GOVERNMENT OF KHYBER PAKTUNKHWA
IRRIGATION DEPARTMENT

BID SOLICITATION DOCUMENTS

FOR

THE WORK

"CONSTRUCTION OF IRRIGATION TUBE WELLS / LIFT IRRIGATION SCHEMES AND SOLARIZATION OF EXISTING IRRIGATION TUBE WELLS IN MERGED AREAS (AIP) ADP NO. 210588 (2023-24)" **(SOLAR COMPONENTS)**

Name of Sub Work:_____

_____

IRRIGATION DIVISION, DISTRICT MOHMAND

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KHYBER PAKHTUNKHWA PUBLIC PROCUREMENT REGULATORY AUTHORITYNOTIFICATION

(Updated from Time to Time)

GOVERNMENT OF KHYBER PAKHTUNKHWA,
KHYBER PAKHTUNKHWA
PUBLIC PROCUREMENT REGULATORY AUTHORITY

Peshawar, the May 10, 2022 /6058-71

NOTIFICATION

S.R.O. (14)/Vol: 1-24/2021-22: In exercise of the powers conferred under Section 35-A of the Khyber Pakhtunkhwa Public Procurement Regulatory Authority Act, 2012 (Khyber Pakhtunkhwa Act No. XI of 2012) the Authority has been pleased to issue the following regulation, namely: -

1. **Short title and commencement.-** (i) This regulation may be called the Khyber Pakhtunkhwa Public Procurement Regulation No. XIV 2022.

(ii) This shall come into force at once.

2. **Matters pertaining to Additional Security in case of abnormally low bids.-** This regulation relates to the matters pertaining to Additional Security submitted by the bidders in procurement of works.

i. The contractors quoting their bids up to a limit of 10% below Engineer estimate shall submit bid security @ 2% only of Engineer Estimate.

ii. The contractors quoting their bids more than 10% below upto 20% below on Engineers' Estimate shall submit along with their bids 8% Additional Security of Engineer's Estimated cost in addition to 2% bid security. If the bid is not accompanied with the required amount of additional security then it will be considered as non-responsive and the 2% bid security shall be forfeited in favour of Government and the second lowest bidder and so on will be considered accordingly.

iii. **[Similarly, a contractor quoting bid more than 20% below shall submit with his bid an additional security on Engineer's Estimated cost equal to the differential amount of submitted bid and Engineers' Estimate along with detailed rate analysis]**[1]**.** In case of more than 20% below bids, if the bid is not accompanied by the detailed rate analysis and / or required amount of additional security, then the said bid shall be considered as non-responsive. All the securities submitted along with such non-responsive bid shall be forfeited in favour of Government and the 2nd lowest bidder and so on will be considered accordingly.

iv. In case detailed rate analysis submitted with the bids is, in view of the Procuring Entity, not convincing, the Head of the Procuring Entity may declare such bid as non-responsive without any forfeiture of bid securities and record reasons thereof.

v. The procuring entity may offer the contract to next lowest bidder after due diligence in the context of financial difference between such two bids or may advertise procurement opportunity afresh.

[1] Differential amount; if a contractor quote, e.g. 25% below engineer estimate bid then he has to deposit along with his bid 2% bid security and 25% additional security of engineer estimate.

vi. After commencements of work by the successful bidder, the procuring entity may replace the Additional Security with a bank guarantee of the same amount from the scheduled bank; if the already deposited security is not in the form of bank guarantee.

vii. The Additional Security shall be released to the contractor in four installments i.e. 1st installment of 25% to be released upon completion of 25% of the project, 2nd installment of 25% to be released upon completion of 50% of the project, 3rd installment of 25% to be released upon completion of 75% of the project and the 4th installment of 25% to be released after 100% completion of the project.

viii. All previous orders, instructions and regulations issued regarding additional security shall stand superseded.

-SD-
Managing Director
KPPRA

ENDST: No. As above: **Peshawar, the May 10, 2022**

Copy forwarded to:-

1. The Additional Chief Secretary (P&D) Department, Govt. of Khyber Pakhtunkhwa.
2. The Administrative Secretaries (C&W, Irrigation, Public Health Engineering and Local Government, Elections & Rural Development Department) Khyber Pakhtunkhwa with request to circulate the same to their downstream formations for compliance.
3. The Principal Secretary to Governor, Khyber Pakhtunkhwa.
4. The Principal Secretary to Chief Minister, Khyber Pakhtunkhwa.
5. The Inspector General of Police, Khyber Pakhtunkhwa.
6. The Secretary Provincial Assembly, Khyber Pakhtunkhwa.
7. The Accountant General, Khyber Pakhtunkhwa.
8. The Registrar, Peshawar High Court, Peshawar.
9. All Commissioners and Deputy Commissioners in Khyber Pakhtunkhwa.
10. PSO to Chief Secretary, Govt. of Khyber Pakhtunkhwa.
11. All Heads of Autonomous/Semi-Autonomous Bodies in Khyber Pakhtunkhwa.
12. Director, Treasuries & Accounts with request to circulate the same to all DAOs & Treasuries Officers in Khyber Pakhtunkhwa.
13. The Section Officer (Admn), Finance Department, Govt. of Khyber Pakhtunkhwa with respect to his office letter No. SO(A)/FD/1-40/2022, dated 22.04.2022.
14. Manager, Stationery and Printing Press Khyber Pakhtunkhwa, for printing in the official gazette.

SANA ULLAH
Assistant Director (M&E), KPPRA

INVITATION FOR BID

NOTICE INVITING E-BIDDING
(Single Stage Two Envelop Procedure)

The Chief Engineer (Merged Area) Irrigation Department, Government of Khyber Pakhtunkhwa, Peshawar, through Executive Engineer, Mohmand Irrigation Division Mohmand invites Technical and Financial proposals in accordance with KPPRA procurement rules 2014 on Single Stage Two Envelop Procedure for the following works,

S#	Name of Work / Sub Work	E/Cost (million)	Earnest Money (Rs)	PEC Category / Relevant Code
(A)	**Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No. 210588 (2023-24)**			
1.	Construction of new Irrigation Tube Well at Sadu Khel Kamali Halimzai District Mohmand (Solar Component)	3.564	71280	C-6 & EE-11
2.	Construction of new solar Irrigation Tube Wells in District Mohmand (02 Nos) (Solar Component)	7.12	142400	C-6 & EE-11
3.	Construction of new solar Irrigation Tube Wells in Lower Mohmand (02 Nos) (Solar Component)	6.90	138000	C-6 & EE-11
4.	Construction of new solar Irrigation Tube Well in Lower Mohmand (Solar Component)	3.470	69400	C-6 & EE-11
5.	Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 02 Nos. at Pindiali, 02 Nos. at Ambar and 04 Nos. at Prang Ghar) (Solar Component)	32.433	648660	C-5 & EE-11
6.	Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos at Ekka Ghund, 04 Nos at Pindiali, 03 Nos at Ambar and 05 Nos at Prang Ghar) (Solar Component)	46.702	934040	C-5 & EE-11
7.	Solarization of 15 Nos Existing Irrigation Tube Wells in Hassan Khel Sub Division Peshawar (Solar Component)	50.373	1007460	C-5 & EE-11
8.	Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)	56.900	1138000	C-5 & EE-11
9.	Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos. Khawazai / Baizai, 07 Nos. at Safi, 07 Nos. Halimzai, 03 Nos. Dawazai Ambar, 03 Nos. at Prang Ghar and 03 Nos. at Pindiali) (Solar Component)	85.263	1705260	C-4 & EE-11

TERMS AND CONDITIONS

1. Bid Solicitation Documents containing all the terms and conditions and other relevant instructions for the works can be downloaded from the Irrigation Department and/or Khyber Pakhtunkhwa Public Procurement Regulatory Authority websites (www.irrigation.gkp.pk) (www.kppra.gov.pk).
2. Electronic bidding shall be done on **"Above / Below system"** on BOQ / Engineer's estimate.
3. The bidder shall submit their bids on the following address **"Executive Engineer Mohmand Irrigation Division, Gate No: 03 (DC Peshawar Complex) Khyber road Peshawar"** through reliable courier Service on or before the deadline along with required documents as per details mentioned in Bid Solicitation Documents.
4. All bidders are required to have valid registration with Khyber Pakhtunkhwa Revenue Authority (KPRA).

5. The bidder shall submit 02% bid security of the estimated cost as mentioned above, in the shape of deposit at call (Original) enclosed along with their bid before closing date and time in the name of Executive Engineer, Mohmand Irrigation Division, Mohmand.
6. Notifications issued by Khyber Pakhtunkhwa Public Procurement Regulatory Authority pertaining to procurement process issued from time to time shall be applicable.
7. If the evaluated electronic bid costs of two or more bidders are equal, then the successful bidder will be declared through draw/toss.
8. Pre-Bid meeting will be held on 25-06-2024 at 11:00 A.M in the office of Chief Engineer (Merged Area) H# 18 / BB-1, Park road, University Town Peshawar.
9. The last date & time for Submission of the Technical & Financial Bid along with relevant documents is 04-07-2024 upto 2:00 P.M. The Technical bids will be opened on the same day at 02:30 P.M in the office of Executive Engineer, Mohmand Irrigation Division, Mohmand in presence of Contractors and their representatives who wishes to attend.
10. The Financial Bids of the Technically Approved Contractors / Firms only, will be opened on 19-07-2024.
11. The defect liability period of 2 years (for all allied accessories) & warranty for solar panels of 25 years shall commence from the date of commissioning of the tube wells.
12. Any bidder who provided incorrect information shall stand disqualified as per KPPRA Act Section 29 (I) rule (43).
13. The procuring entity has the authority to reject any E-bid or all E-bids assigning valid reasons.
14. Bid security of 1st, 2nd and 3rd lowest bidders will be retained till the approval of bids by the competent authority.
15. All Govt. Notifications/Rules/Taxes updated from time to time shall be applicable.

Executive Engineer, Mohmand Irrigation Division Mohmand

INSTRUCTIONS TO BIDDERS

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INSTRUCTIONS TO BIDDERS

A. GENERAL

IB.1 Scope of Bid and Source of Funds

1.1 Scope of Bid
The Employer as defined in the bidding data wishes to receive bids for the following scope of work "Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)"
Sub Work: As per NIT

Bidders must quote for the complete scope of work. Any bid covering partial scope of work will be rejected as non-responsive, pursuant to Clause IB.24.

1.2 Source of Funds

ADP / AIP No: 1242 / 210269 during 2023-24.

IB.2 Eligible Bidders

2.1 Bidding is open to all firms and persons meeting the following requirements:

a. Duly licensed by the Pakistan Engineering Council (PEC) in the category relevant to the value of the works with specialization code as mentioned in the invitation for E-Bidding.

b. Firms have not been blacklisted by any Govt: Organization or involved in such like litigations.

c. Registered with KPRA.

d. NTN/Registration certificate from income Tax department along with up to date clearance certificate. The contractor must also be active on "Active Tax Payer list."

e. Enlistment with the Irrigation Department.

f. Furnished valid 2% Earnest Money and Additional Security as per KPPRA Notification No. S.R.O (14)/Vol: 1-24/2021-22, Dated: 10th May, 2022.

IB.3 Eligible Goods and Services

3.1 All Goods and ancillary Services to be supplied under this Contract shall have their origin in eligible countries listed in Appendix „A" to Instructions to Bidders and all expenditures made under the Contract will be limited to such Goods and Services.

3.2 For purpose of this Clause, "origin" means the place where the Goods are mined, grown or produced or from where the ancillary services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembling of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

3.3 The origin of Goods and Services is distinct from the nationality of the Bidder.

IB.4 Cost of Bidding

4.1 The bidder shall bear all costs associated with the preparation and submission of its bid and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. BIDDING DOCUMENTS

IB.5 Contents of Bidding Documents

5.1 In addition to Invitations for Bids, the Bidding Documents are those stated below, and should be read in conjunction with any Addendum issued in accordance with Clause IB.7.

1. Instructions to Bidders with Appendices
2. Form of Bid & Schedules to Bid

   Schedules to Bid are the following:

   (i) Schedule A: Specific Works Data
   (ii) Schedule B: Work to be Performed by Subcontractors
   (iii) Schedule C: Proposed Programme of Works
   (iv) Schedule D: Deviations from Technical Provisions
   (v) Schedule E: Deviations from Contractual Conditions
   (vi) Schedule F: Method of Performing Works
   (vii) Schedule G: Proposed Organisation
   (viii) Schedule H: Integrity Pact
3. Schedule of Prices
4. Preamble to Conditions of Contract
5. General Conditions of Contract
6. Particular Conditions of Contract
7. Standard Forms

   Forms include the following:
   (i) Form of Bid Security
   (ii) Form of Contract Agreement
   (iii) Form of Performance Security
   (iv) Form of Bank Guarantee/Bond for Advance Payment
8. Specifications - Special Provisions
9. Specifications - Technical Provisions
10. Drawings

5.2 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.24, bids which are not substantially responsive to the requirements of the Bidding Documents will be rejected.

IB.6 Clarification of Bidding Documents

6.1 A prospective bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Employer with a copy to the Engineer in writing at the address mentioned in the bidding data. Employer will examine the request for clarification of the Bidding Documents which it receivesearlier than the period specified in the Bidding Data prior to the deadline for submission of bids

and if needed will issue the clarification/amendment of the Bidding Documents before the date of submission of Bids (without identifying the source of enquiry) to all prospective bidders.

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

IB.7 Amendment of Bidding Documents

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

7.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub-Clause 7.1 hereof, and shall be communicated in writing to all purchasers of the Bidding Documents. Prospective bidders shall acknowledge receipt of each addendum in writing to the Employer. The bidder shall also confirm in the Form of Bid that the information contained in such addenda have been considered in preparing his bid.

7.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may at its discretion extend the deadline for submission of bids in accordance with Clause IB.19.

C. PREPARATION OF BIDS

IB.8 Language of Bid

8.1 The Bid prepared by the Bidder and all correspondence and documents relating to the Bid, exchanged by the Bidder and the Engineer shall be written in the English language, provided that any printed literature furnished by the Bidder may be written in another language so long as accompanied by an English translation of its pertinent passages in which case, for purposes of interpretation of the Bid, the English translation shall govern.

IB.9 Documents Comprising the Bid

9.1 The bid prepared by the bidder shall comprise the following components:

(a) Covering Letter

(b) Form of Bid duly filled, signed and sealed, in accordance with Clause IB.17.

(c) Schedules (A to H) to Bid duly filled and signed, in accordance with the instructions contained therein.

(d) Schedule of Prices completed in accordance with Clauses IB.11 and 12.

(e) Bid Security furnished in accordance with Clause IB.15.

(f) Power of Attorney in accordance with Clause IB 17.5.

(g) Joint Venture Agreement (if applicable).

(h) Documentary evidence established in accordance with Clause IB.13 that the bidder is

eligible to bid and is qualified to perform the contract if its bid is accepted.

(i) Documentary evidence established in accordance with Clause IB.14 that the Goods and ancillary Services to be supplied by the bidder are eligible Goods and Services and conform to the Bidding Documents.

(j) Bidders applying for eligibility for domestic preference in bid evaluation shall supply all information & evidence to establish the claim for domestic preference required to satisfy the criteria for eligibility as described in Clause IB.27. The particulars for domestic Goods prescribed in Appendix C to these Instructions shall also be filled in to substantiate claim for domestic preference.

(k) Any other documents prescribed in Particular Conditions of Contract or Technical Provisions to be submitted with the bid.

IB.10 Form of Bid and Schedules

10.1 The bidder shall complete, sign and seal the Form of Bid, Schedules (A to H, or as modified) to Bid and Schedule of Prices furnished in the Bidding Documents and shall also enclose other information as detailed in Clause IB.9.

10.2 For the purpose of granting a margin of domestic preference pursuant to Clause IB.27, the Employer/Engineer will classify the bids, when submitted in one of three groups as follows:

(a) **Group "A" Bid:** (i) For Goods for which labour, raw materials and components from within Pakistan account for at least 20% of the ex-factory bid price of the products offered (ii) For Goods for which labour, raw materials and components from within Pakistan account for over 20% and up to 30% of the ex-factory bid price of the products offered (iii) For Goods for which labour, raw materials and components from within Pakistan account for over 30% of the ex-factory bid price of the products offered.

(b) **Group "B" Bid:** For Goods manufactured in Pakistan for which the domestic value added in the manufacturing cost is less than 20% of the ex-factory bid price; and

(c) **Group "C" Bid:** For Goods of foreign origin.

In preparing their bids, the bidders,whether local or foreign, shall enter in the Schedule of Prices ex-factory price for indigenously manufactured products and CIF price as well as customs duty and sales tax and other import charges for products to be imported from outside Pakistan.

IB.11 Bid Prices

11.1 The bidder shall fill up the Schedule of Prices attached to these documents indicating the unit rates and prices of the Works to be performed under the Contract. Prices on the Schedule of Prices shall be entered keeping in view the instructions contained in the Preamble to the Schedule of Prices.

11.2 The bidder shall fill in rates and prices for all items of the Works described in the Schedule of Prices. 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 Schedule of Prices.

11.3 The bidder's separation of price components in accordance with Sub-Clause 11.1 above, will be solely for the purpose of facilitating the comparison of bids by the Employer/Engineer and will

not in any way limit its right to contract on any of the terms offered.

11.4 Unless otherwise stipulated in the Conditions of Contract, prices quoted by the bidder shall remain fixed during the bidder's performance of the Contract and not subject to variation on any account. When the bidders are required to quote only fixed price(s) a bid submitted with an adjustable price quotation will be treated as non-responsive and rejected, pursuant to Clause IB.24.

11.5 Any discount offered shall be valid for at least the period of validity of the bid. A discount valid for lesser period shall be considered null and void.

IB.12 Currencies of Bid

12.1 Prices shall be quoted in the following currencies:

(a) For Goods and Services which the bidder will supply from within Pakistan, the prices shall be quoted in the Pak. Rupees.

(b) For Goods and Services which the bidder will supply from outside Pakistan, the prices shall be quoted either in U.S. Dollars or in any other freely convertible currency.

12.2 Further, a bidder expecting to incur a portion of its expenditure in the performance of the Contract in more than one currency (but use no more than 3 foreign currencies), and wishing to be paid accordingly, shall so indicate in its bid.

12.3 The currencies of payment shall be as stated in Particular Conditions of Contract. However, provisions in Sub-Clauses 12.1 & 12.2 above, shall not in any way constitute a contractual or legal binding on the Employer for the payment in the currencies required by the Contractor.

IB.13 Documents Establishing Bidder's Eligibility And Qualifications

13.1 Pursuant to Clause IB.9, the bidder shall furnish, as part of its bid, documents establishing the bidder's eligibility to bid and its qualifications to perform the Contract if its bid is accepted.

13.2 The documentary evidence of the bidder's eligibility to bid shall establish to the Employer's satisfaction that the bidder, at the time of submission of its bid is from an eligible source country as defined under Clause IB.2.

13.3 The documentary evidence of the bidder's qualification to perform the Contract if its bid is accepted, shall establish to the Employee's / Engineer's satisfaction:

(a) that, in the case of a bidder offering to supply Goods under the Contract which the bidder did not manufacture or otherwise produce, the bidder has been duly authorized by the Goods manufacturer or producer to supply the Goods to Pakistan;

(b) that the Bidder/Manufacturer has the financial, technical and production capability necessary to perform the Contract; and

(c) that, in the case of a bidder not doing business within Pakistan the bidder is or will be (if successful) represented by an agent in Pakistan equipped and able to carry out the Supplier's maintenance, repair and spare parts stocking obligations prescribed by the Conditions of Contract and/or Technical Provisions.

13.4 (a) Bidder/Manufacturer must possess and provide evidence of the following experience as mentioned in the bidding data.

The Bidder shall certify the capacity and capability of the plant (from which Goods are now offered) for manufacturing, quality assurance and testing facilities, qualified man-power and production/delivery of quality materials according to bid specifications and delivery requirements. The number of years of working of such plant having production of same required items and number of years and such Goods shall have proven successful in the field as mentioned in the bidding data.

The bidder shall submit with the bid all necessary documentation in this regard. The Employer/Engineer will have the right to verify the particulars regarding the plant and other related information furnished with the bid and the joint venture as well as the partners thereof shall be liable for disqualification in the event of any mis-statement/mis-representation on their part.

The bidder shall furnish documentary evidence of qualification on the Form "Evidence of Bidder's Capability" specified in the Bidding data.

(b) The bidder should have an average annual turnover in the last five years equal to or more than the Total Bid Price. Alternately, the bidder should have successfully completed in the last five years any specific project having value equal to or higher than the total Bid Price.

13.5 Joint Venture

In order for a Joint Venture to qualify:

(a) At least one of the partners of joint venture shall satisfy the relevant experience criteria specified in Sub-Clause 13.4(a) hereinabove.

(b) All firms comprising the joint venture shall be legally constituted and shall meet the eligibility requirement of Sub-Clause 2.1 hereof.

(c) All partners of the joint venture shall at all times and under all circumstances be liable jointly and severally to Employer for the execution of the entire Contract in accordance with the Contract terms and conditions and a statement to this effect shall be included in the authorization mentioned under para (f) below as well as in the Form of Bid and Form of Contract Agreement (in case of a successful bidder).

(d) The Form of Bid, and in the case of successful bidder, the Form of Contract Agreement, shall be signed so as to be legally binding on all partners.

(e) One of the joint venture partners shall be nominated as being in-charge and this authorisation shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the joint venture partners.

(f) The partner-in-charge shall be authorized to incur liabilities, receive payments and receive instructions for and on behalf of any or all partners of the joint venture.

(g) A copy of the agreement entered into by the joint venture partners shall be submitted with the bid stating the conditions under which it 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. No amendments / modifications whatsoever in the joint venture agreement shall be

agreed to between the joint venture partner without prior written consent of the Employer.

13.6 The Bidder shall propose, in order of his priority; plant, equipment or goods of not more than three Manufacturers. Employer at his own jurisdiction will evaluate the plant, equipment or goods of only one of such Manufacturers.

IB.14 Documents Establishing Goods Eligibility and Conformity to Bidding Documents

14.1 Pursuant to Clause IB.9, the bidder shall furnish, as part of its bid, documents establishing the eligibility and conformity to the Bidding Documents of all Goods and Services which the bidder proposes to perform under the Contract.

14.2 The documentary evidence of the Goods and Services eligibility shall establish to the Employer‟s satisfaction that they will have their origin in an eligible source country as defined under Clause IB.3. A certificate of origin issued at the time of shipment will satisfy the requirements of the said Clause.

14.3 The documentary evidence of the Goods and Services‟ conformity to the Bidding Documents may be in the form of literature, drawings and data and shall furnish:

(a) A detailed description of the Goods, essential technical and performance characteristics.

(b) Complete set of technical information, description data, literature and drawings as required in accordance with Schedule A to Bid, Specific Works Data. This will include but not be limited to the following:

(i) A sufficient number of drawings, photographs, catalogues, illustrations and such other information as is necessary to illustrate clearly the significant characteristics such as general construction dimensions and other relevant information about the Goods to be furnished.
(ii) Details of equipment and machinery with capacity.
(iii) Any other information which is required for evaluation purposes.

(c) A clause-by-clause commentary on Technical Provisions, provided with the Bidding Documents, demonstrating the Goods‟ and Services‟ substantial responsiveness to those Specifications or a statement of deviations and exceptions to the provisions of the Technical Provisions as required in Schedule D to Bid.

14.4 For purpose of the commentary to be furnished pursuant to Sub-Clause 14.3(c) above, the Bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers, designated by the Engineer in the Technical Provisions are intended to be descriptive only and not restrictive. The bidder may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates to the Engineer‟s satisfaction that the substitutions are substantially equivalent or superior to those designated in the Technical Provisions. Copies of the standards proposed by the bidder other than those specified in the Bidding Documents shall be furnished.

IB.15 Bid Security

15.1 Each bidder Each bidder shall furnish, as part of his bid, a Bid Security in the amount stipulated in NIT & Bidding Data in Pak. Rupees (or Additional Bid Security as per KPPRA notification No. **S.R.O (14)/Vol: 1-24/2021-22, Dated: 10th May, 2022** in the form of Deposit at Call in favour of the **Executive Engineer, Mohmand Irrigation Division, Mohmand**. [The bid security shall be submitted from the account of the firm/bidder/contractor who submits the bid].

15.2 The Bid Security shall be in the form of Deposit at Call (Original) from a Scheduled Bank in Pakistan, in favour of the Procuring Entity.

15.3 The Bid Security is required to protect the Employer against the risk of bidder's conduct which would warrant the security's forfeiture, pursuant to Sub-Clause 15.7 hereof.

15.4 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Employer as non-responsive, pursuant to Clause IB.24.

15.5 The bid securities of unsuccessful bidders will be returned upon award of contract to the successful bidder or on the expiry of validity of Bid Security which ever is earlier.

15.6 The Bid Security of the successful bidder will be returned when the bidder has furnished the required Performance Security, pursuant to Clause IB.34 and signed the Contract Agreement, pursuant to Clause IB.35.

15.7 The Additional Security shall be released to the contractor in four installments that is 25% to be released upon completion of 25% of the project, 50% to be released upon completion of 50% of the project, 75% to be released upon completion of 75% of the project and the remaining amount to be released after completion of the project.

15.8 The Bid Security may be forfeited:

(a) if a bidder withdraws his bid during the period of bid validity; or

(b) if a bidder does not accept the correction of his Bid Price, pursuant to Sub-Clause 24.2 hereof; or

(c) in the case of a successful bidder, if he fails to:

(i) furnish the required Performance Security in accordance with Clause IB.34, or

(ii) sign the Contract Agreement, in accordance with Clause IB.35.

IB.16 Validity of Bids

16.1 Bids shall remain valid for 120 days after the date of bid opening as prescribed in Clause IB.19.

16.2 In exceptional circumstances prior to expiry of original bid validity period, the Employer may request the bidders to extend the period of validity for a specified additional period which shall in no case be more than the original bid validity period. The request and the responses thereto shall be made in writing. A bidder may refuse the request without forfeiture of his Bid Security. A bidder agreeing to the request 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 in which case, the Employer will be obligated to compensate the bidders, upon substantiation for their increase in costs (if it is a fixed price bid).

IB.17 Format and Signing of Bid

17.1 Bidders are particularly directed that the amount entered on the Form of Bid shall be for performing the Contract strictly in accordance with the Bidding Documents.

17.2 All Schedules to Bid are to be properly completed and signed.

17.3 No alteration is to be made in the Form of Bid nor in the Schedules thereto except in filling up the blanks as directed. If any alteration be made or if these instructions be not fully complied with, the bid may be rejected.

