



**PORT QASIM AUTHORITY
BIN QASIM, KARACHI-75020**

NOTICE INVITING TENDER

1. Port Qasim Authority (PQA) Invites sealed bids from the reputed Contractors / Firms registered with (i) Pakistan Engineering Council (PEC) in C-5 Category or above, valid upto 31st December, 2024 (ii) with specialization codes EE-04 and EE-11 (Solar Energy system) (iii) registered with Income Tax Department under FBR (Federal Board of Revenue) on Active Tax Payer list having Tax Payers Registration Certificate (iv) registered with SRB (Sindh Revenue Board) on Active Tax payer list (v) and also registered with e-Pak Acquisition and Disposal System (e-PADS) of PPRA for the works mentioned here under:

Tender No.	Name of work	Earnest Money	Tender fee by pay Order	Contract Period	Tender submission & opening date
182	Design, Supply, Installation, Testing & Commissioning of 232 KW On-Grid Solar PV System for 3 x Admin Buildings of PQA	Rs. 2,000,000/- in shape of pay order or bank guarantee in favor of PQA. (Refundable)	Rs. 5,000/= (In favor of PQA) (Non-Refundable)	04 months	24-07-2024

2. Bidding documents containing detailed Terms & Conditions are available for the interested bidders at the office of Director (M&E), PQA, Bin Qasim, Karachi. The documents will be provided upon providing evidence for registration in relevant PEC Category, specialization and upon payment of a non-refundable bid documents price of Rs. 5,000/= (Rupees, five thousand only), in the shape of pay order in favour of "Port Qasim Authority" issued by a scheduled Bank of Pakistan located in Karachi having minimum "AA" rating. Bidding documents can also be downloaded from PQA/PPRA websites.
3. Single Stage Two Envelope Procedure, under rule 36(b) of PPRA-2004 shall be adopted. One envelope containing information regarding Qualification of bidder and respective information shall be clearly marked "Technical Proposal" & the second envelope containing the Bid price shall clearly marked "Financial Proposal". Technical proposal must contain the earnest money amounting to Rs. 2,000,000/- (Rupees two million only) in the form of pay order or bank guarantee in favour of Port Qasim Authority, issued by a scheduled Bank of Pakistan located in Karachi having minimum "AA" rating. Tender submitted without Earnest Money shall be rejected.
4. Technical Proposal and Financial Proposal (Both Envelopes) are to be submitted in the office of Director (M&E) by 1200 hours on date indicated above along with earnest money in the shape of Pay order (Refundable) in favour of Port Qasim Authority and the same shall also be submitted through E-PADS. Technical proposals only shall be opened on the same date at 1230 hours in the presence of Bidders or their authorized representative who may wish to be present.
5. Financial proposal of technically qualified bidders shall be opened in the presence of bidders or their authorized representatives who may wish to attend. The date, time & venue will be intimated later. The financial proposal of technically non-qualified bidders shall be returned unopened.
6. In case of holiday on the date of submission/opening of tender, the same will be opened on the next working day at the same time.
7. Port Qasim Authority reserves the right to accept or reject any or all bids as per PPRA-2004 and no claim whatsoever shall be entertained in this regards. Authority's decision in this respect shall be final and binding upon all bidders.


(TIPU SULTAN SHAIKH)
SECRETARY PQA

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Bidding Documents
(Single Stage-Two Envelope Bidding Procedure)

**Design, Supply, Installation, Testing & Commissioning of
232 KW On-Grid Solar PV System for 3 x Admin Buildings of PQA**

(2024)

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INVITATION FOR BIDS

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

(Note: These Instructions to Bidders along with Bidding Data will not be part of the Contract and will cease to have effect once the contract is signed.)

A. GENERAL

IB.1 Scope of Bid

- 1.1 The **Employer** (as defined in the Bidding Data) wishes to receive bids for the Design, Supply, Installation, Testing & Commissioning of On-Grid solar PV system as described in these Bidding Documents, and summarized in the Bidding Data hereinafter referred to as the “**Works**”.
- 1.2 The Successful Bidder will be expected to complete the Works within the time specified in Appendix-A to the Bid.

IB.2 Source of Funds

- 2.1 The Employer has available to it sufficient resources / funds to completely finance the supply, construction and completion of the Works.

IB.3 Eligible Bidders

This invitation for Bids is open to local firms / Contractors:-

a. Firms / Contractor shall have to submit with bid the following:-

- (i) Pakistan Engineering Council (PEC) in C-5 Category or above, valid up to 31st December, 2024 with specialization codes EE-04 and EE-11 (Solar Energy system).
- (ii) Registered with Income Tax Department under FBR (Federal Board of Revenue) on Active Tax Payer list having Tax Payers Registration Certificate.
- (iii) Registered with SRB (Sindh Revenue Board) on Active Tax Payer list.
- (iv) Registered with e-Pak Acquisition and Disposal System (e-PADS) of PPRA.

b. In case of JV, all the members shall individually comply / qualify the requirements as specified above.

IB.4 One Bid per Bidder

- 4.1 Each bidder shall submit only one bid either by himself, or as a partner in a Joint Venture. A bidder who submits or participates in more than one bid (other than alternatives pursuant to Clause IB.16) will be disqualified.

IB.5 Cost of Bidding

- 5.1 The bidders shall bear all costs associated with the preparation and submission of their respective bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

IB.6 Site Visit

- 6.1 The bidders may visit and examine the Site of Works and its surroundings and obtain for themselves on their own responsibility all information that may be necessary for preparing the bid and entering into a contract for the Works. All cost in this respect shall be at the bidder's own expense.

- 6.2 The bidders and any of their personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such inspection, but only upon the express condition that the bidders, their personnel and agents, will release and indemnify the Employer, his personnel and agents from and against all liability in respect thereof and will be responsible for death or personal injury, loss of or damage to property and any other loss, damage, costs and expenses incurred as a result of such inspection.

B. BIDDING DOCUMENTS

IB.7 Contents of Bidding Documents

- 7.1 The Bidding Documents, in addition to invitation for bids, are those stated below and should be read in conjunction with any Addenda issued in accordance with Clause IB.9.

1. Instructions to Bidders;
2. Bidding Data;
3. Letters of Technical Bid & Price Bid;
4. Appendices to Bid;
5. Conditions of Contract;
6. Contract Data;
7. Form of Bid Security;
8. Form of Performance Security;
9. Form of Advance Payment Guarantee;
10. Form of Contract Agreement;
11. Specifications & Employer Design.

- 7.2 The bidders are expected to examine carefully the contents of all the above Bidding Documents. Failure to comply with the requirements of bid submission will be at the Bidder's own risk. Pursuant to Clause IB.26, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.8 Clarification of Bidding Documents

- 8.1 Any prospective bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer in writing at the Employer's address indicated in bidding data. **The Employer will respond to any request for clarification which he receives at least five (5) days prior to the deadline for submission of bids.**
- 8.2 Copies of the Employer's response will be forwarded to all purchasers of the Bidding Documents, including a description of the enquiry but without identifying its source.

IB.9 Amendment of Bidding Documents

- 9.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the Bidding Documents by issuing addendum.

- 9.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub-Clause 7.1 hereof and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer.
- 9.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may extend the deadline for submission of bids in accordance with Clause IB.20

C. PREPARATION OF BIDS

IB.10 Language of Bid

- 10.1 The bid and all correspondence and documents related to the bid exchanged by a bidder and the Employer shall be in the bid language stipulated in the Bidding Data and particular Conditions of Contract. Supporting documents and printed literature furnished by the bidders may be in any other language provided the same are accompanied by an accurate translation of the relevant parts in the bid language, in which case, for purposes of evaluation of the bid, the translation in bid language shall prevail.

IB.11 Documents Comprising the Bid

- 11.1 **The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Proposal and the other Financial Proposal, containing the documents listed in Bidding Data under the heading of 11.1 A & B respectively. Both envelopes to be enclosed together in an outer single envelope called the Bid. Each bidder shall furnish all the documents as specified in Bidding Data at 11.1 A & B.**
- 11.2 Bids submitted by a Joint Venture (JV) shall include a copy of the JV Agreement entered into by all partners. Alternatively, a letter of intent to execute a JV Agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement. The role to be played by each partner to be specified therein. Bids submitted by a JV of two (2) or more firms shall comply with the following requirements:
- (a) In case of successful bid, the form of JV Agreement shall be signed and submitted **within seven (7) days of the receipt of Letter of Acceptance** failing which the contract and the Letter of Acceptance shall stand void and redundant.
 - (b) **One of the JV partners shall be nominated as being in charge** and this Authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the JV partners. In case of a company submitting chain of Authority including board resolution to this effect or any authorization required under the law shall be mandatory.
 - (c) The partners-in-charge shall always be duly authorized to deal with the Employer regarding all matters related with and/or incidental to the execution of Works as per the terms and conditions of JV Agreement and in this regard to incur any and all liabilities, receive instructions, give binding undertakings and receive payments on behalf of the JV.

- (d) All partners of the JV shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para (b) above as well as in the Form of Bid and in the Form of JV Agreement (in case of a successful bid): and
- (e) A copy of JV Agreement shall be submitted before signing of the Contract, stating the conditions under which JV will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the JV, and any other information necessary to permit a full appraisal of its functioning. The JV agreement shall be deemed part of the Contract. No amendments/modifications whatsoever in the JV agreement shall be agreed to between the JV partners without prior written consent of the Employer.

11.3 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in the Bidding Forms, in sufficient detail to demonstrate the adequacy of Bidders' proposal to meet the Works requirements and the completion time referred to in Contract Data.

IB.12 Bid Prices

12.1 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole of the Works as described in Sub-Clause 1.1 hereof, based on lump sum price of the Works. **The criteria for evaluation of bids are provided in the Bidding Data.**

12.2 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause shall be included in the rates and prices and the total Bid Price submitted by a bidder. After the date of bid submission deadline, any additional / reduced duties, taxes and levies due to subsequent additions or changes in legislation shall be reimbursed / deducted.

IB.13 Currencies of Bid and Payment

13.1 The price of the Works shall be quoted by the bidders entirely in Pak rupees.

IB.14 Bid Validity

14.1 Bids shall remain valid for the period stipulated in the Bidding Data after the date of Bid Opening specified in Clause IB.23.

14.2 In exceptional circumstances, prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period which shall in no case be more than the original bid validity period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiting his Bid Security. A bidder agreeing to the request will not be required or permitted to modify his bid, but will be required to extend the validity of his Bid Security for the period of the extension, and in compliance with Clause IB.15 in all respects.

IB.15 Bid Security

- 15.1 Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in the Bidding Data in Pak Rupees.
- 15.2 The Bid Security shall be, at the option of the bidder, in the form of Pay Order or a Bank Guarantee issued by a Scheduled Bank in Pakistan in favour of and acceptable to the Employer valid for a period thirty (30) days beyond the Bid Validity date.
- 15.3 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive.
- 15.4 The bid securities of unsuccessful bidders will be returned as promptly as possible, but not later than fifteen (15) days after the expiration of the period of Bid Validity.
- 15.5 The Bid Security of the Successful Bidder will be returned when the bidder has furnished the required Performance Security and signed the Contract.
- 15.6 The Bid Security may be forfeited:
 - (a) If the bidder withdraws his bid except as provided in Sub-Clause 22.1;
 - (b) If the bidder does not accept the correction of his Bid Price pursuant to Sub-Clause 27.2 hereof; or
 - (c) In case of Successful Bidder, if he fails within the specified time limit to:
 - (i) Furnish the required Performance Security; or
 - (ii) Sign the Contract.
 - (iii) Furnish the required JV agreement within seven (7) Days of the receipt of Letter of Acceptance.

IB.16 Alternate Proposal by Bidder

- 16.1 Should any bidder consider that he can offer any advantages to the Employer by a modification to the specifications or other conditions, he may, in addition to his bid to be submitted in strict compliance with the Bidding Documents, submit any Alternate Proposal(s) containing (a) relevant design specifications/calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Form of Bid shall be that which represents complete compliance with the Bidding Documents. The technical details and financial implications involved are to be submitted in two separate sealed envelopes as to be followed in main bid proposals.
- 16.2 Alternate Proposal(s), if any, of the lowest evaluated responsive bidder in sole discretion of the Employer may only be considered by the Employer as the basis for the award of Contract to such bidder.

IB.17 Pre-Bid Meeting

- 17.1 The Employer may, on his own motion/discretion or at the request of any prospective bidder(s), hold a pre-bid meeting to clarify issues and to answer any questions on matters related to the Bidding Documents. The date, time and venue of pre-bid meeting is as stipulated in the Bidding Data. All prospective bidders or their authorized representatives shall be invited to attend such a pre-bid meeting.

- 17.2 The bidders are requested to submit questions, if any, in writing so as to reach the Employer not later than three (3) days before the proposed pre-bid meeting.
- 17.3 Minutes of the pre-bid meeting, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bidding Documents. Any modification of the Bidding Documents listed in Sub-Clause 7.1 hereof which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause IB.9 and not through the minutes of the pre-bid meeting.
- 17.4 Absence at the pre-bid meeting will not be a cause for disqualification of a bidder.

IB.18 Format and Signing of Bid

- 18.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.
- 18.2 All appendices to Bid are to be properly completed and signed.
- 18.3 **No alteration is to be made in the Form of Bid nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the bid may be rejected.**
- 18.4 Each bidder shall prepare by filling out the forms completely and without alterations one (1) original and one (1) copy of the documents comprising the bid and clearly mark them "ORIGINAL" and "COPY" as appropriate. In the event of discrepancy between them, the original shall prevail.
- 18.5 The original and the copy of the bid shall be typed or written in indelible ink (in the case of copies, Photostats are also acceptable) and shall be signed by a person or persons duly authorized to sign on behalf of the bidder. This authorization shall consist of a written confirmation as specified in the Bidding Data and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for un-amended printed literature, shall be signed or initiated by the person signing the bid.
- 18.6 The bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the bidder, in which case such corrections shall be initialled by the person or persons signing the bid.
- 18.7 Bidders shall indicate in the space provided in the Form of Bid their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent.
- 18.8 Bidders should retain a copy of the Bidding Documents as their file copy.

