

**GOVERNMENT OF KHYBER PAKHTUNKHWA  
IRRIGATION DEPARTMENT**



**BID SOLICITATION DOCUMENTS  
(FOR SOLARIZATION)  
(SINGLE STAGE SINGLE ENVELOP)**

**FOR**

**Name of Scheme: -**

**Rehabilitation/ improvement of canals and other  
Irrigation infrastructure in Khyber Pakhtunkhwa.  
ADP No.2214/210665. dg: 2022-23.**

**NAME OF CONTRACTOR:**

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**TUBE WELLS IRRIGATION DIVISION PESHAWAR.**

**NOTICE FOR INVITING E-BIDDING**  
**SINGLE STAGE SINGLE ENVELOP PROCEDURE**

Tubewells Irrigation Division Peshawar Irrigation Procurement Department, Government of Khyber Pakhtunkhwa, invites electronic Bids from the eligible firms / contractors in accordance with KPPRA procurement rules 2014 on single stage single envelop procedure for the following works: -

S#	Name of Work / Sub Works	E/Cost In Rs	Earnest Money+ Stamp Duty	PEC Relevant Code
<b>Name of Work: Rehabilitation/ improvement of canals and other Irrigation infrastructure in Khyber Pakhtunkhwa. ADP No.2214/210665. dg: 2022-23.</b>				
1	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. SKA-2 (Drilling / Civil Work)	5224062/-	113481/-	CE-04 CE-09 CE-10
2	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. SKA-7 (Drilling / Civil Work)	5224062/-	113481/-	CE-04 CE-09 CE-10
3	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. SKA-8 (Drilling / Civil Work)	5224062/-	113481/-	CE-04 CE-09 CE-10
4	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. SKA-9 (Drilling / Civil Work)	5224062/-	113481/-	CE-04 CE-09 CE-10
5	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. MPA-8 (Drilling / Civil Work)	5224062/-	113481/-	CE-04 CE-09 CE-10
6	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. NWB-1 (Drilling / Civil Work)	5809350/-	125187/-	CE-04 CE-09 CE-10
7	Reboring, Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. TKM-3 (Drilling / Civil Work)	5809350/-	125187/-	CE-04 CE-09 CE-10
8	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 23 (Solar work)	3224639/-	68493/-	CE-04 EE-11
9	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 29 (Solar work)	3224639/-	68493/-	CE-04 EE-11
10	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 54 (Solar work)	3224639/-	68493/-	CE-04 EE-11
11	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. MPA-11 (Solar work)	3224639/-	68493/-	CE-04 EE-11
12	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 23 & 29 (Civil Work)	5690722/-	122814/-	CE-04 CE-10
13	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 54 & MPA-11 (Civil Work)	5690722/-	122814/-	CE-04 CE-10
14	Construction of boundary wall & Solarization for Irrigation tube well No. JSU-24 (Solar & Civil Work)	4150000/-	87000/-	CE-04 CE-10 EE-11
15	Construction of Pump house, operator quarter, for Irrigation tube well No. JSU-20 (Civil Work)	1930000/-	42600/-	CE-04 CE-10

16	Construction of Pump house, operator quarter, for Irrigation tube well No. JSU-27 (Civil Work)	1930000/-	42600/-	CE-04 CE-10
17	Construction of Pump house, operator quarter, for Irrigation tube well No. JSU-33 (Civil Work)	1930000/-	42600/-	CE-04 CE-10
18	Construction of Pump house, operator quarter, for Irrigation tube well No. TKM-21 (Civil Work)	1930000/-	42600/-	CE-04 CE-10