17.4 Each bidder shall prepare one (1) Original and one Copy, of the documents comprising the bid as described in Clause IB.9 and clearly mark them "ORIGINAL" and „COPY" as appropriate. In the event of discrepancy between them, the original shall prevail.

17.5 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign (in the case of copies, Photostats are also acceptable). This shall be indicated by submitting a written Power of Attorney authorizing the signatory of the bidder to act for and on behalf of the bidder. All pages of the bid shall be initialed and stamped by the person or persons signing the bid.

17.6 The bid shall contain no alterations, omissions or additions, except to comply with instructions issued by the Employer, or as are necessary to correct errors made by the bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

17.7 Bidders shall indicate in the space provided in the Form of Bid their full and proper addresses at which notices may be legally served on them and to which all correspondence in connection with their bids and the Contract is to be sent.

17.8 Bidders should retain a copy of the Bidding Documents as their file copy.

D. SUBMISSION OF BIDS

IB.18 Sealing and Marking of Bids

18.1 Each bidder shall submit his bid as under:

(a) Technical & Financial Bid ORIGINAL and each COPY of the Bid shall be separately sealed and put in separateenvelopes 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 18.2 hereof.

18.2 The inner and outer envelopes shall;

(a) be addressed to the Employer at the address given in Sub-Clause 6.1 heretofore.
(b) bear the Project name, Loan No., Bid No. and Date of opening of Bid.
(c) provide a warning not to open before the time and date for bid opening.

18.3 The Bid shall be delivered by registered mail at the address to Employer as given in Sub-Clause 6.1 heretofore.

18.4 In addition to the identification required in Sub-Clause 18.2 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.20.

18.5 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.19 Deadline for Submission of Bids

19.1 (a) Bids must be received by the Employer at the address specified in Sub-Clause 6.1 hereof not later than the time and date stipulated in the Invitation for Bids.

(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.

(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.

19.2 Bids submitted through telegraph, telex, fax or e-mail shall not be considered.

19.3 The Employer may, at his discretion, extend the deadline for submission of bids by issuing an addendum in accordance with Clause IB.7, 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.20 Late Bids

20.1 (a) Any bid received by the Employer after the deadline for submission of bids prescribed in Clause IB.19 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.21 Modification, Substitution and Withdrawal of Bids

21.1 Any bidder may modify, substitute or withdraw his bid after bid submission provided that modification, substitution or written notice of the withdrawal is received by the Employer prior to the deadline for submission of bids.

21.2 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.18 with the outer and inner envelopes additionally marked "MODIFICATION", "SUBSTITUTION" or "WITHDRAWAL", as appropriate.

21.3 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 pursuant to Clause IB.15.

E. BID OPENING AND EVALUATION

IB.22 Bid Opening

22.1 A committee consisting of nominated members by the Employer and by the Engineer will open the bids, including withdrawals, substitution and modifications made pursuant to Clause IB.21, in the presence of bidders‟ representatives who choose to attend, at the time, date and location stipulated in the Invitation for Bids.

The bidders‟ representatives who are present shall sign in a register evidencing their attendance.

22.2 Envelopes marked “MODIFICATION”, “SUBSTITUTION” or “WITHDRAWAL” shall be opened and read out first and the name of the Bidder shall be read out. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause IB.21 shall not be opened.

22.3 The bidder’s name, Bid Prices, unit rates, any discount and price of any Alternate Proposal(s), bid modifications, substitutions and withdrawals, the presence or absence of Bid Security, and such other details as the Employer at its discretion may consider appropriate, will be announced by the Employer at the bid opening. The Employer will record minutes of bid opening.

Any Bid Price or discount which is not read out and recorded at bid opening will not be taken into account in the evaluation of bid.

22.4 Discounts offered for lesser period than the bid validity shall not be considered in evaluation.

IB.23 Clarification of Bids

23.1 To assist in the examination, evaluation and comparison of Bids the Engineer may, at its discretion, ask the Bidder for a clarification of its Bid. The request for clarification and the response shall be in writing and no change in the price or substance of the Bid shall be sought, offered or permitted.

IB.24 Preliminary Examination & Determination of Responsiveness of Bids

24.1 Prior to the detailed evaluation of bids, pursuant to Clause IB.26,

(a) the Engineer will examine the Bids to determine whether;

(i) the Bid is complete and does not deviate from the scope,
(ii) any computational errors have been made,
(iii) required sureties have been furnished,
(iv) the documents have been properly signed,
(v) the Bid is valid till required period,
(vi) the Bid prices are firm during currency of contract if it is a fixed price bid,
(vii) completion period offered is within specified limits,
(viii) the Bidder/Manufacturer is eligible to Bid and possesses the requisite experience,
(ix) the Bid does not deviate from basic technical requirements and
(x) the Bids are generally in order.

(b) A bid is likely not to be considered, if;

(i) it is unsigned,
(ii) its validity is less than specified,
(iii) it is submitted for incomplete scope of work,
(iv) it indicates completion period later than specified,
(v) it indicates that Works and materials to be supplied do not meet eligibility requirements,
(vi) it indicates that Bid prices do not include the amount of income tax,

(c) A bid will not be considered, if;

(i) it is not accompanied with bid security and additional bid security, if applicable.
(ii) it is submitted by a bidder who has participated in more than one bid,
(iii) it is received after the deadline for submission of bids,
(iv) it is submitted through fax, telex, telegram or email,
(v) it indicates that prices quoted are not firm during currency of the contract whereas the bidders are required to quote fixed price(s),
(vi) the bidder refuses to accept arithmetic correction,
(vii) it is materially and substantially different from the Conditions/Specifications of the Bidding Documents.

24.2 Arithmetical errors will be rectified on the following basis:

If there is a discrepancy between the unit price and total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If there is a discrepancy between the words and figures the amount in words shall prevail. If there is a discrepancy between the total Bid price entered in Form of Bid and the total shown in Schedule of Prices Summary, the amount stated in the Form of Bid will be corrected by the Employer/Engineer in accordance with the Corrected Schedule of Prices.

If the Bidder does not accept the corrected amount of Bid, his Bid will be rejected and his Bid Security forfeited.

24.3 Prior to the detailed evaluation, pursuant to Clause IB.26 the Employer/Engineer will determine the substantial responsiveness of each Bid to the Bidding Documents. For purpose of these Clauses, a substantially responsive Bid is one which conforms to all the terms and conditions of the Bidding Documents without material deviations.

A material deviation or reservation is one

(i) which affects in any substantial way the scope, quality or performance of the Works.
(ii) which limits in any substantial way, inconsistent with the Bidding Documents, the Employer‟s rights or the bidder's obligations under the Contract; or
(iii) whose rectification/adoption would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

The Employer's/Engineer's determination of a Bid's responsiveness will be based on the contents of the Bid itself without recourse to extrinsic evidence.

24.4 A Bid determined as substantially non-responsive will be rejected and will not subsequently be made responsive by the Bidder by correction of the non-conformity.

24.5 Any minor informality or non-conformity or irregularity in a Bid which does not constitute a material deviation may be waived by Employer, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

IB.25 Conversion to Single Currency

25.1 To facilitate evaluation and comparison, the Employer/Engineer will convert, all Bid Prices expressed in the amount in various currencies in which Bid Price is payable, to Pak. Rupees at the Telegraphic Transfer and Over Draft (TT&OD) composite (selling) exchange rates published/authorized by State Bank of Pakistan and applicable to similar transactions, on the date of the opening of Bids.

IB.26 Detailed Evaluation of Bids

26.1 The Employer/Engineer will evaluate and compare only the bids previously determined to be substantially responsive pursuant to Clause IB.24 as per requirements given hereunder.

26.2 Evaluation and Comparison of Bids

(a) Bids will be evaluated for each item and/or complete scope of work.

(b) Basis of Price Comparison
The prices will be compared on the basis of the Evaluated Bid Price pursuant to Para (e) herein below.

(c) Technical Evaluation
It will be examined in detail whether the Goods offered by the bidder comply with the Technical Provisions of the Bidding Documents. For this purpose, the bidder's data submitted with the bid will be compared with the specific work data prescribed by the Employer and technical features/criteria of the Goods detailed in the Technical Provisions. Other technical information submitted with the bid regarding the Scope of Work will also be reviewed.

(d) Commercial Evaluation
It will be examined in detail whether the bids comply with the commercial/contractual conditions of the Bidding Documents. It is expected that no major deviation/stipulation shall be taken by the bidders.

(e) Evaluated Bid Price
In evaluating the bids, the Employer will determine for each bid in addition to the Bid Price, the following factors (adjustments) in the manner and to the extent indicated below to determine the Evaluated Bid Price:

(i) making any correction for errors pursuant to Sub-Clause 24.2 hereof.
(ii) excluding Provisional Sums, if any, but including priced Daywork.
(iii) making an appropriate adjustment for any other acceptable variation or deviation.

26.3 Evaluation Methods

Pursuant to Sub-Clause 26.2, Para (e)(iii) following evaluation methods for price adjustments will be followed:

(a) Price Adjustment for Completeness in Scope of Work
(b) Price Adjustment for Technical Compliance
(c) Price Adjustment for Commercial Compliance
(d) Price Adjustment for Deviations in Terms of Payment
(e) Price Adjustment for completion Schedule

(i) Price Adjustment for Completeness in Scope of Work
In case of omission in the scope of work of a quoted item no price adjustment for the omitted item(s) shall be applied provided that the Bidder has mentioned in his bid that the same is covered in any other item.

The price adjustment shall not justify any additional payment by the Employer. The price(s) of omitted item(s) shall be deemed covered by other prices of the Schedule of Prices.

(ii) Price Adjustment for Technical Compliance

The cost of making good any deficiency resulting from technical noncompliance will be added to the Corrected Total Bid Price for comparison purposes only. The adjustments will be applied taking the highest price quoted by other Bidders being evaluated in detail in their original Bids for corresponding item. In case of non-availability of price from other Bidders, the price will be estimated by the Engineer.

(iii) Price Adjustment for Commercial Compliance

The cost of making good any deficiency resulting from any quantifiable variations and deviations from the Bid Schedules and Conditions of Contract, as determined by the Engineer will be added to the Corrected Total Bid Price for comparison purpose only. Adjustment for commercial compliance will be based on Corrected Total Bid Prices.

(iv) Price Adjustment for Deviation in Terms of Payment

If a bid deviates from the terms of payment/payment conditions as specified in the Conditions of Contract and if such deviation is considered acceptable to the Employer, mark-up earned for any earlier payments involved in the terms outlined in the Bid as compared to those stipulated in the Conditions of Contract shall be calculated at the following mark-up rates:

- for foreign currency component: LIBOR + 1%.
- for local currency component: KIBOR + 1%.

and shall be added to the Corrected Total Bid Price for comparison purposes only.

(v) Price Adjustment for Completion Schedule

Bids indicating completion in advance of the dates stated in Preamble to Conditions of Contract, no credit will be given in this evaluation.

Bids indicating completion period later than the period set out in Preamble to Conditions of Contract shall be adjusted in the evaluation by adding a factor of 0.05% of the Corrected Total Bid Price for each calendar day of completion later than specified period of the completion.

Bids indicating completion beyond 180 days later than the dates set out in Preamble to Conditions of Contract, shall not be considered and rejected as non responsive.

26.4 If the bid of the successful bidder is seriously unbalanced in relation to the Employer‟s estimate of the cost of work to be performed under the Contract (i.e. more than 30% below on Engineer Estimate as per KPPRA notification No. S.R.O. (13)/Vol: 1-21/2021-22, dated 15/09/2021), the the bidder shall produce detailed rate analysis of his bid price in relation to all the items of bill of quantities, scope of work, allocation of risks and responsibilities and/or any other requirements of the bid solicitation document. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in Clause IB.34 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. The contract shall be awarded to the lowest evaluated bidder who has satisfied the procuring entity on rate analysis.

IB.27. Domestic Preference

27.1 In the comparison of evaluated Bids, the Goods manufactured in Pakistan, will be granted a margin of preference in accordance with the following procedures, provided the bidder shall have established to the satisfaction of Employer that the manufacturing cost of such Goods includes a domestic value addition equal to at least 20% of the ex-factory Bid price of such Goods. Bidders applying for domestic preference shall fill in Appendix C to these Instructions to substantiate their claim.

27.2 The Employer/Engineer will first review the Bids to determine, the Bid group classification in accordance with Sub-Clause 10.2 hereof.

27.3 The comparison shall be Ex-factory price of the Goods to be offered from within Pakistan (such prices to include all costs as well as custom duties and taxes paid or payable on raw materials and components incorporated or to be incorporated in the Goods) and the DDP (CIF + Customs duty, sales tax and other import charges) Pakistan seaport price of the Goods to be offered from outside Pakistan.

27.4 The lowest evaluated bid of each Group shall first be determined by comparing all evaluated bids in each Group among themselves taking into account:

(a) In the case of Goods manufactured in Pakistan, sales tax, local body charges and other similar taxes which will be payable on the furnished Goods in Pakistan.

(b) In the case of Goods of foreign origin offered from abroad, customs duties, sales tax and other import charges which will be payable on furnished Goods in Pakistan.

(c) In the case of Goods of foreign origin already located in Pakistan, customs duty, sales tax and import charges on CIF price as applicable for Sub-Clause 27.4(b) here above.

27.5 The price preference to Group A bids will be:

(i) 15% of the ex-factory bid price, if the value addition through indigenous manufacturing is at least 20%;

(ii) 20% of the ex-factory bid price, if the value addition through indigenous manufacturing is over 20% and up to 30%; and

(iii) 25% of the ex-factory bid price, if the value addition through indigenous manufacturing is over 30%.

27.6 The applicable price preference i.e., as per Sub-Clause 27.5 here above will be applied to Group A Bid by reducing the ex-factory bid price.

IB.28 Process to be Confidential

28. 1 Subject to Clause 23 heretofore, no Bidder shall contact Employer and/or Engineer on any matter relating to its Bid from the time of the Bid opening to the time the bid evaluation result is announced by the Employer. The evaluation result shall be announced at least ten (10) days prior to award of Contract. 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.

28.2 Any effort by a Bidder to influence Employer and/or Engineer in the Bid evaluation, Bid comparison or Contract Award decisions may result in the rejection of his Bid. Whereas any bidder feeling aggrieved may lodge a written complaint not later than fifteen (15) days after the announcement of the bid evaluation result; however, mere fact of lodging a complaint shall not warrant suspension of the procurement process.

F. AWARD OF CONTRACT

IB.29. Post-Qualification

29.1 The Employer, at any stage of the bid evaluation, having credible reasons for or *prima facie* evidence of any defect in Supplier's or contractor's capacities, may require the suppliers or contractors to provide information concerning their professional, technical, financial, legal or managerial competence whether already pre-qualified or not:

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

29.2 The determination will take into account the bidder's financial, technical and production capabilities. It will be based upon an examination of the documentary evidence of the bidder's qualification submitted under Appendix B to Instructions to Bidders "Evidence of Bidder's Capability" by the bidder pursuant to Clause IB.13, as well as such other information as required under the Bidding Documents.

29.3 An affirmative determination will be a pre-requisite for award of the Contract to the lowest evaluated bidder. A negative determination will result in rejection of that bidder's bid in which event, Employer will proceed to undertake a similar determination of the next lowest evaluated bidder's capabilities to perform the Contract satisfactorily.

IB.30 Award Criteria

30.1 Subject to Clause IB.32, 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 qualified to satisfactorily perform the Contract in accordance with the provisions of Clause IB.29.

IB.31 Employer's Right to Vary Quantities

31.1 Employer reserves the right at the time of award of Contract to increase or decrease by upto 15% the quantity of goods and services specified in the Schedule of Prices without any change in the unit price or other terms and conditions.

IB.32 Employer's Right to Accept any Bid and to Reject any or all Bids

32.1 Notwithstanding Clause IB.30, 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 to inform the affected bidders of the grounds for the Employer's action except that the grounds for its rejection 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.

32.2 No negotiations with the bidder having been evaluated as lowest responsive or any other bidder shall be permitted. However, the Employer may have clarification meeting(s) to get clarify any item(s) in the bid evaluation report.

IB.33 Notification of Award

33.1 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").

33.2 The Letter of Acceptance 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.

33.3 Upon furnishing by the successful bidder of a Performance Security, the Employer will promptly notify the other bidders that their bids have been unsuccessful and return their bid securities.

IB.34 Performance Security

34.1 The successful bidder shall furnish to the Employer a Performance Security in the form and the amount stipulated in the Conditions of Contract within a period of twenty eight (28) days after the receipt of Letter of Acceptance.

34.2 Failure of the successful bidder to comply with the requirements of Sub-Clause IB.34.1 or Clause IB.35 or Clause IB.43shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security.

IB.35 Signing of Contract Agreement

35.1 Within fourteen (14) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Employer will send to the successful bidder the Form of Contract Agreement provided in the Bidding Documents, duly filled in and incorporating all agreements between the parties for signing and return it to the Employer.

35.2 The formal Agreement between the Employer and the successful bidder shall be executed within fourteen (14) days of the receipt of such Form of Contract Agreement by the successful bidder from the Employer.

G. ADDITIONAL INSTRUCTIONS

IB.36 Instructions not Part of Contract

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

IB.37 Contract Documents

37.1 The Documents which will be included in the Contract are listed in the Form of Contract Agreement set out in these Bidding Documents.

IB.38 Sufficiency of Bid

38.1 Each bidder shall satisfy himself before Bidding as to the correctness and sufficiency of his Bid and of the rates and prices entered in the Schedule of Prices. Except insofar as it is otherwise expressly provided in the Contract, the rates and prices entered in the Schedule of Prices shall cover all his obligations under the Contract and all matters and things necessary for the proper completion of the Works.

IB.40 Bidder to Inform Himself

40.1 The bidder is advised to obtain for himself at his own cost and responsibility all information that may be necessary for preparing the bid and entering into a Contract for execution of the Works. This shall include but not be limited to the following:

(a) inquiries on Pakistani Income Tax/Sales Tax to the Commissioner of the Income Tax and Sales Tax, Pakistan.

(b) inquiries on customs duties and other import taxes, to the concerned authorities of Customs and Excise Department.

(c) information regarding port clearance facilities, loading and unloading facilities, storage facilities, transportation facilities and congestion at Pakistan seaports.

(d) investigations regarding transport conditions and the probable conditions which will exist at the time the Goods will be actually transported.

IB.41 Alternate Proposals by Bidder

41.1 Should any bidder consider that he can offer any advantage to the Employer by a modification to the designs, specifications or other conditions, he may, in addition to his bid to be submitted in strict compliance with the Bidding Documents, submit any Alternate Proposal(s) containing (a) relevant design calculations; (b) technical specifications; (c) proposed construction methodology; and (d) any other relevant details / conditions, provided always that the total sum entered on the Form of Bid shall be that which represents complete compliance with the Bidding Documents.

41.2 Alternate Proposal(s), if any, of the lowest evaluated responsive bidder only may be considered by the Employer as the basis for the award of Contract to such bidder.

IB.42 Local Conditions

42.1 Bidder must verify and supplement by his own investigations the information about site and local conditions. However, Employer will assist the Bidder wherever practicable and possible.

IB.43 Integrity Pact

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

BIDDING DATA

IB Clause Reference	Bidding Data
1.1	Name and address of the Employer: **Chief Engineer (Merged Area) Irrigation Department, Peshawar.** **Through** Executive Engineer, M o h m a n d Irrigation Division, Mohmand. Address: 1st Floor at Old DGHS Office, Deputy Commissioner Peshawar Complex, Gate No. 3, Khyber Road, Peshawar Cantt
1.1	Name of the Project & Summary of the Works: Name of Work: **Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of Existing Irrigation Tube Wells in Merged Areas (AIP). ADP No. 210588 (2023-24)** Sub Work: **As per NIT**
1.2	Name of the Borrower/Source of Financing/Funding Agency: *Provincial ADP/AIP through Govt of Khyber Pakhtunkhwa*
1.2	Amount and type of financing: *As per NIT through Provincial ADP*
2.1 (a)	Bidders shall be duly Licensed by the Pakistan Engineering Council (PEC), relevant to the Works in the category: **As per NIT** In the case of JV of firms, number of Partners shall not be more than 2 Foreign firms may form JV with Local firms having share not less than 30%.
IB Clause Reference	**Bidding Data**
2.1(b)	Bidder,,s Country: *[Eligible countries listed in Annexure-A to Bidding Data]*
2.1(c)	*NA; Any Firm can apply having the required qualifications. Post Qualifications method of procurement is applicable.*
3.1	*[Goods and ancillary Services to be supplied under this Contract shall have their origin in eligible countries listed in Annexure-A to Bidding Data]*

6.1	**Chief Engineer (Merged Area) Irrigation Department through Executive Engineer, Mohmand Irrigation Division,Mohmand.** 1st Floor at Old DGHS Office, Deputy Commissioner Peshawar Complex, Gate No. 3, Khyber Road, Peshawar. **Email:** irrigationmohmand@gmail.com.
6.2	Venue, time, and date of the pre-Bid meeting: **Office of the Chief Engineer (Merged Area) Irrigation Department , H# 18 / BB-1, Park road, University Town Peshawar** **Date & Time as per NIT**
8.1	Bid language: **English**
9.1(j)	*[The particulars for domestic Goods prescribed in Annexure-C to Bidding Data]*
13.4 (a)	Bidder/Manufacturer's Experience: *03 Years* Plant should have produced required items for at least 03 years. Those items have proven successful in the field for at least 02 years. *[The bidder shall furnish documentary evidence of qualification in accordance with Annexure-B to Bidding Data]*
15.1	Amount of Bid Security As per NIT
16.1	Period of Bid Validity: *120 days*
17.4	Number of copies of the Bid to be completed and returned: **01 Original (Technical & Financial Bid)**
IB Clause Reference	**Bidding Data**
19.1(a)	Employer's address for the purpose of Bid submission: **Office of the Executive Engineer, Mohmand Irrigation Division,** 1st Floor at Old DGHS Office, Deputy Commissioner Peshawar Complex, Gate No. 3, Khyber Road, Peshawar. **Email:** irrigationmohmand@gmail.com. Deadline for submission of bids: **As per NIT**
22.1	Venue, time, and date of Bid opening: **Office of the Executive Engineer, Mohmand Irrigation Division,** 1st Floor at Old DGHS Office, Deputy Commissioner Peshawar Complex, Gate No. 3, Khyber Road, Peshawar.
29.2	*[The documentary evidence of the bidder's qualification shall be asper Annexure-B to Bidding Data]*

EVALUATION CRITERIA FOR THE WORKS OF PEC REQUIRED CATEGORY OF C-6 OF NIT

1.1 Eligibility for Qualification

Keeping in view the complexity of the Project, eligibility of Applicants for qualification evaluation is as mentioned below:

Sr. No.	Description	Yes/No
1.	Registration with Pakistan Engineering Council (PEC) in relevant category C-6 with field of specialization EE-11 **(Specified for Solar Energy).** Enlisted with Irrigation Department Khyber Pakhtunkhwa.	If "YES" the applicant will be Eligible for further Evaluation for qualification (copy of valid PEC certificate shall be attached).
2.	Valid NTN and on Active Tax Payer list. Valid KPRA Active registration.	If "YES" the applicant will be Eligible for further Evaluation forqualification.
3.	Blacklisting from any Government/Semi-Government Agency/Department.	If "YES" the applicant will not be Eligible for further Evaluation for qualification. (Original Affidavit on Judicial Stamp Paper that the firm has not been black listed from any Government/ Semi Government Agency/ Department till date shall be provided).
4.	System Design	System Design must be submitted in technical bid otherwise applicant will not be Eligible for further Evaluation.
5.	i. Firm must have ISO 9001-2008 certificate quality management system ii. Warranty period for solar panel etc will be 25 years and Defect Liability Period for electrical /mechanical works will be 2 years. iii. The Firm must have an average annual turnover in the last 5 years equal to or more than the total bid price. Alternately, the bidder should have successfully completed in the last five years any specific project having value equal to or higher than total bid price. Documentary Proof must be attached in support with the average annualturnover. iv. Goods declaration (bill of entry) must be provided for each product (i.e Solar Panel, Pumps, Motors, Inverter). v. Performance curves at STC for both solar panel and pumping machinery should be provided for each work separately along with bidding documents vi. The PV modules offered should not be more than One (01) year old with respect	Attach Valid documents otherwise applicant will not be eligible for further evaluation.

	to the date of manufacturing. vii. Brand name(s) of PV modules, the supplier intends to supply must be included in the technical proposal.	
6	i. Income tax Registration (Active Status) ii. Sales tax Registration (Active Status)	If "YES" the applicant will be Eligible for further Evaluation for qualification.

1.2 Evaluation Criteria

Keeping in view the complexity of the Project works, criteria for qualification has been evolved by considering the prevailing market trends as mentioned below:

Sr. No.	Category	Weightage/Marks
i.	General Capabilities	10
ii.	Financial Soundness	20
iii.	Experience Record	30
iv.	Personnel Capabilities	20
v.	Equipment Capabilities	20
	Total:	100

Qualification will be carried out on the point scoring basis. Any applicant securingoverall minimum score of 60 % as total will be considered as qualified.

An applicant may score below 60% in any one category provided it is not less than 50%.

Applicants having score of less than 60% in any two categories shall not be considered for further evaluation.

For JV, 40% qualifying criteria in each category for lead partner and 25% qualifying criteria in each category for JV partner.

