

**National Engineering Services Pakistan (Pvt.) Limited  
(NESPAK)**



**Design, Supply, Installation, Testing, Commissioning and  
Operation & Maintenance of  
750 kW Ongrid Solar PV System**

**Bidding Documents**  
(Single Stage-Two Envelope Bidding Procedure)

**September 2024**

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# **INVITATION FOR BIDS**

## INVITATION FOR BIDS

For the promotion and development of indigenous renewable energy resources in the country, improving energy mix and to arrest drain of precious foreign exchange on import of fossil fuels, the Federal Government (GOP) under the leadership of the Prime Minister of Pakistan has launched multiple solar power initiatives. Solarization of Public Sector Buildings through transparent competitive bidding process is one of the components of these initiatives.

National Engineering Services Pakistan (Pvt.) Ltd. “Employer” invites bids for the “Design, Supply, Installation, Testing, Commissioning and Operation & Maintenance of net metering based 750 kW On grid Solar PV System” at its premises from the Contractors/Firms registered with PPIB.

Single Stage –

Two Envelope bidding process will be adopted. Bidding Documents containing detailed terms and conditions are available at NESPAK’s official website i.e., [www.nespak.com.pk](http://www.nespak.com.pk). The price of the Bidding Documents is PKR. 2,000 which can be purchased from NESPAK on or before September, 2024, through cash, online payment, pay order or a bank draft in favor of “NESPAK”. The bids of only those Bidders will be considered who have purchased the Bidding Documents.

All bids accompanied by a Bid Security amounting to PKR 750,000/- and all other documents as specified in the Bidding Documents must reach at the office given hereunder on or before September, 2024 at 1100 Hours. The Technical Bids will be opened on the same day at 1130 hours in the presence of the bidders’ representative who choose to attend at the same address. This advertisement is also available on NESPAK and PPRA websites at [www.nespak.com.pk](http://www.nespak.com.pk) and [www.ppra.org.pk](http://www.ppra.org.pk).

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# **INSTRUCTIONSTOBIDDERS**

## **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& O&M of net-metering based 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**

- 3.1 This Invitation for Bids is open to all bidder smeeeting the following requirements:
  - a) registered with Private Power and Infrastructure Board (the “PPIB”) under AEDB (Certification) Regulations, 2021, in the relevant category,
  - b) registered with Income Tax and Sales Tax Departments and who are on Active Taxpayers List of Federal Board of Revenue,
  - c) not having been debarred/ blacklisted by the Employer, Government/Semi Government/Public Departments, a foreign country, international organization or other foreign institutions.

#### **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 Employerwill 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 the Invitation for Bids. **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 Bid and the other Price Bid, 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 be registered

as per law so as to be legally binding on all partners **within four (4) days of the receipt of Letter of Acceptance;**

- (b) One of the JV partners shall be nominated as being in charge who must be registered with PPIB under AEDB (Certification) Regulations 2021 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 partner-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 Letters 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, as part of the Technical Bid, 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 Sub-Clause 1.2 hereof.

#### **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 Demand Draft, Call Deposit Receipt, 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 Employers 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 four (4) 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 Employers 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 Letters 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**

### **1B.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 Bid should comprise of documents listed in 11.1 (A) of Bidding Data & the Price Bid should comprise of documents listed in 11.1 (B) of Bidding Data which shall be placed in separate envelopes 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 fifteen (15) 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 then on-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 and excluding Provisional Sums and provisions (if any) for contingencies.
- 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 *optima 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 Reject any or all Bids**

- 30.1 Notwithstanding anything contained herein, the Employer reserves the right 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").
- 31.2 No Negotiation with the bidder having evaluated as lowest responsive or any other bidder shall be permitted.
- 31.3 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, interalia, 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.