### **TERMS AND CONDITIONS**

1. Bid Solicitation Documents containing all the terms and conditions and other relevant instructions for works can be downloaded from the department and or KPPRA websites ([www.irrigation.gkp.pk](http://www.irrigation.gkp.pk)) / ([www.kppra.gov.pk](http://www.kppra.gov.pk)). For each package separate bid solicitation documents are to be submitted by the interested bidders.
2. Electronic bidding shall be done on “above / below system” on BOQ / Engineer’s estimate.
3. All bidders are required to have registration with Khyber Pakhtunkhwa Revenue Authority.
4. The bidder shall submit 02% bid security, of the estimated cost as mentioned above, in the shape of deposit at call (Original) along with their bid before closing date and time.
5. Notifications issued by KPPRA pertaining to procurement process issued from time to time shall be applicable and notification no S.RO (14)/Vol: 1-24/2021-22, dated 10-05-2022/6058-71.
6. If the evaluated electronic bid costs of two or more bidders are equal, then the successful bidder will be declared through draw / toss.
7. Pre-bid meeting will be held 31-10-2022 at 11:00 AM in the office of the Executive Engineer Tubewells Irrigation Division Peshawar.
8. The Last date & time for Submission of the Bid along with relevant documents is 08-11-2022 up to 12:00PM which will be opened on the same day at 12:30 PM in the office of the undersigned in presence of Contractor and their representatives who wishes to attend.
9. Bid security of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> responsive lowest bidders will be retained by the employer till the approval of bids by the competent Authority.
10. The contractor shall have the ownership of the rig machine duly verified from Excise & Taxation Department which is mandatory for responsive of their bid for drilling works.
11. All Government Notifications/ Rules/Taxes updated from time to time shall be applicable.
12. Any further information regarding the above tender can be obtained from office of the undersigned on any working day prior to bid opening date.
13. The bidder shall submit their bids through leading courier service on or before the deadline along with required document as per NIT with the condition that in case of failure of delivery of the said envelope containing the bids etc shall rest on the bidders / company who has used the relevant courier service. No liability and responsibility shall rest on the department for any delayed delivery and any other pretext leading towards late submission shall be accepted.

**EXECUTIVE ENGINEER.**

BASED ON  
**STANDARD FORM OF BIDDING DOCUMENTS**  
  
**FOR**  
  
**PROCUREMENT OF WORKS**

(For Smaller Contracts)  
**Under Rs.45 Million**

[Notified vide Notification No.KPPRA/M&E/SBDs/1-1/2015](#)  
[Dated Peshawar the May 03, 2016](#)

**KHYBER PAKHTUNKHWA PUBLIC PROCUREMENT  
REGULATORY AUTHORITY (KPPRA)**

# **SUMMARY OF CONTENTS**

## **Subject**

- I.** INVITATION FOR BIDS
- II.** INSTRUCTIONS TO BIDDERS & BIDDING DATA
- III.** FORM OF BID & SCHEDULES TO BID
- IV.** CONDITIONS OF CONTRACT & CONTRACT DATA
- V.** STANDARD FORMS
- VI.** SPECIFICATIONS

**INVITATION  
FOR  
BIDS**

# **KPPRA NOTOFICATION**

## **(Updated from Time to Time)**



GOVERNMENT OF KHYBER PAKHTUNKHWA,  
KHYBER PAKHTUNKHWA  
PUBLIC PROCUREMENT REGULATORY AUTHORITY

Peshawar, the May 10, 2022 / 6058-21

**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]<sup>1</sup>. 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 2<sup>nd</sup> 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.

<sup>1</sup> 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. 1<sup>st</sup> installment of 25% to be released upon completion of 25% of the project, 2<sup>nd</sup> installment of 25% to be released upon completion of 50% of the project, 3<sup>rd</sup> installment of 25% to be released upon completion of 75% of the project and the 4<sup>th</sup> 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.

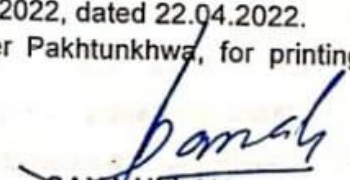
-SD-  
Managing Director  
KPPRA

**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

**INSTRUCTIONS  
TO BIDDERS  
&  
BIDDING DATA**

# INSTRUCTIONS TO BIDDERS

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<b>B. BIDDING DOCUMENTS</b>		
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IB.5	Clarification of Bidding Documents	
IB.6	Amendment of Bidding Documents	
<b>C. PREPARATION OF BID</b>		
IB.7	Language of Bid	
IB.8	Documents Comprising the Bid	
IB.9	Sufficiency of Bid	
IB.10	Bid Prices, Currency of Bid & Payment	
IB.11	Documents Establishing Bidder's Eligibility and Qualifications	
IB.12	Documents Establishing Works Conformity to Bidding Documents	
IB.13	Bidding Security	
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IB.16	Bid Opening, Clarification and Evaluation	
IB.17	Process to be Confidential	
<b>F. AWARD OF CONTRACT</b>		
IB.18	Qualification	
IB.19	Award Criteria & Procuring Entity's Right	
IB.20	Notification of Award & Signing of Contract Agreement	
IB.21	Performance Security	
IB.22	Integrity Pact	