Evaluation Criteria for the Works of PEC required Category of C-6 of the NIT

i) General Capabilities

a)	Copy of Valid dealer ship (pumps & solar panels) certificate from Sub-Contractor/JV Partner	2	▪ No marks will be given if license is not attached and 2 points will be awarded in case of valid certificate.
c)	Litigation History in which Decision has been given against the firm(s)	6	▪ In case the firm is involved in any litigation, **5** points will be deducted and ▪ 6 points will be awarded in case Original affidavit of no litigation is attached on judicial stamp paper.
d)	Description of Internal Quality Control assurance program for Construction/ Erection/Maintenance	2	▪ 2 Marks will be awarded if Description is provided.
Total Marks Allocated			**10**

ii) Financial Soundness

Sr. No.	Description	Marks Assigned	Criteria for Marks Obtained
a)	Bank Certificate including Bank Credit Line (Evidence in Original from Guarantor Bank)	5	**Bank Certificate (2-Marks)** • 2 Marks are given if Original Bank Certificate is provided. **Bank Credit Line (3-Marks)** • 2 Marks are given if the available bank credit line limit is equal to 4 Million. • For limit less than 4 Million, use following weight-age: 2 x (A/4) • For the limit more than 4 million but less than 5 million use following weight-age: 2 + (A/5) A = Available Bank Credit Line Limit

			• Full Marks are given in case of limit is 5 million or more.
b)	Audited Balance Sheets for at least last Three years	5	• No marks will be given if Audited Balance Sheets are not attached and full marks will only be given if complete 03 years audited balance sheets are provided.
c)	Working Capital in last 3 years	5	• 3 Marks are given if the available average working capital for last three years is equal to 4 Million as ascertained from income tax, sales tax (both federal and provincial) and audited balance sheets. • For the capital less than 4 million use following weight-age: 3 x (A/4) • For the capital more than 4 million but less than 5 million use following weight-age. 3+ (A/5) x 2 A = Average working capital in last three years. • Full Marks are given in case of limit is 5 million or more.
d)	Registration with income tax & sale tax department along with sales tax returns (both federal and provincial KPRA) and income tax returns for the last five years.	5	• No marks will be given if NTN & GST Registration certificate is not attached and 5 points will be awarded in case of valid certificates along with returns for last five years.
Total Marks Allocated			**20**

iii) Experience Record

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	Projects of similar nature and complexity of Rs. 3 (M) & Above (Supply & Installation of Solar Based Pumping Machinery) completed in last five years in any Public Works Department / NGOs.	16	• 8 Marks are given if the applicant has completed at least 5 projects of similar nature in last five years. • For less than 5 projects completed use the following weight age. 8 x (A/5) • For more than 5 projects but less than 10 projects completed use the following weight age. 8 + (A/5) x 4 A = No of projects of similar nature completed in last five years • Full Marks are given in case of 10 projects or more.
b)	Projects of similar nature and complexity of Rs. 3 (M) (Supply & Installation of Solar Based Pumping Machinery) in-hand in any Public Works Department/NGOs.	9	• 4 Marks are given if the applicant has in-hand at least 5 projects of similar nature in last five years. • For less than 5 projects in-hand use the following weight age. 4 x (A/5) • For more than 5 projects but less than 10 projects in-hand use the following weight age. 4 + (A/10) x 4

			A = No of projects of similar nature in-hand. Full Marks are given in case of 10 projects or more.
c)	Enlistment record with Government Organizations & other agencies	5	• 03 marks for enlistment with Irrigation Department, C&W & PHED (KP) • 1 Mark for each enlistment up to maximum of 02 enlistments.
Total Marks Allocated			**30**

iv) Personnel Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
i)	B.Sc. Engineers registered with Pakistan Engineering Council (PEC)	14	**Experience (6-Marks)** • 6 Marks will be awarded to the firm if it has on its strength at least one B.Sc. Engineer registered as Professional Engineer with PEC in Electrical/Electronics/Mechanical having experience equal or more than 05 years. **Strength of Engineers (8 Marks)** • 4 Marks will be awarded to the firm if it has on its strength two Nos PEC registered Engineers (Electrical/Electronics/Mechanical). • 8 Marks will be awarded to the firm if it has on its strength 03 Nos PEC registered Engineers (Electrical/Electronics/Mechanical).
ii)	Associates Engineers (DAE)	6	**Experience (4-Marks)** • 4 Marks will be awarded to the firm if it has on its strength at least one Associate Engineer (DAE) Electrical/Mechanical having experience equal or more than 02 years. **Strength of Associate Engineers (2 Marks)** • 2 Marks will be awarded to the firm if it has on its strength two or more Associate Engineer (DAE) Electrical/ Mechanical.
Total Marks Allocated			**20**

v) Equipment Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	Test Bed for verification / testing of Solar pumps along with allaccessories as per ISO-9906 in company premises. (Firm must have Third Party Certification regarding Test Bed arrangements).	10	10 Marks for complete setup aregiven. (Attached Third Party Certificate)
b)	Workshop facilities. Attach layout sketch of workshop.	4	No marks will be given if Contractor has no workshop facilities.
c)	Equipment sole agencies represented by the Contractor	2	1 mark for each agency Upto maximum 2 points
d)	List of Devices with Contractor. i. PV Analyzer ii. Flow Meter iii. Ultrasonic Water Level	4	Provide Make & Serial Number of the following devices. i. PV Analyzer = 01 Mark ii. Flow Meter = 02 Marks iii. Ultrasonic Water Level = 01 Mark
Total Marks Allocated			**20**

EVALUATION CRITERIA FOR THE WORKS OF PEC REQUIRED CATEGORY OF C-5 OF NIT

1.3 Eligibility for Qualification

Keeping in view the complexity of the Project, eligibility of Applicants for qualification evaluation is as mentioned below:

Sr. No.	Description	Yes/No
1.	Registration with Pakistan Engineering Council (PEC) in relevant category C-6 with field of specialization EE-11 **(Specified for Solar Energy).** Enlisted with Irrigation Department Khyber Pakhtunkhwa.	If "YES" the applicant will be Eligible for further Evaluation for qualification (copy of valid PEC certificate shall be attached).
2.	Valid NTN and on Active Tax Payer list. Valid KPRA Active registration.	If "YES" the applicant will be Eligible for further Evaluation forqualification.
3.	Blacklisting from any Government/Semi-Government Agency/Department.	If "YES" the applicant will not be Eligible for further Evaluation for qualification. (Original Affidavit on Judicial Stamp Paper that the firm has not been black listed from any Government/ Semi Government Agency/ Department till date shall be provided).
4.	System Design	System Design must be submitted in technical bid otherwise applicant will not be Eligible for further Evaluation.
5.	vii. Firm must have ISO 9001-2008 certificate quality management system viii. Warranty period for solar panel etc will be 25 years and Defect Liability Period for electrical /mechanical works will be 2 years. ix. The Firm must have an average annual turnover in the last 5 years equal to or more than the total bid price. Alternately, the bidder should have successfully completed in the last five years any specific project having value equal to or higher than total bid price. Documentary Proof must be attached in support with the average annualturnover. x. Goods declaration (bill of entry) must be provided for each product (i.e Solar Panel, Pumps, Motors, Inverter). xi. Performance curves at STC for both solar panel and pumping machinery should be provided for each work separately along with bidding documents xii. The PV modules offered should not be more than One (01) year old with respect	Attach Valid documents otherwise applicant will not be eligible for further evaluation.

	to the date of manufacturing. vii. Brand name(s) of PV modules, the supplier intends to supply must be included in the technical proposal.	
6	iii. Income tax Registration (Active Status) iv. Sales tax Registration (Active Status)	If "YES" the applicant will be Eligible for further Evaluation for qualification.

1.4 Evaluation Criteria

Keeping in view the complexity of the Project works, criteria for qualification has been evolved by considering the prevailing market trends as mentioned below:

Sr. No.	Category	Weightage/Marks
i.	General Capabilities	10
ii.	Financial Soundness	20
iii.	Experience Record	30
iv.	Personnel Capabilities	20
v.	Equipment Capabilities	20
	Total:	100

Qualification will be carried out on the point scoring basis. Any applicant securingoverall minimum score of 60 % as total will be considered as qualified.

An applicant may score below 60% in any one category provided it is not less than 50%.

Applicants having score of less than 60% in any two categories shall not be considered for further evaluation.

For JV, 40% qualifying criteria in each category for lead partner and 25% qualifying criteria in each category for JV partner.

Evaluation Criteria for the Works of PEC required Category of C-5 of the NIT

vi) General Capabilities

a)	Copy of Valid dealer ship (pumps & solar panels) certificate from Sub-Contractor/JV Partner	2	▪ No marks will be given if license is not attached and 2 points will be added in case of valid certificate.
c)	Litigation History in which Decision has been given against the firm(s)	6	▪ In case the firm is involved in any litigation, **-5** will be given and ▪ 6 points will be added in case Original affidavit of no litigation is attached on judicial stamp paper.
d)	Description of Internal Quality Control assurance program for Construction/ Erection/Maintenance	2	▪ 2 Marks will be given if Description is provided.
Total Marks Allocated			**10**

vii) Financial Soundness

Sr. No.	Description	Marks Assigned	Criteria for Marks Obtained
a)	Bank Certificate including Bank Credit Line (Evidence in Original from Guarantor Bank)	5	**Bank Certificate (2-Marks)** • 2 Marks are given if Original Bank Certificate is provided. **Bank Credit Line (3-Marks)** • 2 Marks are given if the available bank credit line limit is equal to 15 Million. • For limit less than 15 Million, use following weight-age: 2 x (A/10) • For the limit more than 15 million but less than 20 million use following weight-age: 2 + (A/12) A = Available Bank Credit Line Limit

			• Full Marks are given in case of limit is 20 million or more.
b)	Audited Balance Sheets for at least last Five years	5	• No marks will be given if Audited Balance Sheets are not attached and full marks will only be given if complete 02 years audited balance sheets are provided.
c)	Working Capital in last 5 years	5	• 3 Marks are given if the available average working capital for last three years is equal to 15 Million as ascertained from income tax, sales tax (both federal and provincial) and audited balance sheets. • For the capital less than 15 million use following weight-age: 3 x (A/10) • For the capital more than 15 million but less than 20 million use following weight-age. 3+ (A/12) x 2 A = Average working capital in last three years. • Full Marks are given in case of limit is 20 million or more.
d)	Registration with income tax & sale tax department along with sales tax returns (both federal and provincial KPRA) and income tax returns for the last five years.	5	• No marks will be given if NTN & GST Registration certificate is not attached and 5 points will be added in case of valid certificates along with returns for last five years.
Total Marks Allocated			**20**

viii) Experience Record

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	Projects of similar nature and complexity Rs. 25 (M) & Above (Supply & Installation of Solar Based Pumping Machinery) completed in last five years in any Public Works Department / NGOs.	16	• 8 Marks are given if the applicant has completed at least 5 projects of similar nature in last five years. • For less than 5 projects completed use the following weight age. 8 x (A/5) • For more than 5 projects but less than 10 projects completed use the following weight age. 8 + (A/5) x 4 A = No of projects of similar nature completed in last five years • Full Marks are given in case of 10 projects or more.
b)	Projects of similar nature and complexity Rs. 25 (M) (Supply & Installation of Solar Based Pumping Machinery) in-hand in any Public Works Department/NGOs.	9	• 4 Marks are given if the applicant has in-hand at least 5 projects of similar nature in last five years. • For less than 5 projects in-hand use the following weight age. 4 x (A/5) • For more than 5 projects but less than 10 projects in-hand use the following weight age. 4 + (A/10) x 4

			A = No of projects of similar nature in-hand. Full Marks are given in case of 10 projects or more.
c)	Enlistment record with Government Organizations & other agencies	5	• 03 marks for enlistment with Irrigation Department, C&W & PHED (KP) • 1 Mark for each enlistment up to maximum of 02 enlistments.
Total Marks Allocated			**30**

ix) Personnel Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
i)	B.Sc Engineers registered with Pakistan Engineering Council (PEC)	14	**Experience (6-Marks)** • 6 Marks will be awarded to the firm if it has on its strength at least one B.Sc. Engineer registered as Professional Engineer with PEC in Electrical/Electronics/Mechanical having experience equal or more than 05 years. **Strength of Engineers (8 Marks)** • 4 Marks will be awarded to the firm if it has on its strength two Nos PEC registered Engineers (Electrical/Electronics/Mechanical). • 8 Marks will be awarded to the firm if it has on its strength 03 Nos PEC registered Engineers (Electrical/Electronics/Mechanical).
ii)	Associates Engineers (DAE)	6	**Experience (4-Marks)** • 4 Marks will be awarded to the firm if it has on its strength at least one Associate Engineer (DAE) Electrical/Mechanical having experience equal or more than 02 years. **Strength of Associate Engineers (2 Marks)** • 2 Marks will be awarded to the firm if it has on its strength two or more Associate Engineer (DAE) Electrical/ Mechanical.
Total Marks Allocated			**20**

x) Equipment Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	Test Bed for verification / testing of Solar pumps along with allaccessories as per ISO-9906 in company premises. (Firm must have Third Party Certification regarding Test Bed arrangements).	10	10 Marks for complete setup aregiven. (Attached Third Party Certificate)
b)	Workshop facilities. Attach layout sketch of workshop.	4	No marks will be given if Contractor has no workshop facilities.
c)	Equipment sole agencies represented by the Contractor	2	1 mark for each agencyUpto maximum 2 points
d)	List of Devices with Contractor. iv. PV Analyzer v. Flow Meter vi. Ultrasonic Water Level	4	Provide Make & Serial Number of the following devices. v. PV Analyzer = 01 Mark v. Flow Meter = 02 Marks vi. Ultrasonic Water Level = 01 Mark
Total Marks Allocated			**20**

Evaluation Criteria for the Works of PEC required Category of C-4 of the NIT

1.5 Eligibility for Qualification

Keeping in view the complexity of the Project, eligibility of Applicants for qualification evaluation is as mentioned below:

Sr. No.	Description	Yes/No
1.	Registration with Pakistan Engineering Council (PEC) in relevant category C-6with field of specialization EE-11 **(Specified for Solar Energy).** Enlisted with Irrigation Department Khyber Pakhtunkhwa.	If "YES" the applicant will beEligible for further Evaluation forqualification (copy of valid PEC certificate shall be attached).
2.	Valid NTN and on Active Tax Payer list. Valid KPRA Active registration.	If "YES" the applicant will beEligible for further Evaluation forqualification.
3.	Blacklisting from any Government/Semi-Government Agency/Department.	If "YES" the applicant will not be Eligible for further Evaluation forqualification. (Original Affidavit on Judicial Stamp Paper that the firm has not been black listed from any Government/ Semi Government Agency/ Department till date shall be provided).
4.	System Design	System Design must be submitted in technical bid otherwise applicant will not be Eligible for further Evaluation.
5.	xiii. Firm must have ISO 9001-2008 certificate quality management system xiv. Warranty period for solar panel etc will be 25 years and Defect Liability Period for electrical /mechanical works will be 2 years. xv. The Firm must have an average annual turnover in the last 5 years equal to or more than the total bid price. Alternately, the bidder should have successfully completed in the last five years any specific project having value equal to or higher than total bid price. Documentary Proof must be attached in support with the average annualturnover. xvi. Goods declaration (bill of entry) must be provided for each product (i.e Solar Panel, Pumps, Motors, Inverter). xvii. Performance curves at STC for both solar panel and pumping machinery should be provided for each work separately along with bidding documents xviii. The PV modules offered should not be more than One (01) year old with respect	Attach Valid documents otherwise applicant will not be eligible for further evaluation.

	to the date of manufacturing. vii. Brand name(s) of PV modules, the supplier intends to supply must be included in the technical proposal.	
6	v. Income tax Registration (Active Status) vi. Sales tax Registration (Active Status)	If "YES" the applicant will be Eligible for further Evaluation for qualification.

1.6 Evaluation Criteria

Keeping in view the complexity of the Project works, criteria for qualification has been evolved by considering the prevailing market trends as mentioned below:

Sr. No.	Category	Weightage/Marks
i.	General Capabilities	10
ii.	Financial Soundness	20
iii.	Experience Record	30
iv.	Personnel Capabilities	20
v.	Equipment Capabilities	20
	Total:	100

Qualification will be carried out on the point scoring basis. Any applicant securing overall minimum score of 60 % as total will be considered as qualified.

An applicant may score below 60% in any one category provided it is not less than 50%.

Applicants having score of less than 60% in any two categories shall not be considered for further evaluation.

For JV, 40% qualifying criteria in each category for lead partner and 25% qualifying criteria in each category for JV partner.

Evaluation Criteria for the Works of PEC required Category of C-4 of the NIT

xi) General Capabilities

a)	Copy of Valid dealer ship (pumps & solar panels) certificate from Sub-Contractor/JV Partner	2	▪ No marks will be given if license is not attached and 2 points will be added in case of valid certificate.
c)	Litigation History in which Decision has been given against the firm(s)	6	▪ In case the firm is involved in any litigation, **-5** will be given and ▪ 6 points will be added in case original affidavit of no litigation is attached.
d)	Description of Internal Quality Control assurance program for Construction/ Erection/Maintenance	2	▪ 2 Marks will be given if Description is provided.
Total Marks Allocated			**10**

xii) Financial Soundness

Sr. No.	Description	Marks Assigned	Criteria for Marks Obtained
a)	Bank Certificate including Bank Credit Line (Evidence in Original from Guarantor Bank)	5	**Bank Certificate (2-Marks)** • 2 Marks are given if Original Bank Certificate is provided. **Bank Credit Line (3-Marks)** • 2 Marks are given if the available bank credit line limit is equal to 50 Million. • For limit less than 50 Million, use following weight-age: 2 x (A/50) • For the limit more than 50 million but less than 60 million use following weight-age: 2 + (A/60) A = Available Bank Credit Line Limit

			• Full Marks are given in case of limit is 60 million or more.
b)	Audited Balance Sheets for at least last five years	5	• No marks will be given if Audited Balance Sheets are not attached and full marks will only be given if complete 5 years audited balance sheets are provided.
c)	Working Capital in last 5 years	5	• 3 Marks are given if the available average working capital for last three years is equal to 50 Million as ascertained from income tax, sales tax (both federal and provincial) and audited balance sheets. • For the capital less than 50 million use following weight-age: 3 x (A/50) • For the capital more than 50 million but less than 60 million use following weight-age. 3 + (A/60) x 2 A = Average working capital in last three years. • Full Marks are given in case of limit is 60 million or more.
d)	Registration with income tax & sale tax department along with sales tax returns (both federal and provincial) and income tax returns for the last five years.	5	• No marks will be given if NTN & GST Registration certificate is not attached and 5 points will be added in case of valid certificates along with returns for last five years.
Total Marks Allocated			**20**

xiii) Experience Record

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	Projects of similar nature and complexity Rs. 50 (M) & Above (Supply & Installation of Solar Based Pumping Machinery) completed in last five years in any Public Works Department / NGOs.	16	• 8 Marks are given if the applicant has completed at least 5 projects of similar nature in last five years. • For less than 5 projects completed use the following weight age. 8 x (A/5) • For more than 5 projects but less than 10 projects completed use the following weight age. 8 + (A/5) x 4 A = No of projects of similar nature completed in last five years • Full Marks are given in case of 10 projects or more.
b)	Projects of similar nature and complexity Rs. 50 (M) (Supply & Installation of Solar Based Pumping Machinery) in-hand in any Public Works Department/NGOs.	9	• 4 Marks are given if the applicant has in-hand at least 5 projects of similar nature in last five years. • For less than 5 projects in-hand use the following weightage. 4 x (A/5) • For more than 5 projects but less than 10 projects in-hand use the following weightage. 5 + (A/10) x 4

			A = No of projects of similar nature completed in last five years Full Marks are given in case of 10 projects or more.
c)	Enlistment record with Government Organizations & other agencies	5	• 03 marks for enlistment with Irrigation Department, C&W & PHED (KP) • 1 Mark for each enlistment up to maximum of 02 enlistments.
Total Marks Allocated			**30**

xiv) Personnel Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
i)	B.Sc. Engineers registered with Pakistan Engineering Council (PEC)	14	**Experience (6-Marks)** • 6 Marks will be given if the individual relevant experience of at least 1 numbers of B.Sc. Engineer Electrical/Electronics/Mechanical (professional) is equal to 10 years or above. **Strength of Engineers (8 Marks)** • 4 Marks will be given if the total no. of Engineers registered with PEC is 2. • 8 Marks will be given if the total no. of engineers registered with PEC is 3 or above.
ii)	Associates Engineers (DAE)	6	**Experience (4-Marks)** • 4 Marks will be given if the individual relevant experience of at least 1 number of Associates Engineers Electrical/Mechanical (DAE) is equal to 05 years or above. **Strength of Associate Engineers (2 Marks)** • 2 Marks will be given if the total no. of Associate Engineers (DAE) are 2 or above.
Total Marks Allocated			**20**

xv) Equipment Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	1. Test Bed for verification / testing of Solar pumps along with all accessories as per ISO-9906 in company premises. (Firm must have Third Party Certification regarding Test Bed arrangements).	10	10 Marks for complete setup aregiven. (Attached Third Party Certificate)
b)	Workshop facilities. Attach layout sketch of workshop.	4	No marks will be given if Contractor has no workshop facilities.
c)	Equipment sole agencies represented by the Contractor	2	1 mark for each agency Upto maximum 2 points
d)	List of Devices with Contractor. vii. PV Analyzer viii. Flow Meter ix. Ultrasonic Water Level	4	Provide Make & Serial Number of the following devices. ii. PV Analyzer = 01 Mark viii. Flow Meter = 02 Marks ix. Ultrasonic Water Level = 01 Mark
Total Marks Allocated			**20**

Note :

A.

- Grouping and Merging of projects will not be considered.
- Each completed work in all categories must be supported by completion certificate, work order / acceptance letter duly signed & stamped by the issuing authority with office address. Substantial completion certificate will not be considered as completion certificate for that particular project. In other words in progress work shall not be considered even if it is above the threshold amount.
- Any claim experience without supporting documents will not be entertained.
- If any documents found fake, the bid of that bidder will be considered not qualified.
- Each running / in hand project must be supported by tender Letter of Acceptance, Letter of Commencement and work order with full details of the issuing agency including official designation, office address, signed by the official, phone and Fax Nos. In case of Photocopy, the document must be attested by the concerned issuing authority.

B:

- Machinery list should be provided on stamp paper, verified and stamped by Notary public and /or Oath Commissioner.
- Photocopies of Ownership documents of owned Machinery must also be attached and attested. In case of unavailability of ownership documents, the same will be consider as rented.

C:

- Special Note: All documents submitted must provide official sign, designation, address, phone and Fax No of the issuing agency. In case of photocopies, it must be attested by the concerned issuing agency.
- Incomplete / missing document of any claim will be marked zero. Fake documents provided by bidder will lead to not qualified.

FORM OF BID AND SCHEDULES TO BID

FORM OF BID
(LETTER OF OFFER)

Bid Reference No._____

ADP No. 2175 / 210588 during 2023-24
Name of work: Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No. 210588 (2023-24)

Sub Work: As per NIT

E/Cost: As per NIT

To

Executive Engineer
Mohmand Irrigation Division, Mohmand.

_____

Gentlemen,

1. Having examined the Bidding Documents including Instructions to Bidders, Conditions of Contract, Specifications, Drawings, Schedule of Prices and Addenda Nos._____for the execution of the above-named Works, we, the undersigned, being a company doing business under the name of and address _____ _____ and being duly incorporated under the laws of _____ hereby offer to execute and complete such Works and remedy any defects therein in conformity with the said Documents including Addenda thereto for the Total Bid Price comprising Foreign Currency Component of _____ (_____) and Local Currency Component of Rs. _____ (Rupees_____) or such other sum as may be ascertained in accordance with the said Documents.

2. We understand that all the Schedules attached hereto form part of this Bid.

3. As security for due performance of the undertakings and obligations of this Bid, we submit herewith a Bid Security in the amount of _____ _____drawn in your favour or made payable to you and valid for a period twenty eight (28) days beyond the period of validity of Bid.

4. We undertake, if our Bid is accepted, to commence the Works and to deliver and complete the whole of the Works comprised in the Contract within the time(s) stated in Preamble to the Conditions of Contract.

5. We agree to abide by this Bid for the period of __days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
6. Unless and until a formal Agreement is prepared and executed, this Bid, together with your written acceptance thereof, shall constitute a binding contract between us.

7. We undertake, if our Bid is accepted, to execute the Performance Security referred to in Clause 10 of Conditions of Contract for the due performance of the Contract.

8. We understand that you are not bound to accept the lowest or any Bid you may receive.

9. We do hereby declare that the Bid is made without any collusion, comparison of figures or arrangement with any other person or persons making a Bid for the Works.

10. We confirm, if our Bid is accepted, that all partners of the joint venture shall be liable jointly and severally for the execution of the Contract and the composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer. (Please delete in case of Bid from a single firm).

Dated this_____day of_____20_____

Signature _____
in the capacity of_____duly authorized to sign bids for and on behalf of

_____
(Name of Bidder in Block Capitals)
(Seal)

Address

_____
_____
__

Witness:

(Signature)_____

(Name)_____

Address:_____
_____

Occupation_____

SCHEDULES TO BID INCLUDE THE FOLLOWING:

- Schedule A to Bid: Specific Works Data
- Schedule B to Bid: Work to be Performed by Subcontractors
- Schedule C to Bid: Proposed Programme of Works
- Schedule D to Bid: Deviations from Technical Provisions
- Schedule E to Bid: Deviations from Contractual Conditions
- Schedule F to Bid: Method of Performing Works
- Schedule G to Bid: Proposed Organisation
- Schedule H to Bid: Integrity Pact

SCHEDULE – A TO BID

SPECIFIC WORKS DATA

(Proforma for specific Data to be prepared and incorporated by the Employer which will be filled in by the bidders)

SCHEDULE – B TO BID

WORK TO BE PERFORMED BY SUBCONTRACTORS

The bidder will do the work with his own forces except the work listed below which he intends to sub-contract.

Items of Work to be Sub-Contracted	Name and address of Sub-Contractor	Statement of similar works previously executed (attach evidence)

Note:

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

SCHEDULE – C TO BID

PROPOSED PROGRAMME OF WORKS

Bidder shall provide a programme in a bar-chart/CPM/PERT form showing the sequence of work items by which he proposes to complete the work of the entire Contract. The programme should indicate the sequence of work items and the period of time during which he proposes to complete the Works including the activities like designing, schedule of submittal of drawings, ordering and procurement of materials, manufacturing, delivering, construction of Solar / civil works, erection, testing and commissioning of Works to be supplied under the Contract.

SCHEDULE – D TO BID

DEVIATIONS
FROM
TECHNICAL PROVISIONS

It is presumed that the bidder shall not take any deviation. However, if he intends to take deviations to the specified terms, those must be listed in the space provided below:

Sr. No.	Clause No. / Section No.	Deviations/Clarifications

[Note**:** Attach additional sheets, if necessary]

SCHEDULE – E TO BID

DEVIATIONS
FROM
CONTRACTUAL CONDITIONS

It is presumed that the bidder shall not take any deviation. However, if he intends to take deviations to the specified Contractual/Commercial Conditions, those must be listed in the space provided below:

Sr. No.	Clause No. / Section No.	Deviations/Clarifications

[Note: Attach additional sheets, if necessary]

SCHEDULE – F TO BID

METHOD OF PERFORMING WORKS

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

- The sequence and methods in which he proposes to carry out the Works, including the number of shifts per day and hours per shift, he expects to work.

- A list of all major items of constructional and erection plant, tools and vehicles proposed to be used in carrying out the Works at Site, including number of each kind, make, type, capacity of all equipment, working condition, which shall be deployed by him for Civil Work and Erection, Testing and Commissioning of the Works, in sufficient detail to demonstrate fully that the equipment will meet all the requirements of the Technical Provisions.

