

BIDDING DOCUMENTS
FOR
SOLARIZATION OF DISPOSAL STATIONS IN
MUNICIPAL COMMITTEE OKARA



**Local Government &
Community Development
Government of the Punjab**

May 2024

MC Okara

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INVITATION FOR BIDS

TENDER NOTICE
FOR
SOLARIZATION OF DISPOSAL STATIONS IN
MUNICIPAL COMMITTEE OKARA

Municipal Committee, Okara (MC Okara) (hereinafter referred to as the "client"), invites the sealed bids from Contractors / Firms / Manufacturer / Authorized dealers having valid License from **PEC** in category **C4 & Above** with relevant code **EE11** and having **AEDB** certificate in category **C-1** registered with **FBR & PRA (NTN and PNTN)** concerning **SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA**.

2. The bidding documents are available immediately after publication (2014 Punjab Procurement Rule 25(1)) at the office of **Municipal Officer (I&S), Municipal Committee Okara** and a complete set of Bidding Documents can be obtained on submission of written application along with deposited slip of Bank of Punjab in the favor of Municipal Committee Okara for Rs.10,000/- (non-refundable fee). Bidding documents shall be issued to owner of the firm by showing original CNIC and / or to Authorized representative of firm having authority letter with specimen signature of representative of firm along with original CNIC.

3. **Single stage two envelopes** bidding procedure will be adopted. The Bids (**Technical & Financial**) prepared in accordance with the instructions given in the Bidding Documents must be accompanied by a Bid Security **2%** of estimated cost in shape of CDR / Bank Guarantee from any Scheduled Bank in Pakistan, for an amount of **Rs. 2,954,540/-** in the name of the Chief Officer, Municipal Committee Okara. Last date for purchase of bidding documents is **01-06-2024**. The Bids (**Technical & Financial**) must be delivered in the office of Chief Officer, Municipal Committee Okara on **03.06.2024** at **10:00 A.M.** The Technical bids will be opened on the same day at **10:30 A.M** in presence of the bidder / bidder's representatives who choose to present.

4. Only technically responsive bidder(s) will be qualified for opening of financial bid(s). Financial bid(s) of bidder(s) found technically nonresponsive shall be returned unopened to the bidder(s).

5. The procuring Authority may reject all bids or proposals at any time prior to the acceptance of a bid or proposal under Punjab Procurement Rules 2014 (**Rule-35**).

6. Conditional tender will not be accepted.

7. Tendered rates and amount should be filled in figures as well as in words and tenders should be signed as per general directions given in the tender documents.

8. In case the total tendered amount is equal to or less than 5% of the approved estimated (DNIT) amount, the lowest bidder will have to deposit quality assurance security equal to the amount difference between approved DNIT amount and the quoted bid amount from the Scheduled Bank within 15 days of issuance of notice or within expiry period of bid, whichever is earlier.

9. The bids will be valid for 120 days.

10. In case, the last date of bid submission falls in / within the official holiday(s), the last date for submission of the bids shall be the next working day.

11. A pre-bid meeting will be held on **May 23, 2024** at **11:00 AM**, or any other date and time which may separately be notified by the Client to clarify any queries and to answer any questions on matters related to the bidding documents.

12. Estimated cost is Rs. **147,726,999/-**.

Chief Officer
Municipal Committee
Okara

Administrator
Municipal Committee
Okara

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

A. GENERAL

IB.1 Scope of Bid

The Client “Chief Officer MC Okara” intends **SOLARIZATION OF DISPOSAL STATION IN MUNICIPAL COMMITTEE OKARA**

Identification and number of Contract is: _____

IB.2 Source of Funds

2.1 The Source of fund is mentioned in bidding data.

IB.3 Eligible Bidders

3.1 The bidder (Firm/ Joint Venture) must fulfill the basic eligibility criteria as per Appendix – M to Bid.

Sub-Clause 3.1

- (c) A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be Non-Responsive. A Bidder may be considered to have a conflict of interest with one or more parties in this Bidding process, if they:
- i. are associated or have been associated, directly or indirectly with a firm or any of its affiliates which have been engaged by the Procuring Agency to provide consulting services for the preparation of the design and other documents to be used.
 - ii. have controlling shareholders in common; or
 - iii. receive or have received any direct or indirect subsidy from any of them; or
 - iv. have the same legal representative for purposes of this Bid; or
 - v. have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Procuring Agency regarding this Bidding process;
 - vi. The Bidder (including all members of a JV) must not be associated, nor have been associated in the past, with the consultant or any other entity that has prepared the design, specifications, and other prequalification and bidding documents for the project, or was proposed as Engineer for the contract, over the last Ten years. Any such association may result in disqualification of the Bidder.

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 Bidder shall bear all costs associated with the preparation and submission of their respective Bids and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Bidding process.

IB.6 Site Visit

- 6.1 The Bidders are advised to 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 construction of 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 would be free to visit site 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. BID DOCUMENTS

IB.7 Documents Comprising the Bid

- 7.1 The Bid Documents 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 Sheet
 3. Special Stipulations
 4. Form of Bid & Appendices to Bid
 5. Bill of Quantities (Appendix-D to Bid)
 6. Form of Bid Security
 7. Form of Contract Agreement
 8. Forms of Performance Guarantee and Mobilization Advance Guarantee and Form of Indemnity Bond for Secured Advance
 9. Special Provisions
 10. Environmental & Social Mitigation Plan
- 7.2 The Bidders are expected to examine carefully the contents of all the above documents. Failure to comply with the requirements of Bid submission will be at the Bidders own risk. Pursuant to Clause IB.26, Bids which are not substantially responsive to the requirements of the Bid Documents will be rejected.

IB.8 Clarification of Bid 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 earlier than 7 days prior to the deadline for submission of bids. 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 Bid 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 Bid Documents by issuing addendum.
- 9.2 Any addendum thus issued shall be part of the Bid Documents pursuant to IB 7.1 hereof and shall be communicated in writing to all purchasers of the Bid Documents. Prospective Bidders shall acknowledge receipt of each addendum in writing to the Employer.

- 9.3 To give 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

- 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 Sheet and conditions of Particular Application. 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 English language, in which case, for purposes of evaluation of the Bid, the English translation shall prevail.

IB.11 Documents Accompanying the Bid

- 11.1 The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Bid and the other the Financial Bid, containing the documents listed in Bidding Data Sheet under the heading of IB 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 Sheet 11.1 A& B
- 11.2 Bids submitted by a JV shall include a copy of the Joint Venture Agreement (in line with PEC JV modalities) entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture 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 (in line with PEC JV modalities). The role to be played by each partner to be specified therein. Bids submitted by a joint venture of two (2) or more firms shall comply with the following requirements:-
- (a) In case of a successful bid, the Form of JV Agreement shall be signed so as to be legally binding on all partners within 7 days of the receipt of letter of acceptance failing which the contract and the letter of acceptance shall stand void and redundant.
 - (b) One of the joint venture partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners;
 - (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 joint venture;
 - (d) All partners of the joint venture shall at all times and under all circumstances be liable jointly and severally for the execution of the Contract in accordance with the Contract terms and a statement to this effect shall be included in the authorization mentioned under Sub-Para (b) above as well as in the Form of Bid and in the Form of JV Agreement (in case of a successful bid); and
 - (e) A copy of JV agreement shall be submitted before signing of the Contract, stating the conditions under which JV will function, its period of duration, the persons authorized to represent and obligate it and which persons will be directly responsible for due performance of the Contract and can give valid receipts on behalf of the joint venture, the proportionate participation of the several firms forming the joint

venture, and any other information necessary to permit a full appraisal of its functioning. The JV Agreement shall be made part of the contract. No amendments / modifications whatsoever in the joint venture agreement shall be agreed to between the joint venture 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 Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time referred to in Sub-Clause 1.2 hereof.

IB.12 Bid Prices

- 12.1 Unless stated otherwise in the Bid Documents, the Contract shall be for the whole of the Works as described in IB 1.1 hereof, based on the unit rates and / or prices submitted by the Bidder.
- 12.2 The Bidders shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by a Bidder will not be paid for by the Employer when executed and shall be deemed covered by rates and prices for other items in the Bill of Quantities.
- 12.3 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, throughout the duration of the Contract except PRA, shall be included in the rates and prices and the total Bid Price submitted by a bidder.

IB.13 Currencies of Bid and Payment

- 13.1 The unit rates and the prices shall be quoted by the bidder entirely in Pak rupees only.

IB.14 Bid Validity

- 14.1 Bids shall remain valid for the period stipulated in the Bidding Data Sheet after the Date of Bid Opening specified in sub-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 or 180 days whichever is more. 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 Sheet in Pak Rupees.
- 15.2 The Bid Security shall be, at the option of the bidder, in the form of Deposit at Call or a Bank Guarantee issued by a Scheduled Bank in Pakistan in favor of the Employer valid for a period 28 days beyond the Bid Validity date.

- 15.3 Any Bid not accompanied by an acceptable Bid Security/Earnest money shall be rejected by the Employer as non-responsive.
- 15.4 The Bid security of unsuccessful bidder will be returned by adopting the following mechanism:
- a) Written request certifying that bidder has no objection or grievance against the Procurement process.
 - b) Time for grievance period as provided by Punjab Procurement Rules-2014 has expired.
 - c) If he filed a grievance and same is dismissed by the Grievance Committee.
- 15.5 The Bid Security of the successful Bidder will be returned when the Bidder has furnished the required Performance Guarantee and signed the Agreement.
- 15.6 The Bid Security may be forfeited:
- (a) If the bidder withdraws his bid except as provided in IB 22.1;
 - (b) If the Bidder does not accept the correction of his Bid Price pursuant to IB 27.2 hereof; or
 - (c) In the case of successful Bidder, if he fails within the specified time limit to:
 - (i) Furnish the required Performance Guarantee, or
 - (ii) Sign the Agreement.
 - (iii) Furnish the required JV agreement within 7-days of the receipt of letter of acceptance.

IB.16 Alternate Proposals by Bidder

Not Applicable

IB.17 Pre-Bid Meeting

- 17.1 The Employer may, on his own motion 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 Bid Documents. The date, time and venue of pre-bid meeting, if convened, is as stipulated in the Bidding Data Sheet. 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 one week before the proposed pre-bid meeting.
- 17.3 Minutes of the pre-bid meeting in shape of response to queries or suggestions of the bidders, including the text of the questions raised and the replies given, will be transmitted without delay to all purchasers of the Bid documents. Any modification of the Bid documents listed in IB 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.
- 17.5 All the concerned teams of client and consultant including Environmental and Social Management Team will be present to attend the queries / questions / clarifications of the bidders.

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 Bid Documents.
- 18.2 All appendices to Bid are to be properly completed and signed.
- 18.3 No alteration is to be made in the Form of Bid nor in the Appendices thereto except in filling up the blanks as directed. If any such alterations be made or if these instructions be not fully complied with, the Bid may be rejected.
- 18.4 Each Bidder shall prepare by filling out the forms completely and without alterations one (1) original and number of copies, specified in the Bidding Data, of the documents comprising the Bid as described in Clause IB.7 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 all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the Bidding Data Sheet 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 initialed by the person signing the bid.
- 18.6 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.
- 18.7 Bidders shall indicate in the space provided in the Letter of Technical and Financial Bids, 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 FOR SINGLE STAGE TWO ENVELOPE PROCEDURE

IB.19 Sealing and Marking of Bids

- 19.1 Each Bidder shall submit his Bid as under:
 - (a) ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.
 - (b) The envelopes containing the ORIGINAL and copies 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 IB11.1 (A) & the Financial Bid should comprise of documents listed in IB 11.1 (B) which shall be placed in separate envelopes in accordance with IB 11.1.
- 19.2 The inner and outer envelopes shall;
 - (a) Be addressed to the Employer at the address provided in the Bidding Data Sheet.
 - (b) Bear the name and identification number of the contract as defined in the Bidding Data Sheet, and;

- (c) Provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data Sheet.
- 19.3 In addition to the identification required in IB 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 Sheet
- (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 and Withdrawal of Bids

- 22.1 Any Bidder may modify or withdraw his Bid after Bid submission provided that written notice of the modification or withdrawal is received by the Employer prior to the deadline for submission of Bidders.
- 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 IB 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 SINGLE STAGE TWO ENVELOPE 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 Sheet in the presence of Bidders` designated representatives and anyone who choose to attend. The Financial Bids will remain unopened and will be held in custody of the Employer until the specified time of their opening.
- 23.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal 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 Financial 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 Financial Bid will remain unopened in accordance with IB .23.1. No envelope shall be substituted unless the corresponding Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening
- 23.4 Next, outer envelopes marked “MODIFICATION” shall be opened. No Technical Bid and/or Financial 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, read out, and recorded at the opening. Financial Bids, both Original and Modification, will remain unopened in accordance with IB 23.1. The Bidders` representatives who are present shall be requested to sign the record. The omission of a Bidder`s 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.
- 23.5 Other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded:
- (a) The name of the Bidder;
 - (b) Whether there is a modification or substitution;
 - (c) The presence of a Bid Security, if required; and
 - (d) Any other details as the Employer may consider appropriate.

No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with IB21.1. Only Technical Bids read out and recorded at bid opening, shall be considered for evaluation

- 23.6 Pre-liminary Examination of Technical Bids
- (a) The Employer shall first examine qualification and experience Data as per appendix M and N submitted by the Bidder. The technical proposal examination of those bidders only shall be taken in hand who meet the minimum requirement as mentioned in appendix M and N. Only substantially responsive qualification shall be considered for further evaluation.
 - (b) The Employer shall examine the Technical Bid to confirm that all the documents have been provided, and to determine the completeness of each document submitted
- 23.7 The Employer shall confirm that all the documents and information have been provided for evaluation of Technical bid as required under these bidding documents.
- 23.8 At the end of the evaluation of the Technical Bids, the Employer will invite only those bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Financial Bids. The date, time, and location of the opening of Financial Bids will be advised in writing by the Employer. Bidders shall be given reasonable notice for the opening of Financial Bids.
- 23.9 The Employer will notify Bidders in writing who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document and return their Financial Bids unopened before inviting others, who are determined as being qualified, to attend the opening of Financial Bids.
- 23.10 The Employer shall conduct the opening of Financial Bids of all Bidders who submitted substantially responsive Technical Bids, publicly in the presence of Bidders` representatives who choose to attend at the address, date and time specified by the Employer. The Bidder`s representatives who are present shall be requested to sign a register evidencing their attendance.
- 23.11 All envelopes containing Financial Bids shall be opened one at a time and the following read out and recorded:
- (a) The name of the Bidder;
 - (b) Whether there is a modification or substitution;
 - (c) The Bid Prices, including any discounts and alternative offers; and
 - (d) Any other details as the Employer may consider appropriate.

Only Financial Bids and discounts, read out and recorded during the opening of Financial Bids shall be considered for evaluation. No Bid shall be rejected at the opening of Financial Bids.

- 23.12 If this Bidding Document allows Bidders to quote separate prices for different contracts, and the award to a single Bidder of multiple contracts, the methodology to determine the lowest evaluated price of the contract combinations is that which is most economical to the Employer.

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 ten (10) 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. Whereas any bidder feeling aggrieved may lodge a written complaint not later than ten (10) days after the announcement of the bid 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, including breakdowns of unit rates. 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 criteria; (ii) has been properly signed; (iii) is accompanied by the required Bid Security; (iv) Includes signed Integrity Pact where required as per clause IB.35 and (v) 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; (iii) adoption/rectification whereof would affect unfairly the competitive position of other bidders presenting substantially responsive bids. Only substantially responsive bid shall be considered for further evaluation.
- 26.3 If a bid is not substantially responsive, it may not subsequently be made responsive by correction or withdrawal of the non-conforming material deviation or reservation. The Employer may, however, seek confirmation/ clarification in writing or by email which shall be responded accordingly.

IB.27 Correction of Errors

- 27.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors. Errors will be corrected by the Employer as follows:
- (a) Where there is a discrepancy between the amounts in figures and in words, the amount in words will govern; and
 - (b) where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer there is an obviously gross misplacement of

the decimal point in the unit rate, in which case the line item total as quoted will govern and the unit rate will be corrected.

- 27.2 The amount stated in the Letter of Financial 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 IB 15.6(b) hereof.

IB.28 Evaluation and Comparison of Bids

- 28.1 The Employer will evaluate and compare only the Bids determined to be 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 as follows:-
- (a) Making any correction for errors pursuant to Clause IB.27
 - (b) Excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including competitively priced Day work.
 - (c) Making an appropriate adjustment for any other acceptable variation or deviation.
- 28.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.
- 28.4 If the Bid of the successful Bidder is seriously imbalanced in relation to the Employer's estimate of the cost of work to be performed under the Contract, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, the Employer may require that the amount of the Performance Guarantee set forth in IB.32 be increased at the expense of the successful Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

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 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 IB 29.2.
- 29.2 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in Bidder's capacities, may require the bidders 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 in writing. They shall form part of the records of that bid evaluation report

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

30.1 Notwithstanding Clause IB.29, the Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all bids, at any time prior to award of Contract, without thereby incurring any liability to the affected bidders or any obligation except that the grounds for rejection of all bids shall upon request be communicated to any bidder who submitted a bid, without justification of grounds. Rejection of all bids shall be notified to all bidders promptly.

IB.31 Notification of Award

31.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder in writing ("Letter of Acceptance") that his Bid has been accepted. This letter shall name the sum which the Employer will pay the Contractor in consideration of the execution and completion of the Works by the Contractor as prescribed by the Contract (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, However, the lowest evaluated bidder may further reduce the Bid Price voluntarily without compromising the quality/ quantity.

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 Agreement.

31.4 Upon furnishing by the successful bidder of a Performance Guarantee, the Employer will promptly notify the other bidders that their Bids have been unsuccessful. No bid security can be returned without exhausting the grievance period or without finally disposing off the complaint of the non-responsive bidder. However, bid security may be returned earlier if any bidder submits affidavit that he is satisfied with the proceedings and hence his bid security may be returned.

IB.32 Performance Guarantee

32.1 The successful bidder shall furnish to the Employer a Performance Guarantee in the form and the amount stipulated in the Bidding Data Sheet and the Conditions of Contract within a period of 15 days after the receipt of Letter of Acceptance.

32.2 Failure of the successful bidder to comply with the requirements of IB.32.1 or 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 Agreement

33.1 Upon furnishing of acceptable Performance Guarantee under the Conditions of Contract, formal Agreement between the Employer and the successful bidder shall be executed.

IB.34 General Performance of the Bidders

The Employer reserves the right to obtain information regarding performance of the bidders on their previously awarded contracts/works. The Employer may in case of consistent poor performance of any Bidder as reported by the employers of the previously awarded

contracts, inter-alia, reject his bid and/or refer the case to the Pakistan Engineering Council (PEC). Upon such reference, PEC in accordance with its rules, procedures and relevant laws of the land take such action as may be deemed appropriate under the circumstances of the case including black listing of such Bidder and debarring him from participation in future bidding for similar works.

The Successful Contractor/Joint Venture shall comply with and acquire all consents, approvals, permits and licenses applicable under the laws of Pakistan in relation to the performance of the work & services.

IB.35 Integrity Pact

The Bidder shall sign and stamp the Integrity Pact provided at Appendix-L to Bid in the Bidding Documents for all Federal / Provincial 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

Submission of bids shall be construed as evidence that the bidder has admitted all provisions of the instruction to the bidder.

IB.37 PPRA Act, 2009 and PPR-14 will have over-riding effect

PPRA Act, 2009 and PPR-14 as amended upto date will supersede and will have an over-riding effect in case in case of any contradiction with these Instructions, the Contract, or any other part of the Bidding Documents.

BIDDING DATA SHEET

BIDDING DATA SHEET

The following specific data for the Works shall complement, amend, or supplement the provisions in the Instructions to Bidders. Wherever there is a conflict, the provisions herein shall prevail over those in the Instructions to Bidders.

Instruction to Bidders

Clause Reference

Clause IB-1:

Sub-Clause: 1.1 Name and address of the Employer

Chief Officer,

Municipal Committee Okara

Tel: 044-9330011

E-mail: info@mcokara.lgpunjab.org.pk

Summary of Works

Description of major equipment, items and structure:

- Disposal Works 2/4 L
- Disposal Works 1/4 L
- New Waste Water Treatment Plant (WWTP)
- P/F Transformer 630 KVA
- Environmental and Social Mitigation Plan

Clause IB-2: Source of Funds

Sub-Clause 2.1

The Project is funded by Government of the Punjab through World Bank.

Clause IB-10: Language of Bid

Sub-Clause 10.1

English

Clause IB-11: Documents Accompanying the Bid

Sub-Clause 11.1:

A) The Bidder shall submit with its Technical Bid the following documents:

- (a) Letter of Technical Bid
- (b) Bid Security (IB.15)
- (c) Written confirmation authorizing signatory of the bid to commit the Bidder. (IB 18.5)
- (d) Pending litigation information.
- (e) Special Stipulations Appendix-A
- (f) Proposed Construction Schedule Appendix-E
- (g) Method of Performing the work Appendix-F

(h) Availability of Critical Equipment	Appendix-G
(i) Construction Camp and Housing Facilities	Appendix-H
(j) List of Sub-Contractor	Appendix-I
(k) Organization Chart for Supervisory Staff	Appendix-K
(l) Integrity Pact	Appendix-L
(m) Eligibility Criteria	Appendix-M1 & M2
(n) Qualification Criteria	Appendix-N

B) The Bidder shall submit with its Financial Bid the following documents:

(o) Letter of Financial Bid	
(p) Bid Security	
(q) Bill of Quantities	Appendix-D
(r) Estimate Progress Payment	Appendix-J

Clause IB-13: Currency of Bid and Payment:

Sub-Clause 13.1

The unit rates and the prices shall be quoted by the Bidder entirely in Pakistani Rupees and likewise payments will also be made entirely in Pakistani Rupees.

Clause IB-14 Bid Validity:

Sub-Clause 14.1 Period of Bid Validity

120 Days

Clause IB-15 Bid Security

2% of the Estimated Cost of Rs. 147,726,999/- .i.e (Rs. 2,954,540/-)

The bids must be accompanied with Bid Security for the Project in the form of CDR/Bank Guarantee of amount Specified above in the name of the undersigned from a Scheduled Bank of Pakistan. No bid security in cash will be accepted. **Bid security should be attached with the technical bid, otherwise the bid will not be taken into account for evaluation and it will be rejected straight forward.**

Clause IB-16 Alternate Proposals by Bidders

NOT APPLICABLE

Clause IB-17 Pre-Bid Meeting

The pre bid meeting with bidders and their authorize representatives will be held on **May 23rd, 2024** at 11:00 AM in the office of Chief Officer, Municipal Committee Bahawalnagar or in any other office specified by Client to clarify the issues and to answer any questions on matters related to bid documents

Clause IB-18 Format and Signing of Bid

Sub-Clause 18.4 Format and Signing of Bid

One Original & Three Copies (Two hard and one electronic in USB/DVD) of **Technical Bid** whereas One original and Two copies for **Financial Bid**.

Clause IB-19 Sealing and Making of Bid

Sub-Clause 19.2 (a) Employer’s address for the purpose of Bid Submission is as follows:-

Municipal Committee Okara
Tel: 044-9330011
E-mail: info@mcokara.lgpunjab.org.pk

19.2 (b) Name and Number of the Contract is as follows: -

Contract No. _____

Clause IB-20 Deadline for submission of Bid:

Sub-Clause 20.1 (a)
Venue: Chief Officer, Municipal Committee Okara
Time: 10.00 AM,
Date: June 03rd, 2024

Clause IB-23 Bid Opening:

Sub-Clause 23.1 (a) Venue, Time and Date of Bid Opening
Venue: Chief Officer, Municipal Committee Okara
Time: 10.30 AM,
Date: June 03rd, 2024

Clause IB-32 Performance Guarantee:

Sub-Clause 32.1
Delete the text sub-clause 32.1 and substitute with the following: -
The Performance Guarantee shall be 05% of **Contract Amount** (work being greater than 50 Million) mentioned in the Letter of Acceptance on the prescribed form [PS-1] in shape of Bank Guarantee from any Scheduled Bank in Pakistan in favor of the Employer.