## **BIDDINGDATA**

## 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.

Referencet o instr uctio n to Bidd er	<b>Bidding Data</b>
<b>IB-I</b> 1.1	<b>Name of the Project &amp; Summary of the Works</b> “Design, Supply, Installation, Testing, Commissioning& O&M of 750 kW net metering based Ongrid Solar PV System” at NESPAK House.The Worksshallbeperformed/executedaspertheSpecificationsprovided intheBiddingDocumentsandapprovedContractor’sDesignaspertheCondition sofContract”.
1.1	<b>Name and Address of Employer</b> National Engineering Services Pakistan (PVT.) LTD. NESPAK House, 1-C, Block-N, Model Town Extension, Lahore 54700, Pakistan
<b>IB-10</b> 10.1	<b><u>Bid Language:</u></b> English
<b>IB-11</b> 11.1	<b><u>11.1 (A)</u></b> The Bidder shall submit with its Technical Bid the following documents: <ul style="list-style-type: none"> <li>(a) Letter of Technical Bid</li> <li>(b) Bid Security (IB.15)</li> <li>(c) Written confirmation authorizing the signatory of the Bid to commit the Bidder(1B.18.5)</li> <li>(d) Proposed Construction Schedule(Appendix-A)</li> <li>(e) List of Sub-Contractors (as required) (Appendix-B)</li> <li>(f) Past Experience and Financial Strength(Appendix-C)</li> <li>(g) Joint Venture Agreement (if applicable) (Appendix-D)</li> <li>(h) Integrity Pact (Appendix-E)</li> <li>(i) Proof of purchase of Bidding Documents (Appendix-F)</li> <li>(j) Copy of PPIB Certificate (Appendix-G)</li> <li>(k) Declaration of Beneficial Ownership (Appendix-H)</li> <li>(l) Affidavit of Blacklisting (Appendix-I)</li> <li>(m) Specific System Data Checklist(Appendix-J)</li> </ul> <b><u>11.1 (B)</u></b> The Bidder shall submit with its Price Bid the following documents: <ul style="list-style-type: none"> <li>(a) Letter of Price Bid</li> <li>(b) Bill of Quantities (BOQ) (Appendix-K)</li> </ul>
<b>IB-12</b>	<b><u>Bid Evaluation Criteria shall be as follows:</u></b> Lump sum lowest evaluated price for the design, supply, installation, testing, commissioning& O&M of the Works.

<b>IB-14</b>	<b><u>Bid Validity</u></b>
14.1	Period of Bid Validity shall be ninety (90) days from the date of Bid Opening.
<b>IB-15</b>	<b><u>Bid Security</u></b>
15.1	Amount of Bid Security shall be PKR 750,000/-
<b>IB-17</b>	<b><u>Pre-Bid Meeting</u></b>
17.1	The Pre-Bid meeting will be held on August 28, 2024 at 1100 Hours at NESPAK House, Lahore.
<b>IB-19</b>	<b><u>Address for the purpose of Bid submission:</u></b>
19.2 (a)	NESPAK House, 1-C, Block-N, Model Town Extension, Lahore 54700, Pakistan.
<b>IB-20</b>	<b><u>Deadline for submission of Bids:</u></b>
20.1	As notified in the invitation for Bids.
<b>IB-32</b>	<b><u>Performance Security:</u></b>
32.1	10% of the Contract Price. The Performance security shall be an irrevocable & unconditional bank guarantee from any Scheduled Bank in Pakistan acceptable to the Employer strictly as per Form of Performance Security provided in the Bidding Documents.
	<p>Following clauses are added in Instructions to Bidders:</p> <p><b>IB.37 Sufficiency of Bid</b> 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.</p> <p><b>IB.38 Sub-Contractors</b> 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.</p> <p><b>IB.39 Taxes &amp; Duties</b> 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.</p> <p><b>IB.40 Insurance</b> The Bidder shall estimate the amounts required to be provided for all the insurances under the Contract from National Insurance Company Limited (NICL), Pakistan in accordance with the laws applicable in Pakistan and the Bid Price shall be deemed to include all such amounts.</p> <p><b>IB.41 Indexation</b></p>