- The procedure for installation of equipment and transportation of equipment and materials to the site.

- Details regarding mobilization in Pakistan, the type of facilities including personnel accommodation, office accommodation, provision for maintenance and for storage, communications, security and other services to be used.

- Organization chart indicating head office & field office personnel involved in management, supervision and engineering of the Works to be done under the Contract.

SCHEDULE – G TO BID

PROPOSED ORGANISATION

The bidder shall list in this Schedule the key personnel he will employ from Head office and from Site office to direct and execute the Works, together with their names, qualifications, experience, positions held and their nationalities.

Designation	Name of	Summary of Qualifications Experience, Present Position and Nationality

- Head Office:

- Site Office:
  Contractor's Representative
  Site Superintendent
  Supervising Engineer
  Plant Erectors
  Construction Supervisors
  Other Key Staff

SCHEDULE – H TO BID

(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 entity owned or controlled by GoP through any corrupt 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 form 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 time 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 form from GoP.

Name of Buyer: ……	Name of Seller/Supplier: ……
Signature: ……	Signature: ……
[Seal]	[Seal]

SCHEDULE OF PRICES

PREAMBLE TO CONDITIONS OF CONTRACT

Commencement Date	Sub-Clause 1.1.1.(i) The date for commencement of the Works is the date as per work order.
Defect Liability Period	Sub-Clause 1.1.11 The Defect Liability Period is **730** days.
The Employer	Sub-Clause 1.1.12. The Employer is **Chief Engineer (Merged Area) Irrigation Department Khyber Pakhtunkhwa through Executive Engineer, Mohmand Irrigation Division, Mohmand.**
The Engineer	Sub-Clause 1.1.15. The Engineer is **Executive Engineer, Mohmand Irrigation Division, Mohmand.**
Time for Completion	Sub-Clause 1.1.35. The Time for Completion is 365 days from the Commencement Date.
Warranty Period	Sub-Clause 1.1.40. The Warranty Period is **25** years for solar panels, **10** years for inverter. Other equipment warranty shall be as per specifications provided in the bidding documents.
Engineer"s Duties & Authorities	Sub-Clause 2.1 Amount of Variation Order in emergency is **Upto maximum 15% of the Contract Price stated in the Letter of Acceptance.**
Confirmation in Writing	Sub-Clause 2.6 (i) If the Contractor shall require the confirmation it shall be notified to the Engineer within **14** days. (ii) Engineer shall confirm the decision/instruction within **28** days.
Ruling Language	Sub-Clause 5.1. The version in **English** language (ruling language) shall prevail.
As-Built Drawings	Sub-Clause 6.10 As-Built drawings shall be provided to the Engineer within **28** days from the date of issue of Taking Over Certificate.
Programme to be Furnished	Sub-Clause 12.1. The Programme must be submitted in the form of **as per instruction of the Engineer incharge.**
Electricity Water, Gas and Other Services	Sub-Clause 14.3. Supplies on the Site are: a. Electricity: **Contractor to make his own arrangements.** b. Water: **Available.** c. Gas: **Contractor to make his own arrangements**. d. Other Services: **Contractor to make his own arrangements.**

Employer"s Equipment	Sub-Clause 14.4. The following Employer"s equipment is available for use by the Contractor under the Employer"s operation: **Contractor to arrange all the equipments required for erection etc.**
Working Hours	Sub-Clause 18.3. The normal working hours are **as per working standards.**
Time for Completion	Sub-Clause 25.1 (i) Place of the Project **District Mohmand & FR Peshawar**. **(ii)** Period **As per work order.**
Earlier Completion	Sub-Clause 26.3 **(i)** Amount of Bonus per day **Not Applicable.** **(ii)** Max. Amount of Bonus **Not Applicable.**
Delay in Completion	Sub-Clause 27.1. Failure to meet the Time for Completion entitles the Employer to reduction in Contract Price as follows: Percentage per day **0.05% of Contract cost** Maximum **0.01% of Contract cost per day.**
Prolonged Delay	Sub-Clause 27.2. Maximum amount recoverable from the Contractor by the Employer **10% of Contract Price of stated in the Letter of Acceptance.**
Terms of Payment	Sub-Clause 33.1. In addition to the provisions under Clause 33, the terms of payment shall be as stated in Particular Conditions of Contract.
Payment	Sub-Clause 33.5 **(i)** Period of Payment by Employer to Contractor **As soon as possible.** **(ii)** Period of Final Certificate of Payment **As soon as possible.**
Payment in Foreign Currencies	Sub-Clause 35.1. Payment in foreign currencies shall be arranged as follows: **Not Applicable.**
Insurance of Works	Sub-Clause 43.1. The deductible limits in the insurance cover of the Works shall not exceed **Rs. 2.00 (Million).** Sub-Clause 43.1.(a) The additional risks to be insured are: _____
Third Party Liability	Sub-Clause 43.3. The amount of insurance against third party liability taken out by the Contractor shall not be less than: **Rs. 5.00 (Million).**

Notices to Employer and Engineer	Sub-Clause 49.2. The address of the Employer for notices is: **Chief Engineer (merged Area) Irrigation Department, Peshawar through Executive Engineer, Mohmand Irrigation Division, Mohmand.** The address of the Engineer for notices is: **1st Floor at Old DGHS Office. Deputy Commissioner Peshawar Complex, Gate No. 3, Khyber Road Peshawar Cantt**
Disputes & Arbitration	Sub-Clause 50.4 Venue of Arbitration **Mohmand** Pakistan.
Applicable Law	Sub-Clause 51.1. The applicable law is **Islamic Republic of Pakistan** law.
Procedural Law for Arbitration	Sub-Clause 51.2. The procedural law for arbitration is **Arbitration Act 1940.**
Language and Place of Arbitration	Sub-Clause 51.3. The language of arbitration is **English** language. The place of arbitration is **Mohmand.**

FORMS

BID SECURITY
PERFORMANCE SECURITY
CONTRACT AGREEMENT
MOBILIZATION ADVANCE GUARANTEE/BOND

BS-1

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 the request of the said Principal (Bidder) we, the Surety above named, are held and firmly bound unto _____
(hereinafter called the 'Procuring Entity') 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 Procuring Entity; and

WHEREAS, the Procuring Entity 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 or from a foreign bank duly counter-guaranteed by a Scheduled Bank in Pakistan, to the Procuring Entity, 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 Procuring Entity, notice of which extension(s) to the Surety is hereby waived;

(2) that the Bid Security of unsuccessful Bidders will be returned by the Procuring Entity after expiry of its validity or upon signing of the Contract Agreement; and

(3) that in the event of failure of the successful Bidder to execute the proposed Contract Agreement for such work and furnish the required Performance Security, the entire said sum be paid immediately to the said Procuring Entity pursuant to Clause 15.6 of the Instruction to Bidders for the successful Bidder's failure to perform.

NOW THEREFORE, if the successful Bidder shall, within the period specified therefor, on the prescribed form presented to him for signature enter into a formal Contract with the said Procuring Entity in accordance with his Bid as accepted and furnish within twenty eight (28) days of his being requested to do so, a Performance Security with good and sufficient surety, as may be required, upon the form prescribed by the said Procuring Entity for the faithful performance and proper fulfillment 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 Procuring Entity the said sum upon first written demand of the Procuring Entity (without cavil or argument) and without requiring the Procuring Entity to prove or to show grounds or reasons for such demand, notice of which shall be sent by the Procuring Entity by registered post duly addressed to the Surety at its address given above.

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

SURETY (Bank)

WITNESS: Signature _____

1. _____ Name _____

_____ Title _____

Corporate Secretary (Seal) Corporate Guarantor (Seal)

2. _____

_____

Name, Title & Address

PS-1

FORM OF PERFORMANCE SECURITY
(Bank Guarantee)

Guarantee No._____
Executed on _____
Expiry date _____

[Letter by the Guarantor to the Procuring Entity]

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 Procuring Entity) in the penal sum of the amount stated above for the payment of which sum well and truly to be made to the said Procuring Entity, 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 the Procuring Entity'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 Procuring Entity, 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.

PS-2

We, _____ (the Guarantor), waiving all objections and defences under the Contract, do hereby irrevocably and independently guarantee to pay to the Procuring Entity without delay upon the Procuring Entity's first written demand without cavil or arguments and without requiring the Procuring Entity to prove or to show grounds or reasons for such demand any sum or sums up to the amount stated above, against the Procuring Entity'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 Procuring Entity's designated Bank & Account Number.

PROVIDED ALSO THAT the Procuring Entity 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 Procuring Entity 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)

CA-1

FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the _____ day Of (month) 20____ between _____ (hereafter called the "Procuring Entity") Of the one part and_____ (hereafter called the "Contractor") of the other part.

WHEREAS the Procuring Entity 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 witnesseth as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

2. The following documents after incorporating addenda, if any, except those parts relating to Instructions to Bidders shall be deemed to form and be read and construed as part of this Agreement, viz:

(a) The Contract Agreement;
(b) The Letter of Acceptance;
(c) The completed Form of Bid;
(d) Special Stipulations (Appendix-A to Bid);
(e) The Particular Conditions of Contract – Part II;
(f) The General Conditions – Part I;
(g) The priced Bill of Quantities (Appendix-D to Bid);
(h) The completed Appendices to Bid (B, C, E to L);
(i) The Drawings;
(j) The Specifications.
(k) _____(any other)

3. In consideration of the payments to be made by the Procuring Entity to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Procuring Entity to execute and complete the Works and remedy defects therein in conformity and in all respects with the provisions of the Contract.

4. The Procuring Entity 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	Signature of Procuring Entity
_____	_____
(Seal)	(Seal)
Signed, Sealed and Delivered in the presence of:	
Witness:	Witness:
_____	_____
(Name, Title and Address)	(Name, Title and Address)

MG-1

MOBILIZATION ADVANCE GUARANTEE (N/A)

Guarantee No. _____ Date _____

WHEREAS _____ (hereinafter called the 'Procuring Entity') has entered into a Contract for _____
(Particulars of Contract)
with _____ (hereinafter called the "Contractor').

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

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

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

NOW, THEREFORE, the Guarantor hereby guarantees that the Contractor shall use the advance for the purpose of above mentioned Contract and if he fails and commits default in fulfillment of any of his obligations for which the advance payment is made, the Guarantor shall be liable to the Procuring Entity for payment not exceeding the aforementioned amount.

Notice in writing of any default, of which the Procuring Entity shall be the sole and final judge, on the part of the Contractor, shall be given by the Procuring Entity 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 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 null and void after the aforesaid date or earlier if the advance made to the Contractor is fully adjusted against payments from Interim Payment Certificates of the Contractor provided that the Guarantor agrees that the aforesaid period of validity shall be deemed to be extended if on the above mentioned date the advance payment is not fully adjusted.

MG-2

GUARANTOR (BANK)

1. Signature _____
2. Name _____
3. Title _____

WITNESS

1. _____
   _____
   Corporate Secretary (Seal)

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

PART-II: PARTICULAR CONDITIONS OF CONTRACT

[Notes on the Conditions of Contract

The Conditions of Contract comprise two parts:

(a) Part I - (b) General Conditions of Contract
Part II - Particular Conditions of Contract

Over the years, a number of "model" General Conditions of Contract have evolved. The one used in these Standard Bidding Documents was prepared by the International Federation of Consulting Engineers (Federation Internationale des Ingenieurs-Conseils, or FIDIC), and is commonly known as the FIDIC Conditions of Contract. (The used version is the fourth edition, 1987, reprinted in 1992 with further amendments).

The FIDIC Conditions of Contract have been prepared for an ad measurement (unit price or unit rate) type of contract, and cannot be used without major modifications for other types of contract, such as lump sum, turnkey, or target cost contracts.

The standard text of the General Conditions of Contract chosen must be retained intact to facilitate its reading and interpretation by bidders and its review by the Client. Any amendments and additions to the General Conditions, specific to the contract in hand, should be introduced in the Particular Conditions of Contract.

The use of standard conditions of contract for all civil Works will ensure comprehensiveness of coverage, better balance of rights or obligations between Procuring Entity and Contractor, general acceptability of its provisions, and savings in time and cost for bid preparation and review, leading to more economic prices.

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* Add the following text if the bidding documents, as issued, do not include a copy: "Copies of the FIDIC Conditions of Contract can be obtained from:

FIDIC Secretariat
P.O. Box 86
1000 Lausanne 12
Switzerland
e-mail: fidic.pub@fidic.org – FIDIC.org/bookshop]

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PART II - PARTICULAR CONDITIONS OF CONTRACT
(Mandatory Provisions not to be Amended / Substituted except as instructed by KPPRA)

1.1 Definitions

(a) (i) The Procuring Entity is ....(insert name along with his full address).

(a) (iv) The Engineer is .....

.....(insert name of the Firm/Company/Person nominated as Engineer alongwith his full address), or any other competent person appointed by the Procuring Entity, and notified to the Contractor, to act in replacement of the Engineer. Provided always that except in cases of professional misconduct, the outgoing Engineers is to formulate his

certifications/ recommendations in relation to all outstanding matters, disputes and claims relating to the execution of the Works during his tenure.

The following paragraph is added:

(a)(vi) "Bidder or Tenderer" means any person or persons, company, corporation, firm or joint venture submitting a Bid or Tender.

(b)(v) The following is added at the end of the paragraph:
The word "Tender" is synonymous with "Bid" and the word "Tender Documents" with "Bidding Documents".

The following paragraph is added:

(b)(ix) "Program" means the program to be submitted by the Contractor in accordance with Sub-Clause 14.1 and any approved revisions thereto.

(e)(i) The text is deleted and substituted with the following:

"Contract Price" means the sum stated in the Letter of Acceptance as payable to the Contractor for the execution and completion of the Works subject to such additions thereto or deductions therefrom as may be made and remedying of any defects therein in accordance with the provisions of the Contract.

2.1 Engineer's Duties and Authority

With reference to Sub-Clause 2.1(b), the following provisions shall also apply;

The Engineer shall obtain the specific approval of the Procuring Entity before carrying out his duties in accordance with the following Clauses:

(i) Consenting to the sub-letting of any part of the Works under Sub-Clause 4.1 "Subcontracting".

(ii) Certifying additional cost determined under Sub-Clause 12.2 “Not Foreseeable Physical Obstructions or Conditions”.

(iii) Any action under Clause 10 “Performance Security” and Clauses 21,23,24 & 25 “Insurance” of sorts.

(iv) Any action under Clause 40 “Suspension”.

(v) Any action under Clause 44 “Extension of Time for Completion”.

(vi) Any action under Clause 47 “Liquidated Damages for Delay” or Payment of Bonus for Early Completion of Works (PCC Sub-Clause 47.3).

(vii) Issuance of “Taking Over Certificate” under Clause 48.

(viii) Issuing a Variation Order under Clause 51,except:

a) in an emergency* situation, as stated here below, or

b) if such variation would increase the Contract Price by less than the amount stated in the Appendix-A to Bid.

(ix) Fixing rates or prices under Clause 52.

(x) Extra payment as a result of Contractor’s claims under Clause 53.

(xi) Release of Retention Money to the Contractor under Sub-Clause 60.3 “Payment of Retention Money”.

(xii) Issuance of “Final Payment Certificate” under Sub-Clause 60.8.

(xiii) Issuance of “Defect Liability Certificate” under Sub-Clause 62.1.

(xiv) Any change in the ratios of Contract currency proportions and payments thereof under Clause 72 “Currency and Rate of Exchange”.

(Note: Procuring Entity may further vary according to need of the project)

* (If in the opinion of the Engineer an emergency occurs affecting the safety of life or of the Works or of adjoining property, the Engineer may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Procuring Entity.)

2.2 Engineer's Representative

The following paragraph is added:

The Procuring Entity shall ensure that the Engineer's Representative is a professional engineer as defined in the Pakistan Engineering Council Act 1975 (V of 1976)

The following Sub-Clauses 2.7 and 2.8 are added:

2.7 Engineer Not Liable

Approval, reviews and inspection by the Engineer of any part of the Works does not relieve the Contractor from his sole responsibility and liability for the supply of materials, plant and equipment for construction of the Works and their parts in accordance with the Contract and neither the Engineer's authority to act nor any decision made by him in good faith as provided for under the Contract whether to exercise or not to exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any Subcontractor, any of their representatives or employees or any other person performing any portion of the Works.

2.8 Replacement of the Engineer

"If the Procuring Entity intends to replace the Engineer, the Procuring Entity shall, not less than 14 days before the intended date of replacement, give notice to the Contractor, of the name, address and relevant experience of the intended replacement Engineer. The Procuring Entity shall not replace the Engineer with a person against whom the Contractor raises reasonable objection by notice to the Procuring Entity, with supporting particulars."

5.1 Language(s) and Law

(a) The Contract Documents, shall be drawn up in the English language.
(b) The Contract shall be subject to the Laws of Islamic Republic of Pakistan.

5.2 Priority of Contract Documents

The documents listed at (1) to (6) of the Sub-Clause are deleted and substituted with the following:

(1) The Contract Agreement (if completed);
(2) The Letter of Acceptance;
(3) The completed Form of Bid;
(4) Special Stipulations (Appendix-A to Bid);
(5) The Particular Conditions of Contract – Part II;
(6) The General Conditions – Part I;
(7) The priced Bill of Quantities (Appendix-D to Bid);
(8) The completed Appendices to Bid (B, C, E to L);
(9) The Drawings;

(10) The Specifications; and
(11) _____(any other).

In case of discrepancies between drawings, those of larger scale shall govern unless they are superseded by a drawing of later date regardless of scale. All Drawings and Specifications shall be interpreted in conformity with the Contract and these Conditions. Addendum, if any, shall be deemed to have been incorporated at the appropriate places in the documents forming the Contract.

The following Sub-Clauses 6.6 and 6.7 are added:

6.6 Shop Drawings

The Contractor shall submit to the Engineer for review 3 copies of all shop and erection drawings applicable to this Contract as per provision of relevant Sub-Clause of the Contract.

Review and approval by the Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory and that the Engineer's review or approval shall not relieve the Contractor of any of his responsibilities under the Contract.

6.7 As-Built Drawings

At the completion of the Works under the Contract, the Contractor shall furnish to the Engineer 6 copies and one reproducible of all drawings amended to conform with the Works as built. The price of such Drawings shall be deemed to be included in the Contract Price.

10.1 Performance Security

The Contractor shall provide Performance Security to the Procuring Entity in the prescribed form. The said Security shall be furnished or caused to be furnished by the Contractor within 28 days after the receipt of the Letter of Acceptance. The Performance Security shall be of an amount equal to 10% of the Contract Price stated in the Letter of Acceptance. Such Security shall, at the option of the bidder, be in the form of either (a) bank guarantee from any Scheduled Bank in Pakistan or

(b) bank guarantee from a bank located outside Pakistan duly counter-guaranteed by a Scheduled Bank in Pakistan [deleted][6].

The cost of complying with requirements of this Sub-Clause shall be borne by the Contractor.

The following Sub-Clause10.4 is added:

[6] Words "(c) an insurance company having at least AA rating from PACRA/JCR" deleted by KPPRA Notification
No. KPPRA/M&E/Estt:/1-4/2016 dated May 24, 2016.

10.4 Performance Security Binding on Variations and Changes

The Performance Security shall be binding irrespective of changes in the quantities or variations in the Works or extensions in Time for Completion of the Works which are granted or agreed upon under the provisions of the Contract.

14.1 Program to be Submitted

The program shall be submitted within 42 days from the date of receipt of Letter of Acceptance, which shall be in the form of:

i) a Bar Chart identifying the critical activities.
ii) a CPM identifying the critical path/activities.
(Procuring Entity to select appropriate one)

14.3 Cash Flow Estimate to be Submitted

The detailed Cash Flow Estimate shall be submitted within 21 days from the date of receipt of Letter of Acceptance

The following Sub-Clause 14.5 is added:

14.5 Detailed Program and Monthly Progress Report

a) For purposes of Sub-Clause 14.1, the Contractor shall submit to the Engineer detailed program for the following:

(1) Execution of Works;
(2) Labour Employment;
(3) Local Material Procurement;
(4) Material Imports, if any; and
(5) Other details as required by the Engineer.

(b) During the period of the Contract, the Contractor shall submit to the Engineer not later than the 8th day of the following month, 5 copies each of Monthly Progress Reports covering:

(1) A Construction Schedule indicating the monthly progress in percentage;
(2) Description of all work carried out since the last report;
(3) Description of the work planned for the next 56 days sufficiently detailed to enable the Engineer to determine his program of inspection and testing;
(4) Monthly summary of daily job record;
(5) Photographs to illustrate progress ;and
(6) Information about problems and difficulties encountered, if any, and proposals to overcome the same.

(c) During the period of the Contract, the Contractor shall keep a daily record of the work progress, which shall be made available to the Engineer as and when requested. The

daily record shall include particulars of weather conditions, number of men working, deliveries of materials, quantity, location and assignment of Contractor's equipment.

The following Sub-Clauses 15.2 and 15.3 are added:

15.2 Language Ability of Contractor's Representative

The Contractor's authorized representative shall be fluent in the English language. Alternately an interpreter with ability of English language shall be provided by the Contractor on full time basis. The Engineer / Procuring Entity, however, may relax conditions of the language from English to other local languages if deemed appropriate,

15.3 Contractor's Representative

The Contractor's authorized representative and his other professional engineers working at Site shall register themselves with the Pakistan Engineering Council. The Contractor's authorized representative at Site shall be authorized to exercise adequate administrative and financial powers on behalf of the Contractor so as to achieve completion of the Works as per the Contract.

The following Sub-Clauses 16.3 and 16.4 are added:

16.3 Language Ability of Superintending Staff of Contractor

A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the English language. If the Contractor's superintending staff are not fluent in English language, the Contractor shall make competent interpreters available during all working hours in a number deemed sufficient by the Engineer. The Engineer / Procuring Entity, however, may relax conditions of the language from English to other local languages if deemed appropriate,

16.4 Employment of Local Personnel

The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour from sources within KPK.

The following Sub-Clauses 19.3 and 19.4 are added:

19.3 Safety Precautions

In order to provide for the safety, health and welfare of' persons, and for prevention of damage of any kind, all operations for the purposes of or in connection with the Contract shall be carried out in compliance with the Safety Requirements of the Government of Pakistan and KPK with such modifications thereto as the Engineer may authorize or direct and the Contractor shall take or cause to be taken such further measures and comply with such further requirements as the Engineer may determine to be reasonably necessary for such purpose.

The Contractor shall make, maintain and submit reports to the Engineer concerning safety, health and welfare of persons and damage to property, as the Engineer may from time to time prescribe.

19.4 Lighting Work at Night

In the event of work being carried out at night, the Contractor shall at his own cost, provide and maintain such good and sufficient light as will enable the work to proceed satisfactorily and without danger. The approaches to the Site and the Works where the night-work is being carried out shall be sufficiently lighted. All arrangement adopted for such lighting shall be to the satisfaction of the Engineer's Representative.

20.4 Procuring Entity's Risks

The Procuring Entity's risks are:

Delete the text and substitute with the following:

(a) insofar as they directly affect the execution of the Works in KPK

(i) war and hostilities (whether war be declared or not), invasion, act of foreign enemies,
(ii) rebellion, revolution, insurrection, or military or usurped power, or civil war,
(iii) ionizing radiations, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof,
(iv) pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
(v) riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors and arising from the conduct of the Works;

(b) loss or damage due to the use or occupation by the Procuring Entity of any Section or part of the Permanent Works, except as may be provided for in the Contract;

(c) loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible; and

(d) any operation of the forces of nature (insofar as it occurs on the Site) which an experienced contractor:

(i) could not have reasonably foreseen, or
(ii) could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measures:
(a) prevent loss or damage to physical property from occurring by taking appropriate measures, or
(b) insure against.

21.1 Insurance of Works and Contractor's Equipment

(Procuring Entity may vary this Sub-clause 1.1 (b))

21.4 Exclusions

The text is deleted and substituted with the following:

There shall be no obligation for the insurances in Sub-Clause 21.1 to include loss or damage caused by the risks listed under Sub-Clause 20.4 para (a) (i) to (iv).

The following Sub-Clause 25.5 is added:

25.5 Insurance Company

The Contractor shall be obliged to place all insurances relating to the Contract (including, but not limited to, the insurances referred to in Clauses 21, 23 and 24) with either National Insurance Company of Pakistan or any other insurance company operating in Pakistan and acceptable to the Procuring Entity.

Costs of such insurances shall be borne by the Contractor.

The following Sub-Clause 31.3 is added:

31.3 Co-operation with other Contractors

During the execution of the Works, the Contractor shall co-operate fully with other contractors working for the Procuring Entity at and in the vicinity of the Site and also shall provide adequate precautionary facilities not to make himself a nuisance to local residents and other contractors.

The following Sub-Clauses 34.2 to 34.12 are added:

34.2 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of' wages and observe conditions of labour not less favourable than those established for the trade or industry where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable than the general level of wages and conditions observed by other Procuring Entities whose general circumstances in the trade or in industry in which the Contractor is engaged are similar.

34.3 Employment of Persons in the Service of Others

The Contractor shall not recruit his staff and labour from amongst the persons in the services of the Procuring Entity or the Engineer; except with the prior written consent of the Procuring Entity or the Engineer, as the case may be.

34.4 Housing for Labour

Save insofar as the Contract otherwise provides, the Contractor shall provide and

maintain such housing accommodation and amenities as he may consider necessary for all his supervisory staff and labour, employed for the purposes of or in connection with the Contract including all fencing, electricity supply, sanitation, cookhouses, fire prevention, water supply and other requirements in connection with such housing accommodation or amenities. On completion of the Contract the temporary camps or housing provided by the Contractor shall be removed and the Site reinstated to its original condition, all to the approval of the Engineer.

34.5 Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour at all times throughout the period of the Contract. The Contractor shall further ensure that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.

34.6 Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities, for purpose of dealing with and overcoming the same.

34.7 Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions**,** provide on the Site, to the satisfaction of the Engineer or his representative, adequate supply of drinking and other water for the use of his staff and labour.

34.8 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his Subcontractors, agents, staff or labour.

34.9 Arms and Ammunition

The Contractor shall not give, or otherwise dispose of to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

34.10 Festivals and Religious Customs

The Contractor shall in all dealings with his staff and labour have due regard to all recognized festivals, days of rest and religious and other customs.

34.11 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst staff and labour and for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.

34.12 Compliance by Subcontractors

The Contractor shall be responsible for compliance by his Subcontractors of the provisions of this Clause.

The following Sub-Clauses 35.2 and 35.3 are added:

35.2 Records of Safety and Health

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may from time to time prescribe.

35.3 Reporting of Accidents

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means.