Add at the end of **Sub-Clause 32.2:**

Next lowest Bidder

In the event, the Performance Guarantee is not provided by the lowest bidder, and the award is annulled, the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and technically accepted and is determined by the Employer to be qualified to perform the Contract satisfactorily.

Clause IB-36 Instructions not part of Contract:

Fraud and Corrupt Practices:

Bidders and their sub-contractors under contracts must observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Employer:

- a) Defines, for the purposes of this provision, the terms set forth below are defined as follows:
 - “Corrupt practice” means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party.
 - “Fraudulent practice” means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation
 - “Coercive practice” means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - “Collusive practice” means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party.
 - obstructive practice” means (a) deliberately destroying· falsifying· altering· or concealing of evidence material to an investigation by the Employer; making false statements to investigators in order to materially impede an investigation by the Employer; (c) failing to comply with requests to provide information· documents· or records in connection with an office of Anticorruption investigation; (d) threatening· harassing· or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding the Employer’s contractual rights of audit or access to information
 - “Integrity violation” is any act which violates the Government's Anticorruption Policy· including (i) to (v) above and the following: abuse, conflict of interest· violations of the Government sanctions, retaliation against whistleblowers or witnesses· and other violations of the Government’s Anticorruption Policy including failure to adhere to the highest ethical standard.
- b) will reject any Bid/proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;
- c) will cancel the contract if it determines at any time that its representatives or those of the Bidder were engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the selection process or the execution of the Contract; and
- d) will sanction bidders or its successor including declaring ineligible, either indefinitely or for a stated period of time, to participate in bidding activities in Pakistan if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing Contract
- e) Will have the right to require that consultants permit the Government or its appointed agent to inspect their accounts and records and other documents relating to the

submission of proposals and contract performance and to have them audited by auditors appointed by the government.

**FORM OF BID
AND
APPENDICES TO BID**

Letter of Technical Bid

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

To:

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;

We offer to execute and complete in conformity with the Bidding Documents the following Works:
“SOLARIZATION OF DISPOSAL STATION IN MUNICIPAL COMMITTEE OKARA”

- (a) Our Bid consisting of the Technical Bid and the Financial Bid shall be valid for a period of 120 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;
(b) As security for due performance of the under takings and obligations of our bid, we submit here with a Bid security, in the amount specified in Bidding Data Sheet, which is valid (at least) 30 days beyond validity of Bid itself.
(c) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process, other than alternative offers submitted in accordance with IB16 (as applicable).
(d) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Address.....

Letter of Financial Bid

Date:

Bid Reference No:

(Name of Contract/Works):

To:

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, excluding any discounts offered in item (c) below is:

(c) The discounts offered and the methodology for their application are:

(d) Our Bid shall be valid for a period of 120 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;

(e) If our Bid is accepted, we commit to obtain a Performance Guarantee and Quality Assurance Security in accordance with the Bidding Documents;

(f) 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.

(g) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(h) We agree to permit Employer or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors. This permission is extended for verification of any information provided in our Technical Bid which comprises all documents enclosed herewith in accordance with IB.11.1 of the Bidding Data Sheet.

(i) If awarded the contract, the person named below shall act as Contractor's Representative.

Name

In the capacity of

Signed

Duly authorized to sign the Bid for and on behalf of

Date

Address.....

SPECIAL STIPULATIONS**Clause****Conditions of Contract**

1.	The Engineer's (Consultant) Authority to issue Variation in emergency	2% of the Contract Price stated in the Letter of Acceptance with the written approval of client.
2.	Law applicable	The relevant laws applied in the Province of Punjab.
3.	Amount of Performance Guarantee	The Performance Guarantee shall be 05% of Contract Amount mentioned in the Letter of Acceptance on the prescribed form [PS-1] in the shape of Bank Guarantee from any Scheduled Bank in Pakistan in favor of the Employer.
4.	Time for Furnishing Work Programme	Within 14 days from the date of receipt of Letter of Acceptance.
5.	Minimum amount of Third Party Insurance	The amount of insurance taken out by the Contractor per occurrence with number of occurrences unlimited shall be as follows: a. Bodily injury (any one person) PKR 0.5 (Half Million (Max)) b. Fatal Case (any one person) PKR 01 (one) million (Minimum) c. Property Damages Depending upon nature of loss (100% of the Damage)
6.	Time for Commencement	Within 7 days from the date of receipt of Engineer's Notice to Commence which shall be issued within 14 days after signing of Contract Agreement.
7.	Time for Completion	From the commencement of the Project = 18 Months (6 Months Construction Phase + 24 Months O&M (DLP))
8.	a) Amount of Liquidated Damages	0.1 % of the Contract Price for each day of delay in completion of the Works subject to a maximum of 10% of Contract Price stated in the Letter of Acceptance.
	b) Amount of Bonus for early completion	Not Applicable.
9.	Defects Liability Period	365 days from the effective date of Taking Over Certificate.
10.	Percentage of Retention Money	10 % on the amount of work done up to Rs. 5 million and 5 % on the amount of work done beyond 5 million
11.	Limit of Retention Money	05% of Contract Price stated in the Letter of Acceptance.
12.	Minimum amount of Interim Payment Certificates (Running Bills)	Greater than PKR. Ten Million (10 Million) except last 2 IPC's
13.	Time of Payment from delivery of Engineer's Interim Payment Certificate to the Employer.	30 days
14.	List of material	NOT USED

15	Mobilization Advance (Interest Free)	<u>Not Applicable</u>
16	Environment, Health & Safety	Contractor will be bound to comply the Environmental and Social Mitigation Plan and Environmental Health Safety SOPs for Labor/Construction Workers including Women Workers to fulfill E&S safeguards compliance otherwise 1 % of contractual amount will be forfeited upon Engineer's report from last IPC

NAME OF ELIGIBLE COUNTRIES

All countries of the World with whom Islamic Republic of Pakistan has commercial trade relations.

FOREIGN CURRENCY REQUIREMENTS

NOT APPLICABLE

PRICE ADJUSTMENT

Price adjustment / variation for the materials specified by the Government of Punjab will be paid as per rates issued by Finance department Government of Punjab from time to time and in the line with Punjab Local Government works Rules.

BILL OF QUANTITIES**D. Preamble**

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract (in case of item not mentioned in Bill of Quantities).
3. 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 14 days prior to dead line for submission of Bids in case of ICB/NCB respectively, shall be included in the rates and prices and the total bid price submitted by the bidder.
4. 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 and shall not be paid separately.
5. 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.
6. General directions and description of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the bidding documents shall be made before entering prices against each item in the priced Bill of Quantities.
7. 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 Engineer in accordance
8. Contractor will submit his submittal to Engineer/Employer in case of Non-scheduled items for approval prior to booking to supplier/manufacturer before undertaking the item into execution. Submittal proposed from contractor must comprise minimum three proposed manufacturers to be submitted to Engineer for approval purposes. It will be discretion of Engineer to recommend

for approval one of them or as contractor for other than those manufacturers proposed in shape of submittal by contractor for someone else on equivalency basis.

9. The contractor will also provide the submittals of imported items as stated above. Pre-shipment inspection of the selected manufacturer's equipment will be carried out as per by the engineer/employer. Contractor must submit Bill of lading of such imported equipment prior to transport to site.

10. Work program of level three must be submitted to Engineer/employer along with submittal.

BILL OF QUANTITIES
SUMMARY
ABSTRACT OF TENDER PRICE

Sr. No.	Description	Amount (Rs)
1	Disposal Works 2/4 L	
2	Disposal Works 1/4 L	
3	New Waste Water Treatment Plant (WWTP)	
4	P/F Transformer 630 KVA	
5	Environmental and Social Mitigation Plan	
	Sub Total	
Total Amount (Rs)		N/A
Note: These rates are exclusive of PRA charges		

Note: All Provisional Sums are to be expended in whole or in part at the direction and discretion of the Engineer in-charge

PROPOSED CONSTRUCTION SCHEDULE

The Works shall be completed on or before the date stated in Appendix-A to Bid. The Bidder shall provide as Appendix-E to Bid his Construction Schedule in the Bar Chart form 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 program for completion of the whole of the Works and parts of the works may meet Employer’s completion targets in days noted below and counted from the date of issue of Engineer’s Notice to Commence (Bidder to attach sheets as required for the specified form of Construction Schedule):

<u>Description</u>	<u>Time for Completion</u>
a) Whole Works	_____ days
b) Part-A	_____ days
c) Part-B	_____ days
d) _____	_____ days
e) _____	_____ days

Appendix-F to Bid

METHOD OF PERFORMING THE WORK

The Bidder is required to submit a narrative outlining the method of performing the Work. The narrative should indicate in detail and include but not be limited to:

1. Organization Chart indicating head office and field office personnel involved in management and supervision, engineering, equipment maintenance and purchasing.
2. Mobilization at site of works, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for Storage, communications, security and other services to be used.
3. The method of executing the Works, the procedures for installation of equipment and machinery and transportation of equipment and materials to the site.
4. Quality control/ Quality assurance measures to be adopted including procedures to be followed for carrying out all tests required under specifications.
5. Production of Authorization from Original Equipment Manufacturer.
6. Pre-shipment inspection at the factory premises shall be carried out by an independent Third-Party Firm having specialization in the task and possess the relevant professionals of the field. Third Party Validation Firm (TPV) shall be engaged by the Chief Engineer / D.G. (O&M) if required. The expenses in this connection shall be borne by the Contractor.
7. The Contractor should submit appropriate plans detailing how they intend to coordinate the Works with the ongoing system so that the existing system is not disturbed in any manner, and how they will ensure that the necessary facilities are available to enable it.

Note

- The Bidder shall provide the methods for performing the work in such manner that the works falling under the Construction must be in compliance with the Technical Specifications. These shall form part of and be included at the relevant appendix in the respective Contracts.
- Import documents like bill of lading, custom clearance, Air-way bill, port of shipment etc. will be provided by the contractor to the consultant/employer for verification of imported plants & equipment prior to submit the bill invoice of the same.

G-1
Appendix-G to Bid

LIST OF MAJOR EQUIPMENT – RELATED ITEMS

The Bidder will provide a list of all major equipment and related items, under separate heading for items owned, to be purchased or to be arranged on lease by him to carry out the Works. The information shall include make, type, capacity, and anticipated period of utilization for all equipment which shall be in sufficient detail to demonstrate fully that the equipment will meet all requirements of the Specifications.

LIST OF MAJOR EQUIPMENT

Owned Purchased or Leased	Description of Unit (Make, Model, Year)	Capacity HP Rating	Condition	Present Location or Source	Date of Delivery at Site	Period of Work on Project
1	2	3	4	5	6	7
a. Owned						
b. To be Purchased						
c. To be arranged on Lease						

CONSTRUCTION CAMPS AND HOUSING FACILITIES

The Contractor in accordance with Clause 34 of the Conditions of Contract shall provide description of his construction camp's facilities and staff housing requirements.

The Contractor shall be responsible for pumps, electrical power, water and electrical distribution systems, and sewerage system including all fittings, pipes and other items necessary for servicing the Contractor's construction camp.

The Tenderer shall list or explain his plans for providing these facilities for the service of the Contract as follows:

1. Site Preparation (clearing, land preparation, etc.).
2. Provision of Services.
 - a) Power (expected power load, etc.).
 - b) Water (required amount and system proposed).
 - c) Sanitation (sewage disposal system, etc.)
3. Construction of Facilities
 - a) Contractor's Office. Workshop and Work Areas (areas required and proposed layout, type of construction of buildings, etc.).
 - b) Warehouses and Storage Areas (area required, type of construction and layout).
 - c) Housing and Staff Facilities (Plans for housing for proposed staff, layout, type of construction, etc.)
4. Construction Equipment Assembly and Preparation (detailed plans for carrying out this activity)
5. Other Items Proposed (Security services, etc.)

LIST OF SUBCONTRACTORS

I/We intend to subcontract the following parts of the Work to sub-contractors. In my/our opinion, the sub-contractors named hereunder are reliable and competent to perform that part of the work for which each is listed.

Enclosed are documentation outlining experience of sub-contractors, the curriculum vitae and experience of their key personnel who will be assigned to the Contract, equipment to be supplied by them, size, location and type of contracts carried out in the past.

Part of Works (Give Details)	Sub-Contractor (With Complete Address)
1	2

ESTIMATED PROGRESS PAYMENTS

Note: Appendix – J duly filled by the Contractor should only be included in the **Financial Proposal/Financial Bid.**

Month	Amounts (Million Rs.)
1	2
Ist	
2 nd	
3 rd	
4 th	
5 th	
6 th	
Bid Price	

ORGANIZATION CHART
FOR THE
SUPERVISORY STAFF AND LABOUR

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

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

.....[Name of Supplier] 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 owned or controlled by GoP through any business practice.

Without limiting the generality of the foregoing, [name of Supplier] 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 from GoP, except that which has been expressly declared pursuant hereto.

[Name of Supplier] 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 Supplier] 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 Supplier] 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 Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever from GoP.

Name of Employer:.....

Name of Contractor:.....

Signature:.....

Signature:

Seal/Stamp.....

Seal/Stamp.....

Eligibility Criteria

The Bidders (Firm/ Joint Venture) fulfilling the following basic eligibility criteria shall only be considered for further evaluation. (Relevant documents to be attached):

- a) Duly licensed by the Pakistan Engineering Council (PEC) in the category **C4 & Above** with relevant code **EE-11**. Alternative Energy Development Board (**AEDB**) certification in **C1**. In case of Joint Venture, the Lead partner must be registered in the category **C4 & Above** with the relevant code for PEC, and the other member/s should have at least registration from PEC. Further, at least one member of JV shall have AEDB certification in **C1**. No foreign Firm(s) is allowed to participate whether as Single entity or Lead member of JV.
- b) Valid legal entity of the bidder / firm / company e.g. Certificate of registration from SECP or registrar of firms etc.
- c) Certificate of registration with active Income Tax & active Sales Tax under Relevant Authority.
- d) Affidavit on Non-Judicial Stamp paper for No litigation OR submission of Litigation History of last 10 years.
- e) Affidavit declaring “Neither the firms nor its Directors, Stakeholders, as a whole or as a part of the firm have ever been black listed/ defaulted by any government agency / department / organization / Donors or settled dispute in plea bargain or Volunteer recovery”. MC will check and maintain the record of verification of the blacklisting status from the PPRA website and also from the World Bank debarred/blacklisting list.

Un-signed and un-stamped bids will be rejected.

Note: In case of Joint Venture, all the members have to meet in full the afore-mentioned basic eligibility criteria.

Eligibility Criteria (Part-B)

TECHNICAL SPECIFICATIONS

Sr. No.	Description / Specification	Bidder to Specify
1	<p>Solar Modules</p> <p>Wafer Type: N Type</p> <p>Cell Technology: HJT Bifacial</p> <p>PV Panel Size: 600W or Above</p> <p>Cell Quality: A grade, Tier-1 (Bloomberg)</p> <p>Model/Make: Longi, Risen, JA, Jinko, Huasun or equivalent</p> <p>Maximum Module Efficiency: 22% or above</p> <p>First Year Power Degradation: 2% or less</p> <p>Product Warranty: 10 Years or more</p> <p>Linear output warranty: 25 years or more</p>	
2	<p>Inverter (Grid Type)</p> <p>Max Input Power (KW): 100 – 300KW (According to requirement of 575 KW) accumulative capacity of Inverter Must be equal or greater than Total PV Capacity</p> <p>Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories</p> <p>Efficiency: 98% Peak</p> <p>Rated Power @ 400 V, 50Hz: 575 KW Minimum</p> <p>Standby power consumption: less than 10W</p> <p>Warranty: 5 Years replacement or more</p> <p>Nominal AC Voltage: 3c, 230/400 VAC 50Hz</p> <p>Protection: Ground Fault Protection, Leakage Protection</p> <p>LVRT: Grid Frequency under/over</p> <p>Ingress protection rating: IP65 or above</p>	

<p>3</p>	<p>Inverter (Grid Type)</p> <p>Max Input Power (KW): 100 – 300KW (According to requirement of 280 KW) accumulative capacity of Inverter Must be equal or greater than Total PV Capacity</p> <p>Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories</p> <p>Efficiency: 98% Peak</p> <p>Rated Power @ 400 V, 50Hz: 280 KW Minimum</p> <p>Standby power consumption: less than 10W</p> <p>Warranty: 5 Years replacement or more</p> <p>Nominal AC Voltage: 3c, 230/400 VAC 50Hz</p> <p>Protection: Ground Fault Protection, Leakage Protection</p> <p>LVRT: Grid Frequency under/over</p> <p>Ingress protection rating: IP65 or above</p>	
<p>4</p>	<p>Inverter (Grid Type)</p> <p>Max Input Power (KW): 60 – 75KW (According to requirement of 60 KW) accumulative capacity of Inverter Must be equal or greater than Total PV Capacity</p> <p>Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories</p> <p>Efficiency: 98% Peak</p> <p>Rated Power @ 400 V, 50Hz: 60 KW Minimum</p> <p>Standby power consumption: less than 10W</p> <p>Warranty: 5 Years replacement or more</p> <p>Nominal AC Voltage: 3c, 230/400 VAC 50Hz</p> <p>Protection: Ground Fault Protection, Leakage Protection</p> <p>LVRT: Grid Frequency under/over</p> <p>Ingress protection rating: IP65 or above</p>	

<p>5</p>	<p>Mounting Structure</p> <p>Material: Mountings for Standard Roof Structure made of Aluminum with at least 15-degree tilt (or as per site requirement) designed at wind speed of 33 m/s/120kmph. Structure as per Configuration P1/L2.</p> <p>Installation: Complete Installation Including Excavation 2 feet below ground level and 1 feet above ground with 1:2:4 PCC Civil Work for each Mounting</p>	
<p>6</p>	<p>DC Distribution Box</p> <p>IP65 GI DB for each inverter for placing DC strings</p> <p>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</p>	
<p>7</p>	<p>DC Breakers with base 1 -pole</p> <p>1,000 V DC 1P 16 Amps or compatible with selected PV Modules</p>	
<p>8</p>	<p>AC, DC and Grounding Cables</p> <p>DC wire for PV: 10 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO</p> <p>DC wire for PV: 16 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO</p> <p>DC wire for PV: 25 mm Sq. DC flexible wire 1500V DC Copper conductor, Cu XLPO</p> <p>AC wire from DB to Inverter: Cu, XLPE/PVC 0.6/1 kV, 4*35 mm Sq. AC stranded</p> <p>AC wire from inverter grounding: Cu, PVC 0.6/1 kV, 1*16 mm Sq. AC flexible wire stranded</p> <p>DC wire for frame-frame grounding: PVC 1*6 mm Sq. AC standard Wire</p> <p>DC wire for PV frames to grounding point: PVC 1*16 mm Sq. AC standard Wire</p> <p>Copper Bare Conductor: 25 mm Sq</p>	

<p>9</p>	<p>Cable Trays, Pipes, Ducts, MC4 connectors</p> <p>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 with earth braids</p> <p>Cable Trench: Outdoor Excavation and back filling with sand for DC string cable along with bricks,Trench minimum size(ft.) Depth*Width*Length (ft.) =3*1*66.</p> <p>UPVC pipe: 51mm dia pipe for laying string wires PV area to inverters including sockets</p> <p>UPVC pipe: 25mm including bends and sockets</p> <p>MC4 connectors: IP67/IP68 for PV stringing</p>	
<p>10</p>	<p>Net metering</p> <p>Net metering services: Net metering services complete in all aspects along with bidirectional meters and NEPRA license</p>	
<p>11</p>	<p>Earthing System</p> <p>DC Earthing: Earthing bore with resistance <3 ohm (including all necessary equipment)</p> <p>AC Earthing: Earthing bore with resistance <3 ohm (including all necessary equipment)</p>	

Note:

1. This part of evaluation shall be of knock out basis if the bidder fails to provide the authorization from Original Equipment Manufacturer (**OEM**) / authorized distributor of OEM Manufacturer for items at Sr. No. 1 & 2 and fails to comply the given specifications he shall be considered as **non-responsive** and shall not be considered for further evaluation.
2. Similar to other than above or better specifications of an equivalent item will be accepted by the Procurement Committee / Bid Opening & Evaluation Committee, provided the bidder attaches brochure mentioning the relevant specifications. In absence of brochure the bid will be considered as non-responsive and the decision of the committee shall be final.
3. The Contractor / Manufacturer must also provide undertaking for the availability of spares parts for the period of ten (10) years that will be made part of the main contract.

Qualification Criteria

Technical Evaluation will be based on the criteria given in succeeding paras regarding the Bidder's General Experience, Specific Experience, Personnel Capabilities and Equipment Capabilities as demonstrated by the Bidder's responses in the forms attached. The Procuring Agency reserves the right to waive minor deviations, if these don't materially affect the capability of a Bidder to perform the contract. Sub-contractor's experience and resources shall not be taken into account in determining the Bidder's compliance with the qualifying criteria. However, Joint Venture experience & resources shall be considered. Consortium or Association of Contractors will be considered for similar treatment as in case of Joint Venture. The detailed qualification criteria for Technical Evaluation is provided as follows:

Sr.No.	Category	Weightage/Marks
1.	Financial Soundness	30
2.	General & Relevant Experience	45
3.	Personnel Capabilities	15
4.	Equipment Capabilities	10
	Total:	100

The applicants must score total 65 marks and at least 50 % marks in each category, to qualify.

SUB CATEGORY A: FINANCIAL SOUNDNESS

For financial soundness, Letter from Banks and audited financial statements for *last five financial years shall be submitted. if Bank statement (In case of Cash), letter from Banks (In case of Credit Line) & audited financial statements of last five financial years are not attached, no consideration will be given to bidder.*

Sr. No.	Description	Maximum Marks
i)	<p>Available Cash / Bank Credit Line Limit (or combination of both)</p> <p>A= Available Cash/Bank Credit Line limit or combination of both (in PKR Million)</p> <p>(15 - Marks)</p>	<ul style="list-style-type: none"> • Full Marks will be given if “A” is PKR 100 Million or above. • For ‘A’ less than PKR 100 Million, marks will be awarded as: (A/100) *15 • No Marks will be given if “A” is less than PKR 50 Million. <p><u>No marks shall be allotted if Bank statement (In case of Cash) & letter from Bank (In case of Credit Line as proof of Credit Line) is not attached.</u></p>
ii)	<p>Average Working Capital in last Five financial years.</p> <p>A= Average Working Capital in last five financial years (in PKR Million)</p> <p>(15 - Marks)</p>	<ul style="list-style-type: none"> • Full Marks will be given if “A” is PKR 100 Million or above. • For ‘A’ less than PKR 100 Million, marks will be awarded as: (A/100) *15 • No Marks will be given if “A” is less than PKR 50 Million. <p><u>No marks shall be allotted if audited financial statements of last five financial years are not attached.</u></p>
	Sub-total:	30

SUB-CATEGORY B: EXPERIENCE RECORD

Bidder must meet following criteria for evaluation of the experience of the Firm/JV.

Sr. No.	Description	Max. Marks
i)	Projects of similar nature and complexity a. Max 03-projects of Solarization and allied works Min Cost Rs. 50 Million each (completed over last 05 years) (Completion certificate must be provided) Each project having above-said minimum cost bracket; will have equal marks. (i.e. 3*10=30)	30
ii)	Projects of similar nature and complexity a. Max 03-projects of projects of Solarization and allied works Min Cost Rs. 50 Million each (in hand) (LoA or Agreement must be provided) Each project having above-said minimum cost bracket; will have equal marks. (i.e. 3*5=15)	15
	Sub-total:	45

SUB-CATEGORY C: PERSONNEL CAPABILITIES

The following key experts at a minimum shall be evaluated:

No personnel will be considered for evaluation if declaration of Professional Staff Employment & availability for this Project (**Form T11-12-13**) **duly signed by authorized signatory** is not attached. Bidder will also provide **affidavit of employee** on judicial stamp paper.

Bidders will submit the detailed particular of his experts considering that all staff **will serve at site full time during execution of works** In case bidder fails to appoint full time Project Manager at site, a penalty of PKR 100,000 will be imposed on monthly basis and in case bidder fails to appoint full time other supporting staff (all personnel or partly) mentioned below (other than Project Manager) at site, a penalty of Rs. 100,000/- will be imposed on monthly basis.