D. SUBMISSION OF BIDS

IB.19 Sealing and Marking of Bids

- 19.1 Each bidder shall submit his bid as under:
- (a) ORIGINAL and the copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.
 - (b) The envelopes containing the ORIGINAL and copy will be put in one sealed envelope and addressed / identified as given in Sub- Clause 19.2 hereof.
 - (c) **The technical Proposal should comprise of documents listed in 11.1 (A) of Bidding Data & the Financial Proposal should comprise of documents listed in 11.1 (B) of Bidding Data which shall be placed in separate envelops in accordance with 11.1.**
- 19.2 The inner and outer envelopes shall:
- (a) Be addressed to the Employer at the address provided in the Bidding Data;
 - (b) Bear the name and identification number of the tender as defined in the Bidding Data; and
 - (c) Provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data.
- 19.3 In addition to the identification required in Sub- Clause 19.2 hereof, the inner envelope shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared “late” pursuant to Clause IB.21.
- 19.4 If the outer envelope is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Bid.

IB.20 Deadline for Submission of Bids

- 20.1
- (a) Bids must be received by the Employer at the address specified no later than the time and date stipulated in the Bidding Data or such extended deadline as the Employer has duly notified in accordance with Clause IB.9.
 - (b) Bids with charges payable will not be accepted, nor will arrangements be undertaken to collect the bids from any delivery point other than that specified above. Bidders shall bear all expenses incurred in the preparation and delivery of bids. No claims will be entertained for refund of such expenses.
 - (c) Where delivery of a bid is by mail and the bidder wishes to receive an acknowledgment of receipt of such bid, he shall make a request for such acknowledgment in a separate letter attached to but not included in the sealed bid package.
 - (d) Upon request, acknowledgment of receipt of bids will be provided to those making delivery in person or by messenger.
- 20.2 The Employer may, at his discretion, extend the deadline for submission of bids by issuing an amendment in accordance with Clause IB.9, in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline will thereafter be subject to the deadline as extended.

IB.21 Late Bids

- 21.1 (a) **Any bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.20 will be returned unopened to such bidder.**
- (b) Delays in the mail, delays of person in transit, or delivery of a bid to the wrong office shall not be accepted as an excuse for failure to deliver a bid at the proper place and time. It shall be the bidder's responsibility to determine the manner in which timely delivery of his bid will be accomplished either in person, by messenger or by mail.

IB.22 Modification, Substitution and Withdrawal of Bids

- 22.1 Any bidder may modify, substitute or withdraw his bid after bid submission provided that the modification, substitution or written notice of withdrawal is received by the Employer prior to the deadline for submission of bids.
- 22.2 The modification, substitution, or notice for withdrawal of any bid shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause IB.19 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL" as appropriate.
- 22.3 No bid may be modified by a bidder after the deadline for submission of bids except in accordance with Sub-Clauses 22.1 and 27.2.
- 22.4 Withdrawal of a bid during the interval between the deadline for submission of bids and the expiration of the period of bid validity specified in the Form of Bid may result in forfeiture of the Bid Security in pursuance to Clause IB.15.

E. BID OPENING AND EVALUATION FOR SINGLE STAGE TWO ENVELOPE BIDDING PROCEDURE

IB.23 Bid Opening

- 23.1 The Employer will open the Technical Bids in public at the address, date and time specified in the Bidding Data in the presence of Bidders' designated representatives and anyone who choose to attend. The Price Bid will remain unopened and will be held in custody of the Employer until the specified time of their opening.
- 23.2 First, envelopes marked "WITHDRAWALS" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawals shall be permitted unless the corresponding withdrawal Notice contains a valid authorization to request the withdrawal and is read out at bid opening.
- 23.3 Second, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with IB 23.1. No envelope shall be substituted unless the corresponding.

- 23.4 Next, outer envelopes marked “MODIFICATION” shall be opened. No Technical Bid and /or Price Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, readout, and recorded in accordance with IB 23.1. The Bidders’ representatives who are present shall be requested to sign the record. The omission of a Bidders signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

IB.24 Process to be Confidential

- 24.1 Information relating to the examination, clarification, evaluation and comparison of bid and recommendations for the award of a contract shall not be disclosed to bidders or any other person not officially concerned with such process before the announcement of bid evaluation report which shall be done at least seven (07) days prior to issue of Letter of Acceptance. The announcement to all Bidders will include table(s) comprising read out prices, discounted prices, price adjustments made, final evaluated prices and recommendations against all the bids evaluated. Any effort by a bidder to influence the Employer’s processing of bids or award decisions may result in the rejection of such bidder’s bid. However, any bidder feeling aggrieved may lodge a written complaint concerning his grievances within seven (07) days of announcement of technical evaluation report and five (05) days after issuance of final evaluation report; however mere fact of lodging a complaint shall not warrant suspension of the procurement process.

IB.25 Clarification of Bids

- 25.1 To assist in the examination, evaluation and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of his bid. The request for clarification and the response shall be in writing but no change in the price or substance of the bid shall be sought, offered or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with Clause IB.28.
- 25.2 If a bidder does not provide clarifications of its Bid by the date and time set in the Employer’s request for clarification, its bid may be rejected.

IB.26 Examination of Bids and Determination of Responsiveness

- 26.1 Prior to the detailed evaluation of bids, the Employer will determine whether each bid is substantially responsive to the requirements of the Bidding Documents.
- 26.2 A substantially responsive bid is one which (i) meets the eligibility and qualification criteria under the Bidding Documents; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; and (iv) conforms to all the terms, conditions and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one (i) which affect in any substantial way the scope, quality or performance of the Works; (ii) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer’s rights or the bidder’s obligations under the Contract; or (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids. Only substantially responsive bids shall be considered for further evaluation.

- 26.3 If a bid is not substantially responsive, it will be rejected by the Employer, and may not subsequently be made responsive by correction or withdrawal of the non-conforming deviation or reservation. The Employer may, however, seek confirmation / clarification in writing which shall be responded in writing.

IB.27 Correction of Errors

- 27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors and where there is a discrepancy between the amounts in figures and in words, the amount in words will govern.
- 27.2 The amount stated in the Form of Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected Bid Price, his Bid will be rejected, and the Bid Security shall be forfeited in accordance with Sub- Clause 15.6(b) hereof.

IB.28 Evaluation and Comparison of Bids

- 28.1 The Employer will evaluate and compare only those Bids which are substantially responsive in accordance with Clause IB.26.
- 28.2 In evaluating the Bids, the Employer will determine for each Bid the evaluated Bid Price by adjusting the Bid Price for errors pursuant to Clause IB.27.
- 28.3 The estimated effect of the price adjustment provisions of the Conditions of Contract due to Variation, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.

F. AWARD OF CONTRACT

IB.29 Award

- 29.1 Subject to Clauses IB.30 and IB.34, the Employer will award the Contract to the bidder whose bid has been determined by the Employer to be substantially responsive to the Bidding Documents and who has offered the lowest evaluated Bid Price, provided that such bidder has been determined to be eligible in accordance with the provisions of Clause IB.3 and qualify pursuant to criteria provided in the Bidding Documents.
- 29.2 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:

Provided that such qualification shall only be laid down after recording reasons therefor in writing. They shall form part of the records of that bid evaluation report.

IB.30 The Employer's Right to Accept any Bid and to Reject any or all Bids

- 30.1 Notwithstanding anything contained herein, the Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidders or any obligation except that the grounds for rejection of all bids shall upon request be communicated to any bidder who submitted a bid, without justification of grounds. Rejection of all bids shall be notified to all bidders promptly.

IB.31 Notification of Award

- 31.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder in writing ("Letter of Acceptance") that his Bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract Agreement (hereinafter and in the Conditions of Contract called the "Contract Price").
- 32.1 No Negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted.
- 32.2 The notification of award and its acceptance by the bidder will constitute the formation of the contract, binding the Employer and the bidder till signing of the formal Contract.
- 31.3 Upon furnishing by the successful bidder of a Performance Security, the Employer will promptly notify the other bidders that their Bids have been unsuccessful and return their bid securities.

IB.32 Performance Security

- 32.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Bidding Data and the Conditions of Contract within a period of seven (7) working days after the receipt of Letter of Acceptance.
- 32.2 Failure of the successful bidder to comply with the requirements of Sub-Clause IB.32.1 or Clauses IB.33 or IB.35 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

IB.33 Signing of Contract Agreement

- 33.1 Simultaneously with the furnishing of acceptable Performance Security under the Conditions of Contract, the formal Contract Agreement between the Employer and the Successful Bidder (s) shall be executed.

IB.34 General Performance of the Bidders

The Employer reserves the right to obtain information regarding performance of the bidders on their previously awarded contracts/works. The Employer may in case of consistent poor performance of any Bidder as reported by the employers of the previously awarded contracts, inter alia, reject his bid and/or take such action as may be deemed appropriate under the circumstances of the case including black listing of such Bidder.

IB.35 Integrity Pact

The Bidder shall sign and stamp the Integrity Pact provided at Appendix- E to Bid in the Bidding Documents for all Federal Government procurement contracts exceeding Rupees ten million. Failure to provide such Integrity Pact shall make the bidder non-responsive.

IB.36 Instructions not Part of Contract

Bids shall be prepared and submitted in accordance with these Instructions which are provided to assist bidders in preparing their bids, and do not constitute part of the Bid or the Contract Documents.

BIDDING DATA

BIDDING DATA

The information in this section is complementary to, amends or supplements the provisions in the Instructions to Bidders. Whenever there is conflict, the provisions herein shall take precedence over those in the Instructions to Bidders.

Reference to instruction to Bidder	Bidding Data
IB-I 1.1	Design, Supply, Installation, Testing & Commissioning of 232 KW On-Grid Solar PV System for 3 x Admin Buildings of Port Qasim Authority, Karachi. The Works shall be performed/executed as per the Specifications provided in the Bidding Documents and approved Contractor Design as per the Conditions of Contract”.
1.1	Port Qasim Authority, Karachi
8.1	(a) <u>Employer’s address:</u> Director General (Technical), Head Office Building, Port Qasim Authority, Bin Qasim Karachi-75020 Fax. No. 021-34730107 (b) <u>Engineer’s address:</u> Director (M&E), Port Qasim Authority, Tel.No.99272182 Fax: No. 021-34730107
IB-10 10.1	<u>Bid Language:</u> English
IB-11 11.1	<u>11.1 (A)</u> The Bidder shall submit with its Technical Bid the following documents: (a) Letter of Technical Bid (b) Bid Security (IB.15) (c) Written confirmation authorizing the signatory of the Bid to commit the Bidder (IB.18.5) (d) Proposed Construction Schedule (Appendix-A) (e) List of Sub-Contractors (as required) (Appendix-B) (f) Past Performance and Financial Strength (Appendix-C) (g) Joint Venture Agreement (if applicable) (Appendix-D) (h) Integrity Pact (Appendix-E) (i) Proof of purchase of RFP (Appendix-F) (j) Copy of PPIB Certificate (Appendix-G) (k) Declaration of Beneficial Ownership (Appendix-H) (l) Affidavit of blacklisting (Appendix-I) (m) Specific System Data Checklist (Appendix-J)
	<u>11.1 (B)</u> The Bidder shall submit with its Bid the following documents: (a) Letter of Price Bid (b) Bill of Quantities (BOQ) (Appendix-K)
IB-12	<u>Bid Evaluation Criteria shall be as follows:</u> Lump sum lowest offered price for the design, supply, installation, testing & commissioning of the Works.
IB-14	<u>Bid Validity</u>
14.1	Period of Bid Validity shall be one hundred and eighty (180) days from the date of Bid Opening.

IB-15 15.1	<u>Bid Security</u> Amount of Bid Security shall be Rs. 2,000,000/-
IB-17 17.1	<u>Pre-Bid Meeting</u> The Pre-Bid meeting will be held on [Date of Pre-Bid Meeting], at [Time of Pre-Bid Meeting] at [Location of Pre-Bid Meeting].
IB-19 19.2 (a)	<u>Address for the purpose of Bid submission:</u> Office of Director M&E, Port Qasim Authority, Karachi
IB-20 20.1	<u>Deadline for submission of Bids:</u> As per Notice Inviting Tender (NIT).
IB-32 32.1	<u>Performance Security:</u> 10% of the Contract Price. The Performance security shall be an irrevocable & unconditional bank guarantee from any Scheduled Bank of Pakistan having minimum “AA” rating acceptable to the Employer strictly as per Form of Performance Security provided in the Bidding Documents.
	Following clauses are added in Instructions to Bidders: IB.37 Sufficiency of Bid Each Bidder shall be deemed to have satisfied fully, before submitting the Bid, as to all aspects of the Works, correctness and sufficiency of his Bid and price stated in the Price Bid which price shall, except in so far as it is otherwise expressly provided in the Contract Agreement, cover all his obligations under the Contract Agreement and all matters and things necessary for the proper completion of Works. Objections, excuses or claims made by the bidder after submission of his Bid to the Employer shall not be entertained. IB.38 Sub-Contractors Any Sub-Contractor is subject to the acceptance of the Employer and the Sub-Contract shall be subject to the same Conditions of Contract as the main Contract. A list, as set forth in Appendix “B” showing the name and address and credentials of each proposed sub-Contractor, the type of work to be sub-let and the reason for sub-letting shall be submitted with the Bid. Overall responsibility of all Works, whether parts of it subcontracted or not, shall rest with the Bidder. IB.39 Taxes & Duties The Bidder shall obtain all information as to Pakistan Income Tax, Sales Tax, Salaries Tax, Professional Tax, Company Tax, Municipal Octroi, Levies and any other taxes imposed by the local bodies,
	export and import duties, import surcharge, iqra surcharge, etc. and necessary permits and confirm the requirements thereof at his own responsibility and include all such cost in his Bid price. The quoted rate shall also include the cost of accepting the general risks/liabilities and obligations set forth or implied in the Contract. IB.40 Insurance Insurance policies may be submitted from the following insurance companies acceptable to the Client: a. Adamjee Insurance Company. b. EFU General Insurance Company Ltd. c. Jubilee General Insurance Company Ltd. d. National Insurance Company Ltd.

CONDITIONS OF CONTRACT

CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1 Definitions

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

The Contract

- 1.1.1 “Contract” means the Contract Agreement and the other documents listed therein.
- 1.1.2 “Specifications” means the minimum specifications of the equipment being parts of On-Grid Solar PV System as set out in the Bidding Documents and any Variation to such document.
- 1.1.3(A) “Employer Design” means the design of On-Grid Solar PV System as set out in the Bidding Documents and any Variation to such design.
- 1.1.3(B) “Contractor Design” means the design of On-Grid Solar PV System, prepared and submitted by the Contractor to the Employer under this Contract, based on the specifications of the offered equipment which design shall be in conformity with the Employer Design.

