



बामर लॉरी एंड कंपनी लिमिटेड

**Balmer Lawrie & Co Ltd.**

(भारत सरकार का एक उद्यम)

(A Government of India Enterprise)

**Survey No .201/1, Sayli,Silvassa-396230**

**Phone -9099084731 &84732 Extn.12 e-mail Srivastava.sk@balmerlawrie.com**

**बामर लॉरी एंड कंपनी लिमिटेड के सिलवासा स्थित प्लांट में रूफ टॉप मॉन्टेड ग्रिड कनेक्टेड 50 KWp सौर फोटोवोल्टिक पावर प्लांट का सप्लाई, अधिष्ठापन (इन्सटालेशन), टेस्टिंग एवं कमीशनिंग ।**

**Supply, Installation, Testing and Commissioning of Grid Connected Roof Top mounted 50 Kwp Solar Photovoltaic Power Plant at Balmer Lawrie, & Co. Ltd. G & L Silvassa**

**Tender No. GLS/TE20/031**

**निविदा तारीख: / Tender Date: 05/11/2020**

**नियत तारीख: को बजे / Due Date : 18/11/2020 upto 6.00 PM**

**अमूल्यंकित भाग (भाग-1) / UN-PRICED PART (PART-I)**

**Declaration for GeM :- "The tendered item/service is not available in GeM. Balmer Lawrie & Co. Ltd. have no objection in providing detailed information for making available the said item(s) on GeM.**

### **TENDERER'S CHECKLIST POINTS**

Tenderer shall require filling in the table below appropriately:

<b>SI No.</b>	<b>Submission of Document</b>	<b>Bidder's Confirmation/Submission (Yes / No)</b>
1	Tender Fees [Not Applicable]	Not Applicable
2	Earnest Money Deposit	
3	120 days validity of the offer confirmation	
4	Audited Annual Reports (for past three years) as per Pre-Qualification Criteria	
5	Copy of Work Order and Completion Certificates for similar job as per Pre-qualification Criteria	
6	Power of Attorney of the Signatory who is filling the tender	
7	PAN	
8	Provident Fund Registration	
9	GSTIN Registration	
10	ESI /WC Registration, if applicable	
11	Document in support of "Micro and Small" industry certificate (In case of "Micro & Small" industries) as per clause no 3.0 of tender.	
12	Compliance of Company's HSE policy	
13	<b>Price Schedule</b> in Un-priced Bid duly blanked out and signed.	
14	<b>Tender Document</b> (along with addendum if any) duly signed and stamped on all pages	
15	<b>Price quoted</b> strictly as per Tender price schedule. It has to Be uploaded online only. No Hard Copy of the price-bid should be sent along with Technical/Unprice Bid.	
16	<b>Payment Terms</b> in compliance to tender requirement	
17	<b>Completion Period</b> in compliance to tender requirement	
18	<b>LD clause</b> in compliance to tender requirement	
19	<b>Warranties and Guarantee</b> in compliance to tender requirement	
20	All others Technical & Commercial Terms & Conditions shall remain unaltered as per Tender document	
21	<b>TPI CHARGES</b> (if any) quoted as per Scope of Work in price bid only.	
22	Duly filled up Technical Particulars sheet, Schematic Dwg of the proposed plant etc documents as per clause of technical specification	

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

## Vendor Information

Sl no.	Description	Details to be filled up by Vendor/Supplier
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. "Silvassa" or "Vapi") (max. 40 char.) or as the name of the city	
8	Country ("India" or as the name of country be)	
9	State (Name the state from where the office of Vendor/Supplier 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	Bank Name (max. 60 char.)	
18	Street (max. 35 char.)	
19	City (max. 35 char.)	
20	Branch (max. 40 char.)	
21	IFSC Code	
22	MICR Code	
23	Account No.	
24	Type of Account (Current, Savings, etc.)	

**LIST OF CONTENT:**

**UN-PRICED PART (PART I)**

1. NOTICE INVITING TENDER
2. TERMS & CONDITION OF CONTRACT
3. TECHNICAL SPECIFICATIONS & TENDER DRAWING

**PRICED PART (PART II)**

1. SCHEDULE OF WORK

## **NOTICE INVITING TENDER**

### **Tender No.**

- 1.0 Balmer Lawrie & Co Ltd invite ONLINE BIDS from experienced, competent and resourceful authorized ERP registered vendors (under DNHPDCL) with sound technical and financial capabilities **for Supply, Installation, Testing and Commissioning of Gird connected, roof top 50 KWp Solar Photovoltaic Power Plant at Grease & Lubricants Division ,Sayli Silvassa-396230**

2.0 **SCOPE OF WORK**

The scope of work under this tender covers Design, Manufacture, Supply, Installation, Testing and Commissioning of Gird connected, roof top mounted 50 KWp Solar Photovoltaic Power Plant **at Balmer Lawrie, Grease & Lubricant Division ,Survey No 201/1 ,Sayli-Rakholi Road , Sayli, Silvassa-396230** as stipulated in Conditions of Contract, Technical Specification, Tender Drawing & Schedule of Work.

Obtaining all approvals and preparation of documents for obtaining those approvals for Construction and installation and commissioning of the Solar PV Plant from CEA / Local State Electricity Board (DNHPDCL) shall be under the scope of this contract. **Necessary statutory fees should be paid by the bidder which will be reimbursed by the Owner (BI has already paid a registration charges for installation of 25 kw solar plant as per DNH PDCL notice)**

Obtaining approval for Net (Import / Export) Metering from Local State Electricity Board / Local Statutory Authority and Supply & Installation of the same NET METER including supply of necessary accessories and necessary modification in metering as advised by local GEB (meter tested and approved by Local Electricity Board) in the HT side of the Plant Electrical is under the scope of this work. For that bidder has to visit the project site to gather necessary information of Owner's HT System before submission of their offer.

The bidder has to conduct a preliminary study of the G&L, Silvassa site for the actual design conditions and setting up 50 KWp Solar PV Power Plant.

This is a turnkey job and all required materials for setting of the plant, even if they are not mentioned in the schedule of work, shall be supplied and installed by the bidder / contractor.

The plant would be covered under non comprehensive annual maintenance contract (AMC) for a period of 5 (five) years. This period will be in effect after one year of guarantee period.

During the guarantee period and AMC period the contractor shall visit site and check the health of PV Plant once in every three months. And should be attend in any no of breakdown call. The Plant will be under the supervision of the contractor for in all six years.

An approaching stairs of suitable size with all safety measure should be provided for climbing on the roof where the Solar Plant is proposed to be installed for safe operations and maintenance of it.

FRP walkway with safety railings on the rooftop in between solar modules shall be provided for accessing for maintenance and cleaning operations.

The vendor has to supply and erect 1" PVC make water pipeline and connect it to the existing water pipe line with clamp, reducer, and bends and all accessories and consumables to make the job complete as per direction of Engineer - in - Charge. Also the vendor has to supply and install 6 nos. 1" CP commercial stopcock at locations shown by Engineer in Charge for washing the Solar Panels.

Thanking You,

Yours faithfully,  
For Balmer Lawrie & Co.Ltd.

Shobhit Kumar Srivastava  
(Manager Purchase)

## **General Terms & Condition Of Contract**

### **1.0 DEFINITIONS**

The following expressions hereunder and elsewhere in the contract documents used shall have the following meanings respectively assigned to them namely,

- 1.1 The "Owner/Client" shall mean M/s **Balmer Lawrie & Co. Ltd**; a company incorporated in India and the plant installed at Balmer Lawrie & Co. Ltd., Grease & Lubricant Division, Survery No. 201/1, Sayli, Silvassa -396230.
- 1.2 The "Project" shall mean **"Supply, Installation, Testing and Commissioning of Gird connected, roof top mounted 50 KWp Solar Photovoltaic Power Plant at G&L, Silvassa"**.
- 1.3 The 'Engineer-In-Charge'/'Engineer' shall mean the Engineer /Officer authorized by the 'Owner' for the purpose of the contract for overall Supervision and Co-ordination of site activity and certification of billing.

### **2.0 COMPLETION PERIOD**

Time is the essence of the contract. The time schedule for total work according to the contract shall be **Three (3) Calendar Months** from the date of placement of LOI or Purchase order whichever is earlier.