Sr. No.	Description	Maximum Points
i)	Engineers in employment of the contractor & Registered with PEC a) Number of Engineers (Min 1 No. Electrical) b) Experience of Electrical Engineer (Minimum 07 years)	6 3

ii)	Number of Diploma Engineers in Employment of the Contractor	
	a) Number of Sub Engineers having Diploma in Associate Engineering (Min 2-No Electrical)	3
	b) Experience of Sub-Engineers in number of Years (Minimum 05 -years)	3
	Sub-total:	15

Bidders will provide **short CVs**, showing details of experts are desired by highlighting the name of expert, qualification, year of graduation or other degree(s), general experience, specific experience, designation, time of association with this firm. Experience certificates, affidavit of employee on judicial stamp paper. No marks if required documents are not attached.

SUB-CATEGORY D: EQUIPMENT CAPABILITIES

The following Equipment shall be evaluated:

Declaration of ownership/lease of Equipment (Form T- 15) duly signed by authorized signatory shall be attached.

Form T-14 shall be filled along with manufacturer authorization.

Sr. No	Equipment Type	Maximum Marks
1	Surveying Equipment (Total Station) (02 Set)	2
2	Megger / Earth Resistance Tester	1
3	AC/DC Clamp Meter	1
4	PV Analyzer	1
5	Irradiance Meter	1
6	Generator (50/100 KVA, 01 No)	1
7	Reciprocating saw / Jig saw, Right angle drill, Conduit bender, Large crimpers	1
8	Welding Plant	1
9	Solar Pathfinder	1

Bidder will provide evidence of ownership in case of his purchased equipment or Lease paper in case of any rented equipment OR Affidavit on his letter head that he will arrange the following equipment subject to award the work.

Joint Venture (JV)

Joint Venture must comply with the following requirements: -

- a) Minimum qualification requirements: -

- i) The joint venture must collectively satisfy the criteria of paras A to D, for which purpose the relevant figures for each of the partners shall be added together to arrive at the JV's total capacity.
- b) Any change in a qualified JV after qualification, shall be subject to the written approval of the Employer prior to the deadline for submission of bids. Such approval may be denied if:-
 - i) Partner(s) withdrawn from a JV and remaining partners do not meet the qualifying requirements;
 - ii) The new partners to a JV are not qualified individually or as another JV; or
 - iii) In the opinion of the Employer, a substantial reduction in competition would result.
- c) Bid shall be signed by all members in the JV so as to legally bind all partners, jointly and severally, and any bid shall be submitted with a copy of the JV agreement providing the joint and several liability with respect to the contract.

General Information

Bidder (or each Member of a Joint Venture) applying for qualification is required to complete the information in this form.

1.	Name of Firm:	
2.	Head Office Address:	
3.	Telephone:	
4.	Email:	
5.	Type of Organization:	
6.	Place of Incorporation/Registration:	Year of incorporation/registration:
7.	PEC Registration Category: PEC Registration No:	Validity:
8.	NTN#	
9.	Name, Designation, email and Mobile Number of Firm's Representative	

Detail of Owners/ Directors

	Name	Designation	Nationality
1.			
2.			
3.			
4.			
5.			

Financial Soundness

Name of Bidder (Lead Member of a Joint Venture, in case of JV)
--

Bidder (Lead Member of a Joint Venture, in case of JV) applying for qualification is required to provide financial information to demonstrate that they meet the requirements of Evaluation Criteria. If necessary, use separate sheets to provide complete information. A copy of the audited financial statements of the past five (5) financial years must be attached.

Bidder’s Legal Name: _____

Date: _____

JV Members Legal Name: _____

Information Balance Sheet

	Year-1	Year-2	Year-3	Year-4	Year-5	Overall Average
Total Assets (TA)						
Total Liabilities (TL)						
Net Worth (TA-TL)						
Current Assets (CA)						
Current Liabilities (CL)						
Average Annual Turnover (AATO)						
Average Annual Turnover						
Financial Resources						
Cash/Bank Balance						
Credit Line Limit						

Details of Similar Nature Projects Completed

Name of Bidder or Member of a Joint Venture

A separate form with adequate documentary evidence (Completion Certificate indicating Cost of Project) shall be provided for each project in Form T-03.

1.	Name of Contract
	Location
2.	Name of Employer
3.	Employer Address
4.	Nature of Works and special features of the contract
5.	Contract Role (Tick One) (a) Sole Contractor (b) Sub-Contractor (c) Member in JV
6.	Value of the total contract (in specified currencies) at completion, or at date of award for current contract PKR..... USD.....
7.	Date of Award
8.	Date of Completion
9.	Contract Duration (Years and Months) _____Years _____Months

Details of Similar Nature Projects in hand

Name of Bidder or Member of a Joint Venture

*A separate form with adequate documentary evidence (**Letter of Award/ Agreement indicating Cost of Project**) shall be provided for each project in **Form T-5**.*

1.	Name of Contract
	Location
2.	Name of Employer
3.	Employer Address
4.	Nature of Works and special features of the contract
5.	Contract Role (Tick One) (a) Sole Contractor (b) Sub-Contractor (c) Member in a JV
6.	Value of the total contract (in specified currencies) at completion, or at date of award for current contract PKR..... USD.....
7.	Date of Award
8.	Planned Date of Completion

Summary of Fast Track Project Completed

Name of Bidder or Member of a Joint Venture

Bidder and each Member of a Joint Venture applying for qualification is required to complete the information in this form.

Use a separate sheet for each Member of a Joint Venture.

Project Name	Year of Completion	Location	Value in PKR (Million)	Completion Duration

NOT USED

Details of Fast Track Similar Nature Projects Completed in Last Ten (10) Years

Name of Bidder or Member of a Joint Venture

A separate form with adequate documentary evidence (Completion Certificate indicating Cost of Project) shall be provided for each project in Form T-09.

1.	Name of Contract
	Location
2.	Name of Employer
3.	Employer Address
4.	Nature of
5.	Contr (a)Sole-C (b)Sub-Contractor (c) Member in a JV
6.	Value of the total contract (in specified currencies) at completion, or at date of award for current contract PKR..... USD.....
7.	Date of Award
8.	Date of Completion
9.	Contract Duration (Years and Months) ____ Years ____ Months

List of Proposed Staff

Name of Bidder: _____
(Bidder or Member of Joint Venture)

1	Title of Position	
	Name of Candidate	
	Education	
	Experience	
	PEC Registration No.	
2	Title of Position	
	Name of Candidate	
	Education	
	Experience	
	PEC Registration No.	

Candidate Summary

Name of Bidder: _____
(Bidder or Member of Joint Venture)

Position	Candidate	
	Prime	Alternate
Candidate Information	Name of Candidate	Date of Birth
	Professional Qualification:	
PEC Registration No. (Only for Engineer)		
Present Employer	Name of Employer:	
	Address of Employer	
	Telephone:	Fax:
	Job Title of Candidate	Years with Present Employer

Summarize professional experience in reverse chronological order.

From	To	Company	Project	Position	Relevant Technical & Management Experience

DECLARATION OF PROFESSIONAL STAFF EMPLOYMENT

[To be submitted on Company Letterhead]

TO WHOM IT MAY CONCERN

PROJECT: _____

SUBJECT: DECLARATION OF PROFESSIONAL STAFF EMPLOYMENT & AVAILABILITY

We hereby certify that the personnel nominated in Form-T-11 are employed by our firm and are available for the above-mentioned Assignment.

Yours Sincerely,

COMPANY NAME:

AUTHORIZED REPRESENTATIVE

Equipment Detail

Name of Bidder or Member of Joint Venture

Bidder and each Member of Joint Venture is required to provide adequate information to demonstrate clearly that it has the sufficient capability to undertake the Project. A separate form shall be prepared for each item of equipment listed in the Evaluation Criteria.

Item of Equipment		
Equipment information	1. Name of manufacturer	2. Model and power rating
	3. Capacity	4. Year of manufacture
Current status	5. Current location	
	6. Details of current commitments	
Source	7. Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased	

Omit the following information if it is owned by the Bidder or Member of JV.

Owner	8. Name of owner	
	9. Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreement	Details of rental/lease specific to the Project.	

Affidavit of ownership/Availability of Equipment

PROJECT: _____

SUBJECT: DECLARATION OF OWNERSHIP/ LEASE OF EQUIPMENT

We hereby certify that the equipment nominated in T-14 is owned by/Leased by our firm and is available in Pakistan for the above-mentioned Assignment.

Yours Sincerely,

COMPANY NAME:

AUTHORIZED REPRESENTATIVE

Litigation History for the last Ten (10) Years

Name: _____
(Bidder or Member of Joint Venture)

Description of Contract	Year	Name of Client, Cause of litigation and matter in dispute	Disputed amount (Current value in PKR or US\$ equivalent)	Award FOR or AGAINST Bidder	Remarks by Bidder

Attach Affidavit/undertaking that non-performance of a contract did not occur within the last ten years based on information on all settled disputes or litigation.

AFFIDAVIT FOR CORRECTNESS OF INFORMATION

(To be printed on PKR 100 Stamp Paper)

Name: _____
(Bidder or member of Joint Venture)

I, the undersigned, do hereby certify that all the statements made in the Forms and in the supporting documents are true, correct and valid to the best of my knowledge and belief and may be verified by employer if the Employer, at any time, deems it necessary.

The undersigned hereby authorize and request the bank, person, firm or corporation to furnish any additional information requested by the Employer deemed necessary to verify this statement regarding my (our) competence and general reputation.

The undersigned understands and agrees that further qualifying information may be requested and agrees to furnish any such information at the request of the Employer. Employer undertakes to treat all information provided as confidential.

Signed by an authorized Officer of the firm

Title of Officer

Name of Firm

Date

POSSESSION OF SITE HANDING / TAKING OVER

Name of Sub-Project / Contract Name:

Name of Contractor / Contracting Firm:

Date of Award of Work:

Date of Contract Agreement:

Contract number:

The sub-project (Name of subproject) which pertains to the sites as shown in drawings are integral part of this Contract is hereby handed over to the Contractor M/s _____ on (Date, day, year) in presence of witness.

(Plan attached list of sites being handed over / taken over)

Handed over by

Name:

Designation: Chief Officer MC _____

Cell:

Stamp:

CNIC No:

taken over by (Contractor / Firm)

Name:

Designation:

Cell No:

Stamp:

CNIC No:

PEC No:

Witness (MOI)

Name:

Designation:

I, hereby take over the sites as marked in the plan attached as Annexure-A of this document

Witness:

Designated approved Site Engineer of
Contracting Firm

FORMS

**BID SECURITY
PERFORMANCE GUARANTEE
CONTRACT AGREEMENT
MOBILIZATION ADVANCE GUARANTEE/BOND**

**BID SECURITY
(Bank Guarantee)**

Security Executed on _____
(Date)

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

Name of Principal (Bidder) with Address _____

Penal Sum of Security Rupees . _____(Rs. _____)

Bid Reference No. _____

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid and at their quest 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 28 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 Guarantee, 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 formal Contract with the said Employer in accordance with his Bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Guarantee 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 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 Guarantee 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 the instrument 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.

WITNESS:	SURETY (Bank)
1. _____ _____	Signature _____
Corporate Secretary (Seal)	Name _____
	Title _____
	Corporate Guarantor (Seal)

2. _____

Name, Title & Address

**FORM OF PERFORMANCE GUARANTEE
(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: _____

Penal Sum of Security (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 bound unto the _____ (hereinafter called the Employer) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Employer, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

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

NOW THEREFORE, if the Principal (Contractor) shall well and truly perform and fulfill all the undertakings, covenants, terms and conditions of the said Documents during the original terms of the said Documents and any extensions thereof that may be granted by the Employer, with or without notice to the Guarantor, which notice is, hereby, waived and shall also well and truly perform and fulfill all the undertakings, covenants terms and conditions of the Contract 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 49, 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 defenses 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 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 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 Instrument 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 _____

Corporate Secretary (Seal)

Name _____

Title _____

2. _____
Name, Title & Address

Corporate Guarantor (Seal)

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "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 / Clarification as agreed or otherwise, 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, viz:
 - a. The Contract Agreement;
 - b. The Letter of Acceptance;
 - c. The completed Form of Bid;
 - d. Special Stipulations (Appendix-A to Bid);
 - e. Contract form for execution of work;
 - f. The priced Bill of Quantities (Appendix-D to Bid);
 - g. The completed Appendices to Bid (B, C, E to O);
 - h. Special Provisions;
 - i. The Drawings;
 - j. The Specifications;
 - k. Work Schedule;
 - l. (any other)
3. The contractor will have to complete the work within the stipulated period, according to specifications as mentioned in the acceptance letter and Contract Agreement to the entire satisfaction of the engineer in-charge
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 the Contract.
5. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

6. That if the contractor fails to comply with any of the conditions of the contract, he will be held liable for the consequences thereof which shall be either in the form of liquidated damages or allotment of work at his risk and cost or both. The damages so incurred shall be recovered from the contractor, either from his security money or his running/outstanding bills. Further, if any information/ document submitted by contractor/ firm, founds false, fabricated, materially incorrect at any stage, he/firm will be liable for blacklisting.

7. The Employer hereby covenants to pay the Contractor, in consideration of the execution and completion of the Works as per provisions of the Contract, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused this 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)

Signed, Sealed and Delivered in the presence of:

Witness:

(Name, Title and Address)

Witness:

(Name, Title and Address)

MOBILIZATION ADVANCE GUARANTEE/BOND

Guarantee No. _____ Date _____

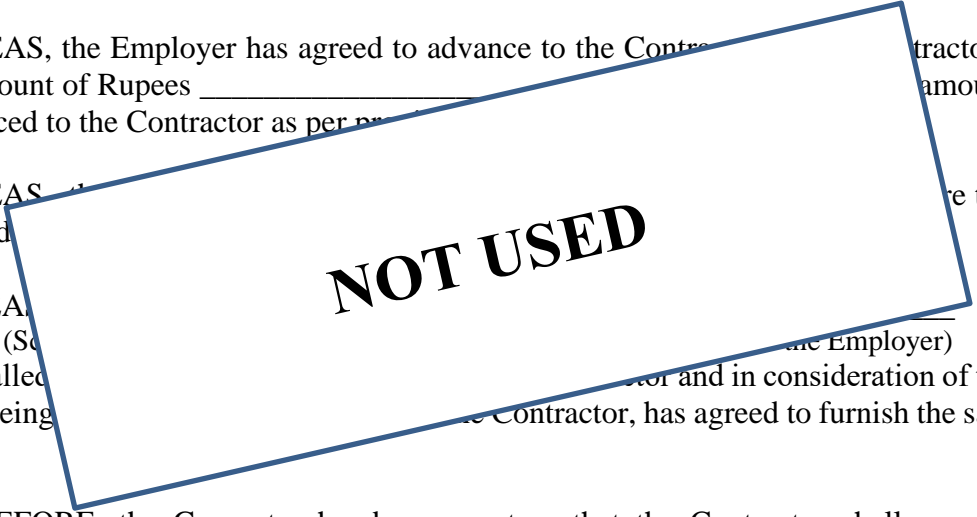
WHEREAS _____ (hereinafter called the 'Employer') has entered into a Contract for _____

(Particulars of Contract)
with _____ (hereinafter called the "Contractor").

AND WHEREAS, the Employer has agreed to advance to the Contractor _____ Contractor's
request, an amount of Rupees _____ amount
shall be advanced to the Contractor as per _____

AND WHEREAS _____ the
mobilization advance of _____

AND WHEREAS _____ the Employer)
(Hereinafter called _____ Contractor and in consideration of the
Employer agreeing _____ 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.

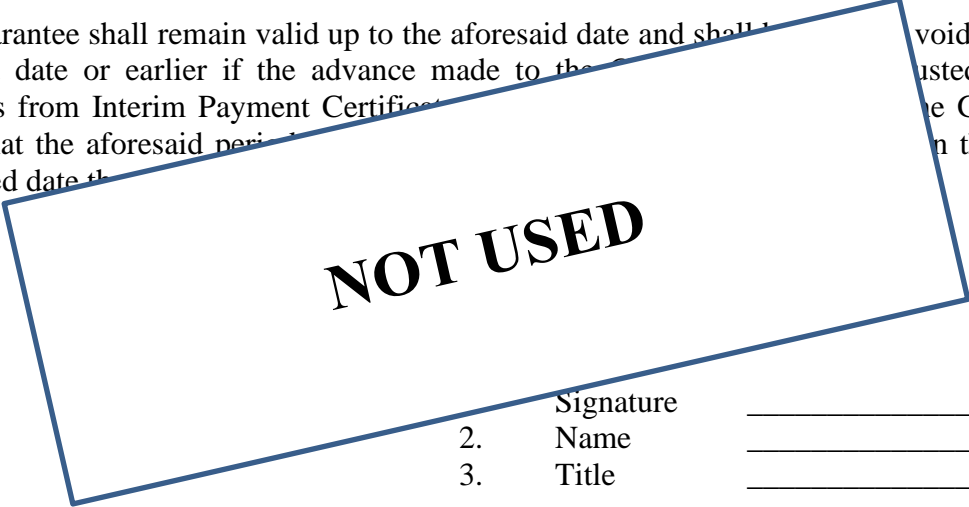
Notice in writing of any default, of which the Employer shall be the sole and final judge, on
the part of the Contractor, shall be given by the Employer to the Guarantor, and on such first
written demand, payment shall be made by the Guarantor of all sums then due under this
Guarantee without any reference to the Contractor and without any objection.

This Guarantee shall remain in force until the advance is fully adjusted against payments from
the Interim Payment Certificates of the Contractor or until
_____ whichever is earlier.

(Date)

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 the aforesaid date and shall be void after the aforesaid date or earlier if the advance made to the _____ is not repaid against payments from Interim Payment Certificates. The Guarantor agrees that the aforesaid period shall be the period for which the above mentioned date the _____



2. Signature _____
3. Name _____
Title _____

WITNESS

1. _____

Corporate Secretary (Seal)

2. _____
(Name Title & Address) _____
Corporate Guarantor(Seal)

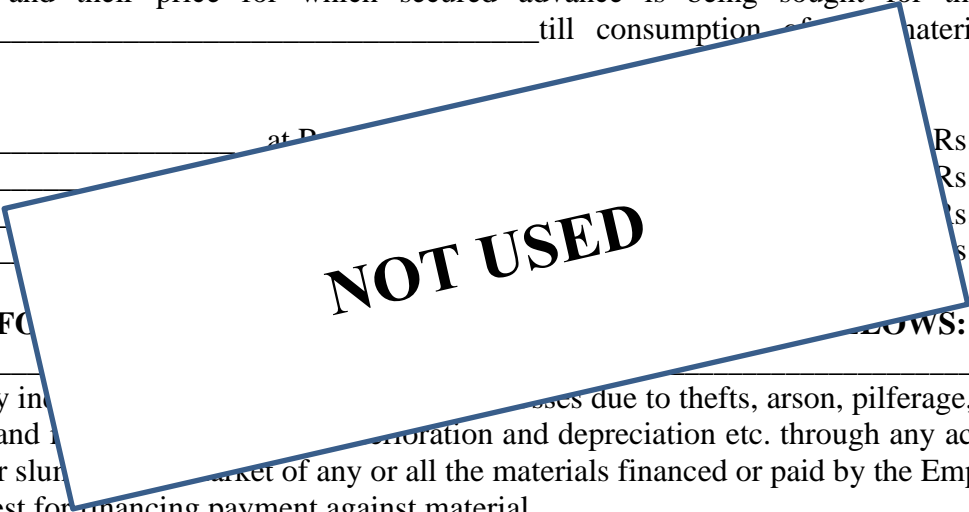
**INDEMNITY BOND
FOR SECURED ADVANCE
AGAINST MATERIALS BROUGHT AT SITE**

(ON RS.40 NON JUDICIAL STAMP PAPER)

This Deed of Indemnity is issued by M/s. _____
_____ (Name of the Contractor) in favour
of M/s. _____ (Name of the Employer).

Whereas _____ (hereinafter called the Employer) has paid the Secured Advance against the cost of material through any Bank or like agency by any other method by virtue of the terms of the contract existing between the parties. The details of the material and their price for which secured advance is being sought for the period _____ till consumption of material is as under:-

- | | |
|----------|--------------|
| 1. _____ | at Rs. _____ |
| 2. _____ | Rs. _____ |
| 3. _____ | s. _____ |
| 4. _____ | s. _____ |



THEREFORE _____
I/We _____
do hereby indemnify _____ against all losses due to thefts, arson, pilferage, loss due to flood and fire, corrosion and depreciation etc. through any act of Man or God or slurrage or loss of any or all the materials financed or paid by the Employer on our request for financing payment against material.
I/We _____ shall indemnify _____ against any or all claims, action damages arising out of or resulting to the said material.
I/We _____ further declare that we will faithfully abide by the above declaration and solemnly affirm that we will not remove, sell, pilferage any of the materials against which M/s _____ has paid us such a secured advance and will not pledge the same with any Bank, Finance Corporation, Firm, Company, Individual or the like agency or create any change whereon in any from what so ever.
I/We _____ do hereby also declare that in the event of my/our infringement of the declaration made above

_____ will be entitled to forfeit all such material and also proceed against me/us according to the relevant clause pertaining to breach of contract and further invoke the power or seek any remedies secured of _____ under the contract Agreement signed with us or otherwise

available under law.

Place _____ Dated _____

Contractor _____

NOT USED

GENERAL / PARTICULAR CONDITIONS OF CONTRACT FOR WORKS

GOVERNMENT OF THE PUNJAB

CONTRACT FORM FOR EXECUTION OF WORK

(To be procured by the Contractor)

Copies of the Contract Form for Execution of Work can be obtained from Finance Department Punjab's Website as well as from the Employer.

SPECIAL PROVISIONS

SPECIAL PROVISIONS (CIVIL WORKS)

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SPECIFICATIONS - SPECIAL PROVISIONS (CIVIL WORKS)

Okara is the capital city of Okara District in the Punjab province of Pakistan. The city is located southwest of the city of Lahore at a distance of 128.6 km and Faisalabad is 100 km bypassing away Ravi River. The nearest major city to Okara is Sahiwal at N5 which is 35 Km away towards Multan. The city coordinates are 30.81' North latitude, and 73.45' East longitude.

Scope of the work for this particular project “**SOLARIZATION OF DISPOSAL STATION IN MUNICIPAL COMMITTEE OKARA**”

From the recent Past the energy crisis is adversely affecting the life of the common lot. The Federal Government and Provincial Government are extending all priority to the energy sector to enhance production but due to restrained economy the total potential especially in hydroelectricity could not be undertaken by the Government. Under the situation PMDFC is exploring alternate energy options such as solar. To address the issue of non-availability / totally unreliable and expensive electricity in the Water Sector across all over the province PMDFC has proposed Solar Energy technology. The details related to the annual energy consumption and available roof/land space for Solar PV Generation Plant were collected. While carrying out the feasibility study all possible design tools / techniques have been adopted to initially assess the requirement of each site. Then the designed optimum solutions related to solar PV were verified while using the relevant software simulations and then the final Solar PV configurations was recommended based on one year energy profile extracted from energy meter readings etc.

The project will provide a continuous flow of power supply to operate electrical motors which will further expedite the water supply and disposal station services without delay, so the ultimate benefits would be (i) Saving Electricity (ii) more independency and security (iii) Financial Savings (iv) The scheme will deliver socio-economic benefits to the community. It provides the community with better water and waste water infrastructure which will reduce the risk of urban flooding. There are certain merits and demerits of using both kinds of energy sources. The review of the comparison reveals that capital cost of solar energy system is more than the electric based energy cost, however the O&M cost of electric energy-based System is far more than the solar one. It can therefore be concluded that solar based technology is more economical on longer term basis.