	<p>The Bidder shall prepare and submit the Bid Price of the Goods taking into account the TT selling rate of US Dollar as notified by the National Bank of Pakistan (NBP) as of date which is five (05) days prior to bid submission deadline.</p> <p>The Bid Price will be adjusted one-time at the Commencement Date (as defined in the Conditions of Contract) after applying the foreign exchange indexation in respect of importation of Goods, as per the formula given in the Contract Data.</p>
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## **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 the net-metering based 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 the net-metering based 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 the net-metering based 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, commissioning & O&M 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 Permits etc.**

The Contractor shall be exclusively responsible to apply for and obtain net metering license from NEPRA if so applicable. The Employer shall, if requested by the Contractor, assist him in applying for permits, licenses or approvals which are required for the Works.

### **2.3 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.

#### 2.4 **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 acceptable to the Employer 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 Defects Liability 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 a reasonable time 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 there under 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-Eto 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's Design
- (d) Contract Data;
- (e) Conditions of Contract;
- (f) Letters of 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	National Engineering Services Pakistan (PVT.) LTD. represented by: Manager General Services Human Resources Division, NESPAK NESPAK House, 1-C, Block-N, Model Town Extension, Lahore 54700, Pakistan Tel: ..... Fax:.....
2.	Contractor's name	1.1.5	[Name of the Successful Bidder]
3.	Commencement Date	1.1.7	Commencement Date shall be the date when all of the following conditions have been fulfilled: 1. The Contractor has submitted to the Employer the advance payment guarantee in accordance with the terms of Conditions of the Contract; and 2. The Employer has paid the Contractor the advance payment.
4.	Site	1.1.17	NESPAK House, 1-C, Block-N, Model Town Extension, Lahore
5.	Engineer's name and address	1.1.20	Executive Vice President/ Head P& M Division, NESPAK NESPAK House, 1-C, Block-N, Model Town Extension, Lahore Tel: 042-99090000 Fax:042-99231936

<b>Sr. #</b>	<b>Description</b>	<b>Clause Conditions of Contract</b>	<b>Explanation</b>
6.	Provision of site	2.1	<p>Site access shall be given within 02 days of signing of Contract whereas the complete site shall be handed over to the EPC Contractor, for Installation of PV Modules, Module Mounting Structures, DC cables and allied accessories, trenches and backfilling etc. after the following pre-requisites are complete:</p> <ol style="list-style-type: none"> <li>1. Equipment designs and layout plans have been duly approved by the Engineer.</li> <li>2. PV Modules and DC cables have been delivered and inspected by the Engineer at the project site.</li> <li>3. Module mounting structure has been inspected and verified by the Engineer at the factory / warehouse.</li> </ol> <p>The installation works shall be completed by the Contractor within a time period of 03 weeks from the date the site is handed over to the Contractor.</p>
7.	Subcontracting	4.3	The aggregate amount of the works subcontracted shall not exceed 40% of the Contract Price.
8.	Amount of Performance Security	4.4	Ten (10%) of Contract Price stated in the Letter of Acceptance.
9.	Validity of Performance Security	4.4	Validity of Performance Security shall be thirteen (13) months from the 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	One Hundred and Eighty (180) days 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 0.27% 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	One year calculated from the date of Taking Over Certificate issued by the Employer. Defect Liability Certificate shall be issued within 14 days after the expiry of the Defect Liability Period.
14.	Remedying Defect Period	9.1	Reasonable time is seven (07) days after notice of defect.