### **3.0 EARNEST MONEY DEPOSIT [EMD]**

**EMD :-** [As per details given below] and Offer without EMD would not be accepted from Non-MSME vendors. Please refer below for more details. Tenderers /Bidders are required to pay an EMD amount of **Rs 20,000** by way of Demand Draft / A/C Payee pay order/ Bank Guarantee / NEFT/RTGS/IMPS/ Online Transfer. Proof of the same has to be submitted along with the unpriced bid. The Demand Draft should be drawn in favor of "Balmer Lawrie & Co. Ltd" payable at Silvassa for EMD. EMD in the form of Bank Guarantee as per the company's specified format may also be submitted. EMD/Security Deposit can also be paid directly to our **HDFC Bank Limited (Account No. 00740110000057 NEFT Code - IFSC "HDFC0000074")** through electronic transfer and proof of transfer of funds should be deposited with us. EMD of the unsuccessful Tenderers will be refunded after finalization of Tender. EMD shall not bear any interest. MSME/SSI registered company/unit has to submit the proof of registration [As per below clause] to get the waiver of EMD. EMD of successful bidder would be retained as a part of security deposit till the execution of contract. Each page of the offer (enclosures) has to be acknowledged by the bidder with their acceptance (signature company stamp). In case of offer, which are not found in line with our guidelines and Terms & Conditions, may subject to rejection.

## Provisions for Micro and Small Enterprises (MSE):

**Following benefits would be extended to qualifying MSE vendors as per Public Procurement policy for MSEs subject to meeting the qualification criteria.**

- a. Qualifying Registered MSE vendors shall be exempted from need to furnish EMD, subject to submission of their registration details and meeting the qualification criteria.

### **Qualification Criterion for MSE's for availing the above benefits:**

- b. MSE vendor must confirm that UAM No has been uploaded on CPPP website as required by Ministry's circular no F: No21(17) / 2016 dated 06.04.18 for qualifying to be considered as MSE vendor under this tender. Qualifying and Registered MSE vendors shall be exempted from need to furnish EMD, subject to submission of their registration details. Declaration of Udyog Aadhar Memorandum [UAM Number] number on Central Public Procurement Portal [CPPP] is mandatory. It is also required for the MSE vendors to submit a certificate (certified by a practicing Chartered Accountant) for investment in Plant & Machinery or equipment by them. It is further required to submit audited balance sheet and Profit & Loss account for their turn over for the last completed Financial Year Certified by a Practicing Chartered Accountant or in the absence of the audited balance sheet and Profit & Loss Account, the turnover for the last completed Financial Year should be certified by a practicing Chartered Accountant.
- c. The above-mentioned provisions are meant for procurement of only goods produced and services rendered by MSEs and not for any trading activities done by them. A self-certification to be provided by the bidder that the tendered item is manufactured or serviced by them and no trading activity for the tendered item is undertaken by them. Balmer Lawrie & Co Ltd reserves the right to verify the same.
- d. All of the above details are mandatory to qualify for availing the benefits as per Public Procurement Policy for MSEs.

Bidder should read **Government Notification dated 1<sup>st</sup>, June'2020 in respect of "New Definition of MSE" as under** before furnishing their MSE status to qualify for availing the benefits as per Public Procurement Policy for MSEs.

## **MINISTRY OF MICRO, SMALL AND MEDIUM ENTERPRISES NOTIFICATION**

New Delhi, the 1st June, 2020

**S.O. 1702(E).**—In exercise of the powers conferred by sub-section (1) read with sub-section (9) of section 7 of the 'Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006) and in supersession of the notification of the Government of India, Ministry of Small Scale Industries, dated the 29th September, 2006, published in the Gazette of India, Extraordinary, Part II, Section3, Sub-section(ii), vide S.O. 1642(E), dated the 30th September 2006 except as respects things done or omitted to be done before such supersession, the Central Government, hereby notifies the following criteria for classification of micro, small and medium enterprises, namely:—

- (i) a micro enterprise, where the investment in Plant and Machinery or Equipment does not exceed one crore rupees and turnover does not exceed five crore rupees;
- (ii) a small enterprise, where the investment in Plant and Machinery or Equipment does not exceed ten crore rupees and turnover does not exceed fifty crore rupees;



This notification shall come into effect from 01.07.2020

**Preference to Make In India Policy** – Local content in the tendered items (Order No P-45021/2/2017-PP (BE-II) dated 04.06.2020 of Department for promotion Of Industry and Internal Trade, Ministry of Commerce and Industry, Govt Of India. Further the above referred Order defines' Local Content, "Class -I local supplier" and "Class II local supplier" as under: "Local Content" means the amount of value added in India which shall unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, in percent.

**Class – I local supplier** – means a supplier or service provider, whose goods, services or works offered for procurement, has local content equal or more than 50%, as defined under this Order.

**Class – II local supplier** – means a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50 %, as defined under this Order.

**Non-Local supplier'** means a supplier OR service provider, whose goods, services or f works offered for procurement, has local content less than or equal to 20%, as defined under this Order. In view of above guidelines, you are required to furnish information in the following prescribed format and to provide a certificate duly signed by authorized person of your company letter head regarding the percentage of local content of the item (s). Your attention is also drawn towards Para 9 (f) and (g) of the above referred Order of GOI, prescribing action in case of false declaration, as under.

**This tender is for Class-I, Local Supplier only so vendor has to give the declaration of the same.**

#### **4.0 PRE-QUALIFICATION CRITERIA**

- 4.1 Average annual turnover of the tenderer shall be minimum of **Rs 30 Lacs** during last three financial years ending 31<sup>st</sup> March, 2020 preferably in related business.
- 4.2 The tenderer should have successfully executed Roof Top Solar Plant Installation Work of similar kind and voltage level of the following minimum values during past three years ending 31<sup>st</sup> March, 2020.
  - a. 3 jobs each of value not less than **Rs 15 lacs** or
  - b. 2 jobs each of value not less than **Rs 20 lacs** or
  - c. 1 job of value not less than **Rs 30 lacs**

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.

- 4.3 Tenderer should have valid PAN, **GSTIN registration**, PF registration, ESI registration/WC Policy as applicable. Copy of the same shall be submitted along with techno commercial offer.
- 4.4 The bidder shall ensure that necessary spares are always available with their service centres during the performance guarantee period and AMC period. Documentary evidences for the details of service centres should be enclosed with the offer.
- 4.5 The bidder should submit the schematic diagram of the plant including ratings, list of manufactures, type, size, and other technical data of the equipment's used as specified in technical specification for the plant along with the offer. Offers without such information will not be eligible for consideration. A team of owner official may / may not visit the facilities of the bidders, and the projects executed for verification.
- 4.6 **Selection & placement of offer:-** A tenderer must have to quote considering all the items/heads under supply, installation and AMC. Balmer Lawrie & Co. Ltd. reserve the right to reject/accept all or any offer(s) without assigning any reason whatsoever. Purchase/work order should be placed on a single technically & commercially qualified vendor, whose total price (Supply + Installation + (AMC ) charges stands lowest.

## 5.0 **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, Condition 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 A Gangopadhyay / Bapi Biswas, (Mob. no. 8155864993/9723968817) and you can also contact Manager (Purchase) on Contact No. 9099084731 Ext- 12

## 6.0 **TENDER SUBMISSION**

The intending bidders 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 and non-visit to site 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):

Tirtha Das	<a href="mailto:tirtha.das@c1india.com">tirtha.das@c1india.com</a>	+91-91632 54290
Tuhin Ghosh	<a href="mailto:tuhin.ghosh@c1india.com">tuhin.ghosh@c1india.com</a>	+91-8981165071
Siva Kumar (Chennai)	<a href="mailto:siva.kumar@c1india.com">siva.kumar@c1india.com</a>	+91-90427 73377
Ravi Gaiwal (Mumbai)	<a href="mailto:ravi.gaiwal@c1india.com">ravi.gaiwal@c1india.com</a>	+91-96193 79192

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 for Tender fee and 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 black listing, 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 for 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 from Sri S K Srivastava.

**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>).** Company calling for tenders should not be responsible for any claims/problems arising out of this.

#### **Tender Cancellation Clause**

The tender may be cancelled due to any unforeseen / unavoidable circumstances or due to any other reason at any stage of the tender processing as per the sole discretion of BL and BL is not liable to provide any reason to the applicants for the same.

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 clause no. 2.0 of Condition of Contract under sealed envelope should reach the office of **at, Balmer Lawrie & Co. Ltd, Survey No 201/1, Sayli Silvassa** 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 1<sup>nd</sup> floor at the above address.