SP-2 DESCRIPTION OF THE WORKS

2.1 The work included in this Contract are as follows but not limited to these items only:

- Disposal Works 2/4 L
- Disposal Works 1/4 L
- New Waste Water Treatment Plant
- P/F Transformer 630 KVA
- Environmental & Social Mitigation Plan

SP-3 SITE OF WORKS

The work mainly comprising of “**SOLARIZATION OF DISPOSAL STATION IN MUNICIPAL COMMITTEE OKARA**”

SP-4 SETTING OUT

Setting out data and control points for the construction of the road and allied works will be provided by the Engineer following the Notice to Commence but, in any case, prior to start of work.

SP-5 CLIMATOLOGICAL DATA

Not used.

SP-6 UTILITIES

The Contractor shall directly enquire from the utility companies about availability of connections of electric power supply and telephone lines for his use at the Site. In case of non-availability of electric power supply from national grid to meet his requirements the Contractor shall provide at his own cost electric power generators as necessary for supply of power for the various parts of the Works including his camps, offices, stores, workshops and other installations as well as for the Engineer's Site office provided under Sub-Clause SP 20.1. The Contractor shall bear all costs for constructing, operating and maintaining the generation system, including the standby generation system, and distribution system including providing diesel, oil or other consumables and all services and necessary attendance to ensure uninterrupted power supply at all times.

The Contractor shall make his own investigations and arrangements for supply of water of acceptable quality for construction requirements and safe drinking water for his staff and workmen and for the staff of the Engineer.

No separate payment will be made to the Contractor for works performed under this Clause and the costs thereof shall be deemed to be included in the rates and prices of the various items in the Bill of Quantities.

SP-7 TOPOGRAPHY AND GEOLOGY OF THE SITE

The details of Topography is with the Employer / Engineer.

SP-8 EXTENT OF WORK

The Contractor shall remove all debris and unsuitable construction to the Engineer's satisfaction with no additional cost.

The Contractor shall construct the Works in accordance with the Drawings and Specifications and as directed by the Engineer. The Contractor shall procure, furnish, provide and arrange all the necessary construction materials, equipment, transportation, fuel, electric power, water and services; be responsible for the construction and maintenance of the construction camps, offices, workshops and warehouses that he may require, and perform all other work necessary for completion of the Works described herein, in complete conformity with the Contract.

SP-9 DRAWINGS

9.1 Bidding Drawings

The Drawings provided as separate volume of Bid Documents and hereinafter referred to as Bid Drawings show the scope of the work to be performed by the Contractor. The Bid Drawings shall not be used as a basis for fabrication or construction, but may be used as the basis for planning, scheduling and placing preliminary orders for materials, subject to corrections based on future issue of Construction Drawings. Any other Drawings if issued through Addenda, before opening of Tenders, shall become part of the Bid Drawings.

9.2 Construction Drawings

After award of Contract, Bidding Drawings will be replaced by Drawings issued by the Engineer for Construction, with such modifications as may be necessary. The Drawings Issued for Construction will include Bid Drawings re-issued, Bidding Drawings modified and additional Drawings as required to develop in greater detail the construction required and shall be referred to hereinafter as "Construction Drawings". The Construction Drawings that show changes from the Tender Drawings and Specifications, will be reviewed by the Engineer for determination of adjustments, if any, of the Contract Price in accordance with the provisions of Clause 51.1, Variations, of the Conditions of Contract. The work shall be executed in conformity with the Construction Drawings.

The Engineer and Contractor shall jointly prepare a schedule for issuance of Drawings Issued for Construction of the various parts of the Works based on a list of drawings provided by the Engineer.

9.3 Checking of Drawings

The Contractor shall carefully check all Construction Drawings as soon as practicable after receipt thereof, and shall promptly advise the Engineer of any errors if discovered.

SP-10 RIGHT TO CHANGE

The Engineer may find it desirable to change location, alignment, dimensions or design of one or more of the features of the Works to conform to the newly disclosed conditions. Toward this end, the Engineer reserves the right to make such reasonable changes, and the Contractor's operations shall be conducted so as to accommodate any such changes in the Works.

SP-11 DRAWINGS/DATA TO BE FURNISHED BY EMPLOYER /ENGINEER

11.1 Procedure for Submittal of Contractor's Drawings

All drawings showing construction details shall be provided by the Employer/Engineer.

11.2 Other Drawings

Other drawings additional to those referred to herein-above required by the Specifications showing proposed methods of constructing Temporary Works and all

bar bending schedules shall be submitted by the Contractor to the Engineer for approval.

11.3 Ownership of Drawings etc.

All the drawings, details, and any other information or documents furnished by the Engineer shall become the property of the Employer.

SP-12 COOPERATION WITH OTHER CONTRACTORS

The Contractor shall cooperate and coordinate his work with that of the other contractors working at the Site, to whatever extent may be necessary to complete the Works in accordance with the approved programme and the Engineer's instructions.

SP-13 QUALITY OF MATERIALS

All materials, fixtures, fittings, and supplies furnished under the Contract shall be new and unused, of standard first grade quality and of the best workmanship and design. No inferior or low grade materials and supplies will be either approved or accepted, and all work of assembly and construction shall be done in a first class and workmanlike manner. In asking for prices of materials intended for delivery to the Site and incorporation in the Works under any portion of these Specifications, the Contractor shall provide the manufacturer or supplier with complete information as may be necessary to secure compliance with these requirements and, in every case, he shall quote this Clause in full to each such manufacturer or supplier.

Prior to procurement, the Contractor shall furnish to the Engineer, for his approval, the names of the manufacturers of all equipment and materials which he contemplates incorporating in the Works. With this information, the Contractor shall also furnish such pertinent information as to capacities, efficiencies and sizes, and such other information as may be required by the Engineer. Samples of materials shall be submitted to the Engineer for approval unless waived of by the Engineer. Equipment, materials, supplies and articles installed or used without the Engineer's approval shall be at the risk of subsequent rejection.

The Contractor shall use non-reactive aggregates from suitable quarries for concrete work. The Contractor shall use deformed steel reinforcement bars rolled from Pakistan Steel Mills billet or equivalent from re-rolling mills proposed by the Contractor and approved by the Engineer.

SP-14 INSPECTIONS AND TESTS

14.1 Inspection

All equipment and materials furnished under the Contract and all work performed in connection therewith under the Contract shall be subject to inspection and testing by the Engineer or his authorized agent at all times and in all stages of completion. Inspection at the manufacturer's plant may be made to determine that the equipment and materials meet the requirements of these Specifications. The Contractor shall notify the Engineer not less than 05 days in advance of the date and place that the equipment or materials will be available for inspection and testing. No equipment or materials shall be transported until inspection at the manufacturer's plant has been made Acceptance

of equipment and materials or the waiving of inspection and testing thereof shall in no way relieve the Contractor of the responsibility for furnishing equipment and materials meeting the requirements of the Contract Documents. Confirmatory tests shall also be carried out at the Site or at an approved laboratory, as instructed by the Engineer. These tests shall be witnessed by the Engineer and performed at no additional cost to the Employer.

Contractor will submit his submittal to Engineer/Employer in case of Non-scheduled items or Items to be imported for approval prior to booking to supplier/manufacturer before undertaking the item into execution. Submittal proposed from contractor must comprise minimum three proposed manufacturers to be submitted to Engineer for approval purposes. It will be discretion of Engineer to recommend for approval one of them or as contractor for other than those manufacturers proposed in shape of submittal by contractor for someone else on equivalency basis. Pre-shipment inspection of the selected manufacturer's equipment will be carried out by the engineer/employer. Contractor must submit Bill of lading of such imported equipment prior to transport to site. Confirmatory tests shall also be carried out at the Site or at an approved laboratory, as instructed by the Engineer. These tests shall be witnessed by the Engineer and performed at no additional cost to the Employer.

14.2 Testing

The Engineer will make such tests on concrete, aggregates, fill materials, reinforcing steel and other materials as he may from time to time select, and the Contractor shall provide at his own cost such samples or assistance in sampling materials at the Site as the Engineer may reasonably require. Testing by the Engineer shall in no way relieve the Contractor of his responsibility to test materials to ensure that they meet all the specified requirements and to control their quality. The Engineer may accept that items manufactured away from the Site meeting the specified requirements without further testing subject to the Contractor furnishing satisfactory proof of compliance with these Specifications in one or more of the ways described below.

The Contractor shall provide free of charge such material testing equipment, labour, materials, electricity, fuel, water, stores, apparatus and feedstock as may be reasonably required by the Employer to carry out the Tests as per the required frequency. Further contractor shall make all kind of arrangements for third party inspection/ Witnessing of Factory Acceptance Tests of major components of manufacturing factory whether located in Pakistan/abroad for four officials (02 from Employer and 02 from Engineer-In-charge side). All expanses regarding air tickets, visa in case of abroad, boarding/lodging, food, transport, hoteling etc. will be borne by the Contractor and no extra/additional payment will be made to contractor. Contractor shall quote his prices keeping in view of such expanses.

Manufacturer's Certificate of Compliance

In the case of standard labelled stock products of standard manufacture which have a record of satisfactory performance in similar work over a period of not less than five years, the Engineer may accept a notarised statement from the approved manufacturer certifying that the product conforms to the applicable specifications.

Mill Certificates

Regarding materials for which such practice is usual, the Engineer may accept the approved manufacturer's certified mill and laboratory certificates.

Testing Laboratory Certificates

The Engineer may accept a certificate from a renowned commercial testing laboratory, satisfactory to him, certifying that the product has been tested within a period acceptable to the Engineer and that it conforms to the requirements of these Specifications.

Service Record

If a demonstrable satisfactory service record for a period not less than five (05) years is available for a material, certain specified tests may be waived off by the Engineer.

14.3 Cost

The cost of any laboratory, field and shop tests required from any agency of compliance with under Specifications shall be borne by the Contractor.

SP-15 CONSTRUCTION PROGRAMME

15.1 General

The Contractor shall submit his programme for execution of the Works in accordance with Clause 14.1 [*Programme to be Submitted*], under the Conditions of Contract, to the Engineer for approval. The programme may contain adjustments if any, to the CPM (Critical Path Method) based Bar Chart submitted with the Bid. The completion date, milestones, and key targets indicated in Appendix-E to Bid, or dates earlier than the said milestone and key target dates, shall be shown on the construction programme to be submitted by the Contractor. Other dates including rates of progress for various parts of the Works in the construction programme may be changed by the Contractor and submitted for approval. The operations under each section of the programme submitted by the Contractor shall be broken down in greater detail than those shown on the Schedule submitted with the Bid.

The programme shall also show the timing of provision of any facilities the Contractor is required to supply for use by the Employer and the Engineer, in such manner that these shall be available as stipulated in the Contract and instructed by the Engineer.

15.2 Submittals

- (a) The initial submittal of network analysis shall include a description of the major items of construction equipment planned to be used. The description of the equipment shall include the type, number of units, their capacity, etc. The forecast shall include the estimated dates on which each major item of construction equipment will be on the job. The Bar Chart and the Network Analysis shall be submitted within 14 days after receipt of the Letter of Acceptance.

The submittal shall consist of:

- (i) 4 copies of the Bar Chart.
- (ii) A narrative summary of the construction plan.
- (iii) A backup of the schedule files on re-writable CD disks or pen drive.

The Engineer will review the construction schedule and the approved initial submittal will be the Project Baseline Schedule by which the performance of the Contractor will be measured

- (b) Monthly submittals shall show completed progress of each activity during the past month, with forecast for the coming month. Hammock networks shall be incorporated on the Base Line Schedule of activities. Each monthly submittal shall contain:
 - (i) 4 copies of the Bar Chart.
 - (ii) 4 copies of a time scaled logic diagram for the next three months.
 - (iii) A narrative summary of the schedule related issues and status. The narrative shall include discussion of pending schedule changes submitted to the Engineer in the past month.
 - (iv) A backup of the schedule files on rewritable CDs or pen drive.
- (c) The successful bidder shall submit the supervision plan in respect of Environmental Health Safety SOPs and Environmental and Social Mitigation Plan on monthly basis along-with other deliverables manifesting the progress activities as per schedule.

15.3 Progress Schedule

Both the bar charts and network analysis schedules shall be continuously monitored and kept current and updated by the Contractor throughout the work, and at least on every milestone date and submitted for approval. The Contractor's schedules shall be available for examination during normal business hours. All revisions shall be accompanied by a detailed explanation of the reasons for the changes and describing any new or modified construction procedure proposed and, if applicable, any steps being taken to improve progress to achieve completion within the Time for Completion.

SP-16 LAY OUT OF WORKS

16.1 Reference Points, Lines and Levels

The Engineer will lay out a reference line or lines in the field with accompanying points and/or bench-marks to enable the Contractor to establish there from survey control for construction.

16.2 Verification

The Engineer may make checks as the work progresses to verify lines, levels and grades established by the Contractor and to determine the conformance of the work as it progresses with the requirements of the Specifications and the Drawings. Shall not relieve the Contractor of his responsibility to perform all work in accordance with the

Drawings and Specifications and the lines, levels and grades given therein.

16.3 Primary Control Points

Based upon the Engineer's basic control, the Contractor shall provide his own primary control points, as needed for the Works, and shall preserve and maintain them until otherwise authorized.

The Contractor shall be responsible for maintaining all survey markers/monuments, and property corners. If any markers/monuments are disturbed or destroyed by the Contractor, the Contractor shall arrange, at his own cost, to retrace and replace them to the entire satisfaction of the Engineer. If a monument cannot be replaced in its original position, the Contractor shall install a witness corner. The Contractor shall complete and file monument reference cards on all monuments as per instructions of the Engineer.

16.4 Construction Surveyors

The Contractor shall provide experienced construction surveyor/s with adequate experience in the construction surveys similar in nature as required by this Contract.

16.5 Basic Control Monument

Based upon the Engineer's established basic control monuments, the Contractor shall establish all lines and grades necessary to control the Works, and shall be responsible for all measurements that may be required for execution of the Works to the tolerance prescribed in Sub-Clause 16.7 below.

16.6 Surveys and Computations

The Contractor shall perform such surveys and computations as are necessary to determine quantities of work performed or placed during each progress payment period, and shall also perform all surveys required by the Engineer to determine final quantities of work in place. The Engineer will determine final quantities based on original ground levels determined by the Contractor and agreed by the Engineer.

The Contractor shall notify the Engineer at least 24 hours before performing a quantity survey and, unless specifically waived, quantity surveys shall be performed in the presence of and agreed by an authorized representative of the Engineer.

16.7 Tolerances

Degree of accuracy for the survey works shall satisfy the following specified tolerances:

- (a) Alignment of tangents and curves shall be within 0.1 foot for 1,000 feet i.e., an accuracy of 1:10,000.
- (b) Structure points shall be set within 0.01 foot accuracy from point to point, except where tighter tolerances are required.
- (c) Cross-section points shall be located within 0.10 foot, horizontally and 0.01 foot vertically.

- (d) Permissible closing error for a levelling line meant for establishing Temporary Bench Mark (TBMs) shall not exceed $0.045 \times \sqrt{M}$ foot, where M is in miles. The permissible closing error shall be duly adjusted.

16.8 Material and Equipment

The Contractor shall provide all materials, equipment and labour required for work.

SP-17 STANDARDS AND SPECIFICATIONS

Except as otherwise provided by these Specifications or the Drawings all materials, equipment and fabrication and testing thereof shall conform to the latest applicable Standards and Specifications contained in the following list or to equivalent applicable Standards and Specifications. Copies of these Standards and Specifications may be purchased from the indicated agency, which publishes them:

- | | | |
|---|--|------|
| - | British Standard | BS |
| - | American Concrete Institute | ACI |
| - | American Society for Testing and Materials | ASTM |

Where relevant Standards and Codes of Practice now quote metric units only, these are to be interpreted as required to the nearest equivalent imperial (foot/pound) unit for the purposes of this Contract.

All materials and workmanship not fully specified herein or covered by an approved Standard shall be of such a kind as is used in first class work and suitable to the climate in the Project Area.

If the Contractor, at any time and for any reason, wishes to deviate from the above standards or desires to use material or equipment not covered by the above standards, he shall state the exact nature of the changes, the reason for making the change and shall submit complete specifications of the materials and equipment to the Engineer for approval.

SP-18 ACCESS TO SITE

18.1 Right of Way for Access and Haul Routes

The Contractor shall be responsible for providing and maintaining access routes for the Works. The right of way for access to the Works from existing roads will be provided by the Employer. The Contractor shall make his own investigations of the condition of available public or private roads and of clearances, restrictions, bridge load limits and other limitations that affect or may affect transportation and ingress and egress at the job sites. The repair and reinstatement of roadways, drain and canal banks if damaged during operation shall be the responsibility of the Contractor without any additional cost to the Employer. The Employer controlled right of way shall be the Right of Way (ROW) available to the Contractor for carrying out the Works.

18.2 Restoration of Site

On completion of the Works, the Site shall be restored by the Contractor to its original conditions as far as practicable and left in tidy condition.

SP-19 FACILITIES TO BE PROVIDED BY THE CONTRACTOR AT SITE

19.1 Contractor's Camps

The Contractor is required to arrange the facility of housing in nearby area of the project for the labour through portable containers or house on rent in compliance with PMDFC SOPs for labour / construction worker including women worker. In case of failure and on lodging of complaint by the labour to the Engineer will result in fining of Rs. 5000 / day. Preference shall be given to utilization of local labour / construction workers.

19.2 Temporary Sanitary Facilities

- (a) The Contractor shall provide adequate temporary sanitary conveniences for the use of his employees and persons engaged on the work, including the Engineer and his employees. He shall ensure that his employees and labour make proper use of the latrines and do not foul the Site.
- (b) In addition to toilet facilities, suitable and adequate washing facilities shall be provided.
- (c) Sanitary facilities shall be located as directed or approved by the Engineer and shall be maintained in a clean and sanitary condition during the entire course of the work.
- (d) The septic tank and/or temporary holding tank(s) shall be kept pumped out at such intervals that the tank(s) will not overflow and contaminate the ground, flowing streams or surface drainage.
- (e) On completion of the Works, sanitary facilities shall be properly disinfected and all evidence of same including temporary buried tanks and foundations removed from the Site.

19.3 Medical Facilities

The Contractor shall arrange provision of adequate medical facilities for his employees.

Adequately equipped dispensary/ies with qualified and experienced staff shall be provided by the Contractor at his camps. In addition suitably equipped first aid stations manned by trained staff shall be provided at strategic locations, to administer first aid treatment at all times free of charge to all persons on the Site, including personnel of the Engineer and the Employer. The nature, number and location of facilities furnished and the Contractor's staff for administering first-aid treatment shall meet the requirements of the Health Services of the Government of Pakistan.

19.4 Operation and Maintenance of the Camps and Facilities

For the purpose of operation and maintenance of the camps and facilities provided as

above, the Contractor shall comply with all applicable provisions of the Pakistani Labour Laws and specifically to the following requirements:

- (a) Camp areas shall be kept dry and free from dense vegetation. Measures shall be taken to control dust within the camp area, by water or oil spraying or other approved means.
- (b) Any ponded water around a camp shall be sprayed weekly with oil or other approved anti-malaria liquid.
- (c) The Contractor shall provide garbage collection and disposal services for his construction camps and the Engineer's office. Disposal shall be by burial (landfill) and/or incineration. Disposal area shall be located a sufficient distance away and downwind from camp facilities and offices so as not to create objectionable odours or health hazards. Equipment, methods of collection and disposal and location of disposal areas shall be submitted to the Engineer for approval.
- (d) The interior walls and ceilings of buildings shall be lime washed or painted. The whole of the open spaces around the buildings shall be swept each day and all rubbish removed. The living areas shall be suitable for the climatic conditions. Roof height shall not be less than 10.5 ft. and adequate number of ceiling fans shall be provided.
- (e) Adequate sanitary conveniences, including washing and bathing places shall be maintained at each of the camps. All sanitary fixtures, receptacles, toilet rooms, lavatories and wash rooms shall be cleaned and disinfected at least once every day.

19.5 Drainage

The ground around the buildings shall be graded to slope away from building perimeters so as to provide adequate drainage and shall be thoroughly compacted. Excavated material shall be disposed of by filling in low areas or as otherwise directed by the Engineer.

19.6 Water Supply

The Contractor shall arrange for the water supply for his staff residences, labour camps, site offices, work yards, workshops, and various camp facilities. Construction of pumps, storage tanks, overhead tank, distribution system, and their proper running and maintenance shall be his responsibility. Water shall be supplied to the camps 24 hours a day. Adequate supply of water, cooled in summer, shall be ensured in camps and sites of work. Water samples shall be tested periodically to ensure that it is fit for human consumption.

19.7 Electricity Supply

The Contractor shall provide electricity required for the Works including labour camps, staff residences, offices including the Engineer's Site office and various camp facilities. The Contractor shall also provide sufficient standby electricity supply arrangements for his needs.

19.8 Utility Lines

The Contractor Shall conduct his operations, make necessary arrangements, take suitable precautions and perform all required work incidental to the protection of and avoidance of interference with power, telephone, water and other utilities within the areas of his operations in connection with the Contract. No separate payment shall be made for such incidental work. In case the utility lines are required to be relocated the Contractor shall arrange their relocation with the concerned departments and organizations. The Contractor shall obtain cost estimates for relocation of utilities for the Engineer/Employer's approval before execution of the Work. The Contractor shall be reimbursed the actual approved cost carried in by him.

19.9 Handing Over/Removal after Completion

Upon completion of the Works, the Contractor shall remove all the Contractor's camps, labour and staff accommodation, site office, other installations and buildings constructed and all facilities provided by the Contractor under this Clause, and the Site cleared and reinstated to the satisfaction of the Engineer.

19.10 Measurement and Payment

Except as provided in SP-19.8 no separate payment will be made for the work included under the Clause SP-19; the cost thereof is deemed to be included in the rates and prices of other items entered in the Bill of Quantities. The contractor is bound to comply with all the instructions stated in SP-19 and in case of otherwise or if any complaint lodged by the labour to the Engineer / Client, the contractor will be penalized for amounting to Rs. 5000 / day.

SP-20 PROVISION OF FACILITIES FOR THE ENGINEER (FOR CONSULTANT STAFF) /EMPLOYER

20.1 Facilities for Engineer/Employer's Staff:

(a) **Site offices:**

One furnished portacabin with all the requisite accessories for the Engineer / Employer

20.2 Ownership of Site facilities

All facilities/utilities provided by the contractor as stated above in Clause-20.1 will be property of Engineer In charge after successful handing taking over of project and expiration of defect liability period considering that the said amount is included in all items listed in Bill of Quantities.

20.3 Measurement and Payment

No extra/separate payment will be made to Contractor considering that Contractor has quoted his bid keeping in view of such expanses.

SP-21 PROGRESS PHOTOGRAPHS

The Contractor shall furnish to the Engineer every month, for the site of Fifteen colour

photographs on CD or pen drive and 4 colour prints of each photograph taken with a digital camera to clearly show the progress of construction. Each photograph shall be submitted in four prints of size 20 cm x 25 cm. Each print shall be marked on the back side with the caption of the activity, date and serial number. There shall be no writing, lettering or marking on the face of the photograph. Progress photographs shall be submitted from the month, following the month in which Notice to Commence is issued and continued till completion of the Works.

No separate payment will be made for the work specified herein and the cost thereof shall be deemed to be included in the other items of the Bill of Quantities.

SP-22 SITE FACILITIES TO BE PROVIDED BY THE EMPLOYER

22.1 General

Without prejudice to the generality of the various clauses of the Contract and except for the facilities referred to hereinafter, particular attention is drawn to the obligations of the Contractor to make his own arrangements for providing, maintenance and furnishing of labour camps, staff residences, offices, workshops, stores watching and guarding thereof.

The Contractor shall submit his written demand of his requirements of land for his Site Facilities as herein specified, at least 28 days in advance.

22.2 Area for Storage and Workshop

The contractor will arrange an open area of adequate size for the facilities listed in Appendix-H to Tender and approved by the Engineer, for use as storage, and workshop areas. The Contractor shall provide and maintain at his own cost, all fencing, any necessary clearing, land levelling, foundations and above ground structures for sheds, covered areas, workshops, electricity, telephone, water distribution and waste water disposal etc, as he may need to meet his requirements.