The following Sub-Clause 36.6 is added:

36.6 Use of Pakistani Materials and Services

The Contractor shall , so far as may be consistent with the Contract, make the maximum use of materials, supplies, plant and equipment indigenous to or produced or fabricated in Pakistan and services, available in Pakistan preferably in KPK provided such materials, supplies, plant, equipment and services shall be of required standard.

41.1 Commencement of Works

The text is deleted and substituted with the following:

The Contractor shall commence the Works on Site within the period named in Appendix-A to Bid from the date of receipt by him from the Engineer of a written Notice to Commence. Thereafter, the Contractor shall proceed with the Works with due expedition and without delay.

The following Sub-Clause 47.3 is added:

47.3 Bonus for Early Completion of Works

The Contractor shall in case of earlier completion for either whole or part(s) of the Works pursuant to Sub-Clauses 48.1 and 48.2(a) respectively of the General Conditions of Contract, be paid bonus up-to a limit and at a rate equivalent to 50% of the relevant limit and rate of liquidated damages prescribed in Appendix-A to Bid "Special Stipulations".

48.2 Taking Over of Sections or Parts

For the purposes of para (a) of this Sub-Clause, separate Times for Completion shall be provided in the Appendix-A to Bid "Special Stipulations".

51.2 Instructions for Variations

At the end of the first sentence, after the word "Engineer", the words "in writing" are added.

52.1 Valuation of Variations

In the tenth line, after the words "Engineer shall" the following is added:
within a period not exceeding one-eighth of the completion time subject to a minimum of 28 days from the date of disagreement whichever is later.

53.4 Failure to Comply

This Sub-Clause is deleted in its entirety.

54.3 Customs Clearance

(Procuring Entity may vary this Sub-Clause)

54.5 Conditions of Hire of Contractor's Equipment

The following paragraph is added:

The Contractor shall, upon request by the Engineer at any time in relation to any item of hired Contractor's Equipment, forthwith notify the Engineer in writing the name and address of the Owner of the equipment and shall certify that the agreement for the hire thereof contains a provision in accordance with the requirements set forth above.

The following Sub-Clauses 59.4 & 59.5 are added:

59.4 Payments to Nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with Clause 58 [Provisional Sums], except as stated in Sub-Clause 59.5 [Certification of Payments].

59.5 Certification of Payments & Nominated Subcontractors

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

a) submits reasonable evidence to the Engineer, or
b) i)satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and
   ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement,

then the Procuring Entity may (at his sole discretion) pay direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Procuring Entity, the amount which the nominated Subcontractor was directly paid by the Procuring Entity.

60.1 Monthly Statements

In the first line after the word "shall", the following is added:

"on the basis of the joint measurement of work done under Clause 56.1,"

In Para (c) the words "the Appendix to Tender" are deleted and substituted with the words " Sub-Cause 60.11 (a)(6) hereof". (in case Clause 60.11 is applicable)

60.2 Monthly Payments

In the first line, "28" is substituted by "14".

60.10 Time for Payment

The text is deleted and substituted with the following:

The amount due to the Contractor under any Interim Payment Certificate issued by the Engineer pursuant to this Clause, or to any other terms of the Contract, shall , subject to Clause 47, be paid by the Procuring Entity to the Contractor within 30 days after such Interim Payment Certificate has been jointly verified by Procuring Entity and Contractor, or, in the case of the Final Certificate referred to in Sub Clause 60.8, within 60 days after such Final Payment Certificate has been jointly verified by Procuring Entity and Contractor; Provided that the Interim Payment shall be caused in 42 days and Final Payment in 60 days in case of foreign funded project. In the event of the failure of the Procuring Entity to make payment within the times stated, the Procuring Entity shall pay to the Contractor compensation at the 28 days rate of KIBOR+2% per annum for local currency and LIBOR+1% for foreign currency, upon all sums unpaid from the date by which the same should have been paid. The provisions of this Sub-Clause are without prejudice to the Contractor's entitlement under Clause 69.

The following Sub-Clause 60.11 is added:

60.11 Secured Advance on Materials

a) The Contractor shall be entitled to receive from the Procuring Entity Secured Advance against an indemnity bond acceptable to the Procuring Entity of such sum as the Engineer may consider proper in respect of non-perishable materials brought at the Site but not yet incorporated in the Permanent Works provided that:

(1) The materials are in accordance with the Specifications for the Permanent Works;

(2) Such materials have been delivered to the Site and are properly stored and protected against loss or damage or deterioration to the satisfaction of the Engineer but at the risk and cost of the Contractor;

(3) The Contractor's records of the requirements, orders, receipts and use of materials are kept in a form approved by the Engineer, and such records shall be available for inspection by the Engineer;

(4) The Contractor shall submit with his monthly statement the estimated value of the materials on Site together with such documents as may be required by the Engineer for the purpose of valuation of materials and providing evidence of ownership and payment therefor;

(5) Ownership of such materials shall be deemed to vest in the Procuring Entity and these materials shall not be removed from the Site or otherwise disposed of without written permission of the Procuring Entity; and

(6) The sum payable for such materials on Site shall not exceed 75 % of the (i) landed cost of imported materials, or (ii) ex-factory / ex-warehouse price of locally manufactured or produced materials, or (iii) market price of other materials.

(b) The recovery of Secured Advance paid to the Contractor under the above provisions shall be effected from the monthly payments on actual consumption basis.

60.11 Financial Assistance to Contractor (N/A)

Financial assistance shall be made available to the Contractor by the Procuring Entity by adopting any one of the following three Alternatives**:**

(Appropriate alternative only to be retained)

Alternative One: Mobilization Advance

(a) An interest-free Mobilization Advance 10-15 % of the Contract Price stated in the Letter of Acceptance shall be paid by the Procuring Entity to the Contractor in two equal parts

(b) upon submission by the Contractor of a Mobilization Advance Guarantee/ for the full amount of the Advance in the specified form from a Scheduled Bank in Pakistan :

(1) First part within 14 days after signing of the Contract Agreement or date of receipt of Engineer's Notice to Commence, whichever is earlier; and

(2) Second part within 42 days from the date of payment of the first part, subject to the satisfaction of the Engineer as to the state of mobilization of the Contractor.

(b) This Advance shall be recovered in equal installments; first installment at the expiry of third month after the date of payment of first part of Advance and the last installment two months before the date of completion of the Works as per Clause 43 hereof.

Alternative Two: Mobilization/ Demobilization Cost

Mobilization Cost shall be paid to the Contractor as a part of the priced Bill of Quantities. This cost shall not exceed 10 % of the Tender Price and shall be paid to the Contractor as follows:

(i) 80 % of the Mobilization Cost shall be paid for mobilization at Site. This payment shall be in three stages as follows:

Stage I:20 % of Mobilization Cost upon obtaining and furnishing of Performance Security and insurance policies and construction of camp and housing facilities as required under the Contract;

Stage II:30 % of Mobilization Cost upon providing & installing preliminary requirements of Contractor's Equipment, materials and temporary structures for the commencement of Works to the satisfaction of the Engineer and achieving 3 % value of the Works (excluding payment under Stage-I);

Stage III: 30 % of Mobilization Cost upon providing balance Contractor's Equipment to complete full requirement for the entire work and after achievement of progress to the extent of 6 % value of the Works (excluding payments under Stages I and II); and

(ii) 20 % of Mobilization Cost shall be paid for operation and maintenance of the

constructed facilities and for demobilization as per schedule of payment to be submitted by the Contractor in accordance with Clause 57.2 and approved by the Engineer.

Alternative Three: Materials Supplied by Procuring Entity

The Procuring Entity shall supply to the Contractor materials, like cement, steel, bitumen or any other material whichever deemed necessary to complete the project; and the cost thereof shall be recovered from the Contractor through monthly statements on the basis of actual consumption.

The list of materials, quantities and rates to be charged to the Contractor shall be provided along with Appendix-A to Bid "Special Stipulations".
(Procuring Entity may opt either "Secured Advance on Materials" or "Financial Assistance to Contractor")

63.1 Default of Contractor

The following para is added at the end of the Sub-Clause:

Provided further that in addition to the action taken by the Procuring Entity against the Contractor under this Clause, the Procuring Entity may also refer the case of default of the Contractor to Pakistan Engineering Council for punitive action under the Construction and Operation of Engineering Works Bye-Laws 1987, as amended from time to time as well as under the prevailing rules of KPPRA.

65.2 Special Risks

The text is deleted and substituted with the following:
The Special Risks are the risks defined under Sub-Clause 20.4 sub paragraphs (a) (i) to (a) (v).

67. 3 Arbitration

In the sixth to eight lines, the words "shall be finally settled ..... appointed under such Rules" are deleted and substituted with the following:

shall be finally settled under the provisions of the Arbitration Act, 1940 as amended or any statutory modification or re-enactment thereof for the time being in force.

The following paragraph is added:
The place of arbitration shall be ……, Pakistan.

68.1 Notice to Contractor

The following paragraph is added:

For the purposes of this Sub-Clause, the Contractor shall, immediately after receipt of Letter of Acceptance, intimate in writing to the Procuring Entity and the Engineer by registered post, the address of his principal place of business or any change in such address during the period of the Contract.

68.2 Notice to Procuring Entity and Engineer

For the purposes of this Sub-Clause, the respective address are:

a) The Procuring Entity :
(to be filled in by the Procuring Entity as appropriate)

b) The Engineer:
(to be filled in by the Procuring Entity as appropriate)

70.1 Increase or Decrease of Cost (N/A)

Sub-Clause 70.1 is deleted in its entirety, and substituted with the following:

The amounts payable to the Contractor, pursuant to Sub-Clause 60.1, shall be adjusted in respect of the rise or fall in the cost of labor, materials, and other inputs to the Works, by applying to such amount the formula prescribed in this Sub-Clause.

(a) Other Changes in Cost

To the extent that full compensation for any rise or fall in costs to the Contractor is not covered by the provisions of this or other Clauses in the Contract, the unit rates and prices included in the Contract shall be deemed to include amounts to cover the contingency of such other rise or fall of costs.

(b) Adjustment Formula

The adjustment to the monthly statements in respect of changes in cost shall be determined from the following formula:-

$$Pn = A + b\frac{Ln}{Lo} + c\frac{Mn}{Mo} + d\frac{En}{Eo} + \cdots\cdots\cdots\cdots$$

Where:

Pn is a price adjustment factor to be applied to the amount for the payment of the work carried out in the subject month, determined in accordance with Paragraph 60.1 (a), and with Paragraphs 60.1 (b) and (e), where any variations and daywork are not otherwise subject to adjustment;

A is a constant, specified in Appendix-C to Bid, representing the nonadjustable portion in contractual payments;

b, c, d, etc., are weightages or coefficients representing the estimated proportion of each cost element (labour, cement and reinforcing steel etc.) in the Works or Sections thereof, net of Provisional Sums and Prime Cost; the sum of A, b, c, d,

etc., shall be one;

Ln, Mn, En, etc., are the current cost indices or reference prices of the cost elements for month "n" , determined pursuant to Sub-Clause 70.1(d), applicable to each cost element; and

Lo, Mo, Eo, etc., are the base cost indices or reference prices corresponding to the above cost elements at the date specified in Sub-Clause 70.1(d).

(c) Sources of Indices and Weightages

The sources of indices and weightages shall be those listed in Appendix-C to Bid, duly filled in by the Procuring Entity /Engineer.

(d) Base, Current, and Provisional Indices

The base cost indices or prices shall be those prevailing on the day 28 days prior to the latest date for submission of bids. Current indices or prices shall be those prevailing on the day 28 days prior to the last day of the period to which a particular monthly statement is related. If at any time the current indices are not available, provisional indices as determined by the Engineer will be used, subject to subsequent correction of the amounts paid to the Contractor when the current indices become available.

(e) Adjustment after Completion

If the Contractor fails to complete the Works within the Time for Completion prescribed under Clause 43, adjustment of prices thereafter until the date of completion of the Works shall be made using either the indices or prices relating to the prescribed time for completion, or the current indices or prices, whichever is more favorable to the Procuring Entity, provided that if an extension of time is granted pursuant to Clause 44, the above provision shall apply only to adjustments made after the expiry of such extension of time.

(f) Weightages

The weightages for each of the factors of cost given in Appendix-C to Bid shall be adjusted if, in the opinion of the Engineer, they have been rendered unreasonable, unbalanced, or inapplicable as a result of varied or additional work executed or instructed under Clause 51. Such adjustment(s) shall have to be agreed in the variation order.

The following Sub-Clauses 73.1, 73.2, 74.1, 75.1, 76.1, 77.1and 78.1 are added:

73.1 Payment of Income Tax

The Contractor, Subcontractors and their employees shall be responsible for payment

of all their income tax, super tax and other taxes on income arising out of the Contract and the rates and prices stated in the Contract shall be deemed to cover all such taxes.

73.2 Customs Duty & Taxes

(Procuring Entity may incorporate provisions where applicable)

74.1 Integrity Pact

If the Contractor or any of his Subcontractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Appendix-L to his Bid, then the Procuring Entity shall be entitled to:

(a) recover from the Contractor an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Contractor or any of his Subcontractors, agents or servants;

(b) terminate the Contract; and

(c) recover from the Contractor any loss or damage to the Procuring Entity as a result of such termination or of any other corrupt business practices of the Contractor or any of his Subcontractors, agents or servants.

The termination under Sub-Para (b) of this Sub-Clause shall proceed in the manner prescribed under Sub-Clauses 63.1 to 63.4 and the payment under Sub-Clause 63.3 shall be made after having deducted the amounts due to the Procuring Entity under Sub-Para (a) and (c) of this Sub-Clause.

75.1 Termination of Contract for Procuring Entity's Convenience

The Procuring Entity shall be entitled to terminate the Contract at any time for the Procuring Entity's convenience after giving 56 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor :

(a) shall proceed as provided in Sub-Clause 65.7 hereof; and

(b) shall be paid by the Procuring Entity as provided in Sub-Clause 65.8 hereof.

76.1 Liability of Contractor

The Contractor or his Subcontractors or assigns shall follow strictly, all relevant

labour laws including the Workmen's Compensation Act and the Procuring Entity shall be fully indemnified for all claims, damages etc. arising out of any dispute between the Contractor, his Subcontractors or assigns and the labour employed by them.

77.1 Joint and Several Liability

If the Contractor is a joint venture of two or more persons, all such persons shall be jointly and severally bound to the Procuring Entity for the fulfillment of the terms of the Contract and shall designate one of such persons to act as leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Procuring Entity.

78.1 Details to be Confidential

The Contractor shall treat the details of the Contract as private and confidential, save in so far as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the prior consent in writing of the Procuring Entity or the Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract, the same shall be referred to the decision of the Engineer whose award shall be final.

PART II –PARTICULAR CONDITIONS OF CONTRACT

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SPECIFICATIONS-
SPECIAL PROVISIONS

Technical Specification and Material Specification as per MRS-2022

SPECIFICATIONS-
TECHNICAL PROVISIONS

Technical Specification and Material Specification as per MRS-2022

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)		
S# 01	Sub work: Construction of New Irrigation Tube Well at Sadu Khel Kamali Halimzai District Mohmand (Solar work)	
Discharge (iGPH)		3500
Head (ft)		426
Pump Setting (ft)		420
Water Horse Power (WHP)		
Pump Efficiency (70% -- 80%)		
Motor Efficiency (%)		
Shaft Power (Pump HP)		
BREAK HOURSE POWER (with 20% safety factor)		
Say Motor Horse Power		
Motor Basic Input Power		
PV Derating Factor (30% -- 80%)		
Total PV Power (Watt) with Safety Factor		
PV Generator Peak Power (Watts)	No of Pv Modules in String	
	No of String in Serries	
	Single PV Module Size (Watts)	
	Total PV Generation	
Motor Model Make, & HP		
Pump Model, Make & HP		
Inverter Make, Model & K.watt		
PV Module Make & Watt		

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 02	Sub work: Construction of new solar Irrigation Tube Wells in District Mohmand (02 Nos) (Solar Component)		
Discharge (iGPH)		No: 01	No: 02
		4000	3900
Head (ft)		488	440
Pump Setting (ft)		470	440
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 03	Sub work: Construction of new solar Irrigation Tube Wells in Lower Mohmand (02 Nos) (Solar Component)		
Discharge (iGPH)		No: 01	No: 02
		4500	4400
Head (ft)		420	430
Pump Setting (ft)		420	430
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)		
S# 04	Sub work: Construction of new solar Irrigation Tube Well in Lower Mohmand (Solar Component)	
Discharge (iGPH)		4424
Head (ft)		340
Pump Setting (ft)		340
Water Horse Power (WHP)		
Pump Efficiency (70% -- 80%)		
Motor Efficiency (%)		
Shaft Power (Pump HP)		
BREAK HOURSE POWER (with 20% safety factor)		
Say Motor Horse Power		
Motor Basic Input Power		
PV Derating Factor (30% -- 80%)		
Total PV Power (Watt) with Safety Factor		
PV Generator Peak Power (Watts)	No of Pv Modules in String	
	No of String in Serries	
	Single PV Module Size (Watts)	
	Total PV Generation	
Motor Model Make, & HP		
Pump Model, Make & HP		
Inverter Make, Model & K.watt		
PV Module Make & Watt		

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 05	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 02 Nos. at Pindiali, 02 Nos. at Ambar and 04 Nos. at Prang Ghar) (Solar Component)		
Discharge (iGPH)		Ekka Ghund 01	Ekka Ghund 02
		5000	4800
Head (ft)		380	390
Pump Setting (ft)		380	390
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 05	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 02 Nos. at Pindiali, 02 Nos. at Ambar and 04 Nos. at Prang Ghar) (Solar Component)		
Discharge (iGPH)		Pindiali 01	Pindiali 02
		5000	4950
Head (ft)		400	405
Pump Setting (ft)		400	405
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 05	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 02 Nos. at Pindiali, 02 Nos. at Ambar and 04 Nos. at Prang Ghar) (Solar Component)		
Discharge (iGPH)		Ambar No: 01	Ambar No: 02
		4600	4500
Head (ft)		445	450
Pump Setting (ft)		445	450
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)					
S# 05	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 02 Nos. at Pindiali, 02 Nos. at Ambar and 04 Nos. at Prang Ghar) (Solar Component)				
Discharge (iGPH)		Prang Ghar 01	Prang Ghar 02	Prang Ghar 03	Prang Ghar 04
		5500	5000	5200	4800
Head (ft)		340	350	345	330
Pump Setting (ft)		340	350	345	330
Water Horse Power (WHP)					
Pump Efficiency (70% -- 80%)					
Motor Efficiency (%)					
Shaft Power (Pump HP)					
BREAK HOURSE POWER (with 20% safety factor)					
Say Motor Horse Power					
Motor Basic Input Power					
PV Derating Factor (30% -- 80%)					
Total PV Power (Watt) with Safety Factor					
PV Generator Peak Power (Watts)	No of Pv Modules in String				
	No of String in Serries				
	Single PV Module Size (Watts)				
	Total PV Generation				
Motor Model Make, & HP					
Pump Model, Make & HP					
Inverter Make, Model & K.watt					
PV Module Make & Watt					

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 06	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos at Ekka Ghund, 04 Nos at Pindiali, 03 Nos at Ambar and 05 Nos at Prang Ghar) (Solar Component)		
Discharge (iGPH)		Ekka Ghund 01	Ekka Ghund 02
		5000	4800
Head (ft)		380	400
Pump Setting (ft)		380	400
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)					
S# 06	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos at Ekka Ghund, 04 Nos at Pindiali, 03 Nos at Ambar and 05 Nos at Prang Ghar) (Solar Component)				
Discharge (iGPH)		Pindiali 01	Pindiali 02	Pindiali 03	Pindiali 04
		5000	4500	5200	4800
Head (ft)		400	380	400	390
Pump Setting (ft)		400	380	400	390
Water Horse Power (WHP)					
Pump Efficiency (70% -- 80%)					
Motor Efficiency (%)					
Shaft Power (Pump HP)					
BREAK HOURSE POWER (with 20% safety factor)					
Say Motor Horse Power					
Motor Basic Input Power					
PV Derating Factor (30% -- 80%)					
Total PV Power (Watt) with Safety Factor					
PV Generator Peak Power (Watts)	No of Pv Modules in String				
	No of String in Serries				
	Single PV Module Size (Watts)				
	Total PV Generation				
Motor Model Make, & HP					
Pump Model, Make & HP					
Inverter Make, Model & K.watt					
PV Module Make & Watt					

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 06	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos at Ekka Ghund, 04 Nos at Pindiali, 03 Nos at Ambar and 05 Nos at Prang Ghar) (Solar Component)			
Discharge (iGPH)		Ambar No: 01	Ambar No: 01	Ambar No: 03
		4600	4500	4200
Head (ft)		445	450	440
Pump Setting (ft)		445	450	440
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 06	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos at Ekka Ghund, 04 Nos at Pindiali, 03 Nos at Ambar and 05 Nos at Prang Ghar) (Solar Component)		
Discharge (iGPH)		Prangghar No: 01	Prangghar No: 02
		5500	5400
Head (ft)		345	350
Pump Setting (ft)		345	350
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 06	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos at Ekka Ghund, 04 Nos at Pindiali, 03 Nos at Ambar and 05 Nos at Prang Ghar) (Solar Component)			
Discharge (iGPH)		Prangghar No:3	Prangghar No: 4	Prangghar No: 5
		5000	4800	5100
Head (ft)		345	350	360
Pump Setting (ft)		345	350	360
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 07	Sub work: Solarization of 15 Nos Existing Irrigation Tube Wells in Hassan Khel Sub Division Peshawar (Solar Component)			
Discharge (iGPH)		Hasan Khel 01	Hasan Khel 02	Hasan Khel 03
		4500	4200	4400
Head (ft)		490	500	475
Pump Setting (ft)		490	500	475
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 07	Sub work: Solarization of 15 Nos Existing Irrigation Tube Wells in Hassan Khel Sub Division Peshawar (Solar Component)			
Discharge (iGPH)		Hasan Khel 04	Hasan Khel 05	Hasan Khel 06
		3500	3200	3400
Head (ft)		470	450	475
Pump Setting (ft)		470	450	475
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 07	Sub work: Solarization of 15 Nos Existing Irrigation Tube Wells in Hassan Khel Sub Division Peshawar (Solar Component)			
Discharge (iGPH)		Hasan Khel 07	Hasan Khel 08	Hasan Khel 09
		4000	4100	4300
Head (ft)		450	480	470
Pump Setting (ft)		450	480	470
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 07	Sub work: Solarization of 15 Nos Existing Irrigation Tube Wells in Hassan Khel Sub Division Peshawar (Solar Component)			
Discharge (iGPH)		Hasan Khel 10	Hasan Khel 11	Hasan Khel 12
		3800	4000	3500
Head (ft)		450	480	470
Pump Setting (ft)		450	480	470
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 07	Sub work: Solarization of 15 Nos Existing Irrigation Tube Wells in Hassan Khel Sub Division Peshawar (Solar Component)		
Discharge (iGPH)		Hasan Khel 13	Hasan Khel 14
		5000	4500
Head (ft)		500	485
Pump Setting (ft)		500	485
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 08	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)			
Discharge (iGPH)		Halimzai 01	Halimzai 02	Halimzai 03
		3982	3900	3950
Head (ft)		440	430	450
Pump Setting (ft)		440	430	450
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 08	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)			
Discharge (iGPH)		Halimzai 04	Halimzai 05	Halimzai 06
		3980	3950	3960
Head (ft)		440	430	450
Pump Setting (ft)		440	430	450
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)		
S# 08	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)	
Discharge (iGPH)		Halimzai 07
		3500
Head (ft)		440
Pump Setting (ft)		440
Water Horse Power (WHP)		
Pump Efficiency (70% -- 80%)		
Motor Efficiency (%)		
Shaft Power (Pump HP)		
BREAK HOURSE POWER (with 20% safety factor)		
Say Motor Horse Power		
Motor Basic Input Power		
PV Derating Factor (30% -- 80%)		
Total PV Power (Watt) with Safety Factor		
PV Generator Peak Power (Watts)	No of Pv Modules in String	
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	Single PV Module Size (Watts)	
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Motor Model Make, & HP		
Pump Model, Make & HP		
Inverter Make, Model & K.watt		
PV Module Make & Watt		

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 08	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)			
Discharge (iGPH)		Safi 01	Safi 02	Safi 03
		3980	3950	3960
Head (ft)		490	480	450
Pump Setting (ft)		490	480	450
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 08	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)			
Discharge (iGPH)		Khawazai 01	Khawazai 02	Khawazai 03
		3982	3950	3960
Head (ft)		490	480	485
Pump Setting (ft)		490	480	485
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 08	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos at Halimzai, 03 Nos at Safi & Qandhari and 06 Nos Khawazai / Baizai) (Solar Component)			
Discharge (iGPH)		Khawazai 04	Khawazai 05	Khawazai 06
		3500	3000	3800
Head (ft)		490	480	485
Pump Setting (ft)		490	480	485
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos. Khawazai / Baizai, 07 Nos. at Safi, 07 Nos. Halimzai, 03 Nos. Dawazai Ambar, 03 Nos. at Prang Ghar and 03 Nos. at Pindiali) (Solar Component)			
Discharge (iGPH)		Khawazai 01	Khawazai 02	Khawazai 03
		3980	3960	3950
Head (ft)		490	480	485
Pump Setting (ft)		490	480	485
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)			
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos. Khawazai / Baizai, 07 Nos. at Safi, 07 Nos. Halimzai, 03 Nos. Dawazai Ambar, 03 Nos. at Prang Ghar and 03 Nos. at Pindiali) (Solar Component)		
Discharge (iGPH)		Khawazai 04	Khawazai 05
		3600	3000
Head (ft)		490	485
Pump Setting (ft)		490	485
Water Horse Power (WHP)			
Pump Efficiency (70% -- 80%)			
Motor Efficiency (%)			
Shaft Power (Pump HP)			
BREAK HOURSE POWER (with 20% safety factor)			
Say Motor Horse Power			
Motor Basic Input Power			
PV Derating Factor (30% -- 80%)			
Total PV Power (Watt) with Safety Factor			
PV Generator Peak Power (Watts)	No of Pv Modules in String		
	No of String in Serries		
	Single PV Module Size (Watts)		
	Total PV Generation		
Motor Model Make, & HP			
Pump Model, Make & HP			
Inverter Make, Model & K.watt			
PV Module Make & Watt			

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Safi 01	Safi 02	Safi 03
		3900	3940	3950
Head (ft)		490	480	450
Pump Setting (ft)		490	480	450
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Safi 04	Safi 05	Safi 06
		3500	3440	3450
Head (ft)		490	480	450
Pump Setting (ft)		490	480	450
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)		
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)	
Discharge (iGPH)		Safi 07 3000
Head (ft)		450
Pump Setting (ft)		450
Water Horse Power (WHP)		
Pump Efficiency (70% -- 80%)		
Motor Efficiency (%)		
Shaft Power (Pump HP)		
BREAK HOURSE POWER (with 20% safety factor)		
Say Motor Horse Power		
Motor Basic Input Power		
PV Derating Factor (30% -- 80%)		
Total PV Power (Watt) with Safety Factor		
PV Generator Peak Power (Watts)	No of Pv Modules in String	
	No of String in Serries	
	Single PV Module Size (Watts)	
	Total PV Generation	
Motor Model Make, & HP		
Pump Model, Make & HP		
Inverter Make, Model & K.watt		
PV Module Make & Watt		

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Halimzai 01	Halimzai 02	Halimzai 03
		3900	3850	3560
Head (ft)		440	430	450
Pump Setting (ft)		440	430	450
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Halimzai 04	Halimzai 05	Halimzai 06
		3600	3250	3100
Head (ft)		450	445	460
Pump Setting (ft)		450	445	460
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)		
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)	
Discharge (iGPH)		Halimzai 07 3400
Head (ft)		450
Pump Setting (ft)		450
Water Horse Power (WHP)		
Pump Efficiency (70% -- 80%)		
Motor Efficiency (%)		
Shaft Power (Pump HP)		
BREAK HOURSE POWER (with 20% safety factor)		
Say Motor Horse Power		
Motor Basic Input Power		
PV Derating Factor (30% -- 80%)		
Total PV Power (Watt) with Safety Factor		
PV Generator Peak Power (Watts)	No of Pv Modules in String	
	No of String in Serries	
	Single PV Module Size (Watts)	
	Total PV Generation	
Motor Model Make, & HP		
Pump Model, Make & HP		
Inverter Make, Model & K.watt		
PV Module Make & Watt		

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Dawazai Ambar 01	Dawazai Ambar 02	Dawazai Ambar 03
		3800	3250	3500
Head (ft)		440	445	460
Pump Setting (ft)		440	445	460
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Prang Ghar 01	Prang Ghar 02	Prang Ghar 03
		5000	4800	4900
Head (ft)		350	340	360
Pump Setting (ft)		350	340	360
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

Construction of Irrigation Tube Wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No: 210588 (2023-24)				
S# 09	Sub work: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos Khawazai / Baizai, 07 Nos at Safi, 07 Nos Halimzai, 03 Nos Dawazai Ambar, 03 Nos at Prang Ghar and 03 Nos at Pindiali) (Solar Component)			
Discharge (iGPH)		Pindiali No: 01	Pindiali No: 02	Pindiali No: 03
		5000	4500	4800
Head (ft)		400	380	390
Pump Setting (ft)		400	380	390
Water Horse Power (WHP)				
Pump Efficiency (70% -- 80%)				
Motor Efficiency (%)				
Shaft Power (Pump HP)				
BREAK HOURSE POWER (with 20% safety factor)				
Say Motor Horse Power				
Motor Basic Input Power				
PV Derating Factor (30% -- 80%)				
Total PV Power (Watt) with Safety Factor				
PV Generator Peak Power (Watts)	No of Pv Modules in String			
	No of String in Serries			
	Single PV Module Size (Watts)			
	Total PV Generation			
Motor Model Make, & HP				
Pump Model, Make & HP				
Inverter Make, Model & K.watt				
PV Module Make & Watt				

BILL OF QUANTITIES
(Available at website also)

BILL OF QUANTITIES.