## **7.0 SUPPLY OF MATERIAL**

7.1 All materials required for the work shall be supplied by the Vendor. In addition, all materials required for temporary and enabling work shall be arranged and provided by the Vendor. All incidental expenses, loading, unloading, transportation, handling etc. shall be the responsibility of the Vendor and cost towards such expenses should be included in the finished item rates.

7.2 All other materials, as required to complete the works in all respects according to the contract rates shall be inclusive of all freights, GST and other taxes, duties, loading, unloading, transporting, handling and storage charges etc.

## **8.0 TAXES & DUTIES**

All taxes and duties etc. as shall be levied by the Govt. (Central and State) and applicable for the equipment shall be included in the quoted price. However, bidder shall indicate all such applicable taxes in their unpriced bid documents.

9.0 **GST Clause** – "The vendor should compulsorily follow all the provisions of GST Law and in the event of any default of complying with any of the provisions of the GST Law, Balmer Lawrie would exercise the right for non-payment / withholding payment / black listing the vendor.

## **10.0 PAN, GSTIN registration, ESI, PF registration**

Tenderers are required to submit PAN, GSTIN registration, Provident Fund registration and ESIC along with Un-priced part of their offer, failing which their offer may be liable to be rejected.

## **11.0 INSTALLATION, COMMISSIONING & TRAINING**

The installation, testing and commissioning of the equipment shall be carried out by competent engineers/technicians of the Tenderer at the work site. During installation / commissioning, Tenderer's engineer / technician shall impart necessary training to Owner's personnel in driving and servicing the equipment to the level of clear understanding / adoptions. No separate charge shall be payable by the Owner for the purpose.

## **12.0 NON-CONFORMANCE**

Tenders not conforming to the above mentioned requirements are liable to be rejected.

## **13.0 VALIDITY OF OFFER**

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

## **14.0 RATES AND OTHER ENTRIES**

- (a) The tenderer should quote for all items in the Schedule of Rates. The rates should be expressed in English both in figures and words. Where discrepancy exists between the two, the rates expressed in words will prevail. Similarly if there is any discrepancy between unit rate and total amount, the unit rate will prevail.
- (b) The rates should be quoted in the same units as mentioned in the tender schedule of quantities.
- (c) All entries in the tender documents should be in ink / type. Corrections if any should be attested by full signature of the tenderer.
- (d) Every page of the tender document including annexure / enclosures shall be stamped and signed by the tenderer or his authorized representative thereby indicating that each and every page has been read and the points noted.

## **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

## 16.0 DETAILS OF HARD COPIES TO BE SUBMITTED ALONG WITH THE TENDER

The tender, as submitted, shall consist of 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.** Priced bid shall only be submitted online. The price bid file in pdf format shall be downloaded from the website, bidder to fill in their item-wise rates & amounts on hard copy, stamp, sign, and scan and upload the same.
- (ii) Earnest money amounting to and in the manner specified along with the Un-priced bid.
- (iii) Similar work done in past three years by the tenderer with copy of work orders and completion/commissioning certificate from the client/ consultant appointed by the client as per PRE-QUALIFICATION CRITERIA
- (iv) Audited annual report for last three financial years as per PRE-QUALIFICATION CRITERIA
- (v) PAN / GSTIN / PF / ESI/ WC as applicable.
- (vi) Any other documents required in terms of this tender.
- (vii) All entries in the tender documents should be in ink / type. Corrections if any should be attested by full signature of the tenderer.
- (viii) 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.

## **17.0 SECURITY DEPOSIT**

- (i) On acceptance of the Bid, Bidder shall within fifteen (15) days, deposit with Owner an Initial Security Deposit of Rs 50000/- and the same shall be in any of the following form:
  - a) Bank draft drawn on a Silvassa Branch of any Scheduled Bank in favour of Balmer Lawrie & Co Ltd.
  - b) Bank Guarantee executed by any Scheduled Bank as per proforma enclosed and shall be valid at least sixty days after the completion of work.
- (ii) If the Bidder 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 Supplier'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. If vendor fails to start/execute the job as per tender terms then initial security deposit would be forfeited.

## **18.0 TESTING & INSPECTION**

- (i) All materials required for the execution of the work should be new and should conform to applicable 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 Vendor. 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 Vendor 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 vendor 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 Vendor and/or at the Vendors work or otherwise, such materials or items or components. The inspection and/or test shall be conducted at the expense of the Vendor and if conducted by the Vendor 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 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 Vendor for incorporation in the works.

- (iv) 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 Vendor 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.

## 19.0 PERFORMANCE GUARANTEE:

### 19.1 Performance Guarantee:

- a) The vendor shall guarantee that the equipment 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 Vendor 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 Vendor 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. Performance Bank Guarantee shall be issued by any Nationalized / Scheduled Bank on basic value of material supplied and shall remain valid for above guarantee period.

## 20.0 Warranty

The Vendor will repair and/or replace all defective parts, components / fittings, accessories etc. which shall be notified to them in writing within the Defect Liability Period Promptly at free of cost. The vendor will provide similar warranty on the parts, components, fittings, accessories etc. repaired and/ or replaced.

## 21.0 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.



## 22.0 LIQUIDATED DAMAGE

- (i) If the Vendor 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 LD. Upon receipt of such a request, owner may at its discretion extend the period of completion and shall recover from the Vendor's bill, as an ascertained and agreed Liquidated Damages, a sum equivalent to **0.5%** of contract value for each week of delay or part thereof. The LD shall be limited to **5%** of the total 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 Vendor and the said amount will be payable without proof of actual loss or damage caused by such delay/breach.

## 23.0 TERMS OF PAYMENT

No mobilization advance shall be paid to the Vendor.

**AMC Part of Solar plant** – Yearly/Annual within 30 days from the date of submission of Invoice against each completed services/maintenance and submission of necessary reports as applicable.

**Supply ,Installation & Commissioning part** – 90% along with all taxes and duties as applicable within 30 days after successful commissioning of the unit. Balance 10% will be paid after completion of the **guarantee** period.

## 24.0 JURISDICTION

All disputes are subject to Silvassa jurisdiction.

## 25.0 SITE FACILITIES BY BL

1. Power Supply – Free at one point, any extension by vendor
2. Water supply - Free at one point, any extension by vendor.
3. Space by the company at the risk of vendor.

## 26.0 HSE REQUIREMENTS BY VENDORS

### Housekeeping

Vendors 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 Vendor.

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.

### **Confined Space**

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

As minimum Vendors must ensure the following:

- a) Confined spaces are kept identified and marked by a sign near the entrance(s).
- b) Adequate ventilation is provided
- c) Adequate emergency provisions are in place
- d) Appropriate air monitoring is performed to ensure oxygen is above 20%.
- e) Persons are provided with Confined Space training.
- f) All necessary equipment and support personnel required to enter a Confined space is provided.

### **Tools, Equipment and Machinery**

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

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

prohibited.

### **Working at Height**

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

For any Vendor Personnel working at height, Vendors shall provide fall prevention whenever possible and fall protection only when fall prevention is not practicable. Before commencing Work in a height the Vendor 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 Vendor must ensure the following is applied:

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

### **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. Vendor Personnel shall not climb or work from scaffold handrails, mid-rails or brace members.

### **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.

### **Lifting Operations**

#### **Cranes and Hoisting Equipment**

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

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

#### **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.

#### **Lockout Tag out ("LOTO")**

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

### **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.

### **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.

### **Electrical Safety**

Prior to undertaking any work on live electrical equipment the Vendor 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:

- a) 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.
- b) Energized panels will be closed after normal working hours and whenever they are unattended. Temporary wiring will be de-energized when not in use.
- c) Only qualified electrical Vendor Personnel may enter substations and/or transformer and only after being specifically authorized by Owner.

### **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.

### **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 Vendor shall assign a competent Vendor 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 Vendor 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.

### **Environmental Requirements**

#### **Waste Management**

The Vendor is responsible to remove any waste generated by the work being done on the Site. The Vendor 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 Owner'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.

#### **Spills**

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

#### **Emissions**

The Vendor 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's Emissions include but are not limited to noise, dust, fumes, vapours.

## **27.0 PENALTIES IN CASE OF NON-COMPLIANCE OF SAFETY/HEALTH/ENVIRONMENT NORMS, RULES & REGULATIONS**

The vendor has to follow all norms, rules and regulations related to safety, health and environment, In case of non-compliance of any one of these norms, rules and regulations by vendor's employee, the vendor shall be held responsible. If any violation or non-fulfilment of these norms, rules and regulation is observed by the Company's authority during checking at any time, a penalty of Rs 5000/- shall be imposed on the vendor for each occasion of non-compliance to these rules and regulations by him or his employees. The decision of the Company's authority shall be final and binding on to the vendor in this regard. The amount of penalties so imposed shall be recovered from the next RA Bill of the work or any other dues payable to the vendor by the authority.