SP-23 SAFETY MEASURES AT CONSTRUCTION SITE

- a) Pursuant to the provisions of Sub-Clause, for Safety Measures the Contractor shall observe high standards of safety for men and machines at all times and with regard to safety.
- b) The Contractor shall take all possible measures to protect his personnel from harm. In case of any casualty or injury to any person due to the Contractor's operations, the Contractor shall ensure quality medical treatment and payment of due compensation.
- c) The Contractor shall not permit casual observers to come close to the sites where excavation and other hazardous operations are being performed.

SP-24 ENVIRONMENTAL PROTECTION

The Contractor shall exercise care to protect the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the Works. Except where clearing is required for the Permanent Works, approved construction roads and the Temporary

Works, and for excavation operations, all trees and native vegetation shall be preserved and shall be protected from damage which may be caused by the Contractor's construction operations and equipment. On completion of the Works, all work areas shall be smoothed and graded in a manner to conform to the natural appearance of the landscape. Where unnecessary destruction, scarring, damage or defacing may occur as a result of the Contractor's operations, it shall be repaired, replanted, or otherwise corrected as directed by the Engineer at no additional cost to the Employer.

Contractor will get appreciation/performance certificate from Engineer in charge and reward of Rs. 200,000/- upon compliance with E&S attributes at the last IPC on recommendation of DPO-ESM to engineering in charge

Contract may be terminated upon serving of 4th E&S Non-Compliance notice from the DPO-ESM to Engineer in charge.

The Environmental Health Safety SOPs for Labour / Construction Workers including Women workers and Environmental & Social Mitigation Plan are attached with this bidding document as **Annexure-1** and **Annexure-II**

BILL OF QUANTITIES OF "SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA"

Summary of Cost

Ser	Description	Cost (Rs.)
1	Disposal Works 2/4 L	
2	Disposal Works at 1/4 L	
3	New Waste Water treatment Plant (WWTP)	
4	P/F Transformer 630 KVA	
Sub-Total		
5	Environment & Social Management Plan (ESMP) Implementation Cost	
Total		

SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA				
SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA	Meter Ref No:	24 11412 22000902 U	Sanction Load (KWp):	112-113-113-50
	Annual Kw-hr-Units Generated through PV	3358000	Annual Kw-hr-Units Consumed	2920000
	Area Available Sqft	45,000	Proposed Solar PV Capacity	575 KW
			Est. Annual Savings PKR (M)	

PV DESIGN					
Design, Supply, Installation and One Year O&M of Roof Top / Ground Mounted Grid Tie Solar PV System					
Location: Disposal Works at 2/4L Okara					
Solar PV Generation Capacity:			575	Kw	
Ser	Description	Quantity	UoM	Unit Rate	Total Price
1	PV Modules & Power Generation System				
1.1	Solar Modules N-type, Bi-facial, TOPCON 575-580W) A grade, Tier-1 (Bloomberg) Model/Make: Longi, Risen, JA, Jinko, Huasun or equivalent Maximum Module Efficiency: 22% or above First Year Power Degradation: 2% or less Product Warranty: 10 Years or more Linear output warranty: 25 years or more	575,000	Wp		
1.2	Inverter (Grid-Tied) Huawei sun 2000 or equivalent 115 KW Max Input Power (KW): According to requirement of BoQ, accumulative capacity of Inverter Must be equal or greater than Total PV Capacity Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories Efficiency: 98% Peak Rated Power @ 400 V, 50Hz: KW Minimum (As per BOQ) Standby power consumption: less than 10W Warranty: 5 Years replacement or more Nominal AC Voltage: 3c, 230/400 VAC 50Hz Protection: Ground Fault Protection, Leakage Protection LVRT: Grid Frequency under/over \\ Ingress protection rating: IP65 or above	5	Set		
1.3	PV-Genset Controller	1	Job		
1.4	Cable for Interconnection (DC)(UV Protected XLPE)	1	Job		
1.5	PV Combiner Boxes with DC Breakers / Fuses , SPD's etc. for string protections	1	Job		
2	AC Termination & Accessories				
2.1	LT Termination				
2.1.1	Secondary Comprehensive Protection Cabinet	1	Set		
2.1.2	Low Voltage Switchgear Cabinet	1	Set		
2.1.3	AC Combiner Breakers for MCCB	1	Set		
2.1.4	AC Combiner Breakers for ACB	1	Set		
3	Fabricated Items				
3.1	Mounting Structure Hot dip galvanized with specification of thickness and nut/bolt/wahers,mid clamps,end clamps,rafters,purlins,columns and braces Material: Mountings for Standard Roof Structure made of Aluminum with at least 15-degree tilt (or as per site requirement) designed at wind speed of 33 m/s/120kmph. Structure as per Configuration P1/L2. Installation: Complete Installation Including Excavation 2 feet below ground level and 1 feet above ground with 1:2:4 PCC Civil Work for each Mounting	1,000	Job		
3.2	Cable Tray	1	Job		
3.3	Distribution Boxes	1	Job		
4	Cable & Accessories				
4.1	AC Cables for Inverter Interconnection xx sqmm,4 core, Armored	1	Set		
4.2	AC Cable for Combined Output xx sqmm,4 Core, Armored	1	Set		
4.3	Installation Material (cable Ducts etc.)	1	Set		
5	Earthing/ Grounding System / ATS Panels				

5.1	Earthing for PV Solar System complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2-ohm max resistance the item includes (2 copper electrodes 15mm2 driven into ground, manholes with iron cover, earth joints, clamps, ducts, conduits and 25 mm2 flexible earthing copper wires and cables (Yellow/Green) from the PV system components to the electrode to complete the system as specifications and supervisor engineer instructions and approval.	1	Job		
5.2	Earthing System For Inverter / WAPDA / Generator Set Neutral Complete independent earthing system for Inverter / WAPDA / Generator Set Neutral must be separated of the main earthing system to obtain 2-ohm max resistance. the item includes (2 copper electrodes 15mm2 driven into ground, manholes with iron cover, earth joints, clamps, ducts, conduits and 50 mm2 flexible earthing copper wires and cables from the Neutral bus bar in the Main Distribution box to the electrode to complete the system as specifications and supervisor engineer instructions and approval.	1	Job		
5.3	Lightening Arrestor (5 spoke 1m long copper with ground earthing)	15	job		
5.3	Surge protection device of appropriate short circuit capacity to secure the overall AC system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories	12	Set		
5.4	Grounding Flat Iron, Grounding Network for the plant Area, Power distribution Room, HV power Distribution room	1	Job		
5.5	Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two 4 poles contactors of appropriate capacity complete with (Mechanical & electrical Interlock) all needed ACU control fittings such timers, relays, undervoltage. with all needed fittings and accessories to get job ready.	1	Job		
5.6	Phase Failure Protection 3ph. Failure, loss of phase, under voltage, over voltage and phase sequence relay (LRST), adjustable type with four poles contactor 4*100A and all needed protection devices, control devices and accessories	1	Job		
6	Remote Monitoring & Data Acquisition System				
6.1	Contractor Shall Provide the access of Remote Monitoring Mobile App and Server from the Inverter Manufacturer for real time monitoring, Data Logging	1	Job		
7	Services				
7.1	Project Design & Execution	1	Job		
7.2	Erecting of Mechanical Mounting Structure	1	Job		
7.3	Installation, testing and Commissioning of Solar System	1	Job		
7.4	Operations and Maintenance "O&M" Services (1 Year)	1	Job		
7.5	Load Flow Study (Required for Net- Metering)	1	Job		
7.6	Net-Metering Process (Including Equipment, Fee, Approvals, Documentation, Inspection)	1	Job		
7.7	SCADA system	1	Job		
Amount of PV system complete in all respect Sub total A					

8	Area Lighting				
Ser.	Description	Quantity	UoM	Unit Rate	Total Amount
8.1	Supply, transportation at site, storage, installation, testing and commissioning of the following items of work (unless specifically stated otherwise) including all material, labour, tools and accessories etc. required for proper completion of each item as per specification and drawings and/or as directed by the Engineer.				
	Road / Street Lighting Poles and Foundations				
8.2 C24/71A	10 m high single arm conical octagonal (hot dip) galvanized steel pole with extension arm luminaire arrangement, base plate, 2Amp., (RC=10KA) circuit breaker, terminal blocks including end caps, base connection plates & end stopper etc. as shown on drawing.	5.00	Each		
a	Road Lighting Pole Foundation (Bitumen Coating)	5.00	Each		
	LED Road Light Fixtures				
8.3 C-24/72	Supplying, installation and commissioning of LED Cobra-head Luminaries of specified wattage and lumens conforming to IP 66 & IK 08 or above Philips/Osram/Thorn or NEECA approved equivalent manufacturer with corrosion resistant die casted Aluminum housing, silicon gasket in special groove, UV stable& scratch resistant synthetic materials, thermally hardened glass complete with LED Chip (Philips Lumiled/Cree/Nichia/Osram make or equivalent approved manufacturer), programmable LED driver (Harvard/TCI/Lumotech/Philips/VOSSLOH Schwabe/Lightech make or approved equivalent manufacturer), minimum 10kV surge protection rating device/c thecost of all accessories/components required for proper operation, fully flexible for future upgradation and easy replacements for maintenance purposes, bucket elevator charges as approved and directed by the Engineer Incharge. 140 Lm/watts				
	60 Watt with 8400 lumens	3.00	Each		
	120 Watt with 16800 Lumens	1.00	Each		
	180 Watt with 25200 Lumens	1.00	Each		
	Conduits / Pipes				
8.4	PVC pipe/conduit with accessories suitable for laying multi-core cables on road crossings.				
a	100 mm Class-B (Pole to pole)	2,201.16	Rft		
	Power Cables				
8.5 C-24/15	Supply and erection of Four Core 25 mm sq (19/0.052") non-armoured XLPE insulated, PVC Sheathed copper conductor cables 600/1000 volts, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing an capping/G.I. wire/trenches (rate for cables only):-	970.60	Rft		
8.6 C-24/15	Supply and erection of Four Core 50 mm sq (19/0.072") non-armoured XLPE insulated, PVC Sheathed copper conductor cables 600/1000 volts, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing an capping/G.I. wire/trenches (rate for cables only):-	800.63	Rft		
8.7 C-24/10c	Supply and erection of single core 16 mm sq (7/0.064") PVC insulated copper conductor cables, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing an capping/G.I. wire/trenches (rate for cables only):-	2,021.85	Rft		
8.8 C-24/10c	Supply and erection of single core 25 mm sq (19/0.052") PVC insulated copper conductor cables, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing an capping/G.I. wire/trenches (rate for cables only):-	864.25	Rft		
8.9	3 Nos. 1 core 2.5 mm ² (Red+Black+Green) Cu. PVC 450/750 Volt grade copper cable including connections at ends. The cables shall be drawn from junction box to the light fitting through hollow of the pole (for street light pole). (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)				
8.10	40 Rft. cable is required for each pole and the unit is taken as No.				
	Price per No.	5.00	Each		

	Lighting Control Panels				
8.11	Road lighting control panel (LCP) with angle iron frame claded 16 SGW, sheet steel enclosure having high quality powder coated paint. The LCP shall be complete with incoming and outgoing MCCBs, Cu busbars, magnetic contactors, photo-electric switches, meters, indication lights, 16 SWG sheet steel construction with IP 43 protection class, door, locking arrangement etc. and all other accessories as required for quality work.	2.00	Each		
a	LCP Description				
	1 No. incoming 63Amp.(adjust.) TP,				
	MCCB, 25 kA, Icu=100%Ics				
	4 Nos. outgoing 16 Amp.(Adj.) TP				
	MCCBs, 18 kA, Icu=100%Ics				
	2 No. spare 16 Amp. (Adj.) TP MCCBs, 18				
	kA, Icu=100%Ics				
	4 Nos. 26 Amp. magnetic contactor, AC-3				
	2 No. spare 26 Amp. magnetic contactor ,				
	AC-3				
	3 Nos. photo-electric switches				
	a) 1 No. ammeters 0-40 Amp., with				
	selector switch (04 position) and				
	CT of 50/5 Amp				
	b) 09 Nos. indication lights				
	c) 1 No. voltmeter with fuse and 7 position				
	selector switch.				
	d) 3 Ph, N & Earth copper busbars				
	e) Internal wiring & line-up terminals etc.				
	f) Brass cable glands/accessories				
	g) 3 Nos. Auto-Manual-OFF (3 position switches for operation in auto (with photocell) and normal (manual mode- photocell override)				
	h) Panel steel grid painted alongwith locking arrangement				
	i) IP =44/54 panel shall be weather proof, dust proof with studded and shade arrangement on top.				
8.12 C-24/90a	Supplying ,Installation and commissioning of MCCB (Moulded Case Circuit Breaker) of specified rating made of LEGRAND FRANCE/ GE U.S.A / SCHNEIDER GERMANY / TERASAKI JAPAN/SIEMEN/ABB SWITZERLAND or approved equivalent manufacturer (with fixed ThermalMagnetic Trip) in prelaid DBs and Panels i/c the cost of screws, necessary wire complete in all respect as approved and directed by the Engineer Incharge 15-63 Amp(7.5 KA)	5.00	Each		
	Earthing Rod				
8.13	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground near each lighting control panel and civil works as per drawings The earthing rods shall be completed with fixing clamps etc.	3.00	Each		
Sub Total (B) :					-

8		Fencing			
MRS Ref	Description	Unit	Quantity	Rate	Cost (Rs.)
26/46	Providing and fixing anti climb high security galvanized razor cut wire having double sharp four U-shaped pointed 0.5 mm thick (22mmx15 mm barbs) spaced @ 33 mm c/c clad over 2.5 mm dia high tensile Core wire making coil fencing of specified diameter @ 4" c/c fixed on 2'-3" high M/S angle iron post 1½"x1½"x3/16" embedded in base of PCC (1:2:4) (4"x4"x9") @ 4' apart i/c the cost of 2 No. bars 3/8" dia welded horizontally with angle iron posts , binding wire, painting of posts, etc. complete in all respects as approved and directed by the Engineer incharge. (ii) 18 " diameter	Per Rft	900		
26/47	Providing and fixing hot dipped Galvanized Iron chain link mesh/fence of 2"x2"mesh made of wire of specified gauge, with the help of 1"x1/8" GI patti, GI. Clamps and screws, i/c the cost of 3 nos 8 SWG GI tie wires penetrated through mesh at top, middle and bottom, fixed on vertical posts of 2" diameter GI pipes (medium quality) erected @ 8 ft C/C duly embedded in PCC(1:2:4) etc. complete in all respect as approved and directed by the Engineer Incharge (i) 8 SWG	Per Sft	7200		
Sub Total (C)					-
Total (A+B+C)					-

SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA				
SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA	Meter Ref No:	24 11412 2201202U	Sanction Load (KWp):	190
	Annual Kw/hr-Units Generated through PV	1635200	Annual Kw/hr-Units Consumed	1109600
	Area Available Sqft	40,550	Proposed Solar PV Capacity	280Kw
Est. Annual Savings PKR (M)				

PV DESIGN					
Design, Supply, Installation and One Year O&M of Roof Top / Ground Mounted Grid Tie Solar PV System					
Location: Disposal Works at 1/4L MC OKARA					
Solar PV Generation Capacity:			280 KW	16,220	
Ser	Description	Quantity	UoM	Unit rate	Total Price
1	PV Modules & Power Generation System				
1.1	Solar Modules N-type, Bi-facial, TOPCON 575-580W) A grade, Tier-1 (Bloomberg) Model/Make: Longi, Risen, JA, Jinko, Huasun or equivalent Maximum Module Efficiency: 22% or above First Year Power Degradation: 2% or less Product Warranty: 10 Years or more Linear output warranty: 25 years or more	280,000	Wp		
1.2	Inverter (Grid-Tied) Huwaei sun 2000 or equilant 115 KW Max Input Power (KW): According to requirement of BoQ), accumulative capacity of Inverter Must be equal or greater than Total PV Capacity Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories Efficiency: 98% Peak Rated Power @ 400 V, 50Hz: KW Minimum (As per BOQ) Standby power consumption: less than 10W Warranty: 5 Years replacement or more Nominal AC Voltage: 3c, 230/400 VAC 50Hz Protection: Ground Fault Protection, Leakage Protection LVRT: Grid Frequency under/over \\ Ingress protection rating: IP65 or above	3	Set		
1.3	PV-Genset Controller	1	Job		
1.4	Cable for Interconnection (DC)(UV Protected XLPE)	1	Job		
1.5	PV Combiner Boxes with DC Breakers / Fuses , SPD's etc. for string protections	1	Job		
2	AC Termination & Accessories				
2.1	LT Termination				
2.1.1	Secondary Comprehensive Protection Cabinet	1	Set		
2.1.2	Low Voltage Switchgear Cabinet	1	Set		
2.1.3	AC Combiner Breakers for MCCB	1	Set		
2.1.4	AC Combiner Breakers for ACB	1	Set		
3	Fabricated Items				
3.1	Mounting Structure Hot dip galvanized with specification of thickness and nut/bolt/wahers,mid clamps,end clamps,rafters,purlins,columns and braces Material: Mountings for Standard Roof Structure made of Aluminum with at least 15-degree tilt (or as per site requirement) designed at wind speed of 33 m/s/120kmph. Structure as per Configuration P1/L2. Installation: Complete Installation Including Excavation 2 feet below ground level and 1 feet above ground with 1:2:4 PCC Civil Work for each Mounting	487	Job		
3.2	Cable Tray	1	Job		
3.3	Distribution Boxes	1	Job		
4	Cable & Accessories				

4.1	AC Cables for Inverter Interconnection xx sqmm,4 core, Armored	1	Set		
4.2	AC Cable for Combined Output xx sqmm,4 Core, Armored	1	Set		
4.3	Installation Material (cable Ducts etc.)	1	Set		
5	Earthing/ Grounding System / ATS Panels				
5.1	Earthing for PV Solar System complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2-ohm max resistance the item includes (2 copper electrodes 15mm ² driven into ground, manholes with iron cover, earth joints, clamps, ducts, conduits and 25 mm ² flexible earthing copper wires and cables (Yellow/Green) from the PV system components to the electrode to complete the system as specifications and supervisor engineer instructions and approval.	1	Job		

5.2	Earthing System For Inverter / WAPDA / Generator Set Neutral Complete independent earthing system for Inverter / WAPDA / Generator Set Neutral must be separated of the main earthing system to obtain 2-ohm max resistance. the item includes (2 copper electrodes 15mm2 driven into ground, manholes with iron cover, earth joints, clamps, ducts, conduits and 50 mm2 flexible earthing copper wires and cables from the Neutral bus bar in the Main Distribution box to the electrode to complete the system as specifications and supervisor engineer instructions and approval.	1	Job		
5.3	Lightening Arrester (5 spoke 1m long copper with ground earthing)	10			
5.4	Surge protection device of appropriate short circuit capacity to secure the overall AC system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories	12	Set		
5.5	Grounding Flat Iron, Grounding Network for the plant Area, Power distribution Room, HV power Distribution room	1	Job		
5.6	Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two 4 poles contactors of appropriate capacity complete with (Mechanical & electrical Interlock) all needed ACU control fittings such timers, relays, undervoltage. with all needed fittings and accessories to get job ready.	1	Job		
5.7	Phase Failure Protection 3ph. Failure, loss of phase, under voltage, over voltage and phase sequence relay (LRST), adjustable type with four poles contactor 4*100A and all needed protection devices, control devices and accessories	1	Job		
6	Remote Monitoring & Data Acquisition System				
6.1	Contractor Shall Provide the access of Remote Monitoring Mobile App and Server from the Inverter Manufacturer for real time monitoring, Data Logging	1	Job		
7	Services				
7.1	Project Design & Execution	1	Job		
7.2	Erecting of Mechanical Mounting Structure	1	Job		
7.3	Installation, testing and Commissioning of Solar System	1	Job		
7.4	Operations and Maintenance "O&M" Services (1 Year)	1	Job		
7.5	Load Flow Study (Required for Net- Metering)	1	Job		
7.6	Net-Metering Process (Including Equipment, Fee, Approvals, Documentation, Inspection)	1	Job		
7.7	SCADA System	1	Job		
Amount of PV system complete in all respect Sub total A					

8 Area Lighting					
Ser.	Description	Quantity	Quantity	UoM	Total Price
8.1	Supply, transportation at site, storage, installation, testing and commissioning of the following items of work (unless specifically stated otherwise) including all material, labour, tools and accessories etc. required for proper completion of each item as per specification and drawings and/or as directed by the Engineer.				
Road / Street Lighting Poles and Foundations					
8.2 C24/71A	10 m high single arm conical octagonal (hot dip) galvanized steel pole with extension arm luminaire arrangement, base plate, 2Amp., (RC=10KA) circuit breaker, terminal blocks including end caps, base connection plates & end stopper etc. as shown on drawing.	5.00		Each	
a	Road Lighting Pole Foundation (Bitumen Coating)	5.00		Each	
LED Road Light Fixtures					
8.3 C-24/72	Supplying, installation and commissioning of LED Cobra-head Luminaries of specified wattage and lumens conforming to IP 66 & IK 08 or above Philips/Osram/Thorn or NEECA approved equivalent manufacturer with corrosion resistant die casted Aluminum housing, silicon gasket in special groove, UV stable & scratch resistant synthetic materials, thermally hardened glass complete with LED Chip (Philips Lumiled/Cree/Nichia/Osram make or equivalent approved manufacturer), programmable LED driver (Harvard/TCI/Lumotech/Philips/VOSSLOH Schwabe/Lightech make or approved equivalent manufacturer), minimum 10kV surge protection rating device/c the cost of all accessories/components required for proper operation, fully flexible for future upgradation and easy replacements for maintenance purposes, bucket elevator charges as approved and directed by the Engineer Incharge. 140 Lm/watts				
	60 Watt with 8400 lumens	3.00		Each	
	120 Watt with 16800 Lumens	1.00		Each	
	180 Watt with 25200 Lumens	1.00		Each	
Conduits / Pipes					
8.4	PVC pipe/conduit with accessories suitable for laying multi-core cables on road crossings.				
a	100 mm Class-B (Pole to pole)	2,201.16		Rft	
Power Cables					
8.5 C-24/15	Supply and erection of Four Core 25 mm sq (19/0.052") non-armoured XLPE insulated, PVC Sheathed copper conductor cables 600/1000 volts, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing a capping/G.I. wire/trenches (rate for cables only):-	970.60		Rft	
8.6 C-24/15	Supply and erection of Four Core 50 mm sq (19/0.072") non-armoured XLPE insulated, PVC Sheathed copper conductor cables 600/1000 volts, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing a capping/G.I. wire/trenches (rate for cables only):-	800.63		Rft	
8.7 C-24/10c	Supply and erection of single core 16 mm sq (7/0.064") PVC insulated copper conductor cables, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing a capping/G.I. wire/trenches (rate for cables only):-	2,021.85		Rft	
8.8 C-24/10c	Supply and erection of single core 25 mm sq (19/0.052") PVC insulated copper conductor cables, in prelaid PVC pipe/M.S. conduit/G.I pipe/wooden strip batten/wooden casing a capping/G.I.wire/trenches (rate for cables only):-	864.25		Rft	

8.9	3 Nos. 1 core 2.5 mm ² (Red+Black+Green) Cu. PVC 450/750 Volt grade copper cable including connections at ends. The cables shall be drawn from junction box to the light fitting through hollow of the pole (for street light pole). (Imported copper shall be used. Verified documentary evidence for source of copper & PVC shall be furnished prior to manufacturing)				
8.10	40 Rft. cable is required for each pole and the unit is taken as No.				
	Price per No.	5.00	Each		