Persons

- 1.1.4 “Employer” means the person named in the Contract Data and the legal successors in title to this person, but not (except with the consent of the Contractor) any assignee.
- 1.1.5 “Contractor” means the person named in the Contract Data whose Bid has been accepted by the Employer and the legal successors in title to such person, but not (except with the consent of the Employer) any assignee of such person.”
- 1.1.6 “Party” means either the Employer or the Contractor.

Dates, Times and Periods

- 1.1.7 “Commencement Date” means the date as mentioned in the Contract Data.
- 1.1.8 “Day” means a calendar day.
- 1.1.9 “Time for Completion” means the time for completion of the Works as stated in the Contract Data (or as extended under Sub-Clause 7.3), calculated from the Commencement Date.

Money and Payments

- 1.1.10 “Cost” means all expenditure properly incurred (or to be incurred) by the Contractor, whether on or off the Site, including overheads and similar charges but does not include any allowance for profit.

Other Definitions

- 1.1.11 “Contractor’s Equipment” means all machinery, apparatus and other things required for the execution of the Works but does not include Materials or System intended to form part of the Works.
- 1.1.12 “Country” means the Islamic Republic of Pakistan.
- 1.1.13 “Employer’s Risks” means those matters listed in Sub-Clause 6.1.
- 1.1.14 “Force Majeure” means an event or situation beyond the control of a Party that is not foreseeable, is unavoidable and its origin is not due to negligence or lack of care on the part of such Party. Such events subject to the conditions as stated in the preceding sentence may include, but not be limited to, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.
- 1.1.15 “Materials” means things of all kinds (other than System) to be supplied and incorporated in the Works by the Contractor.
- 1.1.16 “System” means the machinery and apparatus intended to form or forming part of the Works.
- 1.1.17 “Site” means the place mentioned in the Contract Data where the Works are to be executed, and any other place(s) specified in the Contract as forming part of the Site.
- 1.1.18 “Variation” means a change which is instructed by the Employer under Sub-Clause 10.1.
- 1.1.19 “Works” means any or all the works including design, supply, installation, construction, testing and commissioning of the System to be performed by the Contractor including temporary works and any Variation thereof.
- 1.1.20 “Engineer” means a qualified engineer/engineering firm appointed by the Employer to act as independent engineer for the purpose of the Contract for review of the Contractor Design, equipment inspection and verification of installed System.
- 1.1.21 “Letter of Acceptance” means the formal acceptance by the Employer of the Tender.
- 1.1.22 “Tender” means the Contractor's priced offer to the Employer for the execution and completion of the Works and the remedying of any defects therein in accordance with the provisions of the Contract, as accepted by the Letter of Acceptance.

1.2 **Interpretation**

Words importing persons or parties shall include firms and organizations. Words importing singular or one gender shall include plural or the other gender where the context requires.

1.3 **Priority of Documents**

The documents forming the Contract are to be taken as mutually explanatory of one another. If an ambiguity or discrepancy is found in the documents, the priority of the documents shall be in accordance with the order as listed in the General Provisions of the Conditions of Contract.

1.4 **Law**

The rights and obligations of the Parties under the Contract shall be governed by laws of the Islamic Republic of Pakistan.

1.5 **Communications**

All Communications related to the Contract shall be in English language.

1.6 **Statutory Obligations**

The Contractor shall comply with the laws of the Islamic Republic of Pakistan and shall give all notices and pay all fees and other charges in respect of the Works.

2. **THE EMPLOYER**

2.1 **Provision of Site**

The Employer shall provide the Site and right of access thereto at the times stated in the Contract Data.

2.2 **Employer's Instructions**

The Contractor shall comply with all instructions given by the Employer, in respect of the Works including the suspension of all or part of the Works.

2.3 **Approvals**

No approval or consent or absence of comment by the Employer shall affect the Contractor's obligations required under the Contract.

3. **EMPLOYER'S REPRESENTATIVES**

The Employer shall appoint with precise scope of authority and notify in writing a duly authorized person to act for him and on his behalf for the purposes of this Contract. The details and precise scope of the authority of such authorised person shall be notified in writing to the Contractor immediately after the signing of the Contract.

4. THE CONTRACTOR

4.1 General Obligations

The Contractor shall carry out the Works as per the highest standards of workmanship in the solar industry and in accordance with the terms and conditions of the Contract. The Contractor shall provide all supervision, labour, materials, plant and Contractor's equipment which may be required for the execution of the Works and shall also arrange all permits and licenses at his own cost, required for installation, commissioning and operation of the System.

For avoidance of doubt, the Contractor shall arrange bi-directional meter for the System and bear all related costs.

4.2 Contractor's Representative

The Contractor shall appoint a representative at site on full time basis to supervise the execution of Works and to receive instructions on behalf of the Contractor but only after obtaining the consent of the Employer for such appointment which consent shall not be unreasonably withheld by the Employer. Such authorized representative may be substituted/replaced by the Contractor at any time during the Contract Period but only after obtaining the consent of the Employer as aforesaid.

4.3 Subcontracting

The Contractor shall not subcontract the whole of the Works. The Contractor may subcontract any part of the Works subject to restriction stipulated in the Contract Data.

4.4 Performance Security

The Contractor shall furnish to the Employer within seven (07) working days after receipt of Letter of Acceptance a Performance Security, in the form of irrevocable & unconditional Bank Guarantee from any Scheduled Bank of Pakistan having minimum "AA" rating for the amount and validity specified in Contract Data.

5. DESIGN BY CONTRACTOR

5.1 Submission and Approval of Contractor Design

The Contractor shall promptly submit the Contractor Design to the Employer for approval. Within seven (7) days of receipt, the Employer shall notify any comments or, if the design submitted is not in accordance with the Contract, shall reject it stating the reasons. The Contractor shall not construct any element of the Works designed by him within seven (7) days after the design has been submitted to the Employer or which has been rejected. Design that has been rejected shall be promptly amended and resubmitted.

5.2 **Responsibility for Design**

Notwithstanding that the Contractor Design is submitted and approved by the Employer, the Contractor shall solely remain responsible for his rendered design under this Contract, which shall not only be in strict conformity with the Employer Design and Specifications but also be fit for the intended purposes defined in the Contract. In addition, the Contractor shall also be solely responsible for any infringement of any patent or copyright in respect of such design.

6. **EMPLOYER'S RISKS**

6.1 **The Employer's Risks**

The Employer's Risks are: -

- a) politically motivated riot, commotion or disorder by persons other than the Contractor's personnel and other employees including the personnel and employees of Sub-Contractors, directly affecting the Site and/or the Works;
- b) use or occupation by the Employer of any part of the Works, except as may be specified in the Contract;
- c) late handing over of Site;
- d) a suspension under Sub-Clause 2.3 unless it is attributable to the Contractor's failure; and
- e) physical obstructions or physical conditions other than climatic conditions, encountered on the Site during the performance of the Works, for which the Contractor immediately notified to the Employer and accepted by the Employer.

6.2 **Loss or Damage due to Employer's Risks**

In the event of any such loss or damage happening from any of the risks defined in Sub-Clause 6.1 or force majeure, or in combination with other risks, the Contractor shall, if and to the extent required by the Employer, rectify the loss or damage and the Employer shall determine an addition to the Contract Price in accordance with Clause 10 and shall notify the Contractor accordingly. In the case of a combination of risks causing loss or damage any such determination shall take into account the proportional responsibility of the Contractor and the Employer.

7. **TIME FOR COMPLETION**

7.1 **Execution of the Works**

The Contractor shall commence the Works on the Commencement Date and shall proceed expeditiously and without delay and shall complete the Works, subject to Sub-Clause 7.3 below, within the Time for Completion as stated in the Contract Data.

7.2 **Programme**

Within the time stated in the Contract Data, the Contractor shall submit to the Employer a detailed programme for the Works incorporating the dates, which programme shall be in-line with the Proposed Construction Schedule submitted along with the Bid.

7.3 **Extension of Time**

The Contractor shall, within such time as may be reasonable under the circumstances, notify the Employer of any event(s) falling within the scope of Sub-Clause 6.1 or 10.3 of these Conditions of Contract and request the Employer for a reasonable extension in the time for the completion of Works. Subject to the aforesaid, the Employer shall determine such reasonable extension in the time for the completion of Works as may be justified in the light of the details/particulars supplied by the Contractor in connection with the such determination by the Employer within such period as may be prescribed by the Employer for the same; and the Employer shall extend the Time for Completion as determined.

7.4 **Late Completion**

If the Contractor fails to complete the Works within the Time for Completion, the Contractor's only liability to the Employer for such failure shall be to pay the amount stated in the Contract Data for each day for which he fails to complete the Works.

8. TAKING-OVER

8.1 Notice of Completion by the Contractor. The Contractor shall notify in writing to the Employer when he considers that the Works are complete in all aspects.

8.2 **Taking-Over Notice**

Within ten (10) days of receipt of notice of completion from the Contractor, the Engineer shall determine the conformity of the installed System with the approved Contractor Design and notify the Contractor through Employer that the Works are complete in accordance with the Contract. The Employer shall take over the Works upon the issue of this notice and issue Taking Over Certificate to the Contractor.

Alternatively, the Contractor shall be notified that the Works are not ready for taking over, stating the reasons accordingly. The Contractor shall then promptly complete any outstanding work and, subject to Clause 9, clear the site.

8.3 **Defect Liability Period**

Defect Liability Period shall be as stated in the Contract Data.

9. REMEDYING DEFECTS

9.1 Remedying Defects

The Employer may at any time prior to the expiry of the period stated in the Contract Data, notify the Contractor of any defects. The Contractor shall remedy at no cost to the Employer any defects due to the Contractor Design, Materials, System or workmanship not in accordance with the Contract.

The Cost of remedying defects attributable to any other cause shall be valued as a Variation. Failure to remedy any such defects or complete outstanding work within fourteen (14) days after notice shall entitle the Employer to carry out all necessary works at the Contractor's cost.

9.2 Uncovering and Testing

The Employer may give instruction as to the uncovering and/or testing of any work. Unless as a result of an uncovering and/or testing it is established that the Contractor Design, Materials, System or workmanship are in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 10.2.

9.3 The Contractor at his own responsibility shall arrange all hoisting and fixing equipment necessary for the satisfactory completion of work and shall make good any damage to the existing surface.

10. VARIATIONS AND CLAIMS

10.1 Right to Vary

The Employer may instruct Variations.

10.2 Valuation of Variations

Variations shall be valued at a lump sum price mutually agreed between the Parties.

10.3 Early Warning

The Contractor shall notify the Employer in writing as soon as he is aware of any circumstance which may delay or disrupt the Works, or which may give rise to a claim for additional payment.

To the extent of the Contractor's failure to notify, which results to the Employer being unable to keep all relevant records or not taking steps to minimize any delay, disruption, or Cost, or the value of any Variation, the Contractor's entitlement to extension of the Time for Completion or additional payment shall be reduced/rejected.

10.4. **Valuation of Claims**

If the Contractor incurs Cost as a result of any of the Employer's Risks, the Contractor shall be entitled to the amount of such Cost. If as a result of any Employer's Risk, it is necessary to change the Works, this shall be dealt with as a Variation subject to Contractor's notification for intention of claim to the Employer within fourteen (14) days of the occurrence of cause.

10.5 **Variation and Claim Procedure**

The Contractor shall submit to the Employer an itemized make-up of the value of Variations and claims within twenty-one (21) days of the instruction or of the event giving rise to the claim. The Employer shall check and if possible, agree the value. In the absence of agreement on the claim, the Employer shall determine the value.

11. **CONTRACT PRICE AND PAYMENT TERMS**

11.1 **Contract Price**

The Contract price shall be as provided in the Contract Data.

11.2 **Payment Terms and Statements**

Subject to the terms and conditions of the Contract, the Contractor shall be entitled to be paid the Contract Price at such intervals as given in the Contract Data.

12. **DEFAULT**

12.1 **Default by Contractor**

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Employer or fails to proceed expeditiously and without delay, or is, despite a written complaint, in breach of the Contract, the Employer may give notice referring to this Sub-Clause and stating the default.

If the Contractor has not taken all practicable steps to remedy the default within seven (07) days after receipt of the Employer's notice, the Employer may by a second notice given within a further fourteen (14) days, terminate the Contract. The Contractor shall then immediately demobilize from the Site leaving behind any and all Contractor's Equipment which the Employer instructs, in the second notice, to be used for the completion of the Works at the risk and cost of the Contractor.

12.2 **Default by Employer**

If the Employer fails to pay in accordance with the Contract, or is, despite a written complaint, in breach of the Contract, the Contractor may give notice referring to this Sub-Clause and stating the default. If the default is not remedied within fourteen (14) days after the Employer's receipt of this notice, the Contractor may suspend the execution of all or parts of the Works.

12.3 **Insolvency**

If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract which shall be effective fourteen (14) days after receipt of notice by the other party. The Contractor shall then immediately demobilize from the Site leaving behind, in the case of the Contractor's insolvency, any Contractor's Equipment which the Employer instructs in the notice is to be used for the completion of the Works.

12.4 **Payment upon Termination**

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and System reasonably delivered to the Site, adjusted by the following:

- a) any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b) any sums to which the Employer is entitled,
- c) if the Employer has terminated under Sub-Clause 12.1 or 12.3, the Employer shall be entitled to a sum equivalent to twenty percent (20%) of the value of parts of the Works not executed at the date of the termination, and
- d) if the Contractor has terminated under Sub-Clause 12.2 or 12.3, the Contractor shall be entitled to the cost of his demobilization together with a sum equivalent to ten percent (10%) of the value of parts of the Works executed at the date of termination. The net balance due shall be paid or repaid within twenty-eight (28) days of the notice of termination.

13. **RISKS AND RESPONSIBILITIES**

13.1 **Contractor's Care of the Works**

The Contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Employer's issuance of Certificate of Completion under Sub-Clause 8.2. Responsibility shall then pass to the Employer. If any loss or damage happens to the Works during the above period, the Contractor shall rectify such loss or damage so that the Works conform with the Contract.

Unless the loss or damage happens as a result of any of the Employer's Risks, the Contractor shall indemnify the Employer, or his agents against all claims loss, damage and expense arising out of the Works.

13.2 **Force Majeure**

If Force Majeure occurs, the Contractor shall notify the Employer immediately. If necessary, the Contractor may suspend the execution of the Works and, to the extent agreed with the Employer demobilize the Contractor's Equipment.

If the event continues for a period of eighty-four (84) days, either Party may then give notice of termination which shall take effect twenty-eight (28) days after the giving of the notice.