## BANK GUARANTEE VERIFICATION CHECK LIST

<u>CHECK LIST</u>		<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 and power of attorney No./ Signing Power No. etc. on BG	_____	_____
b.	Is each page of BG duly signed/initialed by the executant and last page is signed with full particulars as required in the Balmer Lawrie's standard proforma of BG and 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.	<b>Is the BG on non-judicial Stamp paper of value Rs. 100/- (Rupees One Hundred only)</b>	_____	_____
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	_____	_____



**PROFORMA OF THE GUARANTEE**  
**EARNEST MONEY DEPOSIT**

To  
M/S. BALMER LAWRIE & CO. LTD.,  
Survey No 201/1 Sayli  
Silvassa-396230.

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., Survey No 201/1 Sayli Silvassa-396230.

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 ..... 2018.

THE CONDITIONS of this obligation are :

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the bid form; or
2. If the Bidder, having been notified of the acceptance of its bid by the Purchaser during the period of bid validity;
  - a) fails or refuses to execute the Contract Form if required; or
  - b) fails or refuses to furnish the Performance Security, in accordance with the instructions to Bidders.

Contd....2/-

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 ..... 2020 granted to him by the Bank.

Your faithfully,

(Specimen Signature)

**BANK GUARANTEE**  
**(PERFORMANCE)**

Letter of Guarantee No.

Dated : the            day of

THE GUARANTEE is executed at Silvassa 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 Vendor) (hereinafter referred to as "the Vendor" which term or  
expression wherever the context so requires shall mean and include the partner or partners of the  
Vendor 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 Vendor 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 Vendor for (set out purpose of the job).

AND WHEREAS under the terms of the said Order the Vendor 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 Vendor 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 Vendor 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 Vendor 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.

Contd....2/-

NOW THIS GUARANTEE WITNESSETH as follows :

1. In consideration of the aforesaid premises at the request of the Vendor, we ..... (set out the full name of the Bank) the Bankers of the Vendor 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 Vendor 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 Vendor 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.
5. 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 Vendor.
6. 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.
7. 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.

Contd....3/-

8. This instrument shall be returned upon its expiry or settlement of claim(s) if any, thereunder.
9. 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.
10. 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 :

**PROFORMA OF THE GUARANTEE  
(SECURITY DEPOSIT)**

M/S. BALMER LAWRIE & CO. LTD.,  
Survey No 201/1 Sayli  
Silvassa-396230.

Dear Sir,

That Messrs/Mr. ....(set out full name and address and constitution of the Vendor) (hereinafter referred to as "the Vendor") 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 Vendor.

The conditions of the said Tender, inter alia, requires that the Vendor 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 Vendor) 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 :

- 3      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 Vendor) 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 Vendor and/or to vary any of the Terms and Conditions of your Contract with the said Messrs/Mr. .... (set out full name of the Vendor), or to extend time of performance by Vendor from time to time or to postpone for any time or from time to time any of the powers exercisable by you against Vendor 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 Vendor 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.

Contd.....2/-

[ 2 ]

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 Vendor), 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.
7. We , ..... (set out full name of the Bank) undertake not to revoke this Guarantee during its currency except with your previous consent in writing.
8. 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 Rs 50000/- granted by the Bank.

Yours faithfully,

Dated : ..... (Place)

.....(Date)

.....  
(Signature of Officer on  
behalf of .....)  
(Set out name of the Bank)

**TECHNICAL  
SPECIFICATION  
FOR  
50 Kwp Grid Connected  
Solar Photovoltaic Power Plant**



## 1.0 System Description and Scope of Work

- 1.1 The scope of Supply & Work include all design, engineering, procurement & supply of equipment and materials, testing at manufacturers works, inspection, packing and forwarding, supply, receipt, unloading and storage at site, preparation of site, associated civil & fabrication works, services, permits, licences, installation, testing and commissioning of **Roof Top mounted Grid Connected Solar PV Power Plant at Balmer Lawrie, G&L, Silvassa.**
- 1.2 Total capacity of the PV Modules to be supplied for the Grid connected Solar Power Plant project is **50 KWp (DC)** which is the rated capacity of all solar PV module under supply as per relevant IEC standards under Standard Temperature Condition (STC) tested at Factory.
- 1.3 **The bidders are advised to visit the site of proposed Solar Plant to assess the quantum of work before submission of their offer.**
- 1.4 Output from Solar String Inverters shall be fed to the Owner's LT Panel through ACDB installed near the Solar Plant and through four pole MCCB of suitable current rating installed in the ACDB.
- 1.5 Unidirectional energy meter of suitable current rating shall be provided at the outgoing feeder of ACDB to monitor Solar PV Generation along with suitable CT/PT.
- 1.6 Data logging system with remote monitoring facility shall be provided.
- 1.7 Pvc pipes, cable conduits, cable tray and its coverings shall be provided as required.
- 1.8 Earthing System and Lightning Arrester System shall be installed at the plant area as required as per relevant IS.
- 1.9 Safety sign as per relevant IS and schematic diagram as per approved design shall be installed at each site.
- 1.10 Necessary cleaning system shall be installed at site (Supply and erection of 1" PVC make water pipeline and connecting it to existing water pipe line with clamp, reducer, bends and all accessories and consumables to make the job complete as per direction of Engineer - in – Charge. Also supply and installation of 6 nos. 1" CP commercial stopcock at locations shown by Engineer in Charge for washing the Solar Panels shall be connection to the new pipeline shall be included under this item)
- 1.11 The specification mentioned for all the equipment which include Solar modules, PCU, combiner boxes, DC cables, module mounting structures, CT, PT, LT cables, interfacing panels, switchgears, energy meters, water pipe line, safety ladder and other associated

equipment etc., to complete the solar PV power generation and evacuation to the designated LT substation.

- 1.12 Adequate capacity of SPV module, PCUs, Junction boxes etc. to ensure generation of power as per design estimates.
- 1.13 Use of equipment and systems with proven design and performance that have high available track record under similar service conditions.
- 1.14 The power plant has to operate in parallel with the grid system which is infinite electrical system. Suitable protective measure is to be in built so that any disturbance of the grid will not cause any damage of the equipment of the solar plant. Very fast responsive microprocessor based directional and reverse power flow protection should be provided to ensure isolation of the solar power plant from the grid at the time of any fault.
- 1.15 SPV power plant should be designed to operate satisfactorily in parallel with the grid within permissible limits of high voltage and frequency fluctuation conditions. It is also extremely important to safeguard the system during major disturbances.
- 1.16 Strict compliance with the approved and proven quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, shipment, storage at site, during erection, testing and commissioning.
- 1.17 Bidder shall design the equipment and plant in order to have sustained life of 25 years with minimum maintenance effort.
- 1.18 The bidder shall furnish following documents along with their offer:
  - i) GA drawing of the proposed plant
  - ii) Schematic diagram of the proposed plant along with design calculation justifying the rating and quantity of the equipment offered
  - iii) Make, Specifications, Rating, Catalogues, Test Certificates of PV Module, Power Conditioning Unit, DC Combiner Box, ACDB, Data Logger, AC / DC cables and wires, Energy Meters offered.  
All test certificates sought specifically elsewhere in the tender specifications.
  - iv) Detail design and drawing of supporting structure, typical foundation drawings
  - v) Roof sheet clamping details
  - vi) GA drawing / technical details Safety / Approach Ladder
  - vii) GA drawing and design calculation of water pipe line system.
  - viii) Detail time schedule
- 1.19 Successful bidder shall prepare detailed project report and design basic and equipment selection criteria, electrical SLDs, schematic diagrams, supporting structure drawings and

details, Safety / approach ladder, Safety railing, Path way details, equipment catalogues for owner's approval within 15 days from the placement of the order.