	<u>Lighting Control Panels</u>				
8.11	Road lighting control panel (LCP) with angle iron frame clad 16 SGW, sheet steel enclosure having high quality powder coated paint. The LCP shall be complete with incoming and outgoing MCCBs, Cu busbars, magnetic contactors, photo-electric switches, meters, indication lights, 16 SWG sheet steel construction with IP 43 protection class, door, locking arrangement etc. and all other accessories as required for quality work.	2.00	Each		
a	<u>LCP Description</u>				
	1 No. incoming 63Amp.(adjust.) TP, MCCB, 25 kA, Icu=100%Ics				
	4 Nos. outgoing 16 Amp.(Adj.) TP MCCBs, 18 kA, Icu=100%Ics				
	2 No. spare 16 Amp. (Adj.) TP MCCBs, 18 kA, Icu=100%Ics				
	4 Nos. 26 Amp. magnetic contactor, AC-3 2 No. spare 26 Amp. magnetic contactor , AC-3				
	3 Nos. photo-electric switches				
	a) 1 No. ammeters 0-40 Amp., with selector switch (04 position) and CT of 50/5 Amp				
	b) 09 Nos. indication lights				
	c) 1 No. voltmeter with fuse and 7 position selector switch.				
	d) 3 Ph, N & Earth copper busbars				
	e) Internal wiring & line-up terminals etc.				
	f) Brass cable glands/accessories				
	g) 3 Nos. Auto-Manual-OFF (3 position switches for operation in auto (with photocell) and normal (manual mode- photocell override) h) Panel steel grid painted alongwith locking arrangement i) IP =44/54 panel shall be weather proof, dust proof with studded and shade arrangement on top.				
	Supplying ,Installation and commissioning of MCCB (Moulded Case Circuit Breaker) of specified rating made of LEGRAND FRANCE/ GE U.S.A / SCHNEIDER GERMANY / TERASAKI JAPAN/SIEMEN/ABB SWITZERLAND or approved equivalent manufacturer (with fixed ThermalMagnetic Trip) in pre-laid DBs and Panels i/c the cost of screws, necessary wire complete in all respect as approved and directed by the Engineer Incharge 15-63 Amp(7.5 KA)	5.00	Each		
	<u>Earthing Rod</u>				
8.12	Earth point comprising of 10 ft. 5/8" dia. (16 mm dia) copper coated M.S. rods driven in ground near each lighting control panel and civil works as per drawings The earthing rods shall be completed with fixing clamps etc.	3.00	Each		
				Sub Total (B) :	

8		Fencing			
MRS Ref	Description	Unit	Quantity	Rate	Cost (Rs.)
26/46	Providing and fixing anti climb high security galvanized razor cut wire having double sharp four U-shaped pointed 0.5 mm thick (22mmx15 mm barbs) spaced @ 33 mm c/c clad over 2.5 mm dia high tensile Core wire making coil fencing of specified diameter @ 4" c/c fixed on 2'-3" high M/S angle iron post 1½"x1½"x3/16" embedded in base of PCC (1:2:4) (4"x4"x9") @ 4' apart i/c the cost of 2 No. bars 3/8" dia welded horizontally with angle iron posts , binding wire, painting of posts, etc. complete in all respects as approved and directed by the Engineer incharge. (ii) 18 " diameter	Per Rft	850		
26/47	Providing and fixing hot dipped Galvanized Iron chain link mesh/fence of 2"x2"mesh made of wire of specified gauge, with the help of 1"x1/8" GI patti, GI. Clamps and screws, i/c the cost of 3 nos 8 SWG GI tie wires penetrated through mesh at top, middle and bottom, fixed on vertical posts of 2" diameter GI pipes (medium quality) erected @ 8 ft C/C duly embedded in PCC(1:2:4) etc. complete in all respect as approved and directed by the Engineer Incharge (i) 8 SWG	Per Sft	6800		
Sub Total (C)					-
Total (A+B+C)					-

SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA				
SOLARIZATION OF DISPOSAL STATIONS IN MC OKARA	Meter Ref No:	28 15312 0203500 U	Sanction Load (KWp):	45
	Annual Kwahr-Units Generated through PV	233,600	Annual Kwahr-Units Consumed	175200
	Area Available Sqft	4,000	Proposed Solar PV Capacity	60
			Est. Annual Savings PKR (M)	

PV DESIGN					
Design, Supply, Installation and One Year O&M of Roof Top / Ground Mounted Grid Tie Solar PV System					
Location: New waste water treatment plant(WWTP)					
Solar PV Generation Capacity:			60 Kw		
Ser	Description	Quantity	UoM	Unit rate	Total Price
1	PV Modules & Power Generation System				
1.1	Inverter (Grid-Tied) Huwaei sun 2000 or equilant 115 KW Max Input Power (KW): According to requirement of BoQ), accumulative capacity of Inverter Must be equal or greater than Total PV Capacity Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories Efficiency: 98% Peak Rated Power @ 400 V, 50Hz: KW Minimum (As per BOQ) Standby power consumption: less than 10W Warranty: 5 Years replacement or more Nominal AC Voltage: 3c, 230/400 VAC 50Hz Protection: Ground Fault Protection, Leakage Protection LVRT: Grid Frequency under/over \ Ingress protection rating: IP65 or above	60,000	Wp		
1.2	Inverter (Grid-Tied) Huwaei sun 2000 or equilant 115 KW Max Input Power (KW): According to requirement of BoQ), accumulative capacity of Inverter Must be equal or greater than Total PV Capacity Type of Inverter: Grid-Tied, 3 phases, WAPDA/Gen.sync, With WiFi Dongle and Data Logger for Remote Monitoring & All Allied Accessories Efficiency: 98% Peak Rated Power @ 400 V, 50Hz: KW Minimum (As per BOQ) Standby power consumption: less than 10W Warranty: 5 Years replacement or more Nominal AC Voltage: 3c, 230/400 VAC 50Hz Protection: Ground Fault Protection, Leakage Protection LVRT: Grid Frequency under/over \ Ingress protection rating: IP65 or above	1	Set		
1.3	PV-Genset Controller	1	Job		
1.4	Cable for Interconnection (DC)(UV Protected XLPE)	1	Job		
1.5	PV Combiner Boxes with DC Breakers / Fuses , SPD's etc. for string protections	1	Job		
2	AC Termination & Accessories				
2.1	LT Termination				
2.1.1	Secondary Comprehensive Protection Cabinet	1	Set		
2.1.2	Low Voltage Switchgear Cabinet	1	Set		
2.1.3	AC Combiner Breakers for MCCB	1	Set		
2.1.4	AC Combiner Breakers for ACB	1	Set		
3	Fabricated Items				
3.1	Mounting Structure Hot dip galvanized with specification of thickness and nut/bolt/wahers,mid clamps,end clamps,rafters,purlins,columns and braces Material: Mountings for Standard Roof Structure made of Aluminum with at least 15-degree tilt (or as per site requirement) designed at wind speed of 33 m/s/120kmph. Structure as per Configuration P1/L2. Installation: Complete Installation Including Excavation 2 feet below ground level and 1 feet above ground with 1:2:4 PCC Civil Work for each Mounting	105	Job		

3.2	Cable Tray	1	Job		
3.3	Distribution Boxes	1	Job		
4	Cable & Accessories				
4.1	AC Cables for Inverter Interconnection xx sqmm,4 core, Armored	1	Set		
4.2	AC Cable for Combined Output xx sqmm,4 Core, Armored	1	Set		
4.3	Installation Material (cable Ducts etc.)	1	Set		
5	Earthing/ Grounding System / ATS Panels				
5.1	Earthing for PV Solar System complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2-ohm max resistance the item includes (2 copper electrodes 15mm2 driven into ground, manholes with iron cover, earth joints, clamps, ducts, conduits and 25 mm2 flexible earthing copper wires and cables (Yellow/Green) from the PV system components to the electrode to complete the system as specifications and supervisor engineer instructions and approval.	1	Job		
5.2	Earthing System For Inverter / WAPDA / Generator Set Neutral Complete independent earthing system for Inverter / WAPDA / Generator Set Neutral must be separated of the main earthing system to obtain 2-ohm max resistance. the item includes (2 copper electrodes 15mm2 driven into ground, manholes with iron cover, earth joints, clamps, ducts, conduits and 50 mm2 flexible earthing copper wires and cables from the Neutral bus bar in the Main Distribution box to the electrode to complete the system as specifications and supervisor engineer instructions and approval.	1	Job		
5.3	Lightening Arrestor (5 spoke 1m long copper with ground earthing)	5	job		
5.4	Surge protection device of appropriate short circuit capacity to secure the overall AC system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories	2	Set		
5.5	Grounding Flat Iron, Grounding Network for the plant Area, Power distribution Room, HV power Distribution room	1	Job		
5.6	Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two 4 poles contactors of appropriate capacity complete with (Mechanical & electrical Interlock) all needed ACU control fittings such timers, relays, undervoltage. with all needed fittings and accessories to get job ready.	1	Job		
5.7	Phase Failure Protection 3ph. Failure, loss of phase, under voltage, over voltage and phase sequence relay (LRST), adjustable type with four poles contactor 4*100A and all needed protection devices, control devices and accessories	1	Job		
6	Remote Monitoring & Data Acquisition System				
6.1	Contractor Shall Provide the access of Remote Monitoring Mobile App and Server from the Inverter Manufacturer for real time monitoring, Data Logging	1	Job		
7	Services				
7.1	Project Design & Execution	1	Job		
7.2	Erecting of Mechanical Mounting Structure	1	Job		
7.3	Installation, testing and Commissioning of Solar System	1	Job		
7.4	Operations and Maintenance "O&M" Services (1 Year)	1	Job		
7.5	Load Flow Study (Required for Net- Metering)	1	Job		
7.6	Net-Metering Process (Including Equipment, Fee, Approvals, Documentation, Inspection)	1	Job		
7.7	SCADA system	1	Job		
Amount of PV system complete in all respect Sub total A					

8		Fencing			
MRS Ref	Description	Unit	Quantity	Rate	Cost (Rs.)
26/46	<p>Providing and fixing anti climb high security galvanized razor cut wire having double sharp four U-shaped pointed 0.5 mm thick (22mmx15 mm barbs) spaced @ 33 mm c/c cladded over 2.5 mm dia high tensile Core wire making coil fencing of specified diameter @ 4" c/c fixed on 2'-3" high M/S angle iron post 1½"x1½"x3/16" embedded in base of PCC (1:2:4) (4"x4"x9") @ 4' apart i/c the cost of 2 No. bars 3/8" dia welded horizontally with angle iron posts , binding wire, painting of posts, etc. complete in all respects as approved and directed by the Engineer incharge.</p> <p>(ii) 18 " diameter</p>	Per Rft	300		
26/47	<p>Providing and fixing hot dipped Galvanized Iron chain link mesh/fence of 2"x2"mesh made of wire of specified gauge, with the help of 1"x1/8" GI patti, GI. Clamps and screws, i/c the cost of 3 nos 8 SWG GI tie wires penetrated through mesh at top, middle and bottom, fixed on vertical posts of 2" diameter GI pipes (medium quality) erected @ 8 ft C/C duly embedded in PCC(1:2:4) etc. complete in all respect as approved and directed by the Engineer Incharge</p> <p>(i) 8 SWG</p>	Per Sft	2400		
Sub Total (B)					
Total (A+B)					-

TRANSFORMER

Ser	Description	Quantity	UoM	Unit rate	Total Price
1	Transformer				
1.1	<p>Supply, insatllation, commissioning and testing of oil cooled type, Step down Power Transformer polemounted of specified rating,11/0.415 kV, i/c thecost of lifting hooks, thermometers, LT & HT bushing 5-steps, tap changer, imported double float buchholz relay, 2 earthing terminals, roller wheels, connecting terminals for cables M.S box on transformer in order to cover complete L.T side, all necessary materials required for connections on H.T & L.T side, rated voltage 11000/415/240 V specified impedance as specified by WAPDA/IEC system earth: Delta / Star, neutral solidly earthed, i/c Wapda testing charges,complete in all respects made of PEL, Siemens, Transfopower, Elmetec or as approved and directed by the Engineer Incharge.</p> <p>a) 4% impedance without buchholz relay (ix) 630 KVA</p>	1	Each		

Estimated Environmental and Social Mitigation Plan Implementation cost

Item	Quantity	Tentative Cost/Item- PKR. /-	Total Cost
A-PPEs for Health and Safety of Labor/Workers			
Face Masks (3 PLY) - box	8		
Safety Hard Helmets	12		
Harness belts	12		
Safety Shoes (Steel Shoes +Long Shoes)	12		
Hand Gloves	12		
Ear Plugs	12		
Reflective Safety Vest	12		
Safety Goggles	12		
Safety Signage	6		
Plantation Cost	1		
Total (PKR)			

ترقیاتی منصوبوں کی تعمیر و مرمت کے دوران کام کرنے والے
مزدوروں، ورکرز، (بشمول خواتین لیبر / ورکرز) کی صحت، حفاظت
اور ماحول کے لئے معیاری اصول و ضوابط درج ذیل پالیسیز،
قوانین اور نوٹیفیکیشنز کا تجزیہ کر کے تجویز کئے گئے ہیں۔

- ◆ The Punjab Occupational Health & Safety Act, 2019
- ◆ General Environment, Health & Safety (EHS) Guidelines by International Finance Corporation (IFC), World Bank
- ◆ International Labour Standards of International Labour Organization (ILO)
- ◆ Punjab Tehsil/Town Municipal Administration (Works) Rules 2003 (Amendments 2016)
- ◆ The Punjab Restriction on Employment of Children Act, 2016
- ◆ The West Pakistan Maternity Benefit Ordinance, 1958
- ◆ ESF/Safeguards Interim Note: COVID-19 Considerations in Construction / Civil Works Projects - World Bank Guidelines
- ◆ Health & safety SOPs for Construction Workers/Sector for COVID 19
- ◆ Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974





📍 184 Scotch Corner, behind NIPA Building,
Upper Mall, Lahore, Punjab 54000

☎ (042) 99204386

🌐 www.pmdfc.org.pk

Disposal Stations/ Tubewells	Sanctioned Load as per latest Bill Kw	Solar Capacity Kw	Available space S.ft.
1.Disposal works at 2/4L		575 Kw	45,000
2.Disposal works at 1/4L	190	280 Kw	40,550
3WWTO	45	60 Kw	4,000

Environmental & Social Screening Checklist

Instructions:

Environmental and Social Focal Persons (ESFPs)¹ nominated by the MCs for PCP environmental and social management, will use this checklist in field for environmental and social screening and categorization of each sub-project proposed to be executed under the Program.

Deputy Program Officers-Environmental and Social Management deputed by PMDFC in regional offices will technically assist and support the ESFPs/MCs in filling in of this Checklist.

It is to be attached with the main document² of sub-projects at planning stage and will be duly signed by the relevant ESFP and endorsed by the respective DPO-ESM.

This checklist focuses on environmental issues and social concerns. To ensure that social dimensions are adequately considered, an Involuntary Resettlement Screening Checklist will also be used.

(iii) The purpose of this E&S Screening Checklists is to identify potential “Negative” impacts of environmental and social attributes or to enhance the existing environmental & social benefits. Use the “remarks” section to discuss any anticipated mitigation measures.

Name of ESFP:	Hafiz Talat Mahmood MO (I& S)	
Name of MC:	Okara	
Sub-Project Sector:	Liquid Waste	
Sub-Project Title:	Solarization of Disposal Stations in MC Okara	
Sub- Project Categorization:	E-1	S-1
	E-2	S-2
	E-3	S-3
Date of Screening:	29-04-2024	
Anticipated Project Activities	Solarization of Disposal works Disposal Works 2/4 L (575 kW)	

¹ In all MCs, ESFPs are notified by Local government; MO (I&S) are focal persons for environmental sector and MO(P) are focal persons for social sectors.

Estimated Cost of Subprojects	178.35 million
Completion Time/Duration	9 moths

CHECKLIST

Screening Questions	Yes	No	Remarks
A. Project Siting			
Is the Sub-Project area adjacent to or within any of the following?			
Environmentally sensitive areas?			
Legally protected Area		✓	No legally protected Area involved
Any surface water body (river, canal, stream, lake, wetland) within 250 meters of the proposed sub project		✓	No water body observed within 250 meters of proposed sub-project area
Estuarine		✓	Not observed
Special area for protecting biodiversity		✓	Not observed in sub project area
Buffer zone of protected area		✓	Not observed in sub project area
Mangroves Forest		✓	Not observed in sub project area
Man-made forest /game reserve, orchid /crops or any other area of environmental importance		✓	Not observed
Socially sensitive /important areas/communities/ people?			
Physical Cultural Resources (PCRs) and or any site of cultural/religious importance (Graveyard, Shrine, Mosque, Church, Gordwarah, Temple, Fort, archeological/historical site) within 100 m of the proposed subproject		✓	No PCR observed within 100 meter of proposed sub project
Sensitive receptors (Schools, colleges, Shrine, Mosque, Church, hospitals and clinics) within 100 meters of the proposed sub project		✓	Not observed

Any graveyard of local community (Muslims or Christians)		✓	Not observed
Any demographic or socio-economic aspects of the subproject area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, squatters, ethnic minorities, people with disabilities, people in old age, socially isolated segments of the society and women or children)?		✓	Not observed within sub project area
Already existing infrastructure (including public amenities) which may be required to dismantle or may be affected temporarily by any means?		✓	No infrastructure would be dismantled
B. Potential Environmental Impacts: Will the Sub-Project cause...			
1. Disturbance to habitats/biodiversity of environmentally sensitive or protected areas?		✓	Sub project will not affect protected area
2. Cutting of trees?		✓	Not involved, at site small plants are present if plants are required to remove then it will be replanted at site.
3. Disruption to habitats/biodiversity of surrounding ecosystem/environment?		✓	No significant adverse impacts on environment

4. Generation of wastewater during construction or operation?		✓	No wastewater will be generated by the subproject, However for Concrete wastewater and slurry The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete wastewater or slurry
5. Pollution of surface water/ground water due to wastewater discharge from construction site or due to direct/indirect disposal of wastewater?		✓	Subproject will not cause any pollution

6. Alteration of surface water hydrology of waterways resulting in increased sediment in streams/rivers or due to increased soil erosion at construction site?		✓	Not applicable
7. Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction.		✓	Subproject would not deteriorate surface water quality
8. Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not observed
9. Serious contamination of soil due to construction works?		✓	Not observed
10. Aggravation of solid waste problems in the area?	✓		Packing material of solar panels and other equipment will be generated. The solid waste need to be properly disposed.
11. Generation of hazardous waste?	✓		Proper handling would be required in case e-waste generated from accidental breakage of solar panels during installation. Also, proper handling would be required for hazardous waste (chemicals) from solar batteries
12. Increased air pollution due to sub-project construction and operation?		✓	No such impacts observed
13. Noise and vibration due to sub-project construction or operation?		✓	No such impacts are envisaged
14. Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents due to solid/liquid?	✓		Haulage of materials and Equipment may cause temporary hinderance in traffic. • Hours of haulage shall be regulated to avoid peak time traffic and night hours.
15. Use of chemicals during construction?	✓		Proper handling and storage of chemicals are essential to prevent spills and accidents. This

			includes storing chemicals in appropriate containers, labeling them correctly, and ensuring that they are stored in a secure location away from potential sources of ignition or contamination.
C: Potential Social Impacts			
Will the Sub-Project cause...			
1. Impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to Physical Cultural Resources (PCRs)?		✓	No impairment/damage to any PCR envisioned
2. Displacement or involuntary resettlement of people? (physical displacement and/or economic displacement) (If "Yes", please also fill Involuntary Resettlement Screening Checklist)		✓	Not observed
3. Disproportionate impacts on the poor, women, and children and or other vulnerable groups ² (mentioned above)?		✓	No impacts are envisaged
4. Temporary impediments in movements of people/transport and animals?		✓	No such impacts are envisaged
5. Large population influx during sub-project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Not anticipated
6. Social conflicts if workers from other areas are hired.		✓	Not applicable
7. Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		PPEs would be required for workers. Specialized electrical PPEs would be required for persons working on electrical components

² Women, Children, Women headed households, People in old age, people having disabilities, socially isolated community groups and or people living below the poverty line.

<p>8. Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel, and other chemicals during construction and operation?</p>	<p>✓</p>	<p>Store materials in designated areas that are properly ventilated, secure, and equipped with spill containment measures.</p> <p>Engage with the local community and inform them about the project, potential risks, and safety measures. Worker Safety during Installation and Maintenance in Windy weather.</p> <p>Workers responsible for cleaning and maintenance tasks may be exposed to airborne contaminants during these activities. Implementing appropriate respiratory protection, personal protective equipment (PPE), and safe work practices can help minimize exposure risks and protect workers' health</p>
<p>9. Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation, and decommissioning.</p>	<p>✓</p>	<p>There can be some community safety risks in a solarization project due to accidental or natural causes like any injury to the community members and direct impacts to the environment around project area can affect community. However, installation of solar plates will be carried out inside the MC owned buildings already used for disposal stations and are away from the population and community.</p> <p>For the safer approach, likelihoods impacts can be mitigated by:</p> <ol style="list-style-type: none"> 1. Implementing robust structural design and regular maintenance to prevent accidents. 2. Regular monitoring and emergency response plans to address natural disasters. 3. Security measures and public awareness to minimize access.

			4. Proper fire safety measures and decommissioning plans in place
10. Any impact on sensitive receptors (mentioned above)		✓	Not observed
11. Any impact of negative nature on already existing infrastructure including public amenities		✓	Not observed

<p>Endorsed By: Name: Hafiz Tallat Mahmood Designation: MO (I&S) Organization: MC Okara Signature Date: 29-04-2024</p>	<p>Prepared By: Name: Siddique Shahid Designation: Deputy Program Officer ESM Organization: PMDFC Signature: Date: 29-4-2024</p>
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**INVOLUNTARY RESETTLEMENT SCREENING
CHECKLIST**

ESFP: Sheren Newton MO (P)

Name of City/MC/LG: Okara

Sub-Project Sector: Liquid Waste

Sub-Project Title: Solarization of Disposal Stations in Okara 24/L

Sub- Project Categorization: E-3 & S-3

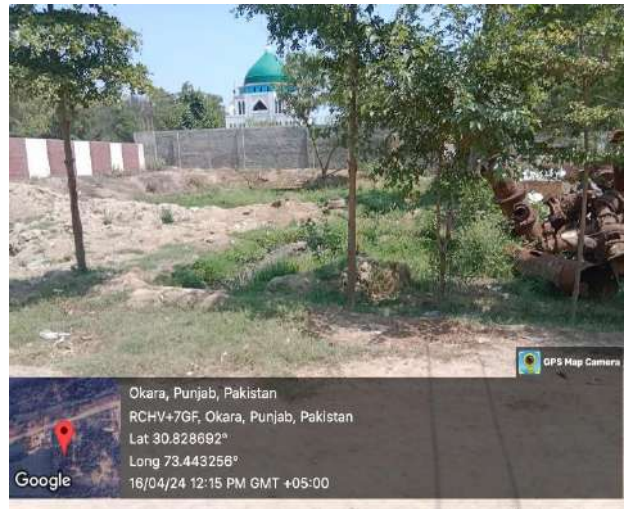
Date of Screening: 29-4-2024

SECTION 1	Yes	No	Expected	Remarks
Does the project require land acquisition? Yes/No		✓		No Land acquired for this sub project. Solar equipment will be installed in the buildings already in possession of MC and have disposal stations owned by MC.
If yes, then describe the type of land being acquired from the categories below:		✓		
Has any AED been conducted at the proposed location by the government? Yes/No		✓		This project is proposed on MC owned land.
Land (Quantify and describe types of land being acquired in "remarks column".		✓		
Government and LG owned land free of occupation (agriculture or settlement)		✓		No land acquired for this sub project
Government or state-owned land (other than LG) free of occupation (agriculture or settlement)		✓		
Private land		✓		
Residential		✓		
Commercial		✓		
Agricultural		✓		
Communal		✓		
Others (specify in "remarks").		✓		Already land owned by govt
Name of owner/owners and type of ownership document if available.		✓		
If land is being acquired, describe any structures constructed on it		✓		
Land-based assets:		✓		
Residential structures		✓		
Commercial structures (specify in "remarks")		✓		

Community structures (specify in "remarks")		✓		
Agriculture structures (specify in "remarks")		✓		
Public utilities (specify in "remarks")		✓		Already land owned by MC
Others (specify in "remarks")		✓		
If agricultural land is being acquired, specify the following:		✓		
Agriculture related impacts		✓		
Crops and vegetables (specify types and cropping area in "remarks").		✓		
Trees (specify number and types in "remarks").		✓		
Others (specify in "remarks").		✓		
Affected Persons (APs)		✓		No persons will be affected during this sub project
Will any people be displaced from the land when acquired? Yes/No		✓		
Number of APs		✓		
Males		✓		
Females		✓		
Titled landowners		✓		
Tenants and sharecroppers		✓		
Leaseholders		✓		
Agriculture wage laborers		✓		
Encroachers and squatters (specify in remarks column)		✓		
Vulnerable APs (e.g. women headed households, minors and aged, orphans, disabled persons, and those below the poverty line). Specify the number and vulnerability in "remarks".		✓		
Others (specify in "remarks")		✓		

<p>Endorsed By:</p> <p>Name: Sheren Newton</p> <p>Designation: Municipal Officer Planning (MOP)</p> <p>Organization: MC Okara</p> <p>Signature</p> <p>Date: 29-04-2024</p>	<p>Prepared By:</p> <p>Name: Hassan Ali</p> <p>Designation: Deputy Program Officer ESM</p> <p>Organization: PMDFC</p> <p>Signature:</p> <p>Date: 29-04-2024</p>
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Pictures:



Environmental & Social Screening Checklist

Instructions:

Environmental and Social Focal Persons (ESFPs)³ nominated by the MCs for PCP environmental and social management, will use this checklist in field for environmental and social screening and categorization of each sub-project proposed to be executed under the Program.