Name of work:- Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)

Sub Wok: Construction of new Irrigation Tube Well at Sadu Khel Kamali Halimzai District Mohmand (Solar Component)

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	15000.00	104.17	1562550
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	120.00	363.34	43601
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	120.00	460.93	55312
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	15000.00	20.39	305850
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	15000.00	22.19	332850
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	15000.00	3.92	58800
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	15000.00	3.92	58800
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Set	1.00	416067.41	416067
10	24-50-c-02	Supply and Installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	120.00	944.63	113356
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	110.00	2858.78	314466
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	80.00	397.12	31770
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	80.00	132.88	10630
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	9.00	330.13	2971
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3394149**
		Add 5% A.C.F:-	**169707**
		G.Total:-	**3563856**
		In Million:	**3.564**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ___% (PKR)		
	Amount chargeable to____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ ____ % (PKR)		
	TOTAL AMOUNT:		

Note: Any other item of work crop out during execution will be paid on MRS-2022

The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature

_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)

Sub Wok: Construction of new solar Irrigation Tube Wells in District Mohmand (02 Nos) (Solar Component)

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	15000.00	104.17	1562550
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	120.00	363.34	43601
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	120.00	460.93	55312
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	15000.00	20.39	305850
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	15000.00	22.19	332850
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	15000.00	3.92	58800
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	15000.00	3.92	58800
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Set	1.00	416067.41	416067
10	24-50-c-02	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	120.00	944.63	113356
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	105.00	2858.78	300172
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	90.00	397.12	35741
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	120.00	132.88	15946
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	9.00	330.13	2971
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3389141**
		Add 1 No. More:-	**6778282**
		Add 5% A.C.F:-	**338914**
		G.Total:-	**7117196**
		In Million:	**7.12**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ___% (PKR)		
	Amount chargeable to____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ ____ % (PKR)		
	TOTAL AMOUNT:		

Note:- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

Name of work:- **BILL OF QUANTITIES.**

Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)

Sub Wok: Construction of new solar Irrigation Tube Wells in Lower Mohmand (02 Nos) (Solar Component)

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	14000.00	104.17	1458380
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	119.00	363.34	43237
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	119.00	460.93	54851
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	14000.00	20.39	285460
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	14000.00	22.19	310660
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	14000.00	3.92	54880
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	14000.00	3.92	54880
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse Indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge ; 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	119.00	944.63	112411
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	119.00	2858.78	340195
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	125.00	397.12	49640
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	120.00	132.88	15946
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	6.00	330.13	1981
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3285714**
		Add 2 No. More:-	**6571428**
		Add 5% A.C.F:-	**328571**
		G.Total:-	**6899999**
		In Million:	**6.900**
	Above / Below		
	Total Bid Price:		
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to_____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ____% (PKR)		
	Amount chargeable to_____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ _____ % (PKR)		
	TOTAL AMOUNT:		

Note:- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- **Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)**

Sub Wok: **Construction new solar Irrigation Tube Well in Lower Mohmand (Solar Component)**

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	13200.00	104.17	1375044
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	117.00	363.34	42511
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	117.00	460.93	53929
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	13200.00	20.39	269148
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	13200.00	22.19	292908
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	13200.00	3.92	51744
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	13200.00	3.92	51744
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and Installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	117.00	944.63	110522
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	170.00	2858.78	485993
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	125.00	397.12	49640
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	119.00	132.88	15813
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	9.00	330.13	2971
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3305159**
		Add 5% A.C.F:-	**165258**
		G.Total:-	**3470417**
		In Million:	**3.470**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to_____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ____% (PKR)		
	Amount chargeable to_____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ _____ % (PKR)		
	TOTAL AMOUNT:		

Note :- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- **Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)**

Sub Wok: **Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 02 Nos. at Pindiali, 2 Nos. at Ambar and 4 Nos. at Prang Ghar (Solar Component)**

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	12018.00	104.17	1251915
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	125.00	363.34	45418
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	125.00	460.93	57616
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	12018.00	20.39	245047
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	12018.00	22.19	266679
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	12018.00	3.92	47111
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	12018.00	3.92	47111
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and Installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	125.00	944.63	118079
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	150.00	2858.78	428817
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	140.00	397.12	55597
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	145.00	132.88	19268
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	9.00	330.13	2971
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3088821**
		Add 9 No. More:-	**30888213**
		Add 5% A.C.F:-	**1544411**
		G.Total:-	**32432624**
		In Million:	**32.433**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to_____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ____% (PKR)		
	Amount chargeable to_____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ _____ % (PKR)		
		TOTAL AMOUNT:	

Note:- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)

Sub Wok: Solarization of Existing Irrigation Tube Wells in District Mohmand (02 Nos. at Ekka Ghund, 04 Nos. at Pindiali, 03 Nos. at Ambar and 05 Nos. at Prang Ghar (Solar Component)

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	13312.00	104.17	1386711
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	116.00	363.34	42147
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	116.00	460.93	53468
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	13312.00	20.39	271432
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	13312.00	22.19	295393
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	13312.00	3.92	52183
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	13312.00	3.92	52183
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	116.00	944.63	109577
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	110.00	2858.78	314466
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	176.00	397.12	69893
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	176.00	132.88	23387
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	9.00	330.13	2971
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3177005**
		Add 13 No. More:-	**44478071**
		Add 5% A.C.F:-	**2223904**
		G.Total:-	**46701975**
		In Million:	**46.702**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ___% (PKR)		
	Amount chargeable to____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ ____ % (PKR)		
		TOTAL AMOUNT:	

Note:- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- **Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)**

Sub Wok: **Solarization of 15 No's Existing Irrigation Tube Wells in Hassan Khel Sub Division Erstwhile FR Peshawar (Solar Component)**

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	13311.00	104.17	1386607
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	130.00	363.34	47234
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	130.00	460.93	59921
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	13311.00	20.39	271411
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	13311.00	22.19	295371
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	13311.00	3.92	52179
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	13311.00	3.92	52179
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and Installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	130.00	944.63	122802
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	110.00	2858.78	314466
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	169.00	397.12	67113
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	172.00	132.88	22855
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	9.00	330.13	2971
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3198304**
		Add 14 No. More:-	**47974556**
		Add 5% A.C.F:-	**2398728**
		G.Total:-	**50373284**
		In Million:	**50.373**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to_____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ____% (PKR)		
	Amount chargeable to_____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ _____ % (PKR)		
		TOTAL AMOUNT:	

Note:- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)

Sub Wok: Solarization of Existing Irrigation Tube Wells in District Mohmand (07 Nos. at Halimzai, 03 Nos. at Safi & Qandhari and 06 Nos. at Khawazai / Baizai) (Solar Component)

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	14772.00	104.17	1538799
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	121.00	363.34	43964
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	121.00	460.93	55773
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	17.00	342.92	5830
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	14772.00	20.39	301201
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	14772.00	22.19	327791
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	14772.00	3.92	57906
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	14772.00	3.92	57906
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	121.00	944.63	114300
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	100.00	2858.78	285878
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	180.00	397.12	71482
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	176.00	132.88	23387
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	8.84	330.13	2918
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**3386899**
		Add 15 No. More:-	**54190389**
		Add 5% A.C.F:-	**2709519**
		G.Total:-	**56899908**
		In Million:	**56.900**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to_____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ___% (PKR)		
	Amount chargeable to_____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ ____ % (PKR)		
TOTAL AMOUNT:			

Note:- Any other item of work crop out during execution will be paid on MRS-2022
The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature
_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

BILL OF QUANTITIES.

Name of work:- Construction of Irrigation tube wells / Lift Irrigation Schemes and Solarization of existing Irrigation Tube Wells in Merged Areas (AIP) ADP No.210588(2023-24)

Sub Wok: Solarization of Existing Irrigation Tube Wells in District Mohmand (05 Nos. Khawazai/Baizai, 7 Nos. at Safi, 7 Nos. Halimzai, 03 Nos. Dawazai Ambar, 03 Nos. at Prang Ghar and 03 No. at Pindiali) (Solar Component)

S.#	MRS 2022	Description.	Unit	Quantity	Rate	Amount (Rs.)
1	26-01-d-01	Supply & Eriction of Solar PV module (Solar Panel) Mono-crystalline A-Grade (Per Watt) (as per approved specification)	Watt	11650.00	104.17	1213581
2	26-01-b-02	Supply & Eriction of PVC flexible pipe "1.5 i/d.	M	120.00	363.34	43601
3	26-01-g-04	Supply & Eriction 1X10 sq. mm flexible copper cable	M	120.00	460.93	55312
4	26-01-h-01	Supply & Eriction MC4 connector (TUV approved)	Pair	10.00	342.92	3429
5	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	11650.00	20.39	237544
6	26-01-m-01	Supply & Eriction of hot dipped (80 microns Average) galvanised steel of minimum thickness of 12 SWG/2.64 mm channel/pipe or 8 SWG/4.06 mm angle.	Watt	11650.00	22.19	258514
7	26-01-n-02	Supply & Eriction of 1x1 ft 4 mm Copper Earthing Plate	Watt	11650.00	3.92	45668
8	26-01-n-03	Supply & Eriction of stainless steel nuts & bolts	M^2	11650.00	3.92	45668
9	24-50-a-02	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewind-able Electric Motor with AC winding and all accessories like Motor Control Unit (equipped with UV/OV, dry run protection device, surge protection, phase reverse indicator) Complete in all accessories including NRV, Pressure Gauge, Sluice valve except column pipe and power cable with appropriate Head and Discharge : 15 HP	Each	1.00	416067.41	416067
10	24-50-c-02	Supply and Installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x16 mm2	M	120.00	944.63	113356
11	24-56-b	Supply & Fixing MS Column Pipe with flunges for Submersible Pump 3" (75 mm) Nominal Pipe Size 3/16" thick, 10' length	M	100.00	2858.78	285878
12	24-30-c-06	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (63 mm dia) PN-12.5	M	180.00	397.12	71482
13	24-30-c-03	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (32 mm dia) PN-12.5	M	176.00	132.88	23387
14	03-25-c	Excavation in foundation of building, bridges etc: complete : complete in hard soil or soft murum	M^3	8.84	330.13	2918
15	06-05-f	Plain Cement Concrete (PCC) including placing, compacting, finishing and curing (Ratio 1:2:4).	M^3	9.00	9299.67	83697

		Total:-	**2900100**
		Add 27 No. More:-	**81202799**
		Add 5% A.C.F:-	**4060140**
		G.Total:-	**85262939**
		In Million:	**85.263**
		Above / Below	
		Total Bid Price:	
	Note : Following Information to be provided by the bidder otherwise bid shall be declared as non-responsive (must be duly supported by evidence of exemption)		
	Amount exempted from Federal GST (PKR)		
	Amount chargeable to_____% Federal (FBR) Sale Tax on goods (PKR)		
	Federal (FBR) Sale Tax on goods @ ____% (PKR)		
	Amount chargeable to_____% Provincial (KPPRA) Sale Tax on Services (PKR)		
	Provincial (KPPRA) Sale Tax on Services @ _____ % (PKR)		
	TOTAL AMOUNT:		

Note: Any other item of work crop out during execution will be paid on MRS-2022

The Quantities are liable to be increased or decreased during execution.

Contractor Premium Schedule Items _____ % Above / Below

Contractor Premium Non-Schedule Items _____ % Above / Below

Contractor Signature

_____

Sub Divisional Officer
Irrigation Division,
District Mohmand

GOVERNMENT OF KHYBER PAKHTUNKHWA
COMMUNICATION & WORKS DEPARTMENT
NO.SO(B)/II-10/Standardization//Solar Panels/PBC/2018-19/C&WD
Dated Peshawar the: 29/01/2019

To

1. Additional Secretary (Admn / Coord), FATA Secretariat Warsak Road Peshawar.
2. Director General M&E P&D Department, Peshawar.
3. Director Agriculture Engineering Tarnab Farm Peshawar.
4. Superintending Engineer, PHE Division Mardan, PHE Department.
5. Superintending Engineer PBC, C&W Department, Peshawar.
6. Director General PDA.
7. Chairman Electrical Engineering Department, University of Engineering & Technology Peshawar.
8. Executive Engineer Warsak Canal Division Peshawar, Irrigation Department.
9. Executive Engineer, Peshawar Division, PHE Department.
10. Deputy Director (PHA), ATI Campus Jamrod road Peshawar.
11. Executive Engineer PBC-II C&W Department.
12. Planning Officer, LG&RD Department.
13. Assistant Engr. CSR / MRS (Cell) C&W Department.
14. Manager Energy & Power Department Peshawar.
15. Deputy Secretary (Technical), Public Health Engineering Department, Peshawar.

Subject: REVISED TECHNICAL SPECIFICATIONS FOR SOLAR PANELS AND ALLIED EQUIPMENT (REV 2018).

I am directed to refer to the subject noted above and to enclose herewith approved Minutes of the standardization of revised technical specification for solar panels and allied equipment's (Rev 2018) meeting held on 11/01/2019 at 10:30 AM under the Chairmanship of Secretary C&W Department along with approved **"Revised specifications for supply and installations of 1).Solar Based Pumping System 2).Solar Buildings / Home Systems 3).Solar Street Lights", duly approved by Standardization Committee of Khyber Pakhtunkhwa** and approved pre-qualification proforma of solar panels for information and necessary action at your end, please.

(Engr. Muhammad Imran)
Section Officer (Buildings)

Endst: No. & Date Even:

Copy is forwarded for information to the:-

1. Chairman Pakistan Engineering Council (PEC) Building, Attaturk Avenue (East) G-5/2 P.O Box 1296, Islamabad.
2. Director Solar, Alternative Energy Development Board, Ministry of Energy / Power Division, Government of Pakistan, 2nd Floor, OPF Building, Shahrah e Jamhuriat, G5/2, Islamabad.
3. Manager Technical, National Energy Efficiency & Conservation Authority (NEECA), Near State Bank of Pakistan, NEECA Building, Sector G5/2, Islamabad.
4. Director Standards, Pakistan Standards & quality Control Authority, PSQCA Complex, Plot No. ST-7/A, Block No. 3 Scheme No. 36, Near Kamran Chowrangi, Gulistan E Jauhar, Karachi.
5. Member Custom Policy, Federal Board of Revenue (FBR), FBR House / Building, Opposite Supreme Court of Pakistan, Islamabad.
6. PS to Secretary C&W Department Peshawar.

Section Officer (Buildings)

Note: **"Revised specifications for supply and installations of 1).Solar Based Pumping System 2).Solar Buildings / Home Systems 3).Solar Street Lights"** is uploaded on C&W Department official website i-e cwd.gov.pk for easy receipt of the same.

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MINUTES OF THE STANDARDIZATION OF REVISED TECHNICAL SPECIFICATION FOR SOLAR PANELS AND ALLIED EQUIPMENT'S (REV 2018).

A meeting of the committee regarding Standardization of Solar Panels & other allied works for the use in public infrastructure was held on **11/01/2019 at 10:30 AM** under the chairmanship of Secretary C&W Department in the committee room of this Department ***(List of participants attached).***

The meeting started with the recitation from the Holy Quran. While opening of discussion the Secretary C&W Department welcomed the participants and the Deputy Secretary (Technical) was asked to inform the forum regarding solar specifications.

The forum was briefed regarding the specification prepared by the sub-committee in its meeting held on 08/01/2019 under the chairmanship of Deputy Secretary (Technical) Public Health Engineering Department. Each and every item of Solar Panel with the allied equipment's have been discussed in detail certain changes proposed by the member were incorporated in the specification presented by the Chairman of the sub-committee. After detail deliberation the specification were approved unanimously and it was further decided to notify these specification in the best interest of public work keeping in view the works already approved or in the process of tendering which has been based on the previous specification notified vide No. SO(B)/II-10/Standardization/PBC/2016-17/C&WD dated 23/06/2017 to facilitate the executing agency in a right direction, therefore a gap of 3 months be kept in the implementation process. Hence these specification would be applicable which are to be tendered on are after 01/04/2019

Meeting ended with vote of thanks.

LIST OF PARTICIPANTS

UP GRADATION IN APPROVED SPECIFICATIONS OF SOLAR PANELS COMMITTEE MEETING SCHEDULED TO BE HELD ON 11/12/2018 AT 10:30 AM.

SUB HEAD: REVISED TECHNICAL SPECIFICATION FOR SOLAR PANELS AND ALLIED EQUIPMENT'S (REV 2018).

S.No.	Name of Officer/Official	Designation	Department	Signature
1.	Engr. Shahab Khattak	Secretary	C&W	
2.	Ishtiaq Ahmad	assistant engineer C&R/MPSCell	C&W	
3.	Amin-Zeb	Director	Housing	
4.	Samiullah Kundi	Xen	Irrigation	
5.	Jehanzeb Khan	SDO	Irrigation	
6.	Engr. Nasir Zaman Khan	SO (Tech)	PHE Deptt	
7.	Engr M. Amjad Khan	DST (Tech)	PMIU	
8.	Mahmood Jan Baba	Director	Agri Engg	
9.	Engr Qaiser Zaman	Superintending	Engineer M&E	
10.	Engr. Babar Nawaz	Assistant Director	M&E System, PED	
11.	Engr. Khurram Durrani	PO	Energy & Power Dept	
12.	Engr. Salman	Dy. Director	PDA (Elect)	
13.	SAUD KHAN	SDO PBC-II	C&WD	
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REVISED
SPECIFICATIONS
FOR
SUPPLY AND INSTALLATIONS OF

1. **SOLAR BASED PUMPING SYSTEMS,**
2. **SOLAR BUILDINGS / HOME SYSTEMS.**
3. **SOLAR STREET LIGHTS**

2019
Version-01

APPROVED BY STANDARIZATION COMMITTEE OF

KHYBER PAKHTUNKHWA

A - SPECIFICATIONS FOR SOLAR SYSTEMS-COMMON PART

1. SOLAR PANELS:

a. The PV module(s) shall contain mono crystalline silicon Grade-A Solar cells. (N-Type Mono PV Cell Modules and Bifacial Double Glass Modules due to its better performance will be given preference).

b. The PV module should Work well with high-voltage input Inverters/ charge controllers (1000 Vdc).

c. The PV Panel must have clear anodized aluminium frame with Anti-reflective, hydrophobic, low-iron Tempered cover glass.

d. The Solar Modules shall meet the following valid IEC Standards or latest:
   - IEC 61215-1, IEC 61215-1-1, IEC 61215-2 :2016 (Design Qualification)
   - IEC61730-1:2016 (Safety - Requirements for construction)
   - IEC61730-2:2016 (Safety - Requirements for testing)
   - IEC TS-62804-1. (i.e: TUV PPP-58042 or Equivalent) Anti-PID Certification.
   - IEC 61701 Salt Mist Corrosion Resistance Test (Latest)
   - IEC 62716 Ammonia Corrosion Resistance Test (Latest)
   - IEC 60068-2-68 Sand and Dust Erosion Resistance Test.

e. Unique Serial number, Name / Logo of manufacturer and separate date of manufacturing (DD/MM/YYYY) should be laminated inside the module so as to be clearly visible from the front side.

f. A properly laminated sticker containing the following details should be available at the back side of the module.
   - Name of the manufacturer / distinctive logo.
   - Model Name and Type of Cell Technology.
   - Peak Watt Ratting (Wp) and Power Tolerance Range
   - Voltage (V_{mp}) and Current (I_{mp}) at STC
   - Open Circuit Voltage (Voc) and Short Circuit Current (Isc)
   - Maximum System Voltage (V_{dc}) (i.e: This should not be less than 1000 V_{dc})
   - Dimensions of PV Module
   - Test Standard(s) to which the module has been tested and certified.

g. Following essential technical parameters of solar panel/modules should be provided with each panel supplied as well as in the technical proposal.
   - I-V curve for the solar photovoltaic module/panel.
   - Date and year of obtaining IEC PV module standardization qualification certificate.
   - Electrical Data (i.e: Pmax, Voc/Vmp, Isc/Imp at nominal Cell Operating Temperature (NOCT).
   - PV Module efficiency at STC.
   - Working temperature range of PV Module.

h. Each panel should have factory equipped weather proof terminal junction box having at least IP67 protection with provision of opening for replacement of DC cables, blocking diodes and easy debugging if necessary.

i. Limited performance guarantee: panel power, in standard conditions, will not be less than 90% of nominal power by the end of 10 years of operation and at least 80% at the end of 25 years of operation with 25-year limited power warranty.

j. The PV Module should have at least 10-years warranty for any defects and efficiency as mentioned above. It should be provided On Stamp Paper Signed and Sealed by Contractor at the time of Handing/Taking Over.

k. The PV Module should have at-least 17.50 % Module efficiency with Positive Power Tolerance.

DIRECTOR
Agri: Engineering
KPK Tarnah, Peshawar

Executive Engineer
Warsak Canals Division
Peshawar

Deputy Secretary (Tech:)
Public Health Engg: Department
Khyber Pakhtunkhwa

l. The PV modules offered should not be more than 12 months old from the date of issue of work order.
m. PV Module should have a Snow Load bearing of 5400 Pa and Wind Load Bearing of at least 2400 pa however if department deem appropriate may go for 3800 pa wind load depending upon their requirement.
n. The Solar Module should be free from visual and cosmetics defects.
o. The department/consultant on the expense of contractor/supplier shall verify Flash test reports with serial numbers from manufacturer for each panel (at the time of supply).
p. All information regarding solar panel with above mentioned featured data should be accessible and verifiable online on the manufacturer website.
q. IEC accredited lab test for solar panels is mandatory.
r. EL (Electro-luminous) test will be performed randomly for each individual project at the cost of contractor/supplier.

2. CABLE & WIRING:

a. The AC / DC cables should be made of 99.9% copper strands and Flexible.
b. From PV Panel to Junction Box, XLPE or XLPO insulated & XLPE/PVC Sheathed, UV stabilized single core, Double Insulated. Stranded /flexible cables (Conforming preferably to EN 50618 or IEC FDIS 62930) be used.
c. From JB to Inverter, the DC cable must have Single Core, double insulated and suitable for minimum 1000 V_{DC} transmission.
d. From Inverter to batteries, the DC cable can be single insulated, Single Core and suitable for minimum 300 V_{DC} transmission.
e. DC circuit breakers (not fuse) of $\geq$ Voc of String Voltage and suitable ampere rating (1.25 to 1.50 Times of Rated Current of all strings connected) must be installed between PV modules and controller / inverter.
f. AC Circuit Breaker (s) of suitable rating (1.25 to 1.50 Times of connected Load) must be installed between Controller / inverter to Load and Grid to Controller / Inverter.
g. AC / DC breakers should be marked with the manufacturer model number, rated voltage, ampere rating and batch/serial number.
h. DC / AC breakers rating should be approved from Engineer In-charge before installation at site.
i. To prevent solar panels from damage an appropriate size of DC Breaker / Fuse should be installed for each PV string and Surge Protection should be installed for combined Array (before Main DC Breaker / Inverter).
j. DC Breaker, AC Breaker & Change overs should be placed in an enclosure. All Enclosures / Junction boxes should be made from Hot Dipped Galvanized Sheets of minimum 16 SWG.
k. Cables shall be clearly labelled with essential electrical parameters including manufacturer name, Voltage Range, standards etc.
l. All DC Wiring shall be aesthetically neat and clean, over all wiring/connection losses shall not exceed 1% of the total rated output power.
m. All connections/ socket outlet among array, controller, inverters, batteries, and pumping set etc must be made in junction boxes of adequate protection level.
n. All wires/cables should be in standard flexible UV-Resistant conduits / HDPE of PN12, SDR 13.6, PE100 for outdoor installation & (2-3 feet deep) for underground wiring / Cabling and PVC ducts for indoor installation.
o. The DC Combiner Junction Box should be properly earthed including earthing of door as well.
p. The DC Combiner should contain proper bus bars of adequate size each for Positive, Negative and Earthing.