- 1.20 Obtaining all approvals and preparation of documents for obtaining those approvals for Construction and installation and commissioning of 50 KW Solar PV Plant from CEA / DNH PDCL / RIO shall be under the scope of this contract. **Necessary statutory fees shall be arranged by the vendor which will be reimbursed by the Owner. ( BI has already paid a registration charges for installation of 25 kw solar plant as per DNH PDCL notice)**
- 1.21 Obtaining approval for Net (Import / Export) Metering from Local State Electricity Board / Local Statutory Authority and Supply & Installation of the same NET METER including supply of necessary accessories and necessary modification in metering as advised by local GEB (meter tested and approved by Local Electricity Board / DNH PDCL / RIO) in the HT side of the Plant Electrical shall be under the scope of this work. For that bidder to visit the project site to gather necessary information of Owner's HT System before submission of their offer.
- 1.22 Such works, not listed in the Schedule of Work but required for completion of the Project shall deemed to have been included in the scope of work of this contract.
- 1.23 The plant would be covered under all inclusive comprehensive maintenance contract without spares and consumables for a period of 5 (five) years. This period will be in effect after one year defect liability / warranty period.

During the Defect Liability period and AMC period the contractor shall visit site and check the health of PV Plant once in every two months (i.e. six compulsory checking at site every year during one year defect liability period and thereafter five year AMC period).

The Contractor shall have to furnish monthly and annual maintenance schedule to the owner to keep breakdown minimum.

For operation & maintenance, payment would be made after completion of the service, generally once in every quarter as per contractors' offer for the same.

## **2.0 Solar Photovoltaic Module**

- 2.1 Modules made by indigenous manufacturers of reputed brand such as BHEL, Tata Solar, Vikram Solar, Kotak Solar, Adani, Waaree or approved equivalent (IEC Tested) shall only be used in the project.
- 2.2 The solar photovoltaic modules should be qualified the following certification

- a) IEC-61215/ IS 14286 : Crystalline silicon terrestrial photovoltaic modules (Design qualification and type approval)
- b) IEC-61701 / IS 61701 : Salt mist corrosion testing of photovoltaic modules
- c) IEC- 61853 Part 1/ IS 16170 Part 1: Module performance testing and energy rating : Irradiance, temperature performance measurements and power rating
- d) IEC-61730-1, 2: Photovoltaic module safety qualification, Part 1 for requirements for construction, Part 2 for requirements for testing.

The proposed PV Module must have the test certificate issued from accredited test laboratories of Ministry of New and Renewable Energy, Government of India.

Type Test certificates issued from IEC accredited laboratories shall also be acceptable.

- 2.3 The Project shall consist of **Poly Crystalline silicon photovoltaic modules**. The solar cell shall have surface anti-reflective coating to help to absorb more light in all weather conditions.
- 2.4 Individual solar photovoltaic module should be of minimum capacity 300 Wp.
- 2.5 Photo electrical conversion efficiency of cells shall be not less than 17%, and module efficiency shall be not less than 15% for poly crystalline silicon based modules with positive tolerance only.
- 2.6 The rated output of the modules shall have positive tolerance of + 5W and no negative tolerance is allowed.
- 2.7 SPV modules of similar output with +/- 2% tolerance in single string shall be employed to avoid array mismatch losses.
- 2.8 Fill factor of the module shall not be less than 72%.
- 2.9 **Number of Cells per module shall be 72.**
- 2.10 The module frame shall be made of anodised aluminium or corrosion resistant material, which shall be electrolytically compatible with the structural material used for mounting the modules.
- 2.11 Each module shall have low iron tempered glass front for strength & superior light transmission. It shall also have tough multi-layered polymer back sheet for environmental protection against moisture & provide high voltage electrical insulation. Transmission of glass shall be not less than 91%.

- 2.12 The junction box used in the modules shall have protective bypass diodes to prevent hot spots in case of cell mismatch or shading. The material used for junction box shall be made with UV resistant material to avoid degradation during module life and the Junction sealing shall comply IP65 degree of protection.
- 2.13 The EVA used for the modules should be of UV resistant in nature. No yellowing of the back sheet with prolonged exposure shall occur.
- 2.14 The crystalline silicon based modules supplied should be of Potential Induced Degradation (PID) free modules and the test certificate from the OEM complying with the same shall be provided.
- 2.15 The I-V characteristics of all modules as per specifications to be used in the systems are required to be submitted at the time of supply.
- 2.16 The temperature co-efficient of power for the modules shall not be more than 0.45% / Deg. C.
- 2.17 RF Identification tag for each solar module shall be provided inside or outside the module and must be able to withstand environmental conditions and last the lifetime of the solar module as per MNRE Norms.
- 2.18 The sealant used for edge sealing of PV modules shall have excellent moisture ingress protection with good electrical insulation and with good adhesion strength.
- 2.19 The bird spike shall be provided suitably to avoid bird sitting on the solar modules at the highest point of the array/module structure.
- 2.20 Whenever more than one module is required, identical modules shall be used.
- 2.21 The SPV modules shall be highly reliable, light weight and shall have a service life of more than 25 years.
- 2.22 All materials used for manufacturing solar PV module shall have a proven history of reliability and stable operation in external applications. Module shall perform satisfactorily in relative humidity up to 95% with ambient temperature between -10 Deg C to + 50 Deg C. The material shall withstand adverse climatic conditions, such as high speed wind, blow with dust, sand particles and saline climate / soil conditions. Materials shall also be suitable to withstand adverse environmental conditions of typical chemical plants.
- 2.23 Modules only with the same rating and manufacturer shall be connected to any single inverter.

- 2.24 Bidder shall provide data sheet and type test certificates for Solar PV Module (under STC) along with their offer.
- 2.25 The Owner or its authorised representative may / may not inspect the modules at the manufacturer's factory prior to dispatch.
- 2.26 Entire drawings, detailed test reports and compliance certificates of the offered modules should be submitted to the Owner before the installation of the plant.
- 2.27 Each module shall carry the indelible markings like Logo, Model No., Sl. No., Year of make, etc. The following details of the module should also be displayed:
- Name, monogram or symbol of manufacturer
  - Type or model number
  - Serial number
  - Power (Pmax)
  - Open circuit voltage (Voc)
  - Short circuit Current (Isc)
  - Voltage at maximum power (Vpm)
  - Current at maximum power (Ipm)
  - Application Class
  - Permissible system voltage
  - Maximum over current protection
  - Date & place of manufacture
  - I-V Curve for the module.
  - The RFID should be placed inside the module laminate
  - Module shall be tested as per relevant ISS/IEC standards
- 2.28 Material Warranty:  
The manufacturer should warrant the Solar Module[s] to be free from the defects and /or failures specified below for a period not less than ten [10] years from the date of sale to the original customer [i.e. EPC Contractor] :
- i. Defects and / or failures due to manufacturing
  - ii. Defects and / or failures due to quality of materials
  - iii. Non conformity to specifications due to faulty manufacturing and / or inspection process.
- 2.29 Performance Warranty:  
The manufacturer shall warrant the output of Solar PV modules for their output peak watt capacity, which should not be less than 90% of the initial value at the end of 10 years and 80% of the initial value at the end of 25 years.

The contractor shall collect the Warranty Certificate for performance of the modules from the manufacturer and submit the same to the Owner. If the solar module[s] fail[s] to exhibit such power output in prescribed time span, during the contractual performance guarantee period of first 12 months the Contractor and after completion of contractual performance guarantee period, the manufacturer will be bound to either deliver additional PV Modules to replace the missing power output with no change in area of site used or replace the PV Modules with no extra cost claimed at Owner's sole option.

### **3.0 PV Array Configurations**

- 3.1 The Solar array shall be configured in multiple numbers of sub arrays, providing optimum DC power to available number of sub arrays. The bidder shall submit their own design indicating configuration of PCU and respective sub arrays and associated bill of material.

### **4.0 Module Mounting Structure**

- 4.1 The structure design shall be appropriate and innovative. It must follow the existing roof profile. A typical Module Mounting Structure drawing has been attached to the tender as guidance for designing Module Mounting Structure.
- 4.2 The structure shall be designed to allow easy replacement of any module and shall be in line with the site requirements.
- 4.3 Design drawings with material selected and their standards shall be submitted for prior approval of Owner within 15 days of issuance of Work Order.
- 4.4 The support structure design & foundation shall be designed with reference to Base Wind speed of 200 kmph .
- 4.5 The structure must be designed with considering appropriate factor of safety. The bidder must provide the detail design and calculation for the structure design.
- 4.6 The structure shall be designed for simple mechanical and electrical installation. The SPV modules should be fixed on the structure by using anodised aluminium channels. It shall support SPV modules at a given orientation & tilt, absorb and transfer the mechanical loads to the ground properly. Welding of structure at site shall not be allowed.
- 4.7 The array structure shall be made of mild steel members of suitable sizes with weather protection coating. The coating shall be hot-dipped galvanized with minimum thickness of 80 microns on each sides. It is to be ensured that before application of this coating, the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale acid or alkali or such foreign material as are likely to interfere with the coating process. The Contractor shall ensure that inner side should also be coated.