Sr. #	Description	Clause Conditions of Contract	Explanation
15.	Contract Price	11.1	<p>The Contract Price will on lump sum basis as stated in the Letter of Acceptance. However, it shall be adjusted one-time at the Commencement Date using the following formula:</p> $\text{Contract Price} = (\text{PG}_{\text{BOQ}} * 0.60) * \text{ER}(\text{Rev})/\text{ER}(\text{Ref}) + (\text{PG}_{\text{BOQ}} * 0.40) + \text{Price of Services as quoted in BoQ} + \text{Provisional Sums as mentioned in BoQ}$ <p>Where:</p> <p><math>\text{PG}_{\text{BOQ}}</math> = Price of Goods as quoted in the Bill of Quantities</p> <p><math>\text{ER}(\text{Rev})</math> = The revised TT selling rate of US Dollar as notified by the National Bank of Pakistan (NBP) on the Commencement Date.</p> <p><math>\text{ER}(\text{Ref})</math> = The reference TT selling rate of US Dollar as notified by the National Bank of Pakistan (NBP) as of date which is five (05) days prior to bid submission deadline.</p>

Sr. #	Description	Clause Conditions of Contract	Explanation
16.	Payment Terms	11.2	<p><b><u>A. Payment on Delivery of Goods</u></b></p> <p><b><u>(i) Advance Payment</u></b></p> <p>Twenty percent (20%) of the Contract value of goods which shall be released by the Employer within five (05) working days upon receipt and verification of Advance Payment Guarantee from the Contractor, as per the form provided in the Bidding Documents, of an amount equivalent to twenty percent (20%) of the contract value of material, issued by any Scheduled Bank in Pakistan in favour of the Employer. Such Advance Payment Guarantee shall be submitted by the Contractor no later than five (05) working days of execution of the Contract Agreement.</p> <p><b><u>(ii) Second Partial Payment</u></b></p> <p>Sixty five percent (65%) of the Contract value of goods 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><b><u>(iii) Third Partial Payment</u></b></p> <p>Ten (10%) of the Contract value of goods shall be released to the Contractor by the Employer upon the issuance of Taking Over Certificate.</p> <p><b><u>(iii) Fourth Partial Payment</u></b></p> <p>Five(5%) of the Contract value of goods shall be released to the Contractor by the Employer after 02 months of issuance of Taking Over Certificate.</p> <p><b><u>B. Payment on Delivery of Services</u></b></p> <p><b><u>(i) First Partial Payment</u></b></p> <p>Eighty percent (80%) of the contract value of services shall be released to the Contractor by the Employer upon the issuance of Taking Over Certificate.</p>

Sr. #	Description	Clause Conditions of Contract	Explanation
			<p><b>(ii) <u>Second Partial Payment</u></b></p> <p>Twenty percent (20%) of the contract value of services which shall be released to the Contractor by the Employer following the successful completion of O&amp;M Services.</p> <p><i>Note: All of the above payments shall be made after deduction of taxes as per the applicable Law.</i></p>
17.	Place of Arbitration	15.3	Lahore

**LETTER OF TECHNICAL BID**

**Date:** -----

Bid Reference No: \_\_\_\_\_

**Design, Supply, Installation, Testing, Commissioning & O&M of 750 kW Ongrid Solar PV System.**

To:

**Manager General Services  
Human Resources Division,  
NESPAK House, 1-C, Block-N,  
Model Town Extension,  
Lahore 54700, Pakistan**

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 Price Bid shall be valid for a period of ninety (90) 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 IB11.1 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: \_\_\_\_\_

**Design, Supply, Installation, Testing, Commissioning & O&M of 750 kW Ongrid Solar PV System.**

To:

Manager General Services  
Human Resources Division,  
NESPAK House, 1-C, Block-N,  
**Model Town Extension,**  
Lahore 54700, Pakistan

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 ninety (90) 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.]