After termination, the Contractor shall be entitled to payment of the unpaid balance of the value of the Works executed and of the Materials and System reasonably delivered to the Site, adjusted by the following:

- a) any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b) the cost of his demobilization, and
- c) less any sums to which the Employer is entitled.

The net balance due shall be paid or repaid within thirty-five (35) days of the notice of termination.

14. INSURANCE

At all times during the execution of the Works, the Contractor shall maintain property insurance on the System for the replacement cost thereof, except for items (a) to (e) of the Employer's Risks.

15. RESOLUTION OF DISPUTES

15.1 Employer's Decision

If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with the Works, the matter in dispute shall, in the first place, be referred in writing to the Employer. Such reference shall state that it is made pursuant to this Clause. No later than the twenty-eight (28) days after the day on which he received such reference, the Employer shall give notice of his decision to the Contractor.

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

15.2 Notice of Dissatisfaction

If the Contractor is dissatisfied with the decision of the Employer or if no decision is given within the time set out in Sub-Clause 15.1 here above, the Contractor may give notice of dissatisfaction referring to this Sub-Clause within fourteen (14) days of receipt of the decision or the expiry of the time for the decision. If no notice of dissatisfaction is given within the specified time, the decision shall be final and binding on the Contractor. If notice of dissatisfaction is given within the specified time, the decision shall be binding on the Contractor who shall give effect to it without delay unless and until the decision of the Employer is revised by an arbitrator.

15.3 Arbitration

A dispute which has been the subject of a notice of dissatisfaction shall be finally settled as per provisions of Arbitration Act 1940 (Act No. X of 1940) and Rules made thereunder and any statutory modifications thereto. Any hearing shall be held at the place specified in the Contract Data and in the language referred to in Sub-Clause 1.5.

16 INTEGRITY PACT

16.1 If the Contractor, or any of his Sub-Contractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Appendix-E to his Bid, then the Employer shall be entitled to:

- (a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Sub-Contractors, agents or servants;
- (b) terminate the Contract; and
- (c) recover from the Contractor any loss or damage to the Employer as a result of such termination or of any other corrupt business practices of the Contractor or any of his Sub-Contractors, agents or servants.

On termination of the Contract under Sub-Para (b) of this Sub-Clause, the Contractor shall immediately demobilize from the Site leaving behind Contractor's Equipment which the Employer instructs, in the termination notice, to be used for the completion of the Works at the risk and cost of the Contractor. Payment upon such termination shall be made under Sub-Clause 12.4, in accordance with Sub-Para (c) thereof, after having deducted the amounts due to the Employer under Sub-Para (a) and (c) of this Sub-Clause.

17. PRIORITY OF CONTRACT DOCUMENTS:

The priority list of contractual documents shall be as follows:

- (a) Contract Agreement;
- (b) Letter of Acceptance;
- (c) Specifications and Employer Design
- (d) Contract Data;
- (e) Conditions of Contract;
- (f) Letters Technical Bid and Price Bid;
- (g) The priced Bill of Quantities; and
- (h) The Appendices to Bid.

CONTRACT DATA

Conditions of Contract

Sr. #	Description	Clause Conditions of Contract	Explanation
1.	Employer's name and address	1.1.4	Port Qasim Authority, Karachi and represented by DG (Technical)
2.	Contractor's name	1.1.5	[Name of the Successful Bidder]
3.	Commencement Date	1.1.7	From the date of issuance of commencement order by the Authority.
4.	Site	1.1.17	Admin Building 1, 2 and 3 of Port Qasim Authority, Karachi.
5.	Engineer's name and address	1.1.20	Engineer as Director (M&E) and Manager (Electrical) as Engineer's representative, Port Qasim Authority, Karachi
6.	Access to site	2.1	Within two (2) days of signing of Contract
7.	Subcontracting	4.3	The aggregate amount of the works subcontracted shall not exceed 40% of the Contract.
8.	Amount of Performance Security	4.4	Ten (10%) of Contract Price.
9.	Validity of Performance Security	4.4	Validity of Performance Security shall be upto twelve (12) months after issuance of Taking Over Certificate (TOC) and, if not encashed pursuant to the terms of the Contract, shall be returned within fourteen (14) days of its expiry.
10.	Time for Completion	7.1	Four (04) months from the Commencement Date.
11.	Time for furnishing Programme	7.2	Within seven (7) days from the date of receipt of Letter of Acceptance.
12.	Amount of Liquidated Damages	7.4	The rate of the Liquidated Damages (LD) shall be 0.33% of the Contract Price stated in the Letter of Acceptance for every day of delay in which whole or part of the work(s) remained unfurnished subject to a maximum of 10% of the Contract Price.
13	Defects Liability Period	8.3	Twelve (12) Months calculated from the date of Taking Over Certificate issued by the Employer. Defect Liability Certificate shall be issued within 14 days after Defect Liability Period.
14.	Remedying Defect Period	9.1	Within fourteen (14) days after notice of defect.
15.	Contract Price	11.1	Rs. _____ Rupees _____ only)

16.	Payment Terms	11.2	<p>(i) <u>Partial Payment:</u></p> <p>Sixty percent (60%) of the Contract Price which shall be released to the Contractor by the Employer upon delivery of machinery, equipment and material forming the System at the Site and certificate from the Engineer confirming the quantity and conformity of the equipment with the approved Contractor Design.</p> <p>(ii) <u>Final Payment:</u></p> <p>Forty percent (40%) of the Contract Price which shall be released to the Contractor by the Employer upon the date of the issuance of Taking Over Certificate.</p>
17.	Seat of Arbitration	15.3	Karachi

LETTER OF TECHNICAL BID

Date: -----

Bid Reference No: _____
(Name of Contract/Works)

To:
[Head of the Procuring Agency/Employer]
[Employer's Address]

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with instructions to Bidders (IB) 9;
- (b) We offer to execute and complete in conformity with the Bidding Documents the Works (as defined in the Bidding Documents);
- (c) Our Bid consisting of the Technical Bid and the Bid Price shall be valid for a period of one hundred eighty (180) days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (d) As security for due performance of the undertakings and obligations of our bid, we hereby submit a Bid Security, in the amount specified in Bidding Data, which is valid (at least) thirty (30) days beyond validity of Bid itself;
- (e) We confirm that our Bid is not in deviation of any technical and commercial terms as provided in the Bidding Documents;
- (f) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process; and
- (g) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB 11.1 of the Bidding Data.

Name-----

In the Capacity of-----

Signed-----

Duly authorized to sign the Bid for and on behalf of:-----

Date:-----

Address:-----

LETTER OF PRICE BID

Date: _____

Bid Reference No: _____

(Name of Contract/Works)

To:

[Head of the Procuring Agency/Employer]

[Employer's Address]

We, the undersigned, declare that:

- a. We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with instructions to Bidders (IB) 9;
- b. The total price of our Bid, including any discounts offered, is PKR [●];
- c. Our Bid shall be valid for a period of one hundred eighty (180) days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- d. If our Bid is accepted, we commit to obtain and post a Performance Security in accordance with the Bidding Documents;
- e. We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed and we do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other bidder for the works;
- f. We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and
- g. If awarded the contract, the person named below shall act as Contractors Representative.

Name -----

In the capacity of -----

Signed -----

Duly authorized to sign the Bid for and on behalf of -----

Date -----

Address -----

APPENDICES TO BID

Appendix-A to Bid

PROPOSED CONSTRUCTION SCHEDULE

[Please note that the Works shall be completed within the time period stated in the Contract Data. The Bidder shall provide as Appendix-A to Bid, the Construction Schedule in the bar chart (CPM, PERT or any other to be specified herein) showing the sequence of work items and the period of time during which he proposes to complete each work item in such a manner that his proposed programme for completion of whole of the Works and parts of the Works shall not exceed the time period specified in the Contract Data. Such period shall commence and counted from the Commencement date as specified in the Contract Data.]

LIST OF SUBCONTRACTORS

[Name of Bidder] intend to subcontract the following parts of the Works to subcontractors. We hereby confirm that the subcontractors named hereunder are reliable and competent to perform that part of the Works for which each is listed.

Please find enclosed the documentation outlining experience of the subcontractors, the curriculum vitae and experience of their key personnel who will be assigned to the Contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

Part of Works (Give Details)	Subcontractor (With Complete Address)
1	2

TECHNICAL EVALUATION CRITERIA**PAST EXPERIENCE, PERSONNEL CAPABILITIES AND FINANCIAL STRENGTH**

Please provide requisite documentary evidence to substantiate the past experience, personnel capabilities and financial strength of the Bidder for evaluation as per the Qualification Criteria given below:

Sr. #	Category	Criteria	Required Documents
I.	Experience Record	On-Grid Solar PV project(s) completed in last two years (as main contractor, JV and sub-contractor) having cumulative capacity of 250kW or above, as a single project or multiple projects.	As per EXP-1 Form
II.	Financial Strength	Average Annual Turnover of minimum PKR 50 million in last two years. Minimum average Net Worth of PKR 30 million in last two years.	Audited Financial Reports of last two years

Note:

- i Qualification status shall be decided on Pass / Fail basis.*
- ii In case of JV, all the members shall collectively comply / qualify the Qualification requirements as specified above.*

**Form EXP-1:
Details of Contracts of Similar Nature and Complexity**

<i>Name of Bidder or partner of a joint venture</i>

Use a separate sheet for each contract

1.	Name of Contract
	Country
2.	Name of Employer
3.	Employer Address & Contact Details
4.	Nature of Works
5.	Contract Role (Tick One) (a) Sole Contractor (b) Sub- Contractor (c) Partner in a Joint Venture
6.	Capacity (kW) & Value (PKR) of the total contract.
7.	Date of Award
8.	Date of Completion
9.	Contract Duration (Years and Months)

Note: The Bidder shall attach documentary evidence (contract agreement & completion certificate) to substantiate the above facts/data.

Appendix-D to Bid

JOINT VENTURE AGREEMENT

[Please provide certified true copy of Joint Venture (JV) Agreement, if applicable.]

INTEGRITY PACT

**DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.
PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN
CONTRACTS WORTH RS. 10.00 MILLION OR MORE**

Contract No. _____ Dated _____
Contract Value: _____
Contract Title: _____

..... [name of Contractor] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan (GoP) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoP through any corrupt business practice.

Without limiting the generality of the foregoing, [name of Contractor] represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder’s fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

[name of Contractor] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of Contractor] accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, [name of Contractor] agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder’s fee or kickback given by [name of Contractor] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.

Name of Employer:
Signature:
[Seal]

Name of Contractor:
Signature:
[Seal]

Appendix-F to Bid

PROOF OF PURCHASE OF RFP

[Please provide certified true copy of purchase of RFP from the Employer]

COPY OF PPIB CERTIFICATE

[Please provide certified true copy of valid PPIB Certificate issued under AEDB Certification Regulations, 2021]

DECLARATION OF BENEFICIAL OWNERS

The “**Declaration of Beneficial Owners**” Information of Public Procurement Contract Awarded Regulations, 2022” require that all procuring agencies while engaging in public procurement contract worth Rs. 50 Million and above shall make a mandatory provision of beneficial ownership information of the company in the said contract as prescribed in following performa to these regulations. The procuring agencies while entering into such contracts shall publicize the beneficial ownership information of the company on PPRA’s website. The procuring agency shall forward all such contracts containing the beneficial ownership information to the Authority for placing it on PPRA’s website. Accordingly, if applicable, the following performa shall be submitted by the bidders along with the Technical Bid.

**DECLARATION OF ULTIMATE BENEFICIAL OWNERS INFORMATION
FOR PUBLIC PROCUREMENT CONTRACTS.**

1. Name _____
2. Father’s Name / Spouse’s Name _____
3. CNIC / NICOP / Passport No. _____
4. Nationality _____
5. Residential Address _____
6. Email Address _____
7. Date on which shareholding control or interest acquired in the business

8. In case of indirect shareholding control or interest being exercised through intermediary companies, entries or other legal persons or legal arrangements in the chain of ownership or control following additional particulars to be provided:

1	2	3	4	5	6	7	8	9	10
Name	Legal form (company)/ limited liability partnership / association of persons / Single Member company / partnership firm / trust any other individual body corporate (to be specified)	Date of incorporation / registration	Name of registering authority	Business Address	Country	Email Address	Percentage of shareholding control or interest of BO in the legal person or legal arrangement	Percentage of shareholding control or interest of legal person or legal arrangement in the company	Identity of natural person who ultimately owns or controls the legal person or arrangement

9. Information about the Board of Directors (Details shall be provided regarding number of shares in the capital of the company as set opposite respective names).

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1	2	3	4	5	6	7	8
Name and Surname (in Block Letters)	CNIC No. (in case of foreigner passport No)	Father's / Husband's name in full	Current Nationality	Any other Nationality (ies)	Occupation	Residential address in full of the registered / principal office address for a subscribers other than natural person	Number of shares taken by cash subscriber (in figures and words)

10. Any other information incidental to or relevant to Beneficial owner(s)

Name and Signature

(Person authorized to issue notice on behalf of the company)

AFFIDAVIT OF BLACKLISTING

[Please provide an affidavit that the bidder has not been blacklisted by any government / public department / donor agencies at the time of submission of bid.]