- 4.8 The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- 4.9 Nut & bolts, washers (packing and spring) supporting structures including Module Mounting Structures shall have to be adequately protected from atmosphere and weather prevailing in the area.
- 4.10 Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each module shall be provided. All the fasteners and washers for Module Mounting Structures and modules, shall be adequately protected from atmosphere and weather prevailing in the area. Fasteners and washers to be used for erection of mounting structures could be of SS 304/ UNS S 20430 or equivalent, however fasteners used for fixing modules over structures shall be of stainless steel of grade SS 316 or equivalent, and must sustain the adverse climatic conditions to ensure the life of structure for 25 years.
- 4.11 Modules shall be clamped & bolted with the structure properly. The material of clamps shall be Al / Steel having weather resistant properties. Clamp – bolt shall use EPDM rubber and shall be designed in such a way so as not to cast any shadow on the active part of a module.
- 4.12 The array structure shall be grounded properly using maintenance free earthing kit.
- 4.13 The bidder/manufacture shall specify installation details of the PV modules and the support structures with appropriate diagram and drawings.
- 4.14 Cable should pass from Pipes and Cable-ties shall be used to hold and guide the Pipes (cables/wires) from the modules to junction boxes or inverters. All the cables were aesthetically tied to module mounting structure.
- 4.15 Every major Component of the Plant should be suitably named/ numbered & marked for ease of traceability, identification and maintenance.
- 4.16 The vendors are requested to make a site visit and assess the site requirement before quoting.
- 4.17 For rooftop installation, the module alignment should be in line with the roof slope & orientation. This shall be decided based on the location of array installation.
- 4.18 If the structure is planned to install above inclined asbestos / aluminium sheet, the solar panels will be fixed to roof purlins using tek screw, suitable clamps and anodised extrusion.
- 4.19 Contractor to confirm that for roof top installation, no damage to existing water proofing of the roof shall be made during the course of installation of the structure on the roof top. Any



damage to the waterproofing found during the above should be rectified to the existing roof condition at contractor's cost. All pedestals shall be finished to the existing roof condition to prevent any water seepage later.

## **5.0 Array Junction Box / Combiner Box**

- 5.1 Array Junction Boxes / Combiner Boxes shall have to be used for termination of string prior connecting array with each inverter. They shall be equipped with appropriate functionality, safety (including fuses, grounding, contacts etc.) and protection.
- 5.2 The Array Junction Boxes / Combiner Boxes shall be dust, vermin and water proof and made of poly carbonate plastic. The number of PV Array Junction Box / Combiner Box shall be as per plant configuration.
- 5.3 The terminals will be connected to copper bus bar arrangement of proper sizes to be provided. The junction boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cable. Suitable markings shall be provided on the bus bars for easy identification and UV resistant cable ferrules will be fitted at the cable termination points for identification. Input termination through VDE / UL / TUV approved PV connectors made of Polyamide with IP 65 / IP 67 protection and Output termination through VDE / UL approved Glands made of Polyamide with IP 65 / IP 67 protection.
- 5.4 Junction boxes should be equipped with fuses on both positive & negative input to protect the PV modules from short circuits.
- 5.5 Copper bus bars / terminal blocks housed in the junction box with suitable termination threads.
- 5.6 Earth terminal block for earthing.
- 5.7 Surge Protection Devices are to protect the PV modules as well as the other electrical / electronic systems from transient over voltages created due to lightning and to reduce insulation breakdowns due to lightning.
- 5.8 Only DC fuses shall be provided for each string / input and DC disconnecter of suitable size should be used.
- 5.9 The Junction Boxes shall have suitable arrangement for the following:
  - i) Combine groups of modules into independent charging sub arrays.
  - ii) Provide arrangement for disconnection for each of the groups.
  - iii) Provide a test point for each subgroup for quick fault location.
  - iv) To provide group array isolation.

- v) The current carrying rating of the Junction Boxes shall be suitable with adequate safety factor to inter connect the Solar PV array.
- 5.10 Accepted make: Hensell / Spellsberg / Ensto / Trinity / Nordac or approved equivalent make.
- 6.0 Power Conditioning Unit (PCU)**
- 6.1 Power Conditioning Unit (PCU)/ Inverter shall consist of an electronic inverter along with associated control, protection and data logging devices.
- 6.2 The rated power/name plate capacity of the inverters shall be the AC output of the inverter at 50°C. Any inverters with AC output at 50°C, below the name plate/rated power of the inverter shall not be allowed.
- 6.3 The inverter supplied shall have minimum of 25% additional DC input Capacity. (E.g. Inverter is supplied with rated capacity of 100 kW (AC) shall accept at least 125 kW of DC power.)
- 6.4 All PCUs should consist of associated control, protection and data logging devices and remote monitoring hardware and compatible with software used for string level monitoring.
- 6.5 Dimension, weight, cooling arrangement etc. of the PCU shall be indicated by the Bidder in the offer. All PCUs shall be suitable for out-door type installation.
- 6.6 Only those PCUs/ Inverters which are commissioned for more than said (AC) capacity solar PV projects till date in India shall be considered for this project. Bidder has to provide sufficient information to the satisfaction of the Employer before placing the final order for PCUs/Inverters.
- 6.7 The minimum European efficiency of the inverter shall be 98% load as per IEC 61683 standard for measuring efficiency. The Bidder shall specify the conversion efficiency of different loads i.e. 25%, 50%, 75% and 100% in its offer. The Bidder should specify the overload capacity in the bid.
- 6.8 The inverters shall have minimum protection to IP 65(Outdoor)/IP 21(indoor) and Protection Class II.
- 6.9 Nuts & bolts and the PCU enclosure shall have to be adequately protected taking into consideration the atmosphere and weather prevailing in the area.
- 6.10 Grid Connectivity: Relevant CERC regulations and grid code as amended and revised from time to time shall be complied. The system shall incorporate a unidirectional inverter and should be designed to supply the AC power to the grid at load end. The power conditioning unit shall adjust the voltage & frequency levels to suit the Grid.

- 6.11 All three phases shall be supervised with respect to rise/fall in programmable threshold values of frequency.
- 6.12 The inverter output shall always follow the grid in terms of voltage and frequency. This shall be achieved by sensing the grid voltage and phase and feeding this information to the feedback loop of the inverter. Thus control variable then controls the output voltage and frequency of the inverter, so that inverter is always synchronized with the grid.

#### **Operational Requirements for Inverter/ PCU**

- 6.13 All PCUs must have the feature to work in tandem with other similar PCU's and be able to be successively switched "ON" and "OFF" automatically based on solar radiation variations during the day. Inverters must operate in synergy and intelligently to optimize the generation at all times with minimum losses.
- 6.14 The PCU shall be capable of controlling power factor dynamically.
- 6.15 Maximum power point tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array. The MPPT should be microprocessor based to minimize power losses. The MPPT unit shall confirm to IEC 62093 for design qualification.
- 6.16 The system shall automatically “wake up” in the morning and begin to export power provided there is sufficient solar energy and the grid voltage and frequency is in range.
- 6.17 Sleep Mode: Automatic sleep mode shall be provided so that unnecessary losses are minimized at night. The power conditioner must also automatically re-enter standby mode when threshold of standby mode reached.
- 6.18 Stand – By Mode: The control system shall continuously monitor the output of the solar power plant until pre-set value is exceeded & that value to be indicated.
- 6.19 Basic System Operation (Full Auto Mode): The control system shall continuously monitor the output of the solar power plant until pre-set value is exceeded & that value to be indicated.

#### **Protection against faults for PCU**

- 6.20 The PCU shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective

devices. In addition, it shall have following minimum protection against various possible faults.

- 6.21 Grounding Leakage Faults: The PCU shall have the required protection arrangements against grounding leakage faults.
- 6.22 Over Voltage & Current: In addition, over voltage protection shall be provided between positive and negative conductor and earth ground such as Surge Protection Devices (SPD).
- 6.23 Galvanic Isolation: The PCU inverter shall have provision for galvanic isolation with external transformer, if required.
- 6.24 Unequal Phases: The system shall tend to balance unequal phase voltage (with 3- phase systems).
- 6.25 Reactive Power: The output power factor of the PCU should be of suitable range to supply or sink reactive power. The PCU shall have internal protection arrangement against any sustained fault in the feeder line and against lightning in the feeder line.
- 6.26 Isolation: The PCU shall have provision for input & output isolation. Each solid- state electronic device shall have to be protected to ensure long life as well as smooth functioning of the PCU.
- 6.27 PCU shall have arrangement for adjusting DC input current and should trip against sustainable fault downstream and shall not start till the fault is rectified.
- 6.28 Each solid state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.
- 6.29 All inverters/ PCUs shall be three phase using static solid state components. DC lines shall have suitably rated isolators to allow safe start up and shut down of the system. Fuses & Circuit breakers used in the DC lines must be rated suitably.