It shall be mandatory for the successful bidder to follow the timelines of 03 weeks (21 days) for installation of Module Mounting Structure, PV Modules, Cable Laying and Backfilling at the Project site. Required implementation plan must include the following:

Sr. No.	Project Activity	Timelines (180calendar days)		
		Month 1&2	Month 3&4	Month 5&6
1	Design Review and Approval by Engineer			
2	Delivery of PV Modules at Project Site and Verified by the Engineer			
3	Mounting Structure Fabrication and Inspection at Factory / Warehouse			
4	Delivery of DC Cables at Project Site			
5	Installation of Mounting Structure, PV Modules, DC Cables and Backfilling etc.			
6	Delivery of Inverters and AC Cables and Verified by the Engineer			
7	Delivery of Balance of System and verified by the Engineer			
8	100% Installation Completion, Testing and Commissioning			

**Note: For Sr. No. 5, car parking area of the site shall be handed over for 03 weeks only (mandatory requirement). Pre-requisites for Sr. No. 5 are Sr. No. 1, 2,3 and 4.**

*Note: In case of non-compliance with the above in Bidder's proposed construction schedule, the bid shall be considered as non-compliant.*

**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.

<b>Part of Works (Give Details)</b>	<b>Subcontractor (With Complete Address)</b>	<b>Statement of similar works previously executed (attach evidence)</b>
<b>1</b>	<b>2</b>	

**Note:**

1. No change of Sub-Contractors shall be made by the Bidder without prior approval of the Employer.
2. The truthfulness and accuracy of the statement as to the experience of Sub-Contractors is guaranteed by the Bidder. The Employer’s judgment shall be final as to the evaluation of the experience of Sub-Contractors submitted by the Bidder.
3. Statement of similar works shall include description, location & value of works, year completed and name & address of the clients.

## Appendix-C to Bid

### PAST EXPERIENCE AND FINANCIAL STRENGTH

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

Sr. #	Category	Criteria	Required Documents
I.	Experience Record	Net-metering based solar PV project(s) completed in last two-year (as lead partner contractor, JV having cumulative capacity of 1,500 kW or above including a single site net metered installation of 375 kW or above	As per EXP-1 Form
II.	Financial Strength	Average Annual Turnover of minimum PKR 100million in last two years. Minimum average Net Worth of PKR 50million 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**

*Name of Bidder or partner of a joint venture*

**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: As per Letter of Price Bid  
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 times 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]

**PROOF OF PURCHASE OF BIDDING DOCUMENTS**

[Please provide copy of purchase of Bidding Documents from the Employer]

## **Appendix-G**

### **COPY OF PPIBCERTIFICATE**

[Please provide 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 proforma 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 proforma 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 debarred/ blacklisted by the Employer, Government/Semi Government/Public Departments, a foreign country, international organization or other foreign institution sat 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:

<b>Specific Plant Data For NESPAK House, Lahore (750 kW)</b>		
<b>EQUIPMENT</b>	<b>SPECIFICATIONS</b>	<b>Yes/No</b>
<b>Solar PV Modules</b>	IEC 61215 Certified	
	Application/ Safety Class II as per IEC 61730	
	N-Type Half Cut Cell	
	Tier 1 Manufacturer as per the most recent Bloomberg list, AAA or AA rated as per PV Module-Tech Ratings	
	605 W or higher with positive tolerance only	
	23% or higher module efficiency	
	25 Year Linear Performance Warranty	
	Anti-Reflective Coating	
	12 Year Material and Workmanship Warranty	
	Power Output after 25 Years $\geq 85\%$	
	Potential Induced Discharge(PID) Resistant	
	Light Induced Degradation (LID) Free	
	Module Temperature Coefficient at $P_{max}$ of $-0.30\%/^{\circ}C$ or better	
	Operating Temperature Range $-40$ to $85^{\circ}C$	
	Barcode Identification	
	Efficiency at $200 W/m^2 \geq 96\%$ 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		
<b>Solar PV Mounting Structure</b>	UV resistant, Hot Dip Galvanized Steel frame of Gauge 12 with 120 micron or thicker zinc coating or better (More details under the drawing attached)	
	Tilt $5^{\circ}$ Degrees, Azimuth $290$ w.r.t North	
	Pitch= For Parking Shed Structure As per Layout	
	Orientation: Parking Shed Mounted	
	Shall withstand wind speeds of $150$ km/h	
	Galvanic Isolation	
	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		