Deputy Program Officers-Environmental and Social Management deputed by PMDFC in regional offices will technically assist and support the ESFPs/MCs in filling in of this Checklist.

It is to be attached with the main document⁴ of sub-projects at planning stage and will be duly signed by the relevant ESFP and endorsed by the respective DPO-ESM

This checklist focuses on environmental issues and social concerns. To ensure that social dimensions are adequately considered, an Involuntary Resettlement Screening Checklist will also be used.

(iii) The purpose of this E&S Screening Checklists is to identify potential "Negative" impacts of environmental and social attributes or to enhance the existing environmental & social benefits. Use the "remarks" section to discuss any anticipated mitigation measures.

Name of ESFP:	Hafiz Tallat Mehmood MO (I& S)
Name of MC:	Okara
Sub-Project Sector:	Liquid Waste
Sub-Project Title:	Solarization of Disposal Stations in Okara City
Sub- Project Categorization:	E-1 S-1 E-2 S-2 E-3 S-3
Date of Screening:	29-04-2024
Anticipated Project Activities	Solarization of Disposal works at 1/4L (280 Kw)
Estimated Cost of Subprojects	178.35 million
Completion Time/Duration	9 moths

CHECKLIST

Screening Questions	Yes	No	Remarks
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³ In all MCs, ESFPs are notified by Local government; MO (I&S) are focal persons for environmental sector and MO(P) are focal persons for social sectors.

⁴ It is meant as PC-I and/or engineering estimates of sub-project.

A. Project Siting			
Is the Sub-Project area adjacent to or within any of the following?			
Environmentally sensitive areas?			
Legally protected Area		✓	No legally protected area within subproject area
Any surface water body (river, canal, stream, lake, wetland) within 250 meters of the proposed sub project		✓	Not observed
Estuarine		✓	Not observed
Special area for protecting biodiversity		✓	Not observed
Buffer zone of protected area		✓	Not observed
Mangroves Forest		✓	Not anticipated
Man-made forest /game reserve, orchid /crops or any other area of environmental importance		✓	Not observed within sub project area
Socially sensitive /important areas/communities/ people?			
Physical Cultural Resources (PCRs) and or any site of cultural/religious importance (Graveyard, Shrine, Mosque, Church, Gordwarah, Temple, Fort, archeological/historical site) within 100 m of the proposed subproject		✓	Not observed within sub project area
Sensitive receptors (Schools, colleges, Shrine, Mosque, Church, hospitals and clinics) within 100 meters of the proposed sub project		✓	
Any graveyard of local community (Muslims or Christians)		✓	Not observed
Any demographic or socio-economic aspects of the subproject area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, squatters, ethnic minorities, people with disabilities, people in old age, socially isolated		✓	

segments of the society and women or children)?			
Already existing infrastructure (including public amenities) which may be required to dismantle or may be affected temporarily by any means?		✓	No infrastructure would be dismantled
B. Potential Environmental Impacts Will the Sub-Project cause...			
1. Disturbance to habitats/biodiversity of environmentally sensitive or protected areas?		✓	Sub project will not affect any protected area
2. Cutting of trees?	✓		No tree cutting is involved
3. Disruption to habitats/biodiversity of surrounding ecosystem/environment?		✓	No observed

4. Generation of wastewater during construction or operation?		✓	No wastewater will be generated by the subproject However for Concrete wastewater and slurry The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete wastewater or slurry
5. Pollution of surface water/ground water due to wastewater discharge from construction site or due to direct/indirect disposal of wastewater?		✓	Subproject will not cause any pollution
6. Alteration of surface water hydrology of waterways resulting in increased sediment in streams/rivers or due to increased soil erosion at construction site?		✓	Not applicable
7. Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction.		✓	Sub project would not deteriorate surface water quality
8. Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not anticipated
9. Serious contamination of soil due to construction works?		✓	Not anticipated

10. Aggravation of solid waste problems in the area?	✓		Packing material of solar panels and other equipment will be generated. The solid waste need to be properly disposed
11. Generation of hazardous waste?	✓		Proper handling would be required in case e-waste generated from accidental breakage of solar panels during installation. Also, proper handling would be required for hazardous waste (chemicals) from solar batteries
12. Increased air pollution due to sub-project construction and operation?		✓	No anticipated
13. Noise and vibration due to sub-project construction or operation?		✓	No such impacts are envisaged
14. Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents due to solid/liquid?	✓		Haulage of materials and Equipment may cause temporary hinderance in traffic. • Hours of haulage shall be regulated to avoid peak time traffic and night hours.
15. Use of chemicals during construction?		✓	Proper handling and storage of chemicals are essential to prevent spills and accidents. This includes storing chemicals in appropriate containers, labeling them correctly, and ensuring that they are stored in a secure location away from potential sources of ignition or contamination.

C: Potential Social Impacts

Will the Sub-Project cause...

2. Impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to Physical Cultural Resources (PCRs)?		✓	No impairment/damage to any PCR envisioned as per scope
2. Displacement or involuntary resettlement of people? (physical displacement and/or economic displacement) (If "Yes",		✓	Not observed

please also fill Involuntary Resettlement Screening Checklist)			
3. Disproportionate impacts on the poor, women and children and or other vulnerable groups 5(mentioned above)?		✓	No impacts are envisaged in sub project area
4. Temporary impediments in movements of people/transport and animals?		✓	
5. Large population influx during sub-project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Not observed
6. Social conflicts if workers from other areas are hired.		✓	Not applicable
7. Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		Proper PPEs would be required for workers. Specialized electrical PPEs would be required for persons working on electrical components
8. Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel, and other chemicals during construction and operation?	✓		Store hazardous materials in designated areas that are properly ventilated, secure, and equipped with spill containment measures. Engage with the local community and inform them about the project, potential risks, and safety measures. Worker Safety during Installation and Maintenance in Windy weather. Workers responsible for cleaning and maintenance tasks may be exposed to airborne contaminants during these activities. Implementing appropriate respiratory protection, personal protective equipment (PPE), and safe work practices can help minimize exposure risks and protect workers' health

⁵ Women, Children, Women headed households, People in old age, people having disabilities, socially isolated community groups and or people living below the poverty line

<p>9. Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation, and decommissioning.</p>	✓		<p>There can be some community safety risks in a solarization project due to accidental or natural causes like any injury to the community members and direct impacts to the environment around project area can affect community.</p> <p>These impacts can be mitigated by:</p> <ol style="list-style-type: none"> 1. Implementing robust structural design and regular maintenance to prevent accidents. 2. Regular monitoring and emergency response plans to address natural disasters. 3. Security measures and public awareness to minimize access. <p>Proper fire safety measures and decommissioning plans in place</p>
<p>10. Any impact on sensitive receptors (mentioned above)</p>		✓	<p>Not observed</p>
<p>11. Any impact of negative nature on already existing infrastructure including public amenities</p>		✓	<p>Not observed</p>

<p>Endorsed By: Name: Hafiz Talat Mahmood Designation: MO (I&S) Organization: MC Okara Signature Date: 29-04-2024</p>	<p>Prepared By: Name: Siddique Shahid Designation: Deputy Program Officer ESM Organization: PMDFC Signature: Date: 29-04-2024</p>
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**INVOLUNTARY RESETTLEMENT SCREENING
CHECKLIST**

ESFP: Sheren Newton MO (P)

Name of City/MC/LG: Okara

Sub-Project Sector: Liquid Waste

Sub-Project Title: Solarization of Disposal Stations in Okara City

Sub- Project Categorization: E-3 & S-3

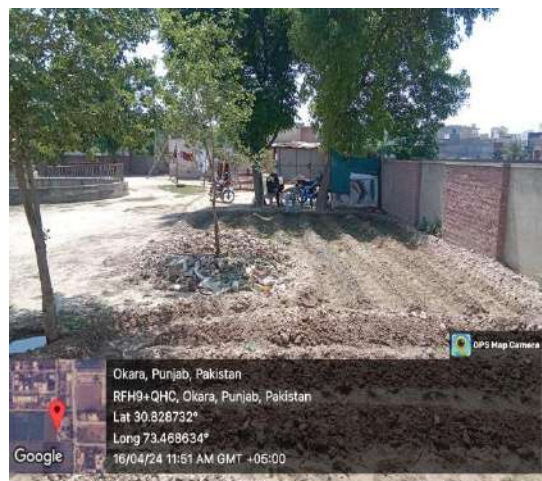
Date of Screening: 29-04-2024

SECTION 1	Yes	No	Expected	Remarks
Does the project require land acquisition? Yes/No		✓		No Land acquired for this sub project. Solar equipment will be installed in the buildings already in possession of MC and have disposal stations owned by MC
If yes, then describe the type of land being acquired from the categories below:		✓		
Has any AED been conducted at the proposed location by the government? Yes/No		✓		This project is proposed on MC owned land.
Land (Quantify and describe types of land being acquired in "remarks column".		✓		
Government and LG owned land free of occupation (agriculture or settlement)		✓		No land acquired for this sub project
Government or state-owned land (other than LG) free of occupation (agriculture or settlement)		✓		
Private land		✓		
Residential		✓		
Commercial		✓		
Agricultural		✓		
Communal		✓		

Others (specify in "remarks").		✓		Already land owned by govt
Name of owner/owners and type of ownership document if available.		✓		
If land is being acquired, describe any structures constructed on it		✓		
Land-based assets:		✓		
Residential structures		✓		
Commercial structures (specify in "remarks")		✓		
Community structures (specify in "remarks")		✓		
Agriculture structures (specify in "remarks")		✓		
Public utilities (specify in "remarks")		✓		Already land owned by govt
Others (specify in "remarks")		✓		
If agricultural land is being acquired, specify the following:		✓		
Agriculture related impacts		✓		
Crops and vegetables (specify types and cropping area in "remarks").		✓		
Trees (specify number and types in "remarks").	✓			No tree cutting is involved
Others (specify in "remarks").		✓		
Affected Persons (APs)		✓		No persons will be affected during this sub project
Will any people be displaced from the land when acquired? Yes/No		✓		
Number of APs		✓		
Males		✓		
Females		✓		
Titled landowners		✓		
Tenants and sharecroppers		✓		
Leaseholders		✓		
Agriculture wage laborers		✓		
Encroachers and squatters (specify in remarks column)		✓		
Vulnerable APs (e.g. women headed households, minors and aged, orphans, disabled persons, and those below the poverty line). Specify the number and vulnerability in "remarks".		✓		
Others (specify in "remarks")		✓		

Endorsed By:	Prepared By:
Name: Sheren Newton	Name: Muhammad Hassan Ali
Designation: Municipal Officer Planning (MOP)	Designation: Deputy Program Officer ESM
Organization: MC Okara	Organization: PMDFC
Signature	Signature:
Date: 29-04-2024	Date: 29-04-2024

Pictures:



Environmental & Social Screening Checklist

Instructions:

Environmental and Social Focal Persons (ESFPs)⁶ nominated by the MCs for PCP environmental and social management, will use this checklist in field for environmental and social screening and categorization of each sub-project proposed to be executed under the Program.

Deputy Program Officers-Environmental and Social Management deputed by PMDFC in regional offices will technically assist and support the ESFPs/MCs in filling in of this Checklist.

It is to be attached with the main document⁷ of sub-projects at planning stage and will be duly signed by the relevant ESFP and endorsed by the respective DPO-ESM

This checklist focuses on environmental issues and social concerns. To ensure that social dimensions are adequately considered, an Involuntary Resettlement Screening Checklist will also be used.

(iii) The purpose of this E&S Screening Checklists is to identify potential “Negative” impacts of environmental and social attributes or to enhance the existing environmental & social benefits. Use the “remarks” section to discuss any anticipated mitigation measures.

Name of ESFP:	Hafiz Tallat Mehmood (I& S)						
Name of MC:	Okara						
Sub-Project Sector:	Liquid Waste						
Sub-Project Title:	Solarization of Disposal Stations In Okara City						
Sub- Project Categorization:	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">E-1</td> <td style="width: 50%; border: none;">S-1</td> </tr> <tr> <td style="border: none;">E-2</td> <td style="border: none;">S-2</td> </tr> <tr> <td style="border: none;">E-3</td> <td style="border: none;">S-3</td> </tr> </table>	E-1	S-1	E-2	S-2	E-3	S-3
E-1	S-1						
E-2	S-2						
E-3	S-3						
Date of Screening:	27-10-2023						
Anticipated Project Activities	New Waste water treatment plant (WWTP) only lighting and office building (60 Kw)						
Estimated Cost of Subprojects	178.35 million						
Completion Time/Duration	9 months						

⁶ In all MCs, ESFPs are notified by Local government; MO (I&S) are focal persons for environmental sector and MO(P) are focal persons for social sectors.

⁷ It is meant as PC-I and/or engineering estimates of sub-project

CHECKLIST

Screening Questions	Yes	No	Remarks
A. Project Siting			
Is the Sub-Project area adjacent to or within any of the following?			
Environmentally sensitive areas?			
Legally protected Area		✓	No legally protected area within subproject area
Any surface water body (river, canal, stream, lake, wetland) within 250 meters of the proposed sub project		✓	Not observed
Estuarine		✓	Not observed
Special area for protecting biodiversity		✓	Not observed
Buffer zone of protected area		✓	Not observed
Mangroves Forest		✓	
Man-made forest /game reserve, orchid /crops or any other area of environmental importance		✓	
Socially sensitive /important areas/communities/ people?			
Physical Cultural Resources (PCRs) and or any site of cultural/religious importance (Graveyard, Shrine, Mosque, Church, Gordwarah, Temple, Fort, archeological/historical site) within 100 m of the proposed subproject		✓	Not observed within sub project area
Sensitive receptors (Schools, colleges, Shrine, Mosque, Church, hospitals and clinics) within 100 meters of the proposed sub project		✓	Not observed
Any graveyard of local community (Muslims or Christians)		✓	Not observed
Any demographic or socio-economic aspects of the subproject area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban		✓	

migrants, illegal settlements, squatters, ethnic minorities, people with disabilities, people in old age, socially isolated segments ⁸ of the society and women or children)?			
Already existing infrastructure (including public amenities) which may be required to dismantle or may be affected temporarily by any means?		✓	No infrastructure would be dismantled
B. Potential Environmental Impacts Will the Sub-Project cause...			
1. Disturbance to habitats/biodiversity of environmentally sensitive or protected areas?		✓	Sub project will not affect any protected area
2. Cutting of trees?	✓		no tree cutting is involved
3. Disruption to habitats/biodiversity of surrounding ecosystem/environment?		✓	No significant impact on environment

4. Generation of wastewater during construction or operation?		✓	No wastewater will be generated by the subproject However for Concrete wastewater and slurry The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete wastewater or slurry
5. Pollution of surface water/ground water due to wastewater discharge from construction site or due to direct/indirect disposal of wastewater?		✓	Subproject will not cause any pollution
6. Alteration of surface water hydrology of waterways resulting in increased sediment in streams/rivers or due to increased soil erosion at construction site?		✓	Not applicable
7. Deterioration of surface water quality due to silt runoff and sanitary wastes from		✓	Sub project would not deteriorate surface water quality

⁸ Due to caste, creed, religion or gender e.g. transgender

worker-based camps and chemicals used in construction.			
8. Over pumping of ground water, leading to salinization and ground subsidence?		✓	Not anticipated
9. Serious contamination of soil due to construction works?		✓	Not anticipated
10. Aggravation of solid waste problems in the area?	✓		Packing material of solar panels and other equipment will be generated. The solid waste need to be properly disposed
11. Generation of hazardous waste?	✓		Proper handling would be required in case e-waste generated from accidental breakage of solar panels during installation. Also, proper handling would be required for hazardous waste (chemicals) from solar batteries
12. Increased air pollution due to sub-project construction and operation?		✓	No anticipated
13. Noise and vibration due to sub-project construction or operation?		✓	
14. Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents due to solid/liquid?	✓		Haulage of materials and Equipment may cause temporary hinderance in traffic. <ul style="list-style-type: none"> Hours of haulage shall be regulated to avoid peak time traffic and night hours.
15. Use of chemicals during construction?		✓	Proper handling and storage of chemicals are essential to prevent spills and accidents. This includes storing chemicals in appropriate containers, labeling them correctly, and ensuring that they are stored in a secure location away from potential

			sources of ignition or contamination.
C: Potential Social Impacts			
Will the Sub-Project cause...			
3. Impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to Physical Cultural Resources (PCRs)?		✓	No impairment/damage to any PCR envisioned as per scope
2. Displacement or involuntary resettlement of people? (physical displacement and/or economic displacement) (If "Yes", please also fill Involuntary Resettlement Screening Checklist)		✓	Not observed
3. Disproportionate impacts on the poor, women, and children and or other vulnerable groups (mentioned above)?		✓	No anticipated
4. Temporary impediments in movements of people/transport and animals?	✓		No such impacts are envisaged
5. Large population influx during sub-project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	Not observed
6. Social conflicts if workers from other areas are hired.		✓	Not applicable
7. Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	✓		Proper PPEs would be required for workers. Specialized electrical PPEs would be required for persons working on electrical components.
8. Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel, and other chemicals during construction and operation?	✓		Store hazardous materials in designated areas that are properly ventilated, secure, and equipped with spill containment measures.

⁹ Women, Children, Women headed households, People in old age, people having disabilities, socially isolated community groups and or people living below the poverty line

			<p>Engage with the local community and inform them about the project, potential risks, and safety measures.</p> <p>Worker Safety during Installation and Maintenance in Windy weather. Workers responsible for cleaning and maintenance tasks may be exposed to airborne contaminants during these activities. Implementing appropriate respiratory protection, personal protective equipment (PPE), and safe work practices can help minimize exposure risks and protect workers' health</p>
<p>9. Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation, and decommissioning.</p>	✓		<p>There can be some community safety risks in a solarization project due to accidental or natural causes like any injury to the community members and direct impacts to the environment around project area can affect community.</p> <p>These impacts can be mitigated by:</p> <ol style="list-style-type: none"> 1. Implementing robust structural design and regular maintenance to prevent accidents. 2. Regular monitoring and emergency response plans to address natural disasters. 3. Security measures and public awareness to minimize access. <p>Proper fire safety measures and decommissioning plans in place</p>
<p>10. Any impact on sensitive receptors (mentioned above)</p>		✓	<p>Not observed</p>

11. Any impact of negative nature on already existing infrastructure including public amenities		✓	Not observed
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<p>Endorsed By: Name: Hafiz Talat Mehmood Designation: MO (I&S) Organization: MC Okara Signature Date: 29-4-2024</p>	<p>Prepared By: Name: Siddique Shahid Designation: Deputy Program Officer ESM Organization: PMDFC Signature: Date: 29-4-2024</p>
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INVOLUNTARY RESETTLEMENT SCREENING CHECKLIST

ESFP: Shrein Newton MO (P)

Name of City/MC/LG: Okara

Sub-Project Sector: Liquid Waste

Sub-Project Title: Solarization of Disposal Stations in Okara City (WWTP Site)

Sub- Project Categorization: E-3 & S-3

Date of Screening: 29-04-2024

SECTION 1	Yes	No	Expected	Remarks
Does the project require land acquisition? Yes/No		✓		No Land acquired for this sub project. Solar equipment will be installed in the buildings already in possession of MC and have disposal stations owned by MC
If yes, then describe the type of land being acquired from the categories below:		✓		
Has any AED been conducted at the proposed location by the government? Yes/No		✓		This project is proposed on MC owned land.
Land (Quantify and describe types of land being acquired in "remarks column".		✓		
Government and LG owned land free of occupation (agriculture or settlement)		✓		No land acquired for this sub project
Government or state-owned land (other than LG) free of occupation (agriculture or settlement)		✓		
Private land		✓		
Residential		✓		
Commercial		✓		
Agricultural		✓		
Communal		✓		
Others (specify in "remarks").		✓		Already land owned by govt
Name of owner/owners and type of ownership document if available.		✓		

If land is being acquired, describe any structures constructed on it		✓		
Land-based assets:		✓		
Residential structures		✓		
Commercial structures (specify in "remarks")		✓		
Community structures (specify in "remarks")		✓		
Agriculture structures (specify in "remarks")		✓		
Public utilities (specify in "remarks")		✓		Already land owned by govt
Others (specify in "remarks")		✓		
If agricultural land is being acquired, specify the following:		✓		
Agriculture related impacts		✓		
Crops and vegetables (specify types and cropping area in "remarks").		✓		
Trees (specify number and types in "remarks").	✓			No tree cutting is involved
Others (specify in "remarks").		✓		
Affected Persons (APs)		✓		No Persons will be affected during this sub project
Will any people be displaced from the land when acquired? Yes/No		✓		
Number of APs		✓		
Males		✓		
Females		✓		
Titled landowners		✓		
Tenants and sharecroppers		✓		
Leaseholders		✓		
Agriculture wage laborers		✓		
Encroachers and squatters (specify in remarks column)		✓		
Vulnerable APs (e.g. women headed households, minors and aged, orphans, disabled persons, and those below the poverty line). Specify the number and vulnerability in "remarks".		✓		
Others (specify in "remarks")		✓		

Endorsed By: Name: Sheren Newton Designation: Municipal Officer Planning (MOP) Organization: MC Okara Signature Date: 29-04-24	Prepared By: Name: Hassan Ali Designation: Deputy Program Officer ESM Organization: PMDFC Signature: Date: 29-04-24
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Environmental and Social Mitigation Plan for Solarization

Solar PV Installation- Design Phase E&S Mitigation Plan

Environmental or Social impact	Pre-Construction Mitigation Actions	Responsible	Start	End
General / all impacts	<ul style="list-style-type: none"> • The ESMP shall be included in the TOR for the Design Engineer. • Feasibility and detailed design studies to be informed by the ESMP. All impacts shall be avoided where possible through site selection, prioritization of sites and technologies, consultation, and array design. 	Design Consultant & PMDFC	Feasibility Study	Tender Preparation
General / all impacts	<ul style="list-style-type: none"> • The ESMP will be included in the Contractors/Suppliers specification and contract. • Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions. 	MC & PMDFC	Tender preparation	Award of tender.
General / all impacts	Obtain all permits and NOCs if required.	MC	Design Phase	Prior to construction starting

Installation of Solar Panel Array	<ul style="list-style-type: none"> • Turning off or replacing bright lighting at the sites with LED lights to avoid attracting insects and use of netting to exclude birds from the panel area 	MC, PMDFC Design Engineer	Tendering for Design Consultant	Prior to construction starting.
Siting and accessing targeted solar array locations	<ul style="list-style-type: none"> • Avoid impacts on private land and assets by locating solar PV arrays on government land. • Review and confirm leases prior to construction. • Consultations will be carried out with identified organizations or agencies that manage any targeted spaces for cooperation and logistical support with planned works. 	MC Design Consultant	Design phase	Prior to construction starting
Health and Safety	<ul style="list-style-type: none"> • The tender shall be prepared in accordance with the health and safety guidelines in the World Bank Environment, Health and Safety Guidelines for Occupational Health and Safety. 	MC	Tender preparation	Award of tender.
Waste Management	<ul style="list-style-type: none"> • The Contractor shall develop a Solid Waste Management Plan in accordance with the guidelines included in ESMP. • All Project staff will be trained on this plan and attendance will be recorded. 	Contractor	Design phase	Prior to Construction n Starting