### **Standards & Compliances**

- 6.30 PCU shall confirm to the following standards and appropriately certified by the labs:
  - Efficiency measurement: IEC 61683
  - Environmental Testing: IEC 60068-2 or IEC 62093
  - Electrical safety: IEC 62109 (1&2), EN 50178 or equivalent
  - Protection against islanding of grid: IEEE1547/ UL1741/ IEC 62116 ore equivalent
  - Grid Connectivity: Relevant CEA/ CERC regulation and grid code (Amended up to date)
  - Reliability test standard: IEC 62093 or equivalent

6.31 Desired Technical Specifications of PCU.

- Sinusoidal current modulation with excellent dynamic response.
- Compact and weather proof housing (indoor/ outdoor)
- Comprehensive network management functions (including the LVRT and capability to inject reactive power to the grid)
- Total Harmonic Distortion (THD) <3%
- No load loss < 1% of rated power and maximum loss in sleep mode shall be less than 0.05%
- Optional VAR control
- Power factor Control range: 0.9 (lead – lag)
- Humidity: 95% Non – Condensing
- Unit wise & integrated Data logging
- Dedicated Prefabs / Ethernet for networking

6.32 Inverter/ Power Condition unit must provide protection against:

- Over current
- Sync loss
- Over temperature
- DC bus over voltage
- Cooling Fan failure (If provided)
- Short circuit
- Lightning
- Earth fault
- Surge voltage induced at output due to external source
- Power regulation in the event of thermal overloading
- Set point pre-selection for VAR control
- Bus communication via -interface for integration
- Remote control via telephone modem or mini web server
- Integrated protection in the DC and three phase system
- Insulation monitoring of the PV array with sequential fault location

6.33 Over voltage protection against atmospheric lightning discharge to the PV array is required.

6.34 The power conditioner must be entirely self-managing and stable in operation.

6.35 A self-diagnostic system check should occur on start up. Functions should include a test of key parameters on start up.

6.36 PCU/inverter front panel shall be provided with display (LCD or equivalent) to monitor, but not limited to, the following:

- DC power input

- DC input voltage
- DC Current
- AC power output
- AC voltage (all the 3 phases and line)
- AC current (all the 3 phases and line)
- Power Factor

#### 6.37 Documentary Requirements & Inspection

- The bill of materials associated with PCU's should be clearly indicated while delivering the equipment.
- The Contractor shall provide to the Employer, data sheet containing detailed technical specifications of all the inverters and PCUs, Type test reports and Operation & Maintenance manual before dispatch of PCUs.
- The Employer or its authorized representative reserves the right to inspect the PCUs/ Inverters at the manufacturer's site prior to dispatch.

6.38 Accepted make: SMA / ABB / Schneider / Siemens / DELTA / KACO or approved equivalent make.

### 7.0 Cable and Wires

- 7.1 All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. (Note: DC cables for outdoor installations should comply with the TUV 2PFG 1169/09.07 for service life expectancy of 25 years)
- 7.2 Insulation: Outer sheath of cables shall be electron beam cross-linked XLPO type and black in colour. In addition, Cable drum no. / Batch no. to be embossed/ printed at every one meter. Cable Jacket should also be electron beam cross-linked XLPO, flame retardant, UV resistant and black in colour.
- 7.3 DC cables used from solar modules to array junction box shall be solar grade copper (Cu) with XLPO insulation and rated for 1.1kV only. However, the cables used from array junction box to inverter can be XLPO Aluminium with 1.1kV rating as per relevant standards. Bidder shall provide the type test report for each type of cable used before dispatch of the cable.
- 7.4 Wires with sufficient amp capacity and parameters shall be designed and used so that maximum voltage-drop at full power from the PV modules to inverter should be less than 1.5% (including diode voltage drop). Successful Bidder shall provide voltage drop calculations in excel sheet.

- 7.5 Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All wires used on the LT side shall conform to IS and should be of appropriate voltage grade. Only copper conductor wires compliant with IEC 60228, Class 5 of reputed make shall be used.
- 7.6 All cables connecting the main junction box/inverters to the owner panel / transformers should be XLPE insulated grade conforming to IS 1554 and cables shall also conform to IEC 60189 for test and measuring the methods.
- 7.7 Cable terminations shall be made with suitable cable lugs & sockets etc., crimped properly and passed through brass compression type cable glands at the entry & exit point of the cubicles.
- 7.8 All cable/wires shall be provided with UV resistant printed ferrules for both side. The marking on tags shall be done with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.
- 7.9 The wiring for modules interconnection shall be in the weather resistant pipe of reputed make. All cables wires shall be routed in GI cable tray with covers. GI cable trays with covers shall be suitably mounted on the rooftop. All the buried cables can be run through HD pipe/ DWC conduit. However, for crossing with road, drain and trenches etc., the cable must pass through GI pipe of appropriate size.
- 7.10 The cable from ACDB near Solar Plant to the Owner's LT Panel / Substation shall be armoured aluminium cable of suitable size mentioned elsewhere in the specification.

Acceptable Make:

DC Cable: Lapp / Hellukable / TKD / Sichem / KEI / Finolex or, approved equivalent

AC Cable: Lapp / Hellukable / TKD / Finolex / Havells / Polycab / Gloster / KEI / Sichem / Finolex or approved equivalent

## **8.0 Switchboard box/DC Distribution Box(DCDB)/AC Distribution Box(ACDB) Panels**

- 8.1 Successful Bidder shall provide sufficient no. of switchboards / DCDB / ACDB wherever required.
- 8.2 All boxes/ panels should be equipped with appropriate functionality, safety (including fuses, grounding, etc.) and protection.

- 8.3 The terminals will be connected to bus-bar arrangement of proper sizes to be provided. The panels/ boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables.
- 8.4 Adequate rating fuses & isolating MCB/ MCCB should be provided.
- 8.5 The panels/ boxes shall have suitable arrangement for the followings:
- Provide arrangement for disconnection
  - Provide a test point for quick fault location
  - To provide isolation
  - The current carrying rating of the boxes/ panels shall be suitable with adequate safety factor
  - The rating of the boxes/ panels shall be suitable with adequate safety factor to inter connect to the local/ internal grid
  - Thermal/ heat dissipation arrangement/ Vent for safe operation.
  - Adequate number of spare terminals
- 8.6 The boxes/ panels shall be dust, vermin, and waterproof and made of thermoplastic/ metallic in compliance with IEC 62208, which should be sunlight/ UV resistive as well as fire retardant & must have minimum protection to IP 65(Outdoor)/ IP 20(indoor) and Protection Class II.
- 8.7 All panels/ boxes shall be provided with adequately rated bus-bar, incoming control, outgoing control etc. as a separate compartment inside the panel to meet the requirements of the Plant. All live terminals and bus bars shall be shrouded. The outgoing terminals shall be suitable to receive suitable runs and size of cables required for the Inverter/Transformer rating.
- 8.8 The boxes/ panels must be grounded properly to ensure all safety related measures for safe operation. The parts of panel, wherever applicable, must be insulated properly.
- 8.9 All the Panels to be manufactured with sufficient space for working and must have temperature suitability up to 85o C with separate cable and bus bar alley.
- 9.0 Lightning Protection for PV Array**
- 9.1 The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a safe level before it reaches the PV or other sub-system components as per NFC 17 – 102. Bidder to provide ESE type lightning arrester, placed at strategic locations to protect the plant from lightning and shall not cause any shadow on the solar modules.



- 9.2 Necessary foundation / anchoring for holding the lightning conductor in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.
- 9.3 The lightning conductor shall be earthed through flats and connected to the grounding mats as per applicable Indian Standards with earth pits. Each lightning conductor shall be fitted with individual earth pit as per required Standards including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS.

#### **10.0 On Line Data Logger & Remote Monitoring**

GPRS / Internet enabled Standard Data Logger for measuring standard parameters of the Solar PV Plant along with necessary equipments required to measure Performance Ratio (PR) shall be provided for the power plant. The GPRS / Internet based Remote Monitoring shall be supplied and installed by the bidder at a PC allocated by the Owner. The remote monitoring system shall show the real time PR. Necessary SIM card / internet shall be provided by Balmer Lawrie. The monitoring system shall be used for monitoring only and shall not be used to control / regulate the solar power plant.