<b>Specific Plant Data For NESPAK House, Lahore (750 kW)</b>		
<b>EQUIPMENT</b>	<b>SPECIFICATIONS</b>	<b>Yes/No</b>
	attached)	
<b>Inverters &amp; String Formation</b>	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		
<b>AC,DC Cables, Earthing wires &amp; Cable Trays</b>	Copper Cables with purity of 99.99%	
	UL 4703 compliant Low Smoke Halogen Free	
	DC cable size : 06 mm <sup>2</sup>	
	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	
	Preparation of Site and all Civil Works	
	Seamless Terminations	
	Perforated Cable Trays of 16 Gauge or thicker	
Avoid Direct Sunlight and Direct Clamping of Cables		

<b>Specific Plant Data For NESPAK House, Lahore (750 kW)</b>		
<b>EQUIPMENT</b>	<b>SPECIFICATIONS</b>	<b>Yes/No</b>
	Cables should not be physically accessible for routine works	
	Labeling of all strings/equipment shall be mandatory	
	06 mm <sup>2</sup> earth wire for equipotential bonding	
	Cables to be laid in UPVC/corrugated PVC pipes and cable trays	
<b>System Design and Installation/As Built Drawings</b>	Energy Yield Assessment	
	Module Layout Drawings as per the drawings attached and referred	
	Cable Layout Plans	
	As built Drawings	
<b>Breakers, Surge Arrester &amp; LV Panel</b>	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	
<b>Monitoring and Control System</b>	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 real-time 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.	
<b>Net Metering Application and Installation of Bidirectional Meter</b>	Compliance with all prevailing regulations set forth by NEPRA for net metering purposes	
	Load flow studies	
	Preparation and submission of application for net metering	

<b>Specific Plant Data For NESPAK House, Lahore (750 kW)</b>		
<b>EQUIPMENT</b>	<b>SPECIFICATIONS</b>	<b>Yes/No</b>
<b>Inverter Data Logger Collection of Data</b>	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)	
	<b>Synchronization Modules for GENSETS AND INVERTERS</b>	GENSETS syncing modules Compatible with Diesel generators and Proposed 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 summarised 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.
7. Any increase in quantities (other than PV module capacity of 750 kW + 2%) during design review stage shall not impact the quoted price(s).

## BILL OF QUANTITIES

The Bill of Quantities is given below for Bidders to price.

<b>BOQ FOR SOLARIZATION OF NESPAK HOUSE, LAHORE 750 kW</b>					
No.	ITEM(s)	Description	Unit	Minimum Quantity	Item / Service Price / Cost Inclusive of all Applicable Taxes (PKR)
<b>A. SUPPLY OF GOODS FOR 750 kW SOLAR PV SYTEM</b>					
1	PV module	Tier 1 Manufacturer according to bloomberg latest issued rankings with IEC 61215 Compliant, not less than 605 W N-Type and Half Cut PV modules or better	Sum	750 kW	
2	String Inverter	3 phase Ongrid Inverter with Remote Monitoring Devices	Sum	680 kW	
3	Communication Box	Data Logger	No.	As per inverter configuration	
4	Genset Synchronization Module	Genset Auto Synchronization Hybrid Genset Controller/Solar-Diesel integration Controller compatible with Inverter and Generator, factory fabricated as approved by the Engineer.	Nos.	02	
5	PV Mount Structure for Parking Shed	<ul style="list-style-type: none"> <li>• Site preparation works including dismantling of existing poles.</li> <li>• Wind speed = 150km/h, azimuth as per site. (UV resistant, 120 micron of zinc coating), 12AWG or as per drawing given in Employer's Design.</li> </ul>	Sum	750 kW	
6	Lightning Arrester	Copper rod height 2 m to be fixed on Parking Shed	Nos.	4	