SPECIFIC SYSTEM DATA CHECKLIST

The specific System data checklist to be filled by the Bidders is given below for Bidders to confirm:

SPECIFIC PLANT DATA PORT QASIM ADMIN BUILDINGS		
EQUIPMENT	SPECIFICATIONS	Yes/No
Solar PV Modules	IEC 61215 Certified	
	Application/ Safety Class II as per IEC 61730	
	Half Cut Cell Mono-PERC	
	Tier 1 Manufacturer as per the most recent Bloomberg list, AAA or AA rated as per PV Module-Tech Ratings	
	540W or higher with positive tolerance only	
	20% or higher module efficiency	
	25 Year Linear Performance Warranty	
	Anti-Reflective Coating	
	12 Year Material and Workmanship Warranty	
	Power Output after 25 Years > 85%	
	Potential Induced Discharge(PID) Resistant	
	Light Induced Degradation (LID) Free	
	Module Temperature Coefficient at P _{max} of -0.37%/°C or lesser	
	Operating Temperature Range -40 to 85 °C	
Solar PV Mounting Structure	Barcode Identification	
	Efficiency at 200 W/m ² > 96% of STC	
	Report of Real Power at STC measured with AAA Class Sun Simulator at the factory to be provided	
	Compliance with S.R.O 604 defined Pre-shipment inspection requirements	
	UV resistant, Hot Dip Galvanized Steel frame of Gauge 12 with 85 micron or thicker zinc coating or better (More details under the drawing attached)	
	Tilt 10 Degrees, Azimuth 15/43/16 for specified orientations	
	Pitch= As per Layout for Elevated Structure	
	Orientation: Portrait	
	Shall withstand wind speeds of 150 km/h	
	Galvanic Isolation	
Inverters & String Formation	PV module fastening: As per module manufacturer guidelines	
	Rawal bolts: Stainless Steel (Grade-304) accompanied with epoxy resin backfilling for water proofing	
	Civil works for mounting structure shall be done to ensure the required strength as defined (More details under the drawing attached)	
	Three Phase Grid Tied	
	String Inverter	
	Strings formation priority: 1.Same Row,2.Adjacent Row	
	String Voc: Must be within MPPT range at -10 to + 80 Degree Celsius cell temperature	
	Anti Potential Induced Degradation Module (PID)	
	Sheds and enclosures for outdoor installation	
	50 Hz Frequency Output	
	CEC Efficiency of 98.5% or above	
	IP65 rated	
	10 Year Plus Warranty	
	THD < 3%	
	IEC 62109/UL1741 Compliant Safety Design	
	Transformer-less modular Design	
	Ambient Operating Temperature Range: -25 °C to 60 °C	
	Multiple MPPT Trackers	
DC/AC ratio not more than 1.1		
Residual Current Monitoring		
DC Insulation Resistance Detection		
Generator Synchronization module		
AC and DC Surge Arrestors: Type II or better		
AC Overcurrent Protection		
DC reverse polarity protection		
PV Array String Fault Monitoring		
Anti-Islanding Protection		
WiFi and Cloud Communication		
USB, Modbus, RS485		
S.R.O 604 Compliant		
AC,DC Cables, Earthing wires &Cable Trays	Copper Cables with purity of 99.99%	
	UL 4703 compliant Low Smoke Halogen Free	
	DC cable size : 06 mm ²	AC
	cable size : As per attached Drawing	
	XLPO Cables for operation under elevated temperatures rated for 1500 V	
	Conduits shall have 30% or higher spare capacity	
	Trenching and all Civil Works	
	Seamless Terminations	
	Perforated Cable Trays of 16 Gauge or thicker	
	Avoid Direct Sunlight and Direct Clamping of Cables	
	Cables should not be physically accessible for routine works	
	Labeling of all strings/equipment shall be mandatory	
06 mm ² earth wire for equipotential bonding		
Cables to be laid in UPVC/corrugated PVC pipes and cable trays		

SPECIFIC PLANT DATA PORT QASIM ADMIN BUILDING		
EQUIPMENT	SPECIFICATIONS	Yes/No
System Design and Installation/As Built Drawings	Energy Yield Assessment	
	Module Layout Drawings as per the drawings attached and referred	
	Cable Layout Plans	
	As built Drawings	
Breakers, Surge Arrester & LV Panel	Circuit Breakers	
	Changeover Switches	
	Class-II Surge protection separate for AC & DC sides	
	Separate DC and AC Earthing each with 5 Ohms or lesser resistance	
	Non-Isolated Lightning Arrestors	
	Protection against lightning currents of 31 kA or higher	
	In case of LV panel installation, the panel shall be IP65 rated with galvanized material of at least 16 gauge with protection Scheme as per IEC Standard 62548, having Input and Output Circuit Breakers as per IEC Standards, Bus Bar Current Bearing Capacity as per requirement, Isolators for Bus Bars and AC Grounding Bus Bar.	
	The panel shall have Digital Ammeter and Voltmeter, RYB indicator with Breather Vents on both Sides of cabinets with RAL Color: 6021	
Monitoring and Control System	Centralized Monitoring and Logging of array level input, System Output	
	Communication through the following : 1. RS485/RS232/TTL/USB for onsite data collection/monitoring 2. GPRS/4G for realtime data transfer to Client's defined server (subscription of GPRS/4G to be paid by the Contractor) 3. Wifi/Bluetooth Module for localized wireless communication 4. Alarm Messages (SMS & Email) for Fault/ Grid Outage / Generator Outage / Inverter Outage etc.	
Inverter Data Logger Collection of Data	Operating status	
	Vdc	
	Vac	
	Pdc	
	Pac	
	Grid Status	
	Generator Status (from Genset Sync. Module)	
	Fault Detection	
	Daily Energy Supplied by PV System	
	Total Energy Supplied by PV System	
	Plant Performance Data Check: Every 15 Seconds or lesser	
	Total Energy Supplied by Genset (from Genset Sync. Module)	
Synchronization Module for GENSETS AND INVERTERS	Compatible with GENSETS and INVERTERS	

BILL OF QUANTITIES

A. Preamble

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Employer Design given in the Bidding Documents.
2. The rates and prices entered in the priced Bill of Quantities shall, except in so far as it is otherwise provided under the Contract include all costs of Contractor's plant, labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore, all duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as on the date of deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
3. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
4. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works.
5. General directions and description of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the priced Bill of Quantities.
6. Provisional sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Employer.

BILL OF QUANTITIES

A. BOQ FOR SOLARIZATION OF PORT QASIM BUILDING 1 (59.4 kW)					
No.	ITEM(s)	Description	Unit	Minimum QTY	Quoted Price (PKR)
1	String Inverter	3 phases On Grid Inverter with Remotely Monitoring Devices	Sum	54 kW	
2	Communication Box	Data Logger	No.	As per inverter configuration	
3	PV module	Tier 1 Manufacturer according to Bloomberg latest issued rankings with IEC 61215 Compliance and not less than 540 W Mono PERC Half Cut PV module	Sum	59.4 kW	
4	PV Mount Structure for Elevated	HDGI P1/P2/P3/P4, wind speed = 150km/h, azimuth as per site. (UV resistant ,125 micron of zinc coating), 12AWG as per drawing.	Sum	59.4 kW	
Lightning Arrester					
5	Lightning Arrester	Copper rod height 2 m to be fixed on Roof Top	Nos.	1	
Electrical					
6	0.4kV LV Panel (59.4kW)	IP65 galvanized iron AC combiner Cabinet, 1 IN 1 Out The size of cabinet : H*L*D ft (4*2.5*2.5) Gauge : 16 AWG, Color : RAL 6021 Mounting type = ground mounted Details of breakers and SPD to be in housed in cabinet: As per drawing attached Others specs: RYB Indicator, Digital Ammeter and Voltmeter =Yes, AC grounding bus bar =Yes(length =1 ft, to be placed at the left bottom of the DB),DC grounding Bus bar=Yes	Nos.	1	
7	DC Distribution Box	IP65 GI DB for each inverter for placing DC strings Expected size but not limited to W*H*D = 3*1*0.75 wall mount, single door with lock and with complete fitting scheme/ railing for DC breakers	Nos.	As per no. of inverters	
8	DC Breakers with base 1 - pole	1500 V DC 16 A 1P	Nos.	As per inverter configuration	

AC, DC and Grounding Cables					
9	DC wire for PV (rooftop)	6 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO/XLPE	mtr	600	
10	AC wire from LV panel to Inverter (For 59.4kW)	Cu, XLPE/PVC 0.6/1 kV, 4*50 mm ² Sq. AC stranded	mtr	30	
11	AC wire from inverter grounding	Cu, PVC 0.6/1 kV, 1*25 mm Sq. AC flexible wire stranded	mtr	30	
12	AC wire from inverter grounding	Cu, PVC 0.6/1 kV, 1*16 mm Sq. AC flexible wire stranded	mtr	15	
13	DC wire for frame-frame grounding	PVC 1*6 mm Sq. AC standard Wire	mtr	30	
14	Dc wire for PV frames to grounding point	PVC 1*16 mm Sq. AC standard Wire	mtr	30	
15	Copper Bare Conductor	25 mm Sq	mtr	30	
Cables Trays, Pipes, Ducts, MC4 connectors					
16	Cable Tray	16 AWG Galvanized iron with flat cover, perforated downside, complete fitting accessories i.e nut bolts, supporting angle iron etc, size (W*D)inch 8*4 for laying string wires	mtr	70	
17	UPVC pipe	51mm dia pipe for laying string wires PV area to inverters including sockets	mtr	As per requirement	
18	UPVC pipe	25mm including bends and sockets	mtr	As per requirement	
19	MC4 connectors	IP67/IP68 for PV stringing	Nos.	As per requirement	
Earthing System					
20	DC Earthing	Earthing bore with resistance <3 ohm (including all necessary equipment)		Job.	
21	AC Earthing	Earthing bore with resistance <3 ohm (including all necessary equipment)		Job.	
Miscellaneous					
22	Installation and Commissioning	Complete project installation and commissioning till handover of the project to client		Job.	
23	MISC	Cable ties, rawal bolts, pvc tapes, steel and PVC clamps, pvc pipes, glands different sizes, thimbles, connectors, warning labels etc		Job.	

Operation and Maintenance					
24	O&M Training	O & M training of 3 personnel of the client	Job.		
		·2 x insulated glove pairs, shoe pairs, hats for site inspection and maintenance activities			
		Manual Panel Cleaner			
		·PV module O&M kit			
a. SUB-TOTAL (Inclusive of taxes)					
B. BOQ FOR SOLARIZATION OF PORT QASIM BUILDING 2 (77.76 kW)					
No.	ITEM(s)	Description	Unit	Minimum QTY	Quoted Price (PKR)
1	String Inverter	3 phases On Grid Inverter with Remotely Monitoring Devices	Sum	70 KW	
2	Communication Box	Data Logger	No.	As per inverter configuration	
3	PV module	Tier 1 Manufacturer according to Bloomberg latest issued rankings with IEC 61215 Compliance and not less than 540 W Mono PERC Half Cut PV module	Sum	77.76 kW	
4	PV Mount Structure for Elevated	HDGI P1/P2/P3/P4, wind speed = 150km/h, azimuth as per site. (UV resistant ,125 micron of zinc coating), 12AWG as per drawing.	Sum	77.76 kW	
Lightning Arrester					
5	Lightning Arrester	Copper rod height 2 m to be fixed on Roof Top	Nos.	1	
Electrical					
6	0.4kV LV Panel (77.76kW)	IP65 galvanized iron AC combiner Cabinet, 1 IN 1 Out The size of cabinet : H*L*D ft (4*2.5*2.5) Gauge : 16 AWG, Color : RAL 6021 Mounting type = ground mounted Details of breakers and SPD to be in housed in cabinet: As per drawing attached Others specs: RYB Indicator, Digital Ammeter and Voltmeter =Yes, AC grounding bus bar =Yes(length =1 ft, to be placed at the left bottom of the DB),DC grounding Bus bar=Yes	Nos.	1	
7	DC Distribution Box	IP65 GI DB for each inverter for placing DC strings Expected size but not limited to W*H*D = 3*1*0.75 wall mount, single door with lock and with complete fitting scheme/ railing for DC breakers	Nos.	As per no. of inverters	

8	DC Breakers with base 1 - pole	1500 V DC 16 A 1P	Nos.	As per inverter configuration	
AC, DC and Grounding Cables					
9	DC wire for PV (rooftop)	6 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO/XLPE	mtr	800	
10	AC wire from LV panel to Inverter (For 77.76kW)	Cu, XLPE/PVC 0.6/1 kV, 4*70 mm ² Sq. AC stranded	mtr	30	
11	AC wire from inverter grounding	Cu, PVC 0.6/1 kV, 1*35 mm Sq. AC flexible wire stranded	mtr	30	
12	AC wire from inverter grounding	Cu, PVC 0.6/1 kV, 1*16 mm Sq. AC flexible wire stranded	mtr	15	
13	DC wire for frame-frame grounding	PVC 1*6 mm Sq. AC standard Wire	mtr	50	
14	Dc wire for PV frames to grounding point	PVC 1*16 mm Sq. AC standard Wire	mtr	30	
15	Copper Bare Conductor	25 mm Sq	mtr	30	
Cables Trays, Pipes, Ducts, MC4 connectors					
16	Cable Tray	16 AWG Galvanized iron with flat cover, perforated downside, complete fitting accessories i.e nut bolts, supporting angle iron etc, size (W*D)inch 8*4 for laying string wires	mtr	90	
17	UPVC pipe	51mm dia pipe for laying string wires PV area to inverters including sockets	mtr	As per requirement	
18	UPVC pipe	25mm including bends and sockets	mtr	As per requirement	
19	MC4 connectors	IP67/IP68 for PV stringing	Nos.	As per requirement	
Earthing System					
20	DC Earthing	Earthing bore with resistance <3 ohm (including all necessary equipment)		Job.	
21	AC Earthing	Earthing bore with resistance <3 ohm (including all necessary equipment)		Job.	
Miscellaneous					
22	Installation and Commissioning	Complete project installation and commissioning till handover of the project to client		Job.	
23	MISC	Cable ties, rawal bolts, pvc tapes, steel and PVC clamps, pvc pipes, glands different sizes, thimbles, connectors, warning labels etc		Job.	
Operation and Maintenance					

24	O&M Training	O & M training of 3 personnel of the client	Job.		
		·2 x insulated glove pairs, shoe pairs, hats for site inspection and maintenance activities			
		Manual Panel Cleaner			
		·PV module O&M kit			
b. SUB-TOTAL (Inclusive of taxes)					
C. BOQ FOR SOLARIZATION OF PORT QASIM BUILDING 3 (95.58 kW)					
No.	ITEM(s)	Description	Unit	Minimum QTY	Quoted Price (PKR)
1	String Inverter	3 phases On Grid Inverter with Remotely Monitoring Devices	Sum	87 KW	
2	Communication Box	Data Logger	No.	As per inverter configuration	
3	PV module	Tier 1 Manufacturer according to Bloomberg latest issued rankings with IEC 61215 Compliance and not less than 540 W Mono PERC Half Cut PV module	Sum	95.58 kW	
4	PV Mount Structure for Elevated	HDGI P1/P2/P3/P4, wind speed = 150km/h, azimuth as per site. (UV resistant ,125 micron of zinc coating), 12AWG as per drawing.	Sum	95.58 kW	
Lightning Arrester					
5	Lightning Arrester	Copper rod height 2 m to be fixed on Roof Top	Nos.	1	
Electrical					
6	0.4kV LV Panel (95.58kW)	IP65 galvanized iron AC combiner Cabinet, 1 IN 1 Out The size of cabinet : H*L*D ft (4*2.5*2.5) Gauge : 16 AWG, Color : RAL 6021 Mounting type = ground mounted Details of breakers and SPD to be in housed in cabinet: As per drawing attached Others specs: RYB Indicator, Digital Ammeter and Voltmeter =Yes, AC grounding bus bar =Yes(length =1 ft, to be placed at the left bottom of the DB),DC grounding Bus bar=Yes	Nos.	1	
7	DC Distribution Box	IP65 GI DB for each inverter for placing DC strings Expected size but not limited to W*H*D = 3*1*0.75 wall mount, single door with lock and with complete fitting scheme/ railing for DC breakers	Nos.	As per no. of inverters	