#### **11.0 Energy Meter**

- 11.1 **Bi Directional Meter for Net Metering:** This meter is capable of bidirectional metering. Power is monitored in both directions (upstream and downstream from the meter). The meter is housed in a thermoplastic enclosure suitable for installation of DIN rail mounting/panel mounting.

The bidirectional meter is provided at HT Switchboard of Electrical System of the plant. All necessary accessories and modification of the existing control circuit shall be under the scope of this contract. Bidder to visit site to gather information about Owners HT System before submission of their bid.

Acceptable Make: EM 6400 IE 0.5 of Schneider or equivalent of L&T (or, as approved by Local Electricity Board / RIO only).

- 11.2 Uni-directional Energy Meter (For each ACDB)

The meter is provided at ACDB's for measure the electrical energy output from solar power plant.

Acceptable Make: EM 1000 of Schneider or equivalent of L&T only (or, as approved by Local Electricity Board / RIO only).

## **12.0 Safety Net (For Roof Top Installation during execution of the work**

- 12.1 A safety net should be provided as and when required during execution of job, under the asbestos/aluminium sheet for the safety of people working above as well as below the roof. Safety net having tested quality IS:5175 manufactured with 12mm poly propylene border rope and 4 mm poly propylene rope with mesh of size 4"x4" with sufficient strength and shall be with braided safety net.

## **13.0 Safety Ladder**

- 13.1 A safety stairs of Iron structure should be provided for climbing on the roof where the Solar Plant is proposed for the safety of people for easy and safe access over panels during installation and maintenance. To protect from potential fall hazards through roof edges and roof hatches, workers must use personal fall protection and other safety parameters.
- 13.2 FRP walkway with safety railing on the rooftop in between solar modules shall be provided for accessing for maintenance and cleaning operation.

## **14.0 Documentation**

- 14.1 Three sets of installation manual / user / operation and maintenance manual shall be supplied. The manual shall include complete system details such as array layout, schematic of system, inverter details, technical catalogue of all major component of the system, warranty certificates, working principle etc. Step by step maintenance and troubleshooting procedure shall be given in the manuals.

## Technical Particular Sheets

### 1.0 Solar PV Module

- |      |   |            |
|------|---|------------|
| 1.1  | PV Module Manufacturer (Name & Country):  |            |
| 1.2  | PV Module type (Crystalline – Mono / Poly)                                      | :          |
| 1.3  | No. of PV Cells per module  | :          |
| 1.4  | No. of PV Modules   | :          |
| 1.5  | Mounting arrangement for Solar Module   | :          |
| 1.6  | Solar Module frame material (if framed)   | :          |
| 1.7  | Module dimensions (in mm)   | :          |
| 1.8  | Output Cables (viz. Polarised Weatherproof<br>DC rated multi-contact connector) | :          |
| 1.9  | Availability of Reverse Blocking Diode and<br>Bypass Diode                      | :          |
| 1.10 | Construction  |            |
|      | Front Glass description and thickness   | :          |
|      | Back sheet details  | :          |
|      | Encapsulating Details   | :          |
| 1.11 | Cell Efficiency (%)   | :          |
| 1.12 | Module Efficiency (%)   | :          |
| 1.13 | Nominal Wattage ( $P_{nom}$ ) (Watt)  | :          |
| 1.14 | Power Tolerance ( $\leq + 5V$ ) (Watt)  | :          |
| 1.15 | Peak Power Voltage ( $V_{mp}$ ) (volts)   | :          |
| 1.16 | Peak Power Current ( $I_{mp}$ ) (amps)  | :          |
| 1.17 | Open circuit voltage ( $V_{oc}$ ) (volts)                                       | :          |
| 1.18 | Short circuit current ( $I_{sc}$ ) (amps)                                       | :          |
| 1.19 | Weight of each module (kg)  | :          |
| 1.20 | Fill Factor (%)   | :          |
| 1.21 | Module is suitable to operate<br>up to 50°C ambient temperature                 | : Yes / No |
| 1.22 | Compliances ( Reference Standards)  | :          |

## 2.0 Power Conditioning Unit (PCU)

- 2.1 PCU Module Manufacturer (Name & Country) :
- 2.2 Capacity & nos. of PCU units :
- 2.3 Model / Catalogue No. :

### AC Side

- 2.4 Nominal AC Power at 25°C (Kw) :
- 2.5 Nominal AC Power at 50°C (Kw) :
- 2.6 Output AC voltage (volts) :
- 2.7 Output AC current (amps) :
- 2.8 Frequency (and variation) (Hz) :
- 2.9 Total Harmonic Distortion (< 3%) (%) :
- 2.10 AC over/under voltage, over/under  
Frequency protection :
- 2.11 Phase shift (Cos Ø) :

### DC Side

- 2.12 Maximum input DC Power. (Kw) :
- 2.13 Maximum DC voltage (volts) :
- 2.14 MPPT voltage range (volts) :
- 2.15 Maximum DC current (amps) :
- 2.16 DC overvoltage protection :
- 2.17 DC voltage ripple (%) :

### Others

- 2.18 Maximum Efficiency (%) :
- 2.19 Ambient temperature range (°C) :
- 2.20 Humidity (none condensing) (RH) :
- 2.21 Quiescent power (Kw) :
- 2.22 Degree of protection (IP) :
- 2.23 Dimension approx... (H x W x D) (mm) :
- 2.24 Weight (Kg) :
- 2.25 Compliances (Reference Standards) :

### **3.0 Energy Meter**

3.1	Make	:
3.2	Model / Catalogue No.	:
3.3	Accuracy class	:
3.4	Voltage	:
3.5	Display	:
3.6	Memory	:
3.7	Communication Compatibility	:
3.8	Battery	:

### **4.0 DC / AC Junction Box**

4.1	Make	:
4.2	Model / Catalogue No.	:

#### **Enclosure**

4.3	Degree of protection	:
4.4	Enclosure material	:
4.5	Withstanding voltage	:
4.6	Withstanding temperature	:

#### **Cable entry and exit**

4.7	Position	:
4.8	Cable entry and exit connector type	:
4.9	Cable Gland	:

#### **Earthing**

4.10	Earthing provision	:
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#### **Terminals**

4.11	Terminals, lugs and busbar material	:
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**TENDER DRAWING**

बामर लॉरी एंड कंपनी लिमिटेड

**Balmer Lawrie & Co Ltd.**

(भारत सरकार का एक उद्यम)

(A Government of India Enterprise)

**Survey No .201/1, Sayli,Sayli-Rakholi Road,Silvassa-396230**

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बामर लॉरी एंड कंपनी लिमिटेड के सिलवासा स्थित प्लांट में रूफ टॉप माँटेड ग्रिड कनेक्टेड 50 KWp सौर फोटोवोल्टिक पावर प्लांट का सप्लाई, अधिष्ठापन (इन्सटालेशन), टेस्टिंग एवं कमीशनिंग ।

**Supply, Installation, Testing and Commissioning of Grid Connected Roof Top mounted 50 Kwp Solar Photovoltaic Power Plant at Balmer Lawrie, & Co. Ltd. G & L Silvassa**

**Tender No. GLS/TE20/031 Date 05/11/2020**

**मूल्यंकित भाग (भाग-2) / PRICED PART (PART-II)**

## NOTES:

- 1.0 Details of the items under this Schedule shall be read in conjunction with the corresponding Specifications, 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 Unless specifically mentioned otherwise in the Contract, the Tenderer shall quote for the finished items and shall provide for the complete cost towards power, fuel, tools, tackles, equipment, Constructional Plant, Temporary Work, labour, materials, levies, taxes, transport, layout, re-pairs, rectification, maintenance till handing over, supervisions, colonies, shops, establishments, services, temporary roads, revenue expenses, contingencies, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the work according to the contract.
- 5.0 The Quantities of the various items mentioned in the Schedule of Items are approximate and may vary or may be deleted altogether. The Contractor, 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 Rates shall be quoted both in figures and in words in clear legible writing. No over writing is allowed. All scoring and cancellations should be countersigned by the Tenderer. In case of illegibility, the rates written in word will be considered final. All entries shall be in English language.
- 7.0 Engineer's decision shall be final and binding on the Contractor regarding clarification of items in this Schedule with respect to the other sections of the Contract.
- 8.0 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 (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.