		Top			
7	0.4kV LV Panel (500kW & 250kW)	<b>Details of breakers and SPD to be in housed in cabinet:</b> As given in AC BoQ and drawings attached	Nos.	2	
8	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	
9	DC Breakers	As per string configuration and PV Module fuse ratings	Nos.	As per inverter string configuration	
10	DC wire for PV	6 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO	m	10,000	
11	DC wire for PV	10 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO	m	3,000	
12	AC wire from LV panel to Inverter	Cu, XLPE/PVC 0.6/1 kV, 4*300 mm Sq. AC stranded	m	960	
13	AC wire from LV panel to Inverter	Cu, XLPE/PVC 0.6/1 kV, 4*150 mm Sq. AC stranded	m	90	
14	AC wire for inverter grounding	Cu, PVC 0.6/1 kV, 1*300 mm Sq. AC flexible wire stranded	m	80	
15	AC wire for inverter grounding	Cu, PVC 0.6/1 kV, 1*150 mm Sq. AC flexible wire stranded	m	80	
16	AC wire for inverter grounding	Cu, PVC 0.6/1 kV, 1*70 mm Sq. AC flexible wire stranded	m	150	
17	AC wire for inverter grounding	Cu, PVC 0.6/1 kV, 1*16 mm Sq. AC flexible wire stranded	m	60	
18	DC wire for frame-frame grounding	PVC 1*6 mm Sq. AC standard Wire	m	100	

19	DC wire for PV frames to grounding point	PVC 1*16 mm Sq. AC standard Wire	m	100	
20	Copper Bare Conductor	25 mm Sq	m	100	
21	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	m	50	
22	UPVC pipe	50mm dia pipe for laying string wires PV area to inverters including sockets	m	As per requirement	
23	UPVC pipe	25mm including bends and sockets	m	As per requirement	
24	MC4 connectors	IP67/IP68 for PV stringing	Nos.	As per requirement	
25	Bi-directional Meter for Net Metering	Delivery of Bi-directional Mete in line with NEPRA / LESCO requirements		01	
26	DC Earthing	Bore Type Earthing for DC Components		01	
27	AC Earthing	Bore Type Earthing for AC Components		01	
28	MISC ITEMS	<ul style="list-style-type: none"> <li>• Cable ties, rawal bolts, pvc tapes, steel and PVC clamps, pvc pipes, glands different sizes, thimbles, connectors, warning labels etc.</li> <li>• 2 x insulated glove pairs, shoe pairs, hats for site inspection and maintenance activities</li> <li>• 2 x Motorized Panel Cleaners (battery operated) with minimum 7-meter pole length</li> <li>• PV module O&amp;M kit</li> <li>• 1 x 55 inch 4K TV Screen for monitoring of generation data from all inverters</li> </ul>			
<b>Subtotal A (inclusive of all applicable taxes on items listed at Sr. No. 1 to 28)</b> <b>= PKR .....</b>					

<b>B. Installation, Testing, Commissioning, O&amp;M Services and Training</b>				
29	Installation, Testing and Commissioning	Complete project installation and commissioning till handover of the Project to Employer	Job.	
30	Net metering services	Net metering services complete in all aspects including NEPRA license and load flow studies required by the distribution company.	Job.	
31	Operation and Maintenance Services	<ul style="list-style-type: none"> <li>• Cleaning of all PV Modules on each Saturday / Sunday for 06 months.</li> <li>• Monitoring of System Performance and submission of monthly electricity generation reports</li> </ul>	Job.	
32	O&M Training	1 week O & M training of 3 personnel of the Employer	Job.	
<b>Subtotal B (inclusive of 16% PST on Services at Sr. No. 29 to 32) = PKR .....</b>				
C.	<b>Provisional Sums (PKR)</b>			3,000,000
33	<b>D. Total Bid Price in PKR ..... (D = A + B+C)</b>			