	<ul style="list-style-type: none"> • 			
Traffic Management	<ul style="list-style-type: none"> • The Contractor shall develop a Traffic Management Plan. The TMP shall also include requirements that are in accordance with the stipulations of this ESMP 	Contractor	Design Phase	Prior to construction starting
Spill Response	<ul style="list-style-type: none"> • The Contractor will have a spill response plan in place to account for all potential instances. • All Project staff will be trained on this plan and attendance will be recorded. 	Contractor	Design Phase	Prior to Construction n Starting
Recruitment of skilled workers	<ul style="list-style-type: none"> • Overseas workers will have the technical skills and experience for solar PV array installation. • Local skilled workers can be preferred. • Hiring of skilled workers will be assured for successful installation of PV array system. 	Contractor	Upon recruitment	Prior to construction starting
HIV/AIDs & GBV Training	<ul style="list-style-type: none"> • All project staff will undergo training by local services providers on prevention of HIV/AID and GBV. • Attendance will be recorded. • The Contractor will develop a Code of Conduct (to be approved by PMDFC) for all workers (local and overseas) to sign detailing the expected behavior of 	Contractor and MEC	Design phase	Prior to construction starting

	project staff, EHS requirements, Cultural respect, OHS requirements, Community Health and Safety considerations			
	•			
Solar PV Installation Construction Phase-E&S Mitigation Plan				
Environmental or social impact	Construction Mitigation Actions	Responsible	Start	End
Mounting and Installation: Working at Heights	<ul style="list-style-type: none"> • For tasks involving working at heights, such as rooftop installations, workers should use appropriate fall protection equipment, including safety harnesses, lanyards, and anchors, to prevent falls. • Provide appropriate fall protection equipment, such as harnesses. • Ensure workers are trained in proper use of fall protection equipment and safe working procedures at heights. • Conduct regular inspections of equipment and scaffolding to ensure their integrity and safety. • Provide proper lifting and manual handling training to workers. 	Contractor / supplier	In the beginning of construction	After completion of construction

	<ul style="list-style-type: none"> • Use lifting aids or machinery, like cranes or pulleys, to reduce manual handling risks. • Encourage team lifting for heavy signboards to distribute the load. 			
<p>Fixation of Solar panels</p> <p>Wind Direction &Speed</p> <p>Strong winds can damage solar panels by loosening or even detaching them from their mounts. Wind can also cause solar panels to vibrate, which can reduce their efficiency and damage their electrical components. Additionally, wind can carry dust and debris, which can accumulate on solar panels and reduce their efficiency.</p>	<ul style="list-style-type: none"> • Choose solar panels and mounts that are designed for high winds. • Install solar panels in a staggered or asymmetrical pattern to reduce wind resistance. • Use wind deflectors to redirect wind away from solar panels. • Plant trees and shrubs around solar panels to help break up the wind. • Regularly inspect solar panel mounts for signs of wear and tear. • Strong winds pose a significant risk to workers involved in the installation and maintenance of solar panels. Working at heights in windy conditions increases the risk of falls and other accidents. Adequate safety measures such as proper fall protection, secure anchoring systems, and adherence to relevant safety protocols are essential to mitigate these risks. • The potential for solar panels to become loosened or detached from their mounts due to strong winds presents a safety 	Contractor / supplier	In the beginning of construction	After completion of construction

	<p>hazard not only to workers but also to individuals and property in the vicinity. Ensuring the structural integrity and stability of panel mounting systems through proper design, installation, and maintenance is crucial to prevent accidents and minimize the risk of falling panels.</p>			
Non-toxic solid wastes (metal, packing, etc.)	<ul style="list-style-type: none"> • Solid Waste Management Plan will be fully implemented. • Metal, cardboard, and plastic will be recycled, where local facilities exist. • Waste that cannot be recycled will be collected and securely stored prior to offsite disposal at a licensed facility. 	Contractor / supplier	In the beginning of construction	After completion of construction
Hazardous wastes	<ul style="list-style-type: none"> • Hazardous wastes such as damaged solar panels and batteries that contain heavy metals shall be collected and stored prior to disposal offshore at a licensed facility as per the requirements of the Solid Waste Management Plan. • The Contractor will provide a 10 ft container and a roofed structure over the container in a location determined by MC for the storage of hazardous waste 	Contractor / Supplier	In the beginning of construction	After completion of construction
Concrete wastewater and slurry	<ul style="list-style-type: none"> • Concrete will be prepared on a secured , covered hard stand surface within the designated laydown areas.All wastewater from concrete production 	Contractor	Start of construction	Completion of construction

	<p>will be collected and treated to lower the pH and allow particulates to settle out before being recycled for construction purposes.</p> <ul style="list-style-type: none"> • Treated and tested wastewater may be discharged for absorption into the ground. Discharge will be at a rate to allow absorption without causing surface flooding. • Slurry from concrete production will be collected and treated. Treatment can vary depending on viscosity of slurry but can include the same measures described for treating concrete wastewater or can be by facilitating the solidification of the slurry to form a gel which can be stored and disposed of according to the Solid Waste Management Plan. • Solid and cured concrete waste is considered safe to be reused by the community or the MC for infrastructure maintenance. • The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete wastewater or slurry. 			
Lay down areas	<ul style="list-style-type: none"> • Laydown areas will be sited on government owned land. 	Contractor	Start of construction	End of construction

	<ul style="list-style-type: none"> • Areas will be securely fenced. • Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery, the preparation of concrete and the prefabrication of solar arrays. • Sand stockpiles shall not exceed 2 meters in height, and will be encircled at the base with sandbags or equivalent material to prevent runoff containing sediment and erosion of the stockpiled materials. Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Worker inductions will include a tour of the laydown area and required practices from workers. • Spill response kits will be available, and workers trained in their use. 			
	<ul style="list-style-type: none"> • 			
Haulage of materials and Equipment	<ul style="list-style-type: none"> • Implement the traffic management plan. • Haulage will be by existing roads only. • Where appropriate employ traffic control measures on the road to prevent traffic 	Contractor	Start of construction	End of construction

	<p>accidents. The workers shall have the relevant training and safety equipment.</p> <ul style="list-style-type: none"> • Hours of haulage shall be regulated to avoid peak time traffic and night hours. • Speed controls shall be in place when passing through residential areas or past sensitive social receptors. • All vehicles will be well maintained and operated by experienced and licensed drivers. • Spill kits will be available on the vehicles and drivers will be trained in their use. • Any damage to road surface will be reported immediately to MC and contractor. 			
Access to public areas during construction	<ul style="list-style-type: none"> • Identify key user groups. • Conduct consultation with user groups to advise of planned disruptions to access. • Ensure working area is securely fenced during construction. • Display notifications of predicted duration of disturbance of access and contact details for GRM 	Contractor, MEC	Start of construction	End of construction
Health and Safety	<ul style="list-style-type: none"> • All work shall be in accordance with the World Bank Health and Safety 	Contractor	Start of construction	End of construction

	<p>Guidelines for Occupational Health and Safety.</p> <ul style="list-style-type: none"> Contractors shall prepare a Health and Safety Plan which will include a risk register and safe work method statements. All workers will be provided with hard hats, hearing protection, boots. Workers involved in panel installation and handling will be provided with suitable gloves, such as leather gloves with padding in the palm and finger areas. 			
Solar PV Installation Operational Phase-E&S Mitigation Plan				
Environmental or social impact	Operation Mitigation Actions	Responsible	Start	End
Disposal of hazardous materials (broken/ decommissioned solar panels, batteries)	<ul style="list-style-type: none"> Any solar panels removed from the array for disposal will first be collected and stored in the covered 10 ft container provided by the Contractor. Solid Waste Management Code of Practice will be integrated into MC SOP For final disposal, the MC will ensure hazardous items are shipped offsite to a 	MC	During operation	Continuous

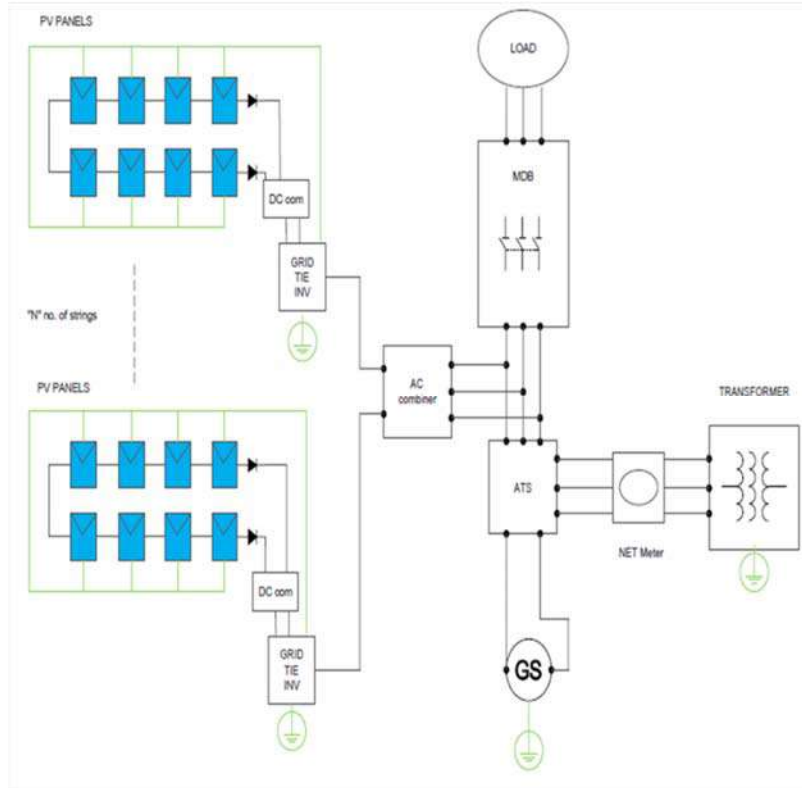
	facility licensed to handle hazardous waste.			
Security and Safety	<ul style="list-style-type: none"> • There will be net metering on grid system • Security will be assured by boundary walls with barbed wires. • Installation of CCTV Cameras and LED lights for 24/7 • Additional Security Guard provision 	MC	During Operation	Continuous
Solar Panel inspections	<ul style="list-style-type: none"> • Weekly monitoring of the condition of the individual solar panels to detect any damage. • Damaged solar panels shall be immediately removed from the array. • Regular inspections to be carried out on solar array foundations by MC and EPA staff. Any defects to the foundations must be immediately reported to the Authority and rectified. 	MC and EPA	During operation	Continuous
Solar panel cleaning	<ul style="list-style-type: none"> • The solar company will be responsible for cleaning and maintaining the solar panels for 1.5 years after installation. • Two methods will be used for the cleaning solar panels. • Dry cleaning of the solar panels will be performed. Dry cleaning involves using a soft brush or microfiber cloth to 	MC and Solar Company	During Operation	Dry cleaning Twice a year Wet cleaning Twice a year

	<p>remove dust and dirt from the surface of the panels.</p> <ul style="list-style-type: none"> Wet cleaning of the solar panels will be performed twice a year. Wet cleaning involves using a water solution to clean the surface of the panels. A low-pressure hose or bucket and sponge can be used to apply the solution to the panels. Sprinklers can also be used to avoid excessive use of water solution. The water and solution mixture used during wet cleaning of the solar panels will be disposed of in a safe and environmentally responsible manner. Vacuum truck will be used to collect the mixture and dispose of it at a licensed hazardous waste disposal facility. 			
Emergencies, leaks catastrophic failures	<ul style="list-style-type: none"> If necessary, following the review of structures and risk assessment, the appropriate EPA response plan, incorporating the design engineers recommended mitigation measures, will be immediately actioned 	EPA and MC	During operation	Continuous
Electromagnetic Fields	<ul style="list-style-type: none"> Install bird diverters or netting to reduce the risk of bird collisions with solar panels. Electromagnetic fields generated by solar panels could potentially interfere 	Contractor / Supplier	During Operation	Periodic

	with birds' navigation and communication systems			
Tree trimming	<ul style="list-style-type: none"> Routine tree trimming will be carried out with the permission of tree owners. 	MC	During Operation	Periodic
Glare and heat island effect	<ul style="list-style-type: none"> Orient solar panels away from glare-sensitive areas. When possible, orient solar panels away from buildings, roads, and other areas where glare can be a problem. (45-60 angle) Glare screens and baffles can be installed around solar panels to block sunlight from reflecting in certain directions. Plant trees and shrubs around solar panels. Trees and shrubs can help to absorb and deflect sunlight, reducing glare. Use cool pavement materials around solar panels. Cool pavement materials reflect more sunlight and absorb less heat, helping to reduce the heat island effect. 	MC	During Operation	Continuous
Maintenance of Plantation	<ul style="list-style-type: none"> Plantation of trees and shrubs will be at least 10 meters away from the solar panels so that they cannot interrupt sunlight. When choosing plants to plant around solar panels, it is important to 	MC	During Operation	Periodic

	<p>select plants that are native to the area and that are drought tolerant. It is also important to choose plants that will not grow too tall, as this can shade the solar panels and reduce their efficiency.</p> <ul style="list-style-type: none">• The plants around solar panels should be pruned regularly to remove any dead or diseased branches. It is also important to prune the plants to keep them from growing too tall and shading the solar panels.			
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SINGLE LINE DRAWING



SOLAR SYSTEMS SUSTAINABILITY

Operation and Maintenance Responsibilities

The major responsibilities include but not limited to

- O&M services as per O&M manual in the scope of work of RFP.
- Periodic preventive maintenance, corrective maintenance, and reporting during O&M period.
- Provide schedule of maintenance and activities.
- Provide date of visit and list of authorized personnel to visit the disposal station mentioned as per O&M Performa.
- Capacity Building, Training of the MC personnel.

It is of foremost importance that the solar systems going to be installed, based on this proposal, should be owned by the respective line department that is all the equipment should be taken on charge/ accordingly, should be responsible / accountable for its operation and maintenance. Following measures in this regard are suggested for making the installed systems more sustainable: -

- (a) It is proposed that solar systems should be formally handed over to the relevant representative of End User after completion of one year Defect Liability Period (DLP). In this regard subject equipment should be transferred through proper Handing/ Taking over Certificates. Same should be signed by the contractor and representatives of the Department.
- (b) 02 technicians per disposal station may be trained especially for operation and field level maintenance of the equipment. These technicians should be formally trained by the contractor who would be assigned the responsibility of installation of solar systems. It will be better if subject technicians are engaged at the beginning of installation phase so that they can get On the Job Training (OJT) during the installation phase.
- (c) The contractor going to be assigned the installation work should also be tasked to prepare user manuals (both in English & Urdu languages) covering the procedures of operation & field level maintenance of the individual systems along with user friendly trouble shooting chart etc.

- (d) For smooth and efficient operation and maintenance, one design topology has been adopted to facilitate the MC.
- (e) The solar rooftop installation is subject to the approval of the concerned department keeping in view the load bearing capacity of the buildings
- (f) The Warranties of the major solar equipment will be as follows

Ser	Equipment	Warranty
1	Solar Panels	20Years for 80% output Power
2	On-Grid Inverter	5 years

The Contractor will be contractually bound to provide the free of cost replacement / repair services of the solar equipment with in the warranty period.

The Contractor / Manufacturer may also provide undertaking for the availability of spares parts for the period of ten (10) years that should be made part of the main contract.

Over & above to the above suggested measures a senior representative of MC and PMDFC should visit each site after a definite interval and inspect / review the status and performance of the installed solar systems. This will ensure proper look after by the technicians. It is hoped that if subject measures are taken seriously then we may expect much longer life of the installed systems.



Minimum Technical Specifications Requirement for Solar Panel and Allied Equipment

Note- The technical specifications of the solar Panels & allied equipment must fulfil the standard requirements (PSS#IES) as per the import policy S.R.O.604 (I) /2019, Dated 28th May,2019. Verifiable Test Certifications for the required standards must be provided with the technical proposal. In case of discrepancy, the mentioned S.R.O shall prevail.

This document provide minimum technical requirement for solar panels and allied equipment. "All products should be compliant to relevant IEC standards/ specifications; however, other equivalent, international standards may be used where, IEC relevant standard is not available, as per the project requirement, with subject to prior approval of the Project Director".

I. Solar PV Panels

S. No.	Parameters	Min. Specifications required
1.	Module Make	Tier 1, Brand should be verifiable for the procurement year
2.	PV Module Capacity	400 Watts or above (as per design)
3.	PV Module Type	Poly-crystalline/Monocrystalline
4.	Cell Quality	A Grade (verifiable)
5.	Module Efficiency	18% or higher
6.	Power Tolerance	Must be + 3% or more
7.	Operating Cell Temperature	-40 ° C to +85 ° C
8.	Temperature Coefficient	-0.40% / ° C or less
9.	Bypass Diode	As per design
10.	Bus Bar	4 or higher
11.	Certification	IEC 61215, IEC 61730, IEC 61439, IEC 60947-3 as amended to date, PID free
12.	Frame	Must Withstand 5400 PA impulse Load
13.	Junction Box	IP 67 or better
14.	Cable	4 mm ² (IEC), 1000mm or higher (as per design)
15.	Connectors	MC4 or Comparable weatherproof
16.	Front Cover	3.2 mm thick prism type tempered glass or higher

In case of conflict between technical specifications mentioned hereinabove or at Eligibility Criteria (Part-B) TECHNICAL SPECIFICATIONS, latter shall prevail

8.	Operating temperature For Ambient	-5°C to 55°C
9.	Communication	With Remote Monitoring Feature, Mobile App, Web server user interface, Cloud Connected. Real Time System Monitoring, Alerts, Faults and Warning data display, System Statistics – System Parameters, PV predicted values, Forecasted values, Load data, Energy Data, Net Metering Data Control
10.	Humidity	10 – 90%RH
11.	THD	≤ 3%, As per IEC 61000-3-2 (as amended to date).
12.	Guarantee	5 years Replacement Guarantee.
13.	Warranty	10 Years or above transferrable warranty from the original inverter manufacturer shall be provided or as defined in the RFP.
14.	Input Voltage Range	150-950 V or above (depending upon the selected design)
15.	Power Factor	0.9 leading to 0.9 lagging (Grid Code Compliant)
16.	Minimum Applicable Standards and Compliances	IEC:62109-1, IEC:62109-2, IEC 61683, IEC 62116, IEC 61727, UL1741/IEEE:1547, 60068-2 (as amended to date).

III. Hybrid Solar Inverter

S.No	Parameters	Min. Specifications required
1.	Inverter Make	500MW or above deployment in last five years. Renowned and verifiable brand having successful performance history in similar climatic conditions. Pure Hybrid Inverter
2.	Inverter Type	Grid synchronized Pure Sine wave, Hybrid
3.	Phase	3 Phase IN /3 Phase OUT. Also able to synchronize with generators on site.
PV INPUT		
4.	Max DC Input Voltage	900 VDC
5.	Minimum MPPT Range	250-850 VDC

In case of conflict between technical specifications mentioned hereinabove or at Eligibility Criteria (Part-B) TECHNICAL SPECIFICATIONS, latter shall prevail

27.	Communication	With Remote Monitoring Feature, Mobile App, Web server user interface, Cloud Connected
28.	Guarantee	3 years Replacement Guarantee
29.	Warranty	5 Years or above transferrable warranty from the original inverter manufacturer shall be provided or as defined in the RFP.

IV. Charge Controller

1. IEC:62509
2. Maximum Power Point Tracking (MPPT) tracing efficiency > 98%
3. External/Built-In charge controller with Hybrid Inverter
4. Minimum 2 independent MPPTs.
5. Warranty- 5 Years transferrable warranty from the original manufacturer.

V. Smart Energy Storage:

Minimum Technical Specifications of Energy Storage System:

1. 15 Years life
2. Manufacturing date of batteries must not be more than 6 months old at the time of installation.
3. High Energy, Compact packs.
4. Elegant, Highly compact and energy dense.
5. Battery Management Unit (BMU), BMS (Battery Management System) controls cell temperature, over charging, DOD, Voltage levels & Cell charging current.
6. Fast and Efficient Charging
7. Extended Cycle Life minimum 5000 cycles at 80% DoD.
8. Temperature control unit.
9. IEC 61427 certified.
10. Warranty- 5 years

The following technical data but not limited to these only shall be provided, wherever applicable for, such as inverter, charge controller, batteries;

S. No	Characteristic
1	Manufacturer Name & Country of Manufacturing
2	Type/Model number/Date of Manufacturing
3	Datasheet
4	Relevant International Certifications
5	Warranties
6	Installation Guide
7	Operating Manual

In case of conflict between technical specifications mentioned hereinabove or at Eligibility Criteria (Part-B) TECHNICAL SPECIFICATIONS, latter shall prevail

roofing must form a waterproof seal (applicable for wiring only).

2. For conduit and duct flexible PVC material with suitable size must be use, so that ¼ spaces in a conduit should be empty.
3. Field installed wiring must be joined using terminal strips or screw connectors. Soldering or crimping in the field must be avoided if at all possible. Wire nuts are not allowed. The rated current carrying capacity of the joint must not be less the circuit current rating. All connections must be made in junction boxes. Fittings for lights, switches, and polarity sensitive socket outlets may be used as junction boxes where practical.
4. All wiring shall be color coded as per IEC standards and labeled at termination point.
5. No conduit or fitting shall be attached directly to thatch or any other non-supportive surface.
6. Especially avoid installing the conduit direct over the roof; there must be distance not less than 2 inches between the roof surface and conduit/duct.
7. Cables must be joined by the use of junction boxes, screw-connectors, and block connectors. MC 4 or equivalent connectors must be used for PV joints.
8. All wires must be terminated with proper end sleeves and wire thimbles with different colors for positive and negative polarity.
9. Size, voltage grade and manufacturer name should be printed on every cable
10. Cable voltage drop specifications are as followed that must be verified through software simulation/ Calculations.
11. Earthing as per NEPRA net metering rules for all sites.

S. No.	Item	Requirement
12.	Solar PV to inverter:	Voltage drop less than 2% tin coated (Stranded and flexible), 99.9 % pure copper fire resistive insulation
13.	Grid / L.V Distribution Board to Inverter	Voltage drop less than 2%. 99.9 % pure copper fire resistive insulation

Solar PV Combiner Box (Junction Box)

S.No.	Parameters	Description
1.	Solar PV Input	As per design
2.	Solar PV Max. Input Voltage	1000VDC (IEC) or Higher
3.	Number of Solar PV array inputs	As per design
4.	Protections	Lightening Protection
		DC over voltage protection
		Short circuit Protection
		Fuse/Breaker Protection.
		AC & DC disconnecting switch
5.	Protection Class	IP 66 or better
6.	Relative humidity	10-90%

In case of conflict between technical specifications mentioned hereinabove or at Eligibility Criteria (Part-B) TECHNICAL SPECIFICATIONS, latter shall prevail

12.	Functional Compliance	IEC 62305-3 (EN62305-3) IEC62305-3 (EN 62305-3) or equivalent
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X. Surge Arrester(with or without counter)

S. No.	Parameters	Min. Specifications required
1.	Applications	Both DC side & AC sides
2.	Discharge current (I max)	min. 20kA (8/20 μ sec.)
3.	Impulse current (I imp)	min. 25kA (10/350μ sec.)
4.	Response time	≤ 50 n sec
5.	Leakage current	≤ 1 mA
6.	Dielectric strength	2000 V AC @ 1 minute
7.	Protection Class	Class 2(Type2) minimum
8.	Discharge voltage	600 V DC (Line to earth) or above (matching the size of inverter)
9.	Ingress Protection	Minimum IP20 (placed in IP 65 Box along with other protections)
10.	Short circuit withstand capacity	min. 30kA

Note: The external surge arresters/protection AC/DC may be added by the procuring department/agency, if required according to the specific site requirement.

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In case of conflict between technical specifications mentioned hereinabove or at Eligibility Criteria (Part-B) TECHNICAL SPECIFICATIONS, latter shall prevail