Deputy Secretary (Tech:)
Public Health Engg: Department
Khyber Pakhtunkhwa

DIRECTOR
Agril: Engineering
KPK Tarnab, Peshawar

q. The Inverter Junction Box should be properly earthed as well as per vetted design of the Engineer in charge.
r. All wiring should be in proper conduit of capping casing. Wire should not be hanging loose.
s. All wires should be terminated properly by using lugs / thimble connectors / sleeves.
t. Distribution board must be installed with proper screws.
u. Electrical Hazards Safety Labels should be pasted on DC Combiner /VFD Enclosure / Charge Controller /Battery Enclosures.
v. Following lab tests are mandatory.
   Conductor resistance test, Insulation resistance test, Pressure test, Spark test.
w. DC Cable from PV Module to Junction Box / Inverter for each string should be minimum size 6 mm^2.
x. DC Cable sizing (For Pumping Schemes) from Junction Box to Inverter as per details below;

S. No	Nos of Strings	Cable Size ((mm^2)	Remarks
1	1	6	If Cable length is >200 ft (One Sided) than cable size should also be increased accordingly.
2	2	10	
3	3	16	
4	4-5	25	
5	6-8	35	

3. <u>PANEL MOUNTING & STRUCTURE:</u>

a. The panel mounting and structure should be made of hot dipped (80 microns Average) galvanized steel of minimum thickness of **12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle** (Profile of channel and Sketch Attached for Reference).
b. A sketch of the mounting frame (As per Actual Site Requirements) showing dimensions of the frame parts should be provided at the time of supply.
c. PV to ground clearance must not be less than 1.5 feet. The height of the upper edge of the structure should not exceed 10 feet above the ground and 6 Feet for Roof Top Installations.
d. To avoid Shading, Distance between two rows of PV panels and from walls should be maintained at a minimum of 1.6 times the height of structure/walls.
e. The pit size for concrete works should be minimum 1.5x1.5x2 feet for each individual leg or 1.5x2.5x2 for double leg and the concrete should be extended at least 1 foot above the ground. The concrete ratio should be 1:2:4.
f. The Surface azimuth angle of PV Module 180° and the Tilt angle (slope) of PV Module should be 33°.
g. The PV modules will be mounted on metallic structures of adequate strength and appropriate design, which can withstand load of modules and high wind velocities up to 150 km per hour.
h. Due to land Non-availability or any other problem, Structure design can be modified as per site requirement. Pole Mounted or manual Tracker Structure can be provided with the approval of Engineer In-charge.
i. Array fasteners (nut/bolts/washers) between PV Module and Structure shall be stainless steel. Washers should be installed on both sides of Module frame.
j. The minimum space between two PV Modules should be 2.54 cm (1 inch), to avoid air push over PV Modules.
k. Mechanism / arrangement for cleaning of PV Panels should be provided. i.e: Space and ladder between panels or at the back side of structure, so that the operator can safely climb and clean the panels.
l. All other array fasteners Structure shall be stainless steel or galvanized steel that provides the required mechanical strength.

m. The PV modules will be mounted on metallic structures at the inner holes for cantilevered installation, which will evenly distribute the load of the panel around the support structure on both sides and in the middle.

4. EARTHING/ GROUNDING:

a. The PV Panel frame and structure should be connected by the shortest practical route to an adequate earth contact (of Less than 5 Ohms Resistance) as per requirement of equipment manufacturer and site earth conditions, using an uninterrupted conductor. Grounding can reduce the risks of damage from lightning-induced surges.
b. The Sizing of Earthing conductor will be done as per NEC Table 250.122
c. The grounding conductor should be 99% Copper and PVC insulated / Bare Copper if installed underground along a defined path where size & Design shall be approved from Engineer In-charge before installation at site.
d. Motor, inverter, Battery / Battery Box (if required), Main Distribution Board should be connected to an adequate earth contact / Grounding.
e. Ground enhancement material (GEM) shall be used below and above the Earthing plate for proper grounding. Gravel or coarse sand shall be pour along with soil in the pit.
f. Grounding / Earthing plate should be made of Copper plate of 4mm thickness & Size minimum 1.0 x 1.0 Ft.
g. Grounding / Earthing conductor should be connected to the plate / Rode / GI Pipe by proper connector of minimum depth of 6 feet.
h. Alternatively Earthing Rod of suitable size and length can be installed. (Instead of Plate). If given / mentioned in the BOQ/Design and Engineer In-Charge Approval.
i. All nut / bolt and Earthing clamp shall be stainless steel or galvanized steel.

5. BATTERIES:

a. The battery should be Deep Cycle, GEL, OPzV/OPzS, Lithium LiFePO4, Lead Carbon Type or equivalent. (Note: Battery type shall be specified in the bidding documents.)
b. The battery must ensure safe and reliable operation in the whole range of ambient temperatures from -5° C to + 50° C.
c. The maximum permissible self-discharge rate should not be more than 5 percent of rated capacity per month at 25° C.
d. The battery shall have a certificate of compliances, issued by a recognized laboratory.
e. The Batteries should have three years Comprehensive replacement warranty.
f. The battery shall meet the requirements and recommendations given in IEC 61427, IEC 60896 21/22 (For VRLA) or equivalent. Lab Test Reports for battery cycle life should be provided.
g. The Battery must support parallel connection to increase capacity in case of future expansion. Each Battery should have following minimum information printed on battery:
   - Model Number, Serial Number and Type of battery.
   - Rated Voltage and Capacity (AH) at discharge rate of 10 Hours.
   - Origin of made.
   - Manufacturer Name with distinct logo.
h. The following information must be provided in the data sheet while submitting technical bid.
   - Certification/Test Standard(s) of the battery.
   - Information regarding cycles & self-discharge rate.
i. In case of rechargeable battery bank (having more than one battery), the interconnection shall be made using lead plated copper bus bars or properly insulated flexible copper conductors.
j. Battery disconnect switch / breaker of suitable size should be installed between batteries and inverter / charge controller.
k. The Battery must have Low self-discharge rate, No memory effect and No gassing.

5.1 GEL BATTERIES:

5.1.1 Cycle life of the GEL battery (12V) before 80% capacity of Initial Capacity must be minimum **1000** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours

5.1.2 Cycle life of the GEL battery (2V Cell) before 80% capacity of Initial Capacity must be minimum **1300** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours

5.2 LEAD CARBON:

5.2.1 Cycle life of the Lead Carbon battery (12V) before 80% capacity of Initial Capacity must be minimum **2000** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours.

5.2.2 Cycle life of the Lead Carbon battery (2V) before 80% capacity of Initial Capacity must be minimum **2500** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours.

5.3 OPzV / OPzS BATTERIES:

5.3.1 Cycle life of the OPzV / OPzS battery (12V) before 80% capacity of Initial Capacity must be minimum **2000** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours

5.3.2 Cycle life of the OPzV / OPzS battery (2V Cell) before 80% capacity of Initial Capacity must be minimum **2500** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours

5.4 LITHIUM BATTERIES (LiFePO4):

5.4.1 Cycle life of the Lithium LiFePO4 battery before 80% capacity of Initial Capacity must be minimum **5750** cycles @ 50% depth of discharge (DOD) at discharge rate of 10 Hours.

5.4.2 The battery must have Integrated Battery Management System (BMS) to ensure battery safety and reliability.

5.4.3 The BMS of the battery must have the following specifications:

- Temperature protection
- Over charge protection
- Low voltage disconnect
- High Voltage Disconnect
- Short circuit alarm function
- Self-balancing function

5.4.4 The LiFePO4 Battery must have LED status and alarm indication.

5.4.5 The charge and discharge rate of the battery must be designed at 0.2C minimum but capable of handling 0.5C charge and discharge currents.

Note:

- **Product brochure, catalogue and certificates must be attached with the Technical Bid.**

6. BOX / STAND FOR BATTERIES, SHS-INVERTER & CHARGE CONTROLLER:

a. The batteries should be housed in a vented compartment/stand that prevents users from coming in contact with battery terminals. This compartment/stand should be strong enough to accommodate the weight of the battery.

b. A mechanism to prevent opening and entry of the battery should be provided.

c. This compartment should be manufactured of mild steel of at least **18 SWG.**

d. The compartment should be powder coated paint.

e. The entire enclosure/stand must be constructed to last at least twenty years without maintenance and should be protected against corrosion. The enclosure should have a clean

DIRECTOR Agril: Engineering KPK Tarnab, Peshawar

Executive Engineer Warsak Canals Division Peshawar

Deputy Secretary (Tech:) Public Health Engg: Department Khyber Pakhtunkhwa

XEN PO LG. SE(HQ) AD (MEE) PDA XEN

and neat appearance. Battery Box /stand should be installed at a place in accordance with user's preference

7. **LED FLOOD LIGHTS:**

a. Solar Based LEDs/Light fixtures shall conform to the latest IEC/ISO internationally recognized standards.
b. LEDs/Light fixtures should not be Chip-on-board (COB) single chip type due to their poor heat dissipation.
c. LEDs/Light fixtures shall be modular type with proper heat sinks.
d. Solar based lights (LED fixtures etc) should provide at least 100 Lumen/watt.
e. The Color rendering Index (CRI) must be equal or greater than 70
f. LEDs/Light fixtures should be designed to deliver at least 10 years of service.
g. Complete lightening unit shall be weather proof (Protection Class IP65).
h. The output from the LEDs/Light fixtures should be constant throughout the duty cycle.

8. **AC ENERGY EFFICIENT LED LIGHT BULBS:**

Shape	Cap/Fitting/Base Type	Colour	Lumens Per Watt	Colour Temperature	Colour rendering index (CRI)	Life Time of Lamp (Hours)	Power Factor & Rated Voltage
Globe	E27	Cool or Warm White	Min 100W	2700K / 6500K	70	10,000	≥ 0.70 & 220 Vac

Note:

- LED Light Bulbs should be marked with the manufacturer model number, rated voltage, Wattage.

9. **AC ENERGY EFFICIENT CEILING FANS:**

Sweep		Rated Power	Speed			
Inches	MM	Watts	Rpm			
56	1400	50 Max	≥ 320			

a. 10% + in Power Consumption is Allowed as per PSQCA Standard
b. Rated Voltage: 230 V~ (±10V)
c. Rated Frequency: 50 Hz
d. Insulation Class: 155 (F) or better
e. Motor Core: Electrical Steel Sheet
f. Winding Wire: 99.99% Super Enamelled Copper CA Wire or 99.99% Pure Copper Wire.

Note:

- Energy efficient fan should be marked with the manufacturer model number, rated voltage, and wattage.

10. **DC ENERGY EFFICIENT LED LIGHT BULBS:**

a. The LED lamps must have luminous efficacy of at least 80 lm/W (at 25 °C ambient temperature).
b. The LED lamp must be protected against reversed polarity of the operation voltage.
c. Base shall be an E-27 thread type.
d. The emitted light shall be cool or warm white.

Deputy Secretary (Tech:)
Public Health Engg: Department
Khyber Pakhtunkhwa

DIRECTOR
Agril: Engineering
KPK Tarnab, Peshawar

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e. The wide angle shall be between 120° to 125°.
f. Operating Voltage 12Vdc / 24Vdc
g. Lamps should be marked with the manufacturer model number, rated voltage, wattage and date of manufacture or batch number.

11. DC CEILING FANS:

Sweep	Rated Power	Speed	Service Value	Operating Voltage
Inches	Watts	Rpm	Air Delivery/W	V
48 ((with Speed Control) Metal Blades	30-36	> =320 RPM	9.54	12 / 24

12. DC PEDISTAL FANS:

Sweep	Rated Power	Speed	Service Value	Operating Voltage
Inches	Watts	Rpm	Air Delivery/W	V
18 Inch (with Speed Control)	18-30 W	1250 RPM (Full Speed)	5.22	12 / 24

13. INVERTER BASED SPLIT AC

Inverter based AC with both heating and cooling option.

S.No	DESCRIPTION	UNIT	DETAILS
1	Compressor	Type	Multistage Rotary
2	Noise Level (Indoor)	Db (Max)	≤ 50
3	Voltage Range	Volts (Min & Max)	180 to 250 Vac

14. PVC CHANNEL DUCTS & PIPES

a. A product of good quality standard material standardized by the provincial standardization committee with suitable size to be provided / used, as per direction/approval of Engineer In-charge.
b. Ducting must be done with proper steel nails and clips.
c. All ducting (wiring) must be align.

15. FLEXIBLE PVC PIPE

a. The flexible PVC pipe should be of good quality material standardized by the provincial standardization committee with suitable size to be provided / used, as per direction/approval of Engineer In-charge.

16. CIVIL WORK:

The following Civil Works should be carried out for ground installation of SPV Modules/mounting structures.

a. Minor Cutting and clearing of trees/plantation to avoid shadows.
b. Civil work for earthing system as per the statutory requirements.

17. REFLECTIVE / INSULATING PAINT

The Roof Paint should be ultra-white, high reflective,100% acrylic elastomeric roof sealer designed for fixing leaks in roofs the paint should contain heat reflective pigments and additives that provide an excellent, highly protective barrier which reflects the sun's heat and destructive UV rays leaves a brilliant ultra-white finish, reducing surface heat absorption up 20°F.

The Reflective paint should comply with ASTM D6083, Fiber Reinforced for more protection, strength and durability which allows for contraction and expansion, Resists surface fungal growth.

18. WARRANTY/AFTER SALE SERVICE:

Three years Comprehensive Free Replacement, Repair and maintenance Warranty at site (Free of Cost) should be provided for all the components of Solar System. (if not mentioned separately otherwise)

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B - SPECIFICATIONS FOR SOLAR PUMPING SYSTEMS

19. PUMP (SUBERSIBLE):

Pump should be supplied having standard ISO-9906 specifications. The pump must be submersible, made of stainless steel. The characteristic curves (Original from Manufacturer) showing the efficiency at duty point and performance of the pump should be provided in the technical proposal and also at the time of pre-supply testing. The quoted pump should be tested for its performance and certified as per ISO-9906 standard. The pump should be suitable for installation and operation in tube wells/dug wells/open well with clear water discharge. Pump shall comprise of bowl assembly and non-return valve as integral part of pump's parts. Pump and motor shall rigidly couple through NEMA standard coupling. The stage casings of pumps should be connected as per NEMA/ANSI/AWWA /ASTM/BSS standard. Each stage casing must have replaceable wear ring. The impellers shall be secured to the pump shaft with tapered conical sleeves pressed into the taper bore of impeller or impeller secured through chrome plated stainless steel hexagonal sleeves. Suction casing must be between pump and motor with suction strainer as protection of pump against coarse impurities of the liquid handled.

Specification for main components of the Pumps:

S.NO	Components	Specifications
1	Casing/Diffuser	The Casing/Diffuser should be in fabricated stainless steel AISI 304 / 316.
2	Impellers	Stainless steel AISI 304 / 316.
3	Driving Shaft	Stainless steel 304/420 / 316
4	Sleeves	Stainless steel AISI 329/ 304 / 316
5	Gaskets	Rubber Gaskets
6	Bearings	AISI 329 stainless steel
7	Coupling & Screen + Cable Guard	Stainless steel AISI 316/319/304/420
8	Non-Return Valve / Sluice Valve	As per British standard specifications (BSS), Minimum PN16 (16 Bar) or Above (As Per Site Requirements) PN Value / Bar Capacity of Valves must be more than Installed Pump Max/Shut-off Head Minus Static Water Level of Bore. (Leakages in Valves are NOT Acceptable).
9	Pressure Gauge	As per British standard specifications (BSS), having PSI or Bar scale (4 Inch Size), Liquid Filled, minimum 350 PSI Range, Looped Siphon tube Pipe, Stainless Steel/polypropylene Casing.
10	Clamps	Steel – Pressed
11	Pump Efficiency	**Minimum efficiency of the pump (For discharge of 3000 GPH and more) should be 70% ensured at duty point. (Duty Point of the Pump be preferably selected at the peak efficiency point or (Within ±10% of discharge) of Pump Peak efficiency Point)**

20. MOTOR:

The winding material should be 99.99% copper. The motor should have wet type, water cool rewind-able/repairable stator. The motor should have non-disposable/non-hermetically sealed winding. The insulation class of the winding material should be mentioned. For each model quoted, all the technical parameters such as rated voltage, power factor, efficiency, full load ampere, speed

and other similar parameters should be provided at the time of pre-supply testing. The testing report with all basic parameters should also be provided at the time of pre-supply testing.

The motor shall be manufactured in compliance with National Electrical Manufacturer Association (NEMA) standards. The motor shall be three-phase submersible and shall be capable of operating at rated voltage of 380 Volts at 50 Hz. The motor should be capable of operating with variable speed through V/F control. Winding of the motor shall of rewind able type with class – IC40 insulation and IP68 protection. The synchronous speed should be 2850-2950 RPM. Motor shall be capable of operating in well water with temperature normally start from 40°C. Motor should be designed for continuous operation. Motor must be filled with water without any chemical additives hazards to health for cooling. The motor must be properly protected against the entry of well water sand etc by double mechanical seal one is rotating and other stationary and must be made of Silicon carbide/ Tungsten carbide and must be protected with sand protection guards. All supports shall be high grade cast iron and stator outer side jacket body should be in stainless steel in AISI 304. The excessive pressure due to heating up of the filled water must be compensated by a pressure equalizing rubber diaphragm in the lower part of the motor. The axial thrust of the pump shall be countered by oscillating sliding block type thrust bearing. The thrust bearing of the motor should be able to bear a download thrust force from the water pump and the upward thrust force produced while starting the water pump. Motor in open well / water tank should be installed with cooling jacket / shroud / sleeve and when motor is installed in bore then installing of cooling jacket is also required. Motor shall be capable of maximum of 20 starts in an hour. Motor efficiency of motors 7.5 HP and above should not be less than 75% at Full Load and Motor Rated Voltage.

Technical specification of rewind-able wet stators, three phase squirrel cage water filled submersible motor.

S.No	Components	Specification
1.	Winding	Made of pure electrolyte copper and the winding insulation should be suitable for > 1000 Volts and must full fill resistant tests range.
2.	Stator	Energy efficient low-losses electrical magnetic sheet should be fixed in stainless steel casing. M800 or M600 magnetic sheet are preferable to use.
3.	Rotor	Energy efficient low-losses electrical magnetic sheet fixed with high grade copper bars. M800 or M600 magnetic sheets are preferable to use.
4.	Spline Shaft	AISI 420 stainless steel, flange dimension according to NEMA standard, over size design to ensure stiffness in severs condition.
5.	Shaft bearing	Water lubricated guide/general bearings fixed in upper and lower brackets should be made of metal impregnated carbon.
6.	Lower thrust bearing	Thrust sliding block bearings, self-aligning Mitchell type, should be able withstand **20000N** axial load
7.	Mechanical Seal (Stationary & Rotary	Silicon carbide or tungsten carbide mechanical seal.
8.	Cooling filling fluid	Water mixed with non-toxic anti-freeze provide cooling and lubrication also protect and prevent inside parts from corrosion.
9.	Degree of protection	IP68
10.	Insulation Class	Insulation Class B (130°C) NEMA Insulation Class F (155°C) NEMA or above Will be given

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		Preference.
11.	Voltage Tolerance	+6% to -10%
12.	Mounting position	Capable of both Vertical or horizontal Installation
13.	Class	IC40
14.	Maximum Immersion	150 Meters
15.	Starting per hour	20

21. SUBMERSIBLE FLATE ELECTRIC CABLE (4-Core):

The Submersible cable (4-Core) should be made of 99.9% copper strands with double PVC insulation for **1000Vac**, should be adequately flexible and environment friendly. Stranded and flexible insulated copper wires and cables must be used for all outdoor and indoor installations. The wiring that leads into the building shall be protected in a conduit. The cable must have undergone quality tests as per BSS standards. Cable size should be selected so that the Voltage drop Losses in the drop cable should not be more than 2.5%.

Following lab tests are mandatory.

- Conductor resistance test.
- Insulation resistance test.
- Pressure test.
- Spark test.
- Note: The Supplier should provide the quality tests certificates at the time of pre-supply testing and inspection.

22. COLUMN PIPE:

The column pipe shall be flanged ERW steel pipes confirming to ASTM designation A-53 with a minimum thickness of **3.6 / 4.0 mm (3.6 mm for pipes upto 2.5" dia and 4 mm for pipes above 2.5" dia)** and shall be painted with corrosion resistance paint of suitable thickness. Flanges thickness of 19-20 mm shall haye grooves for cable passage. Each column pipe shall be complete with gaskets, bolts/studs, washers and nuts. All nuts, bolts, and washers shall be made of minimum A2 grade stainless steel.

The column pipe shall be supplied in interchangeable section having an approximate length of 10 feet column pipe shall be flanged perpendicular to the axis of pipe.

Column pipe size should be selected so that the Head Losses in the column pipe should not be more than 5%.

For Reference a table-1 is given below.

HDPE Pipe of ≥ 0.75 Inch diameter, SDR 13.6, PE100, conforming to ASTM F-2160 Standard without Joints to be installed/included along with and equal to Column pipe for confirming Water Level testing purpose.

FEATURES:

- Manufacturer's pipes should meet international standards like BSEN 10255 & ASTMA 53.
- Dimensional accuracy circularity and plan end cut should be observed,
- Weld strength of pipe and mechanical properties or raw material should be tested as per manufacturing standards.
- Pipes should be NDT tested (Non-destructive – Eddy current)
- Pipes should be hydrostatically pressure as per manufacturing standard.
- Pipes should be gone through straightening process to remove bendiness.

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23. TOPSET:

Top set shall comprise of Bore covers plate, (covering bore hole completely and securely), installation/suspension clamps (2-Nos), sluice valve (BSS/ASTM), reflex valve (BSS/ASTM), Washout Valve approx. 3-4 feet above the ground (T-Connection For Testing Pump's discharge), connector and cable jointing material (Cable connection from motor to switching device shall be joint free), Liquid Filled Pressure gauge minimum 4 Inch diameter suitable / appropriate for the required head pressure and cable ties. Bore Cover Plate should have provision for water level testing facility (i.e: Hole for Sonic Water Level Meter / HDPE Pipe insertion)

For Cleaning of solar Panels, Plastic pressure pipe should be provided of suitable length to reach the furthest / last Solar Panel.

Every Water Supply Scheme should have a non-removable name plate fitted at suitable place / box having essential information and bearing the name of supplier, Consultant and client.

24. SOLAR PUMP INVERTER / CONTROLLER:

a. The solar pump inverter/controller should have built-in advance version of Auto MPPT controller, over load protection, Soft start/Soft Stop Features and Variable Frequency Drive (VFD) with integrated Gate Bipolar Transistors (IGBTs) of European, USA or Japanese origin or atleast equivalent.
b. The make and origin of the inverter/controller should be clearly mentioned in the catalog and submitted in the technical proposal.
c. The inverter offered should comply to or Equivalent standards:
    i. CE/RoHS
    ii. Low Voltage Directive 2014/35/EU
    iii. EMC Directive 2014/30/EU
    iv. IEC 62109-1 (Safety of Power Converters for use in PV Systems)
d. The complete datasheet showing all the electrical parameters like input & output voltage ranges should be provided in the technical bid.
e. All the electrical parameters like input & output voltage ranges, and efficiency should be provided at the time of pre-supply testing and inspection.
f. Efficiency of inverter should be 96% and above at Rated Capacity.
g. Efficiency of MPPT should be 98% and above.
h. The inverter < 25kW ingress protection of inverter must be minimum IP 65 Rating or above and for inverter ≥ 25kW ingress protection of inverter / enclosure will be minimum IP 54 Rating or above.
i. Inverter / Controller having the capability to run both on AC and DC Power would be given preference.
j. Inverter should have at least three (3) years product and performance warranty.
k. The Pump Controller/Inverter should have an ON/OFF Switch/Button to Start and Stop the Pump.
l. Inverter should have active RS232/485 etc communication port available, the Data available through this port can be used for Remote Monitoring.
m. Inverter circuit must include protection against:
    i. Over or Low voltages and currents beyond critical level of the inverters circuits.
    ii. Protection against accidental short circuits & reverse polarity connections.
    iii. Protection against lightning induced transients.
    iv. Over load protection.
    v. Low RPM Protection (i.e: Frequency < 30 Hz or as per pump characteristic curve) Motor Should Stop.
    vi. Dry run protection. (PF / Current Based).

25. dV/dT or Sine Filters With Inverter (VFD):

a. The use of load reactors increases the reliability, performance, and efficiency of VFD systems, extends the life of both drives and motors, and reduces the amount of energy consumed by the motor/drive system.
b. Output dV/dT or Sine Filters (between VFD and Motor) of appropriate size (for 3-phase ≥380Vac Motor of Class B Insulation) should be used where the cable length between motor and inverter is more than Fifty (50) Feet or as advised / recommended by the inverter manufacturer in their Technical Documentation. For Cable lengths of more than 150 meters sine filters should be used.
c. Filter should be enclosed in a vented box.
d. Filter Efficiency should be minimum 97%.
e. Filter should have a current rating of equal or greater than Motor FLA Rated Current.
f. Distance between filter and pumping inverter should not be more than 2 meters.
g. Motors with Insulation Class F, H or above are exempted from the requirement of dV/dT Filter.