8	DC Breakers with base 1 - pole	1500 V DC 16 A 1P	Nos.	As per inverter configuration	
AC, DC and Grounding Cables					
9	DC wire for PV (rooftop)	6 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO/XLPE	mtr	1000	
10	AC wire from LV panel to Inverter (For 77.76kW)	Cu, XLPE/PVC 0.6/1 kV, 1*95 mm ² Sq. AC stranded	mtr	30	
11	AC wire from inverter grounding	Cu, PVC 0.6/1 kV, 1*50 mm Sq. AC flexible wire stranded	mtr	30	
12	AC wire from inverter grounding	Cu, PVC 0.6/1 kV, 1*16 mm Sq. AC flexible wire stranded	mtr	15	
13	DC wire for frame-frame grounding	PVC 1*6 mm Sq. AC standard Wire	mtr	50	
14	Dc wire for PV frames to grounding point	PVC 1*16 mm Sq. AC standard Wire	mtr	30	
15	Copper Bare Conductor	25 mm Sq	mtr	30	
Cables Trays, Pipes, Ducts, MC4 connectors					
16	Cable Tray	16 AWG Galvanized iron with flat cover, perforated downside, complete fitting accessories i.e nut bolts, supporting angle iron etc, size (W*D)inch 8*4 for laying string wires	mtr	90	
17	UPVC pipe	51mm dia pipe for laying string wires PV area to inverters including sockets	mtr	As per requirement	
18	UPVC pipe	25mm including bends and sockets	mtr	As per requirement	
19	MC4 connectors	IP67/IP68 for PV stringing	Nos.	As per requirement	
Earthing System					
20	DC Earthing	Earthing bore with resistance <3 ohm (including all necessary equipment)		Job.	
21	AC Earthing	Earthing bore with resistance <3 ohm (including all necessary equipment)		Job.	
Miscellaneous					
22	Installation and Commissioning	Complete project installation and commissioning till handover of the project to client		Job.	
23	MISC	Cable ties, rawal bolts, pvc tapes, steel and PVC clamps, pvc pipes, glands different sizes, thimbles, connectors, warning labels etc		Job.	

Operation and Maintenance			
24	O&M Training	O & M training of 3 personnel of the client	Job.
		·2 x insulated glove pairs, shoe pairs, hats for site inspection and maintenance activities	
		Manual Panel Cleaner	
		·PV module O&M kit	
c. SUB-TOTAL (Inclusive of taxes)			
GRAND TOTAL (a+b+c) (Inclusive of all applicable taxes in Pakistan)			

FORM OF BID SECURITY
(Bank Guarantee)

Security Executed on _____
(Date)

Name of Surety (Bank) with Address:
(Scheduled Bank in Pakistan)

Name of Principal (Bidder) with Address: _____

Security Amount in Rupees. _____ (Rs. _____)

Bid Reference No. _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto _____ (hereinafter called the 'Employer') in the sum stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Bidder has submitted the accompanying Bid dated _____ for Bid No. _____ for _____ (Particulars of Bid) to the said Employer; and

WHEREAS, the Employer has required as a condition for considering said Bid that the Bidder furnishes a Bid Security in the above said sum from a Scheduled Bank in Pakistan, to the Employer, conditioned as under:

- (1) that the Bid Security shall remain in force up to and including the date 30 days after the deadline for validity of bids as stated in the Instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Surety is hereby waived;
- (2) that the Bid Security of unsuccessful Bidders will be returned by the Employer after expiry of its validity or upon signing of the Contract Agreement; and
- (3) that in the event of failure of the successful Bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said Employer pursuant to Clause 15.6 of the Instruction to Bidders for the successful Bidder's failure to perform.

NOW THEREFORE, if the successful Bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a Contract Agreement with the said Employer in accordance with his Bid as accepted and furnish within seven (07) working days of issuance of Letter of Acceptance, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said Employer for the faithful performance and proper fulfilment of the said Contract Agreement or in the event of non-withdrawal of the said Bid within the time

specified for its validity then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.

PROVIDED THAT the Surety shall forthwith pay the Employer the said sum upon first written demand of the Employer (without cavil or argument) and without requiring the Employer to prove or to show grounds or reasons for such demand, notice of which shall be sent by the Employer by registered post duly addressed to the Surety at its address given above.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Bidder) has duly performed his obligations to sign the Contract Agreement and to furnish the requisite Performance Security within the time stated above, or has defaulted in fulfilling said requirements and the Surety shall pay without objection the said sum upon demand from the Employer forthwith and without any reference to the Principal (Bidder) or any other person.

IN WITNESS WHEREOF, the above bounden Surety has executed this Guarantee under its seal on the date indicated above, the name and seal of the Surety being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

SURETY (Bank)

WITNESS:

Signature _____

1. _____

Name _____

Title _____

Corporate Secretary (Seal)

Corporate Guarantor (Seal)

2. _____

Name, Title & Address

**FORM OF PERFORMANCE SECURITY
(Bank Guarantee)**

Guarantee No. _____

Executed on _____
Expiry date

[Letter by the Guarantor to the Employer]

Name of Guarantor (Bank) with address:

(Scheduled Bank in Pakistan)

Name of Principal (Contractor) with address:

Security Amount (express in words and figures) _____

Letter of Acceptance No. _____ Dated _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bidding Documents and above said Letter of Acceptance (hereinafter called the Documents) and at the request of the said Principal we, the Guarantor above named, are held and firmly and irrevocably and unconditionally bound unto the _____ (hereinafter called the Employer) in the sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has accepted the Employer's above said Letter of Acceptance for _____ (Name of Contract) for the _____

_____ (Name of Project).

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract Agreement and of any and all modifications of said Documents that may hereafter be made, notice of which modifications to the Guarantor being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue till all requirements of Clause 8.3, Defects Liability, of Conditions of Contract are fulfilled.

Our total liability under this Guarantee is limited to the sum stated above and it is a condition of any liability attaching to us under this Guarantee that the claim for payment in writing shall be received by us within the validity period of this Guarantee, failing which we shall be discharged of our liability, if any, under this Guarantee.

We, _____ (the Guarantor), waiving all objections and defences under the Contract, do hereby irrevocably and independently guarantee to pay to the Employer without delay upon the Employer's first written demand without cavil or arguments and without requiring the Employer to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Employer's written declaration that the Principal has refused or failed to perform the obligations under the Contract Agreement which payment will be effected by the Guarantor to Employer's designated Bank & Account Number.

PROVIDED ALSO THAT the Employer shall be the sole and final judge for deciding whether the Principal (Contractor) has duly performed his obligations under the Contract Agreement or has defaulted in fulfilling said obligations and the Guarantor shall pay without objection any sum or sums up to the amount stated above upon first written demand from the Employer forthwith and without any reference to the Principal or any other person.

IN WITNESS WHEREOF, the above-bounden Guarantor has executed this Guarantee under its seal on the date indicated above, the name and corporate seal of the Guarantor being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

	_____ Guarantor (Bank)
Witness:	
1. _____	Signature _____
_____	Name _____
Corporate Secretary (Seal)	Title _____
2. _____	
_____	_____
Name, Title & Address	Corporate Guarantor (Seal)

**FORM OF ADVANCE PAYMENT
(Bank Guarantee)**

Guarantee No. _____ Date _____
WHEREAS _____ (hereinafter called the 'Employer') has entered into a
Contract for _____
(Particulars of Contract) with _____ (hereinafter called the
"Contractor").

AND WHEREAS, the Employer has agreed to advance to the Contractor, at the
Contractor's request, an amount of Rupees _____ (Rs _____)
which amount shall be advanced to the Contractor as per provisions of the Contract.

AND WHEREAS, the Employer has asked the Contractor to furnish Guarantee to
secure the advance for the performance of his obligations under the said Contract.

AND WHEREAS, _____
(Scheduled Bank in Pakistan) (hereinafter called the "Guarantor") at the request of
the Contractor and in consideration of the Employer agreeing to make the above
advance to the Contractor, has agreed to furnish the said Guarantee.

NOW, THEREFORE, the Guarantor hereby guarantees that the Contractor shall use
the advance for the purpose of above-mentioned Contract and if he fails and commits
default in fulfilment of any of his obligations for which the advance payment is made,
the Guarantor shall be liable to the Employer for payment not exceeding the
aforementioned amount. Notice in writing of any default, of which the Employer
shall be the sole and final judge, on the part of the Contractor, shall be given by the
Employer to the Guarantor, and on such first written demand, payment shall be made
by the Guarantor of all sums then due under this Guarantee without any reference to
the Contractor and without any objection. This Guarantee shall remain in force until
the Delivery of Machinery, Equipment and Material of the System at Site upon
verification and confirmation of the Employer. The Guarantor's liability under this
Guarantee shall not in any case exceed the sum of Rupees _____ (Rs
_____). This Guarantee shall remain valid up to seven (07)
days of the aforesaid confirmation letter by the Employer and shall be null and void
after the aforesaid date.

GUARANTOR

Signature _____
Name / Title _____

WITNESS

1. _____

Corporate Secretary (Seal)

2. _____
(Name Title & Address)

Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the “ Contract Agreement”) made on the _____ day of _____(month) 20____ between _____ (hereafter called the “Employer”) of the one part and _____ (hereafter called the “Contractor”) of the other part.

WHEREAS the Employer is desirous that certain Works, viz _____ should be executed by the Contractor and has accepted a Bid by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW this Agreement witnessed as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents after incorporating addenda, if any, except those parts relating to Instructions to Bidders shall be deemed to form and be read and construed as part of this Contract Agreement, viz:
 - (a) Letter of Acceptance;
 - (b) Specifications and Employer Design
 - (c) Contract Data;
 - (d) Conditions of Contract;
 - (e) Letters Technical Bid and Price Bid;
 - (f) The priced Bill of Quantities; and
 - (g) The Appendices to Bid.
3. In the event of any discrepancy or inconsistency within the Contract Documents, then the documents shall prevail in the order listed above.
4. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of this Contract Agreement.
5. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of this Contract Agreement, the Contract Price or such other sum as may become payable under the provisions of this Contract Agreement at the times and in the manner prescribed therein.

IN WITNESS WHEREOF the parties hereto have caused this Contract Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor

(Seal)

Signature of Employer

(Seal)

In the presence of:

Witness:

(Name, Title and Address)

Witness:

(Name, Title and Address)

SPECIFICATIONS

SPECIFICATIONS

The following are the minimum technical specifications of the equipment being parts of the Solar PV System that shall be installed at the premises.

1. Solar PV Modules:

Manufacturer and Material Requirements:

Solar PV modules shall be of Tier-I manufacturer as per latest Bloomberg New Energy Finance (BNEF) list (for Q1 or Q2 of the year 2023). The PV technology shall be half-cut mono-PERC to maximize the yield against the available area and minimize the losses against partial shading. Each module shall have IP 65 rated Junction Boxes which shall be dust and vermin proof having copper bus bar terminals, EPDM rubber gasket, reverse blocking diodes and IEC standard 62790 compliant.

Performance and Rating Requirements:

The power rating for each PV module shall be more than 540Wp under STC conditions with positive power tolerance only. Each PV module must have efficiency greater than 20%. The proposed PV module must exhibit efficiency of more than 96% of the STC efficiency at 200 W/m² (i.e. low lighting conditions). The module Temperature Coefficient at Pmax shall be -0.37% / °C or lesser and the operating temperature range shall be -40°C to +85°C.

Certification Requirements:

The PV Module must be Type Tested based on IEC standard 61215 (Terrestrial PV Modules- Design qualification and type approval) and IEC 61730 (Photovoltaic module safety qualification) based insulation of Safety Class II. Modules must be free of Potential Induced Degradation (PID) and Light Induced Degradation (LID). The module shall be S.R.O 604 compliant issued by Government of Pakistan. The Flash Test report, module Test report as per IEC standards 61215 and 61730 along with pre-shipment inspection certificate shall be provided at the time of delivery of modules at site.

Warranty and Replacement:

Each module shall have minimum 12 years material and workmanship warranty and 25 years performance warranty. The Power output of each PV module shall be greater than 85% after 25 Years. Warranty shall be insured by third party.

Product Identification:

Each PV module shall have a unique barcode identification tag issued by the manufacturer. The same shall be confirmed from the manufacturer prior to verification of equipment delivery at site by the Engineer.

2. Inverters:

Performance and Rating Requirements:

The inverter shall be three phase grid tied with minimum IP65 protection having CEC efficiency of not less than 98.5 % and output frequency of 50Hz. The cumulative capacity of inverter shall be according to the total solar PV capacity to be installed and inverter's minimum input voltage shall be as per array specific design. Under all scenarios, the DC to AC ratio of the inverter shall not be more than 1.1.

The inverters shall have multiple MPPT inputs for 3-phase inverters. The Total Harmonic Distortion shall be less than 3%. The ambient operating temperature range of Inverter shall be between -25°C to 60°C. [Three phase inverter must have Diesel Generator Synchronization module for seamless integration with Generators].

Protection and Safety Requirements:

The inverter shall have AC overcurrent protection, residual current monitoring, DC reverse polarity protection, DC insulation resistance detection, PV array string fault monitoring, anti-islanding protection and Type-2 or better DC and AC SPDs. The inverter must have anti PID module to limit the harmful effects of Potential Induced Degradation of PV Modules. Inverter shall have a built-in data logger; communication interface protections and remote monitoring capability. It shall be compliant with UL 1741, IEC 62109-1/2 for safety design.

Warranty Requirements:

The inverters shall have minimum 10 years of replacement warranty.

3. PV Balance of system:

a) Mounting Structure:

The mounting structure shall be UV resistant and shall have hot dip galvanized steel frame of gauge 12 with 85 micron or thicker zinc coating and 100 micron for base plate. Spacing from Parapet wall must be 3 ft. The structure shall have galvanic isolation and shall withstand wind speed of 150 km/h. Complete civil work (including civil blocks of 1:2:4 composition) for mounting structure installation shall be performed as per Employer Design provided in the list of Works available at Employer's website. For rooftop areas with additional slabs, rawal bolt based anchoring shall be followed in combination with waterproofing treatment.

b) DC Cables, AC Cables, Earthing wires, Conduits, Connectors, Cable Trays etc.

