRACE PLAN

TENDER DRAWING



Balmer Lawrie & Co. Ltd.
ENGINEERING & PROJECTS

SCALE :		PROJECT : TCW, BHUBANESWAR	
DRAWN	KD	03.01.2020	OWNER : BALMER LAWRIE & CO. LTD; SBU-LOGISTICS
CHECKED	SAJ	03.01.2020	TITLE : LAYOUT OF REFRIGERATION SYSTEM
APPD	GCS	03.01.2020	
DWG NO. EP/TCW/BHU/REF/11		SHT 1 OF 2	REV-00

NO.

DATE

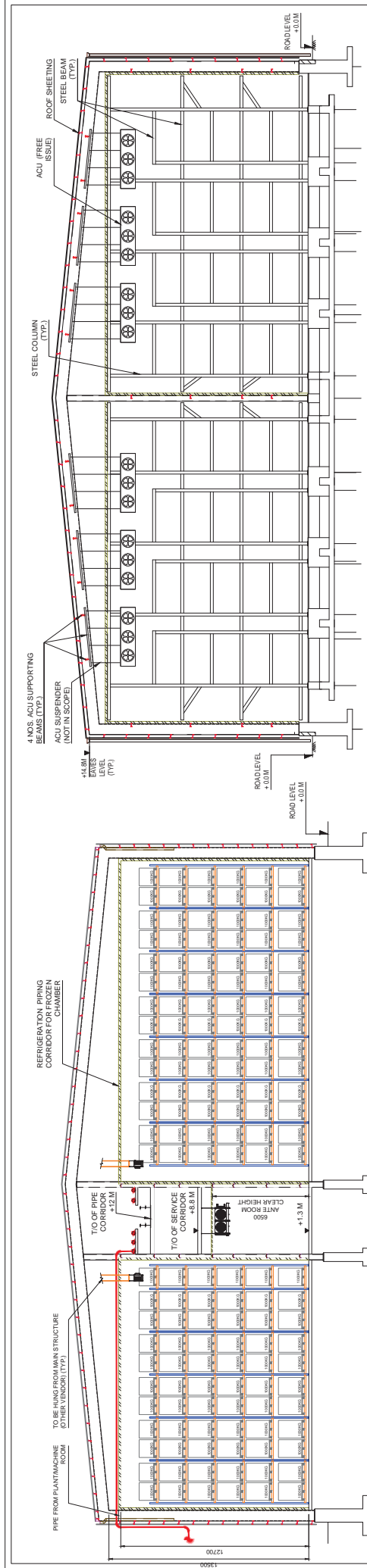
REVISION

BY

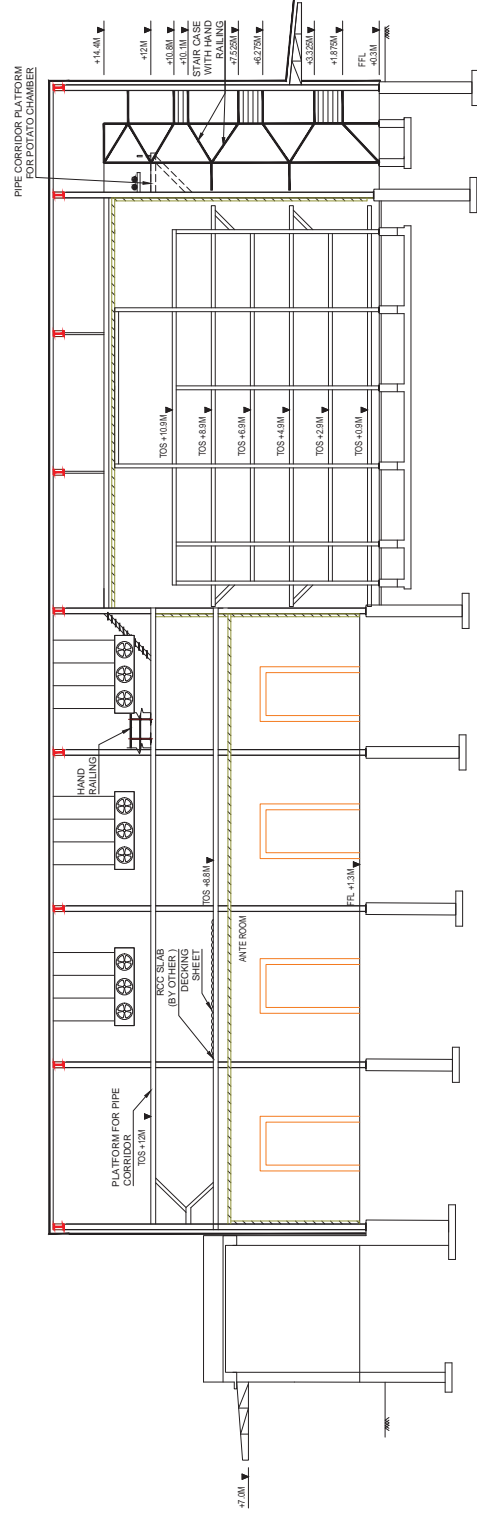
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APPD

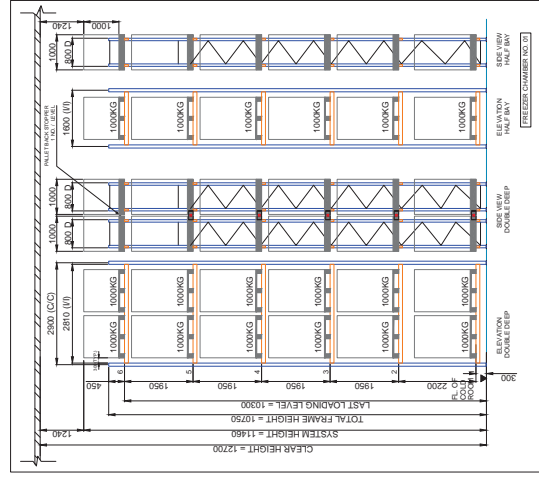
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SECTION VIEW OF "A-A"



SECTION VIEW OF "C - C"



**TYPICAL SECTION
ELEVATION OF RACKING**

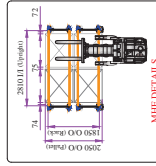
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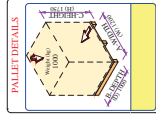
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MHE DETAILS



DOUBLE DEEP REACH TRUCK
CAPACITY - 1.4 - 2MT
LAST LOADING LEVEL : 10.3 M
CLOSE MAST HEIGHT : MAX 4.6 M
LIFT HEIGHT : MIN 10.7 M
AISLE SPACE : 3.3 M



ACCESSORIES

1. Row Guards- at end of Chamber, Ante room, Docking area.
2. Upright Guards- in front of every uprights in picking aisle.
3. Baller Stoppers- in every loading dock

Achieved Pallet Capacity	
7 Cold Chambers - 1986	
1 Dry Chamber - 264	
Total Capacity - 2250	