26. SYSTEM DESIGN FOR PUMPING SYSTEM:

a. Suitable factor of safety should be applied while designing the system in order to have compensations for variations in irradiations.
b. For Fix Structure and Auto Tracker, the PV panel **peak power at STC (Wp) should be 75% more** than the Motor basic input power **(PV Loss Compensation Factor = 1.75)**.
c. For Auto /Manual Tracker, the PV panel **peak power at STC (Wp) should be 50% more** than the Motor basic input power **(PV Loss Compensation Factor = 1.5)** as per direction of Engineer Incharge
d. If Single Axis Auto Tracker Structure is installed on the above factor, then daily operational timings of pumping can be increased by 10-20%, as compared to fixed structure installation.

e. Total PV Power (Wp) (Imperial Gallons) = $\frac{Q\ \textbf{(iGPH)} * TDH\ (ft) * 746 * PV\ Loss\ Factor}{60 * \textbf{3300} * \eta_{pump} * \eta_{motor}}$

f. Total PV Power (Wp) (US-Gallons) = $\frac{Q\ \textbf{(US-GPH)} * TDH\ (ft) * 746 * PV\ Loss\ Factor}{60 * \textbf{3960} * \eta_{pump} * \eta_{motor}}$

g. Total PV Power (Wp) (Metric Units) = $\frac{Q\ \textbf{(m}^3\textbf{/hr)} * TDH\ (m) * 9.81 * 1000 * PV\ Loss\ Factor}{\textbf{3600} * \eta_{pump} * \eta_{motor}}$

h. Voltage (V_{mp}) of Each String of PV Panels should be as per details given below and String Voltage (V_{mp}) should be within the MPPT range of Inverter.
   i. For 380 V_{ac} 3-Phase Motor = 380 * 1.414 * 1.06 = 570 Vdc String, minimum
   ii. For 220 Vac 3-Phase Motor = 220 * 1.414 = 310 Vdc String.
   iii. Small Inverters (i.e: 3-Phase, 220 Vac) with voltage boost function are exempted from the above string voltage requirements. String can made as per boost Inverter / Controller recommended String DC Voltage and should not be less than 230Vdc in any case.

i. Details of each PV Panel string should be submitted in Technical proposal (i.e: Nos of total strings and Nos of PV panels in each string along with wattage and V_{mp} of each PV panel).
j. Unjustified Oversizing in PV Panels Wattage is not allowed.
k. To avoid any oversizing, all commercially available PV Panels should be considered.

l. Solar Pump Inverter should have a kW capacity equal or greater than the Motor Rated Input Power.
m. Solar Pump Inverter / Controller Size (kW) ≥ (Motor Rated Power in kW / Motor Efficiency).
n. Solar Pump Inverter / Controller should have a current rating of 1.15 Times (minimum) of Motor FLA Rated Current.
o. Motor should not be loaded more than 90%. (i.e: Design / Calculated BHP should not be more than 90% of Motor Rated Horse Power)
p. Along with this specification, contractors should also follow manufacturer's recommendations for all major components of Solar Pumping System.
q. Requirement of Efficiency for Motor i.e. 75% will not apply on Motors smaller than or equal to 5.5HP and the requirement of efficiency for pump i.e. 70% will not apply on pumps having discharge equal to or lower than 3000 GPH.

27. PRESSURE PUMPS (UPTO 5.5 HP):

a. Submersible pump confirming to ISO-9906 Standard.
b. Pump + AC Motor (3-Phase-220V/380V) or DC Motor and Pump with Display Unit.
c. Solar pump inverter/controller should be MPPT based and Minimum Ingress Protection of IP65.
d. In case, where the column pipe diameter is less than or equal to 1.5-inch (For discharge equal or less than 6000 LPH and/or for Motor 4 HP and below), HDPE pipe of at least PN12 / SDR 13.6 / PE100 (For TDH of equal or less than 300 ft) without joint may be used instead of MS pipe for better economics and to avoid hydraulic losses. However stainless steel rope of minimum diameter of 6 mm (28 mm^2) for suspension of pump-set must be supplied with HDPE pipe. (Note: For TDH of more than 300 ft, HDPE Pipe type / thickness may be increased/changed accordingly)
e. Top set shall comprise of Suitable Galvanized stand (Design should be verified from Engineer In-Charge before start of work)
f. For Pressure Pumps ≤ 5.5 HP schemes, Solar Module efficiency requirement is minimum 16%. (Only for Cut Cells PV Modules or Cell Size of 5 Inches PV Modules).
g. Connection to overhead water storage tank. Top bend, S.S Fasteners & Erection clamps.
h. Civil work to protect borehole i/e foundation.
i. The pump should operate safely with Sand particles up to (50) $gram/m^3$.

28. DC SOLAR WATER PUMP-SETS (UPTO 5.5 HP)

a. DC Motor can also be provided for Equal or less than 5.5 HP.
b. Motor should be capable of both AC and DC operation. There must be auto power source recognition feature.
c. The motor should be brushless, permanent magnet type.
d. The Controller must have a display Unit, showing all essential parameters (i.e: Current, Voltage etc).
e. The Controller must be of MPPT type. MPPT efficiency should be equal or more than 98%
f. Pump should have auto and soft start / stop feature.
g. The pump-set should have following protections
   1. Dry Running Protection
   2. Reverse Polarity Protection
   3. Over phase protection
   4. Over Head Protection
   5. Lose Phase Protection
   6. Electronic Protection
   7. Over Current/ Overload Protection

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29. SOLAR AUTO TRACKER:

a. The solar tracker offered should be fully automatic and intelligent, and must be capable of Single axis tracking (from east to West) and should have its own power supply (PV Panel, Battery and Charge Controllers) other than PV Panel used for Pumping Setup.
b. Individual Auto-Tracker should be ≥ 4 kW each and Tracking Accuracy should be within ± 5°.
c. The auto Tracker should also have manual control mode to adjust the tracking angle manually. Structure Material Should be Hot Dipped Galvanized Steel (Minimum 80 Microns).
d. All nuts, bolts, washers and other fasteners for mounting structure shall be made of minimum A2 grade stainless steel.
e. Foundation and other details will be separately provided.
f. Three years Comprehensive Free Replacement, Repair and maintenance Warranty (Free of Cost) should be provided for all the components of auto Tracker (including Batteries).

30. PV MOUNTING FRAME WITH MANUAL TRAKERING :

Suitable for 2.5 or 3.5 KW PV Panels easily movable in multi directions having flanges with bearing balls ½" and having angle adjustment. Base steel cage ¾", MS rod 3.5 feet length with nut-bolts system for strong anchoring. Pillar pipe 6 mm with 5.5" dia, base plate 15"x15"x1/2" size with 04 numbers of supports. Support for PV, 5 mm thickness 4" dia pipe and 24"x12"x 1/4" side plates. MS Angle side bracing 2"x 2" x ¼". MS Angle frame 2"x 2" x ¼" for panel mounting. Steel structures/frames shall be powder coated. Galvanized nuts, bolts and washers for tracker fitting. Steel frame shall be properly designed and shall withstand wind speed/load of at least 130 km/hr and tough weather condition.

31. PRE-SUPPLY TESTING & INSPECTION:

The firm applying for the tender has to provide the recent test bed reports from the pump/motor manufacturer or any other third party as per ISO-9906 standard. Each of the offered pump set models must undergo these test prior to supply and installation, In order to ensure the quality and standard of the equipment contractor may be asked to provide test result conducted by third party for re-verification.

32. OPERATION AND MAINTENANCE MANUAL:

An Operation and Maintenance Manual, in English and Urdu language, should be prepared and provided by the contractor with the solar PV pumping system. The Manual should have information about solar energy, photovoltaic, modules, DC/AC motor pump set, tracking system (if any), mounting structures, electronics and switches. It should also have clear instructions about mounting of PV module, DO's and DONT's and on regular maintenance and Trouble Shooting of the pumping system. Name and address of the person or Centre to be contacted in case of failure or complaint should also be provided.

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C- SPECIFICATIONS FOR SOLAR HOMES & BUILDING SYSTEMS.

33. GRID TIE INVERTER (ON`-Grid without battery backup / Hybrid with battery backup)

1. UL-1741 Certified or IEC 62109-1 and IEC 62109-2 or Equivalent Certificates.
2. Minimum 95% Conversion Efficiency at Rated Capacity (High Frequency Inverters).
3. Minimum 87% Efficiency for Transformer based inverters (Low frequency Inverters).
4. The inverter should have built-in MPPT controller
5. The Priority of the inverter should be set that load will be running from the solar energy then Grid and in the end will be running from the Battery Backup.
6. Inverter (Hybrid Only) must be capable of configuring for Charging GEL, Lead Carbon, OPzV/OPzS Batteries and Lithium Iron Phosphate batteries (LiFePO4).
7. Hybrid Inverter (If Quoted along with Lithium Batteries) must be capable of communication with the BMS of Lithium Batteries.
8. Rated output voltage of inverter / Controller shall be pure sine wave AC.
9. Total harmonic distortion (THD) in AC output should not exceed 3% at rated capacity.
10. The degree of protection of the ON-Grid inverter Installation should be IP-65 rated and for indoor Hybrid Inverter installation, the IP rating should be IP-20 or above.
11. Wide input voltage range capability. (i.e: Voltage Range can be adjustable / selectable)
12. Natural convection cooling for maximum reliability
13. Outdoor enclosure for unrestricted use under any environmental conditions
14. Capability to connect external sensors for monitoring environmental conditions.
15. The output of the inverter must synchronize automatically its AC output to the exact AC voltage and frequency of the grid.
16. The Inverter should have the capability of Parallel operation upto three units. (Only For projects, where more than one inverter should be installed).
17. Inverter should have active RS232/485 etc communication port, the Data available through this port can be used for Remote Monitoring.
18. Liquid crystal display should at least be provided on the inverters front panel or on separate data logging/display device to display following
    a. DC Input Voltage
    b. DC Input current
    c. AC Power output (kW)
    d. Current time and date
    e. Temperatures (C)
    f. Converter status
19. Inverter circuit must include protection against:
    - Over or Low voltages and currents beyond critical level of the inverters circuits.
    - Protection against accidental short circuits.
    - Protection against lightning induced transients.
    - Over load protection.

34. OFF-GRID / HYBRID INVERTER:

1. The Inverter must be pure sine wave output suitable for 220 Volt, 50 Hz.
2. Inverter must be capable of configuring for Charging GEL, Lead Carbon, OPzV/OPzS Batteries and Lithium Iron Phosphate batteries (LiFePO4).
3. The Inverter / system must have a MPPT Solar Charge Controller.
4. Minimum 92% Conversion Efficiency at Rated Capacity (High Frequency Inverters).
5. Minimum 87% Efficiency for Transformer based inverters (Low frequency Inverters).
6. Total harmonic distortion (THD) in AC output should not exceed 3% at rated capacity.

7. The inverter must be user programmable for selecting PV, Grid and Battery Priority as well as Built-in programmed and user defined voltage and current settings of the charge controller for GEL, Lead Carbon, OPzV/OPzS batteries and Lithium Iron Phosphate batteries (LiFePO4).
8. The Inverter must have Protective function limits for:
    a. AC under voltage protection
    b. AC over voltage protection
    c. Battery under voltage Alarm
    d. Low Voltage Disconnect
    e. High Voltage Disconnect
    f. Overload and Short Circuit Protection
    g. Over Temperature Protection
9. The inverter must be ISO 9001, ISO 14001 and CE Certified.
10. The inverter must have IEC 62109-1 and IEC 62109-2, or Equivalent Certificates.
11. The degree of protection of the outdoor inverter Installation should be IP-55 rated and for indoor Inverter installation, the IP rating should be IP-20 or above.
12. Wide input voltage range capability.
13. Inverter should have active RS232/485 etc communication port, the Data available through this port can be used for Remote Monitoring.
14. Inverter (If Quoted along with Lithium Batteries) must be capable of communication with the BMS of Lithium Batteries.

Note:

- Product Brochure, Catalog and certificates must be attached with the Technical Bid.

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D - SPECIFICATIONS FOR SOLAR STREET LIGHTS

35. SOLAR STREET / ROAD LIGHT SYSTEM DESIGN:

a. Assessment of Wattage of the LED Luminaire, Pole Height, Pole thickness, Pole top diameter, Pole base diameter, Base plate size, Base Plate thickness, Stiffener size, Stiffener thickness, Pole arm design, Pole Arm Length, Pole arm thickness, Pole arm diameter, Pole arm Placement / Fixing position, RCC foundation size, Anchor / J-bolt size, Steel Rebars cage (Mesh) and Number of Poles (Pole to Pole distance) should be according to the design provided / approved by the Engineer In-charge.
b. Round Conical or Octagonal Hot Dipped Galvanized Pole of average 80 Microns should be installed.
c. All Nuts, Bolts and Washers should be stainless steel.
d. Pole base plate should be tightened in between two stainless steel nuts and washers (one nut and washer at upper and one nut and washer at lower side of the base plate).
e. All Anchor / J-bolt shall be in level and align to each other.
f. All Anchor / J-bolt shall be galvanized.
g. All Anchor / J-bolt shall have at least 150 mm minimum threads.
h. All poles shall be installed on levelling nuts secured to the anchor bolts and with locking nuts on the top of the base flange.
i. The concrete ratio should be 1:2:4 for RCC foundation.
j. Proper sketches of Pole, base plate, RCC Foundation and Steel Rebars cage (Mesh) should be provided and approved from Engineer In-charge.
k. In order to focus on winter sun availability and Easy cleaning of Solar panel from dust etc with Rain water, Solar Panels should be installed at 180° Azimuth Angle and the Tilt angle (slope) of PV Module should be between 45° ±5° (Only for Solar Street Lights).

36. LED SOLAR ROAD/STREET LIGHT FIXTURE:

1. LED Efficacy must be greater than or equal to 130 Lumens/Watt.
2. The fixture must be IP-66 Rated or above.
3. The Color temperature of the LED should be Pure white in the range of 5000-6000 K.
4. The LED Light distribution must be IESNA Type-II
5. The LED must be suitable for working Temperature from -40 ~ + 60°C with relative humidity of 15% ~ 90%
6. The Color rendering Index (CRI) must be equal or greater than 70.
7. The LED Light Fixture must be LM79 and LM80 Tested.
8. LEDs/Light fixtures should not be Chip-on-board (COB) single chip type due to their poor heat dissipation.
9. LEDs/Light fixtures shall be modular type with proper heat sinks.
10. The output from the LEDs/Light fixtures should be constant throughout the duty cycle
11. LED Life should be greater or equal to than 50,000 Hours.
12. The LED Light Fixture must have the following certification:
    - ISO 9001
    - ISO 14001
    - CE (EMC and LVD) Certified or equivalent.
    - International standard Certifications

Note: Product Brochure, Catalog and certificates must be attached with the Technical Bid

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37. SOLAR CHARGE CONTROLLER (FOR STREET / ROAD LIGHTS):

a. The charge controller must be suitable for the required battery voltage, auto voltage recognition feature and capable of charging OPzV & Lithium Ferrous Phosphate (LiFePO4) Batteries
b. The charge controller must be IP-67 rated or above for outdoor installation
c. The charge controller must be Remote Controlled for parameter setting. The system must have the following feature:
   - *Remote Parameter Setting and Monitoring*
   - *Remote control of the Lights (on/off, timer setting etc)*
d. The charge controller must have MPPT Technology
e. The charge controller must have at-least three stage Flexible dimming function (0-100%).
f. The Maximum power point tracking (MPPT) efficiency should be minimum 97%.
g. It must have temperature compensation for charging batteries in higher temperatures.
h. Charge controller must have the following protections:
   - PV Short circuit
   - PV reverse polarity
   - PV over voltage
   - PV over current
   - Battery over charging
   - Battery over discharging
   - Battery reverse polarity protection
   - Load short circuit
   - Load overload protections
i. It must have proper heat sink to dissipate excessive heat
j. The charge controller must have protection for reverse flow of current through the PV modules
k. Controller should have active port for GSM based communication for Remote Monitoring.
l. Mid Night based timing controller will be preferred.
m. The Solar Charge controller must have the following certification:
   - ISO 9001
   - CE Certified

Note: Product Brochure, Catalog and certificates must be attached with the Technical Bid

38. Battery and Controller Box:

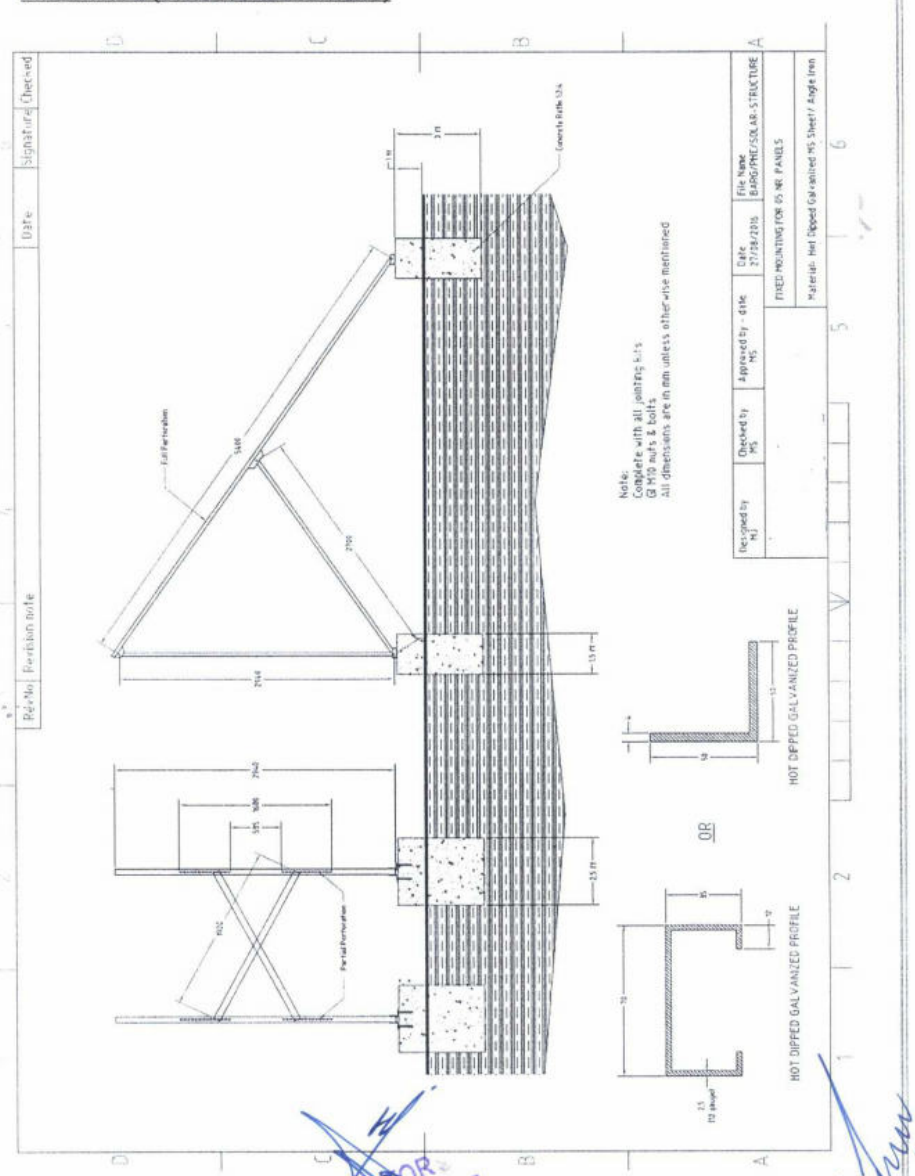
a. The battery box should be made of Hot Dipped Galvanized Sheet of average 80 Microns.
b. The battery box must have vented compartment having inverted louvers.
c. For Pole Mounted batteries Battery boxes must be made of minimum 16 SWG sheet and must have proper locking arrangement for protection against theft.
d. For underground battery installation, the battery box should be made of minimum 16 SWG sheet and should be properly sealed to ensure protection against water. Proper cable glands and packing material should be used to ensure water proofing of the box.
e. The battery and Controller Box should be at least IP65 ingress protection.

39. Electric Cable:

The specifications of Electric cables are as under:

a. Flexible copper cable of proper size along with MC-4 connectors (TUV Approved) from solar panel to charge controller and charge controller to battery as well as to light fixtures.
b. The cables should be made of minimum 99.9% Pure copper cable

ANNEXURE-1 (STRUCTURE DRAWING)



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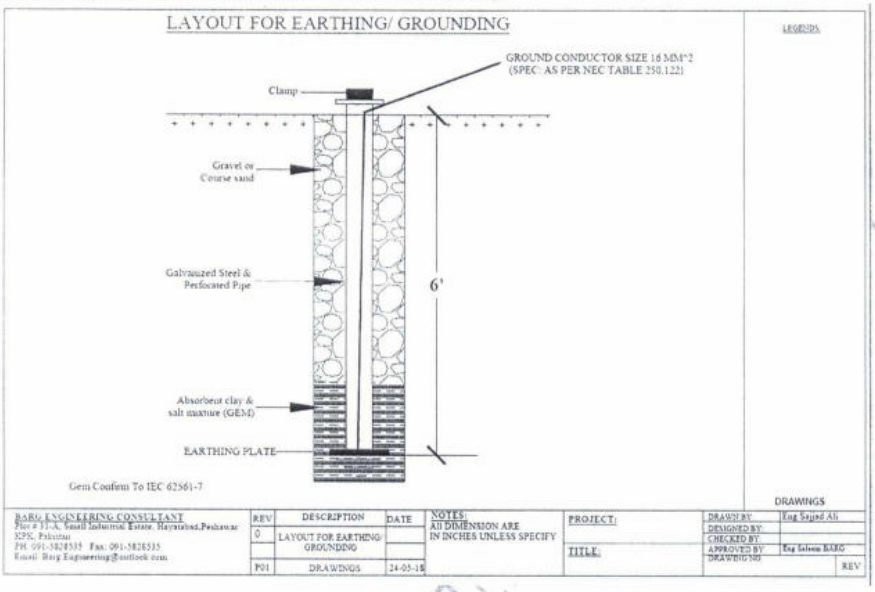
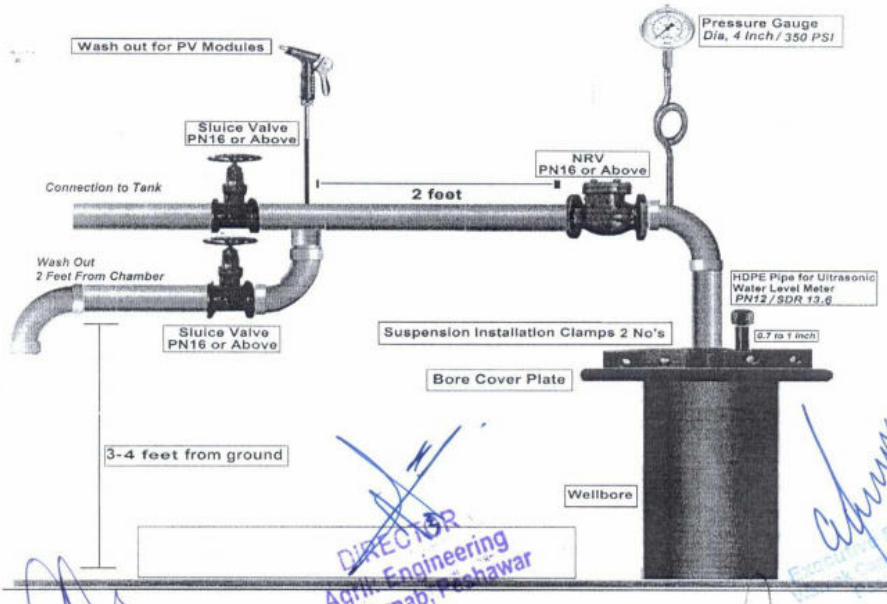
ANNEXURE-2 (EARTHING / GROUNDING DRAWING)



ANNEXURE-3 TOPSET LAYOUT:



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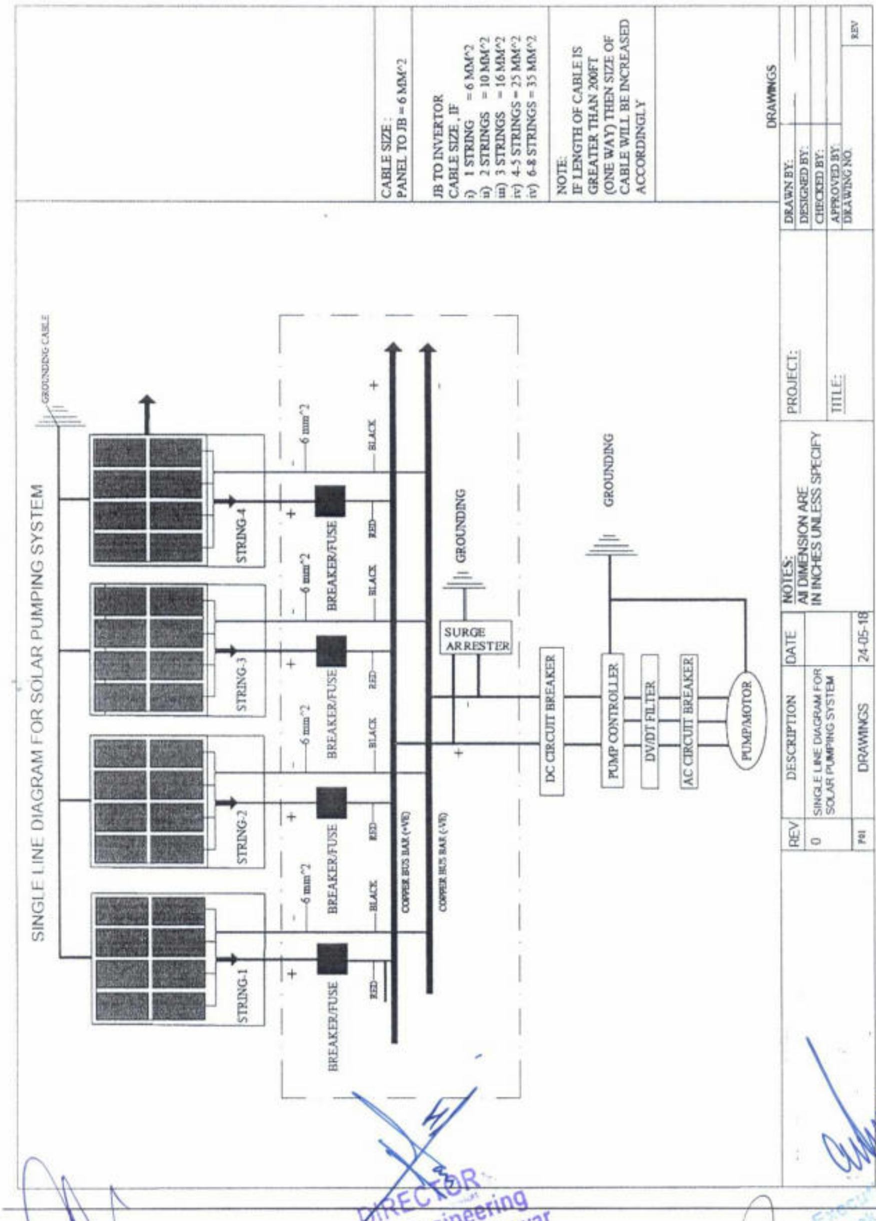
ANNEXURE-4 (SYSTEM SINGLE LINE DIAGRAM-PUMPING)



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