Copper cables with purity of 99.9% or more with XLPO insulation and rated for 1500 V shall be used. Cables shall be low smoke Halogen free along with compliance with BS 6004, BS 7644 and UL 4703 standards. Minimum size for DC cables shall be 4 mm² or as per size of PV Module Output cable (whichever is higher or given in the Bills of Quantities). Under all conditions, for DC

cables, voltage drop shall be less than 0.5% at STC and for AC cables voltage drop shall be less than 1% at STC. 6 mm² earth wires for equipotential bonding shall be used. Separate DC and AC earthing each with 3 ohm or lesser resistance shall be achieved using the earthing arrangement.

Perforated cable trays of 16 gauge or thicker and UPVC/corrugated PVC pipes shall be installed with seamless terminations. The cable tray shall not be physically accessible for routine works. Flexible pipes, glands, conduits, cables ducts shall be installed as per Employer Design. Conduits shall have 30% or higher spare capacity. Labeling of all cables shall be performed in compliance with IEC Standard 62491.

c) Breakers, Surge Arrester, LV Panel etc.

Circuit breaker, Protection devices and Non-Isolated Lightning Arrestors shall be installed as per Employer Design. MCB/MCCB Circuit breaker for each string shall be rated for more than 1.5 times the STC current rating of the string. Under all circumstances circuit breaker rating must be less than the fuse rating of PV Module.

In case of installation of LV panel, the panel shall be IP65 rated of galvanized material with at least 16 gauge. The panel shall have protection scheme compliant with IEC Standard 62548, input and output circuit breakers as per IEC Standards, bus bar current bearing capacity as per requirement, and isolators for bus bars and AC grounding bus bar. The panel shall have digital Ammeter and Voltmeter, RYB indicator with breather vents on both sides of cabinets with RAL Color: 6021.

d) Monitoring and Control System:

Online and real time monitoring shall be provided with following parameters;

1. Energy generation (kWh)
2. Power production (kW)
3. String-level monitoring of Voltage and Current
4. Storage of 1 TB and monitoring data for at least 3 years

e) Operation Manual:

An Operation, Instruction and Maintenance Manual, in English shall be provided with the Solar PV System. The detailed diagram(s) of wiring and connection diagrams shall also be provided with manual.

Note:

- Various components of Solar PV System shall additionally be conformed to the relevant national/international Electrical Safety Standards wherever applicable.

Employer's Design

Employer's Design
Port Qasim Admin Buildings, Karachi

List of Documents

Sr. No.	Description
1.	Building Name, Location and Google Earth Image
2.	Minimum Technical Requirements for Electrical Works (AC Side)
3.	Module and Cable Layout Plans
4.	Single Line Diagram
5.	Structure Drawings

1. Building Name, Location and Google Earth Image

- **Name:** Port Qasim **Admin Building 1**, Karachi
- **Location:** 24.785696488554308, 67.3424928840129

Google Earth Image:



PV Module Layout

Segment No.	Tilt	Azimuth w.r.t North	No. of Modules	Capacity (kW)
Segment (Elevated) 06	10°	137°	39	21.06
Segment (Elevated) 07	10°	137°	39	21.06
Segment (Elevated) 08	10°	137°	12	6.48
Segment (Elevated) 09	10°	137°	20	10.8

- **Name:** Port Qasim Admin Building 2, Karachi
- **Location:** 24.785696488554308, 67.3424928840129

Google Earth Image:



PV Module Layout

Segment No.	Tilt	Azimuth w.r.t North	No. of Modules	Capacity (kW)
Segment (Elevated) 10	10°	164°	63	34.02
Segment (Elevated) 11	10°	164°	63	34.02
Segment (Elevated) 12	10°	164°	18	9.72

- **Name:** Port Qasim Admin Building 3, Karachi
- **Location:** 24.785696488554308, 67.3424928840129

Google Earth Image:



PV Module Layout

Segment No.	Tilt	Azimuth w.r.t North	No. of Modules	Capacity (kW)
Segment (Elevated) 01	10°	195°	39	21.06
Segment (Elevated) 02	10°	195°	39	21.06
Segment (Elevated) 03	10°	195°	40	21.6
Segment (Elevated) 04	10°	195°	39	21.06
Segment (Elevated) 05	10°	195°	20	10.8

2. MINIMUM TECHNICAL REQUIREMENTS FOR ELECTRICAL WORKS (AC SIDE) SOLAR PV SYSTEM FOR PORT QASIM AUTHORITY BUILDING 1			
ELECTRICAL WORKS (AC SIDE)			
Sr. No.	Description	Qty.	Unit
	IMPORTANT NOTES (Applicable to all Electrical Items)		
	All electrical items given below shall be read in conjunction with parts of the Specifications and electrical drawings except otherwise indicated.		
	The Electrical Works include design, supply, transportation, installation, testing and commissioning of the following items of works as mentioned in this BOQ (unless specifically stated otherwise) including all material, labour, tools, accessories, related civil works, etc., as required for proper completion of each item as per specifications unless otherwise mentioned. (Any necessary material not mentioned in specifications, electrical drawings and here in this BOQ required for proper installation, testing and commissioning of equipment and materials shall be included in BOQ rates.		
1.0	<u>POWER CABLE</u>		
1.1	Copper conductor, PVC/PVC 600/1000V cables including with Cu/Brass glands, lugs etc. alongwith all accessories. The cable shall be drawn in cable trench or clipped on the wall or pulled in cable tray/PVC pipes or as required or as shown on drawings. (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)		
a)	4 Core 50 mm ² (For 59.4 kW LV Panel)	30	Rm.
1.2	PVC insulated 450/750 Volt grade (Green - Yellow) unarmoured copper cable laid direct in ground, pulled in PVC pipe already laid, on surface of wall or cable trays etc. with Cu/Brass, glands, lugs etc. alongwith all accessories all accessories as required or as shown on drawings (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing) as earth continuity conductor (ECC/CPC).		
a)	1 Core 25 mm ²	30	Rm.
b)	1 Core 16 mm ²	15	Rm.
2.0	<u>CABLE/LADDER TRAYS</u>		
2.1	Perforated cable/ladder tray 14 SWG & covered with 16 SWG G.I Sheet including installation accessories such as wall support bracket assembly, saddles or straps secured with brass or cadmium nuts, rawal plugs, bolts & washer, cable ladder for horizontal run of cable as and provided specifications or as required.		
a)	300 mm x 100 mm	25	Rm.
3.0	<u>UPVC PIPE</u>		
3.1	Laying of uPVC 8" dia pipe (Class-D) including back filling and compaction for LV Cables.	25	Rm.

4.0	<u>LOW VOLTAGE MAIN PANEL BOARD (LVMPB)</u>		
4.1	LV Switchgear Panel/Main Panel Board of 14 SWG, IP class 44/54 & RAL 7032 including I/C and O/G following electrical items, foundation/base frame with all installation and operational accessories as per site requirements, as per tender specifications and drawings and as directed by the Engineer.		
a)	LV Panel (For 59.4 kW)	1	Each
	INCOMING		
	01 No. 160 Amps TP (adj.),MCCB, RC=25 kA, Icu=100%Ics		
	03 Nos. 200/5 Amps Current Transformers		
-	01 Nos. VSS (07 position)		
-	01 Nos. 0-600 Volts AC DIGITAL Voltmeter		
-	01 Nos. ASS (R-Y-B-OFF)		
-	01 Nos. 0-200 Amps AC DIGITAL Ammeter		
-	6 Nos. LED indication lights (Red, Yellow, Blue, ON, OFF & Trip)		
-	01 Nos. Surge Protection Device		
-	14 SWG steel sheet Panel RAL 7032, IP= 44/54 and all other accessories,		
	OUTGOING		
-	Outgoing Circuit Breakers and allied accessories shall be compatible to the existing panel		
-	01 No. Exhaust fan 6" & 01No. Louver 8" sweep with thermostat relay and all accessories etc.		
-	All other accessories required for completion of the quality works including Cable gland and lugs etc		
-	copper bus bar with PVC mounting including nuts, bolts, washers, control MCB etc. (320 Amps. R+Y+B, N & Earth 50 Hz, 415 V, AC) including cable glands at top/bottom entry for cable)		
-	Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.		
5.0	<u>EARTHING AND BONDING</u>		
	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground. The earthing rods shall be completed with fixing clamps etc.	1	No.

SOLAR PV SYSTEM FOR PORT QASIM AUTHORITY BUILDING 2

ELECTRICAL WORKS (AC SIDE)

Sr. No.	Description	Qty.	Unit
	IMPORTANT NOTES (Applicable to all Electrical Items)		
	All electrical items given below shall be read in conjunction with parts of the Specifications and electrical drawings except otherwise indicated.		
	The Electrical Works include design, supply, transportation, installation, testing and commissioning of the following items of works as mentioned in this BOQ (unless specifically stated otherwise) including all material, labour, tools, accessories, related civil works, etc., as required for proper completion of each item as per specifications unless otherwise mentioned. (Any necessary material not mentioned in specifications, electrical drawings and here in this BOQ required for proper installation, testing and commissioning of equipment and materials shall be included in BOQ rates.		
1.0	<u>POWER CABLE</u>		
1.1	<p>Copper conductor, PVC/PVC 600/1000V cables including with Cu/Brass glands, lugs etc. alongwith all accessories. The cable shall be drawn in cable trench or clipped on the wall or pulled in cable tray/PVC pipes or as required or as shown on drawings. (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing).</p> <p>The Cables shall Comply the following or equivalent standards: PVC insulated cables (BS 6004,BS 6346) PVC insulation and sheath of electric cables (BS 6764) Conductors for insulated cables (BS 6360, IEC 60228)</p>		
a)	4 Core 70 mm ² (For 77.76 kW LV Panel)	30	Rm.
1.2	<p>PVC insulated 450/750 Volt grade (Green - Yellow) unarmoured copper cable laid direct in ground, pulled in PVC pipe already laid, on surface of wall or cable trays etc. with Cu/Brass, glands, lugs etc. alongwith all accessories all accessories as required or as shown on drawings (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing) as earth continuity conductor (ECC/CPC).</p> <p>The Cables shall Comply the following standards: PVC insulated cables (BS 6004,BS 6346) PVC insulation and sheath of electric cables (BS 6764) Conductors for insulated cables (BS 6360, IEC 60228)</p>		
a)	1 Core 35 mm ²	30	Rm.
b)	1 Core 16 mm ²	15	Rm.

2.0	<u>CABLE/LADDER TRAYS</u>		
2.1	Perforated cable/ladder tray 14 SWG & covered with 16 SWG G.I Sheet including installation accessories such as wall support bracket assembly, saddles or straps secured with brass or cadmium nuts, rawal plugs, bolts & washer, cable ladder for horizontal run of cable as and provided specifications or as required. The Cable trays/ladders shall comply to BS 729 or equivalent standard.		
a)	300 mm x 100 mm	20	Rm.
3.0	<u>UPVC PIPE</u>		
3.1	Laying of uPVC 8" dia pipe (Class-D) including back filling and compaction for LV Cables. The Pipes and allied accessories shall comply to BS 6099 and BS 3595 or equivalent standard.	20	Rm.
4.0	<u>LOW VOLTAGE MAIN PANEL BOARD (LVMPB)</u>		
4.1	LV Switchgear Panel/Main Panel Board of 14 SWG, IP class 44/54 & RAL 7032 including I/C and O/G following electrical items, foundation/base frame with all installation and operational accessories as per site requirements, as per tender specifications and drawings and as directed by the Engineer. The DBs/Panels components shall comply to the followings or equivalent standards: IEC 60947 - Triple pole Air Circuit Breakers BS 4752-1 - Triple pole Moulded Case Circuit Breaker VDE 0641 - Single and Triple pole Miniature Circuit IEC 60947 Breaker IEC 60947 - LV Switch gear and Control gear IEC 60439 - Factory Built Assemblies of LV Switchgear IEC 4752 - Switch gear and control gear for Voltages upto and including 1 kV BS 88 - HRC Fuses IEC 6073 - Colors for indicator lights and push buttons. IEC 60446 - Identification of insulated/bare conductors		
a)	LV Panel 77.76 kW	1	Each
	INCOMING		
	01 No. 160 Amps TP (adj.), MCCB, RC=25 kA, Icu=100%Ics		
	03 Nos. 200/5 Amps Current Transformers		
-	01 Nos. VSS (07 position)		
-	01 Nos. 0-600 Volts AC DIGITAL Voltmeter		
-	01 Nos. ASS (R-Y-B-OFF)		
-	01 Nos. 0-200 Amps AC DIGITAL Ammeter		
-	6 Nos. LED indication lights (Red, Yellow, Blue, ON, OFF & Trip)		
-	01 Nos. Surge Protection Device		
-	14 SWG steel sheet Panel RAL 7032, IP= 44/54 and all other accessories,		

-	OUTGOING Outgoing Circuit Breakers and allied accessories shall be compatible to the existing panel		
-	01 No. Exhaust fan 6" & 01No. Louver 8" sweep with thermostat relay and all accessories etc.		
-	All other accessories required for completion of the quality works including Cable gland and lugs etc		
-	copper bus bar with PVC mounting including nuts, bolts, washers, control MCB etc. (320 Amps. R+Y+B, N & Earth 50 Hz, 415 V, AC) including cable glands at top/bottom entry for cable)		
-	Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.		
5.0	<u>EARTHING AND BONDING</u>		
	Bore /Rod type earthing shall comply to the following or equivalent standards:IEC - 62035BS 951 - Earthing ClampsCP 1013 - Earthing BS 2874 - Nuts, bolts, washers, screws & rivets fixing for use on CopperBS 1433 - Hard drawn bare copper conductor for earthing BS 6346 - PVC insulated cables		
5.1	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground. The earthing rods shall be completed with fixing clamps etc.	1	No.