# INSTRUCTIONS TO BIDDERS

## A. GENERAL

### IB.1 SCOPE OF BID & SOURCE OF FUNDS

#### 1.1 SCOPE OF BID

As per NIT

#### 1.2 SOURCE OF FUNDS

The Procuring Entity intends to execute the works from Provincial fund/ADP as tabulated in the title page.

### 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 appropriate category for value of Works i.e Specialization code (mentioned as per NIT).
- b. Duly enlisted with the Provincial Govt. (Works Deptt:).
- c. Registration with Federal Board of Revenue / NTN Registration / Income Tax Department with online active status.
- d. Registration with KPRA (**valid active**)
- e. For each work Separate Bid Solicitation Documents is to be submitted by interested bidders.
- f. The bid will be received through courier as per NIT time, date and venue. Further Bids submitted through telegraph, telex, fax or e-mail shall not be considered.

### IB.3 COST OF BIDDING

#### 3.1 The bidder shall bear all costs including bid solicitation documents fee (nominal so as to cover printing/reproduction and mailing costs) and other costs associated with the preparation and submission of its bid including the submitted Bid Securities and Additional Security (If applicable) and the Procuring Entity 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.4 CONTENTS OF BIDDING DOCUMENTS

#### 4.1 In addition to Invitation for Bids, the Bidding Documents are those stated below, and should be read in conjunction with any Addendum issued in accordance with Sub-Clause IB.6.1.

1. Instructions to Bidders & Bidding Data
2. Form of Bid & Schedules to Bid Schedules to Bid comprise the following:
  - i. Schedule A: Schedule of Prices
  - ii. Schedule B: Specific Works Data
  - iii. Schedule C: Works to be Performed by Subcontractors
  - iv. Schedule D: Proposed Program of Works
  - v. Schedule E: Method of Performing Works
  - vi. Schedule F: Integrity Pact

3. Conditions of Contract & Contract Data
4. Standard Forms:
  - i. Form of Bid Security
  - ii. Form of Performance Security. (As per KPPRA Rules)
  - iii. Form of Bank Guarantee for Advance Payment. (N.A)
5. Specifications (As per SBD/ NIT)
6. Drawings, if any (As per SBD/ NIT)

#### **IB.5 CLARIFICATION OF BIDDING DOCUMENTS**

- 5.1 A prospective bidder requiring any clarification(s) in respect of the Bidding Documents may notify the Engineer/Procuring Entity at the Procuring Entity's/Engineer's address indicated in the Bidding Data.
- 5.2 The Engineer/Procuring Entity will respond to any request for clarification which it receives earlier than seven (7) days prior to the deadline for the submission of Bids. Copies of the Engineer/Procuring Entity's response will be forwarded to all prospective bidders, at least five (5) days prior to dead line for submission of Bids, who have received the Bidding Documents including a description of the enquiry but without identifying its source.

#### **IB.6 AMENDMENT OF BIDDING DOCUMENTS**

- 6.1 At any time prior to the deadline for submission of Bids, the Procuring Entity 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.
- 6.2 Any addendum thus issued shall be part of the Bidding Documents pursuant to Sub-Clause 6.1 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 Procuring Entity.
- 6.3 To afford prospective bidders reasonable time in which to take an addendum into account in preparing their Bids, the Procuring Entity may at its discretion extend the deadline for submission of Bids.

### **C. PREPARATION OF BID**

#### **IB.7 LANGUAGE OF BID**

- 7.1 The bid prepared by the bidder and all correspondence and documents relating to the Bid, exchanged by the bidder and the Procuring Entity 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.8 DOCUMENTS COMPRISING THE BID**

- 8.1 The bid prepared by the bidder may comprise the following components:
  - a. Covering Letter
  - b. Form of Bid duly filled, signed and sealed, in accordance with Sub-Clause IB.14.3 (financial bid shall be submitted through E-bidding System of Irrigation Department).