**Note: Value under “Subtotal B” Must NOT be less than 5% of the “Total Bid Price in PKR”. Financial Bid not following the same shall be rejected.**

**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 therefore, 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 fulfil 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) The Contract Agreement;
  - (b) Letter of Acceptance;
  - (c) Specifications and Employer’s Design
  - (d) Contract Data;
  - (e) Conditions of Contract;
  - (f) Letters of Technical Bid and Price Bid;
  - (g) The priced Bill of Quantities; and
  - (h) 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. PV Modules

Solar PV modules shall be of Tier-1 manufacturer as per latest Bloomberg New Energy Finance (BNEF) list (for Q1 or Q2 of the year 2024). The PV technology shall be half-cut N-type or better to maximize the yield against the available area and minimize the losses against partial shading. Each module shall have at least IP 65 rated Junction Boxes which shall be dust and vermin proof having copper bus bar terminals, EPDM rubber gasket, MOVs and reverse blocking Diodes and IEC 62790 compliant.

#### a) Performance and Rating Requirements:

The power rating for each PV module shall be more than 605Wp under STC conditions with positive power tolerance only. Each PV module must have efficiency of equal to or greater than 23%. The proposed PV module must exhibit efficiency of more than 96% of the STC efficiency at 200 W/m<sup>2</sup> (i.e. low lighting conditions). The module Temperature Coefficient at Pmax shall be 0.3% / °C or better in performance.

#### b) 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 (or equivalent) 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.

#### c) 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.

#### d) 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 third party.

## **2. Inverters:**

### **a) Performance and Rating Requirements:**

The inverter shall be three phase grid tied with 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.

### **(b) 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 120 micron or thicker zinc coating. The structure shall have galvanic isolation and shall withstand wind speed of 150 km/h. Complete civil work (including civil blocks of 3,000 psi strength) for mounting structure installation shall be performed as per drawing attached.

Design requirements for mounting structure:

The supporting structure including PV modules shall be capable of handling the maximum 3 sec-gust wind speed of up to 150 km/h. The EPC contractor shall provide a system design that meets this requirement as well as any additional requirement related to the site-specific snow load (if applicable). Ballasting/concrete block sizing calculations are typically made by the use of professional design software and shall be made available for the installation and plant documentation.

All components of the mounting system and all connecting materials shall be made of corrosion-proof material. All fastening structures shall be verified for durability and resistance to environmental degradation for 25 years, the lifetime requirement of the complete structure. The structural elements shall consist of anodized aluminum, galvanized steel as per ASTM A123/A 123M, or materials with equivalent if not better properties. The applicable building code / construction codes shall be used as well.

The mounting structures shall be earthed for maximum short-circuit current and lightning protection. A racking design that removes the need of PV module to PV module grounding by using the common rail / PV module clips for the grounding is recommended.

Dismantling of existing sheds and site preparatory works and back fillings shall be performed to the satisfaction of Client.

**a) 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 1,500 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 mm<sup>2</sup> 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 mm<sup>2</sup> 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.

**b) 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 IP54 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.

### **c) 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 and monitoring data for at least 3 years
5. TV Screen of size mentioned in BoQ

### **d) Net Metering Application and Installation of Bidirectional Meter**

The Contractor shall comply with all prevailing regulations set forth by NEPRA for net metering purposes including load flow studies on requisite software. Preparation and processing of application for net metering along with requisite clarifications shall be arranged by the Contractor in the Project timelines. Furthermore, in cases where the technical feasibility study is required for purposes of approval of net-metering application, the Contractor shall also carry out the requisite feasibility study and make arrangement for its approval from the relevant DISCO.

### **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 the manual.

#### **Note:**

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

## **4. Operation and Maintenance**

Following the successful Taking Over of the Project, the EPC Contractor shall provide PV Module Cleaning services on each Saturday/Sunday and submit monthly electricity generation reports of PV System for a duration of 06 months.

## **EMPLOYER'S DESIGN**

The Employer Design of the System is attached hereto.