SOLAR PV SYSTEM FOR PORT QASIM AUTHORITY BUILDING 3

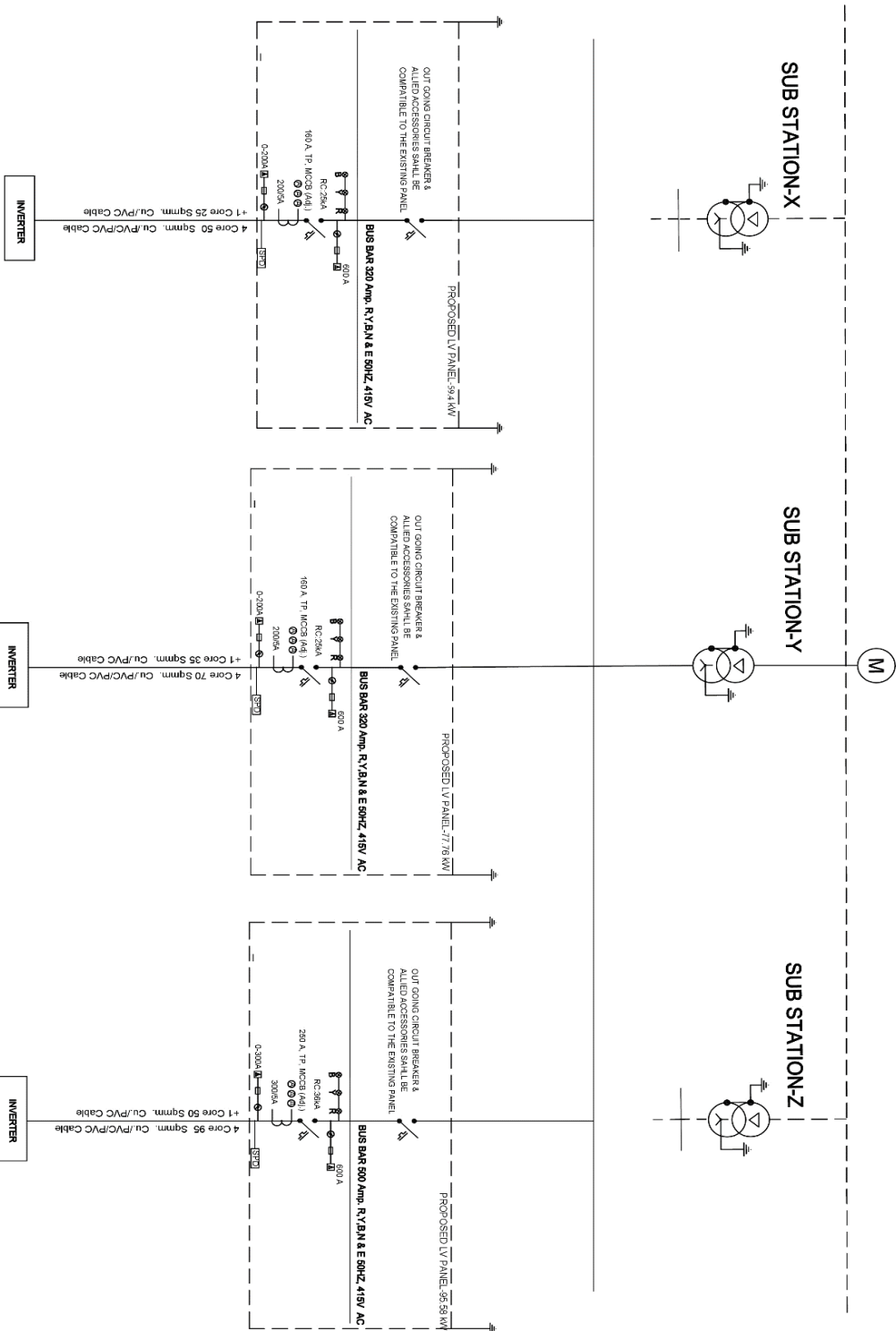
ELECTRICAL WORKS (AC SIDE)

Sr. No.	Description	Qty.	Unit
	IMPORTANT NOTES (Applicable to all Electrical Items)		
	All electrical items given below shall be read in conjunction with parts of the Specifications and electrical drawings except otherwise indicated.		
	The Electrical Works include design, supply, transportation, installation, testing and commissioning of the following items of works as mentioned in this BOQ (unless specifically stated otherwise) including all material, labour, tools, accessories, related civil works, etc., as required for proper completion of each item as per specifications unless otherwise mentioned. (Any necessary material not mentioned in specifications, electrical drawings and here in this BOQ required for proper installation, testing and commissioning of equipment and materials shall be included in BOQ rates.		
1.0	<u>POWER CABLE</u>		
1.1	Copper conductor, PVC/PVC 600/1000V cables including with Cu/Brass glands, lugs etc. alongwith all accessories. The cable shall be drawn in cable trench or clipped on the wall or pulled in cable tray/PVC pipes or as required or as shown on drawings. (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing). The Cables shall Comply the following or equivalent standards:		

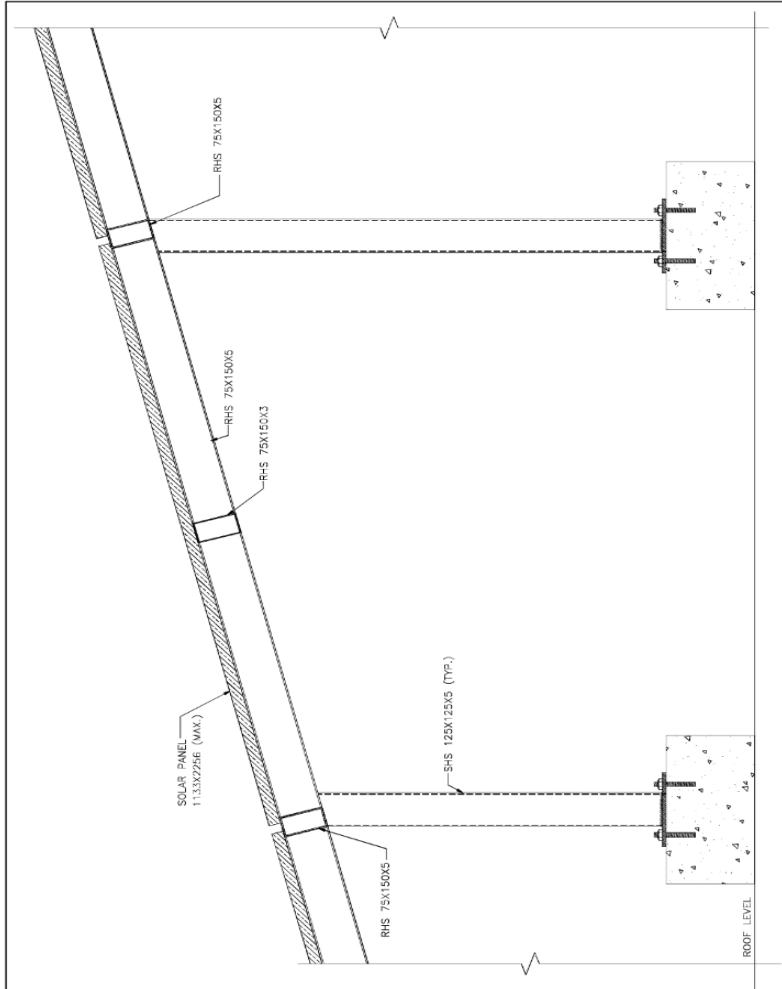
	PVC insulated cables (BS 6004,BS 6346) PVC insulation and sheath of electric cables (BS 6764) Conductors for insulated cables (BS 6360, IEC 60228)		
a)	4 Core 95 mm ² (For 95.58 kW LV Panel)	30	Rm.
1.2	PVC insulated 450/750 Volt grade (Green - Yellow) unarmoured copper cable laid direct in ground, pulled in PVC pipe already laid, on surface of wall or cable trays etc. with Cu/Brass, glands, lugs etc. alongwith all accessories all accessories as required or as shown on drawings (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing) as earth continuity conductor (ECC/CPC). The Cables shall Comply the following standards: PVC insulated cables (BS 6004,BS 6346) PVC insulation and sheath of electric cables (BS 6764) Conductors for insulated cables (BS 6360, IEC 60228)		
a)	1 Core 50 mm ²	30	Rm.
b)	1 Core 16 mm ²	15	Rm.
2.0	<u>CABLE/LADDER TRAYS</u>		
2.1	Perforated cable/ladder tray 14 SWG & covered with 16 SWG G.I Sheet including installation accessories such as wall support bracket assembly, saddles or straps secured with brass or cadmium nuts, rawal plugs, bolts & washer, cable ladder for horizontal run of cable as and provided specifications or as required. The Cable trays/ladders shall comply to BS 729 or equivalent standard.		
a)	300 mm x 100 mm	20	Rm.
3.0	<u>UPVC PIPE</u>		
3.1	Laying of uPVC 8" dia pipe (Class-D) including back filling and compaction for LV Cables. The Pipes and allied accessories shall comply to BS 6099 and BS 3595 or equivalent standard.	20	Rm.
4.0	<u>LOW VOLTAGE MAIN PANEL BOARD (LVMPB)</u>		
4.1	LV Switchgear Panel/Main Panel Board of 14 SWG, IP class 44/54 & RAL 7032 including I/C and O/G following electrical items, foundation/base frame with all installation and operational accessories as per site requirements, as per tender specifications and drawings and as directed by the Engineer. The DBs/Panels components shall comply to the followings or equivalent standards: IEC 60947 - Triple pole Air Circuit Breakers BS 4752-1 - Triple pole Moulded Case Circuit Breaker VDE 0641 - Single and Triple pole Miniature Circuit IEC 60947 Breaker IEC 60947 - LV Switch gear and Control gear IEC 60439 - Factory Built Assemblies of LV Switchgear IEC 4752 - Switch gear and control gear for Voltages upto and including 1 kV BS 88 - HRC Fuses IEC 6073 - Colors for indicator lights and push buttons. IEC 60446 - Identification of insulated/bare conductors		
a)	LV Panel (95.58 kW)	1	Each
	INCOMING		

	01 No. 250 Amps TP (adj.),MCCB, RC=36 kA, Icu=100%Ics		
	03 Nos. 300/5 Amps Current Transformers		
-	01 Nos. VSS (07 position)		
-	01 Nos. 0-600 Volts AC DIGITAL Voltmeter		
-	01 Nos. ASS (R-Y-B-OFF)		
-	01 Nos. 0-300 Amps AC DIGITAL Ammeter		
-	6 Nos. LED indication lights (Red, Yellow, Blue, ON, OFF & Trip)		
-	01 Nos. Surge Protection Device		
-	14 SWG steel sheet Panel RAL 7032, IP= 44/54 and all other accessories,		
	OUTGOING		
-	Outgoing Circuit Breakers and allied accessories shall be compatible to the existing panel		
-	01 No. Exhaust fan 6" & 01No. Louver 8" sweep with thermostate relay and all accessories etc.		
-	All other accessories required for completion of the quality works including Cable gland and lugs etc		
-	copper bus bar with PVC mounting including nuts, bolts, washers, control MCB etc. (500 Amps. R+Y+B, N & Earth 50 Hz, 415 V, AC) including cable glands at top/bottom entry for cable)		
-	Contractor shall submit the genuine certificate from the manufacturer/authorized agent clear by indicating the project name make/model/rating of MCCB, MCB, magnetic contactors, terminal blocks and voltmeters/ ammeter alongwith warranties.		
5.0	<u>EARTHING AND BONDING</u>		
	Bore /Rod type earthing shall comply to the following or equivalent standards:IEC - 62035BS 951 - Earthing ClampsCP 1013 - Earthing BS 2874 - Nuts, bolts, washers, screws & rivets fixing for use on CopperBS 1433 - Hard drawn bare copper conductor for earthing BS 6346 - PVC insulated cables		
5.1	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground. The earthing rods shall be completed with fixing clamps etc.	1	No.

K-ELECTRIC

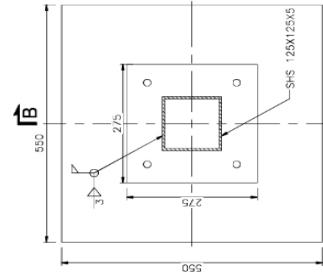


CONSULTANT		DRAWN		PROJECT		SCALE	
NATIONAL ENGINEERING SERVICES		SUBMITTED		SOLARIZATION OF PUBLIC SECTOR		PORT QASIM AUTHORITY BUILDING	
PAKISTAN (PVT.) LTD.		RECOMMENDED		BUILDINGS		SINGLE LINE DIAGRAM	
HEAD OFFICE - NEPAK HOUSE, I-C, BLOCK-4,		COR/DEN		DATE		DRAWING No.	
MODEL TOWN EXTENSION, LAHORE, PAKISTAN		APPROVED		JUNE 2024		G01	
REV.	DATE	DESCRIPTION		APPROVED		REV.	
01						✓	
02							
03							
04							



TYPICAL STRUCTURAL FRAMING PLAN
TO SUPPORT SINGLE PANEL IN PORTRAIT ORIENTATION

SECTION A-A



SECTION B-B

CONCRETE BLOCK DETAIL

CONCEPTUAL DESIGN

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETER.
2. ALL CONNECTIONS TO BE DESIGNED AND DETAILED BY CONTRACTOR.
3. ALL STEEL GRADE SHALL HAVE MINIMUM YIELD STRENGTH OF 250 MPa.
4. ALL WELD SHALL BE OF E70XX ELECTRODE.
5. ALL STEEL STRUCTURE SHALL BE HOT DIP GALVANIZED (MIN 125 MICRON).
6. ALL NUT BOLTS SHALL BE OF STAINLESS STEEL MATERIAL (GRADE 304).
7. IT IS ASSUMED THAT THE EXISTING STRUCTURE IS ADEQUATE TO BEAR THE LOADINGS FROM STRUCTURAL FRAMING OF SOLAR PANEL.
8. MINIMUM CLEARANCE OF PV MODULE SHALL BE 6 FEET ABOVE THE ROOF LEVEL.
9. TWO DRAINAGE CLIPS SHALL BE PROVIDED FOR EACH MODULE IN THE LAST LOWEST FRONT OF THE MODULES IN A ROW.

	NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD.		PROJECT SOLARIZATION OF PUBLIC SECTOR BUILDING	SCALE NTS
	HEAD OFFICE - NESPA HOUSE, 4-C BLOCK-N, MODEL TOWN EXTENSION, LAHORE, PAKISTAN.		DRAWING No. G01	DATE MAY, 2023
DESCRIPTION			TYPICAL VIEW OF MOUNTING STRUCTURE (ELEVATED)	REV.
DRAWN SUBMITTED RECOMMENDED CHECKED APPROVED	F.A. PROJECT	SOLARIZATION OF PUBLIC SECTOR BUILDING PORT QASIM ADMIN BUILDINGS KARACHI	DATE MAY, 2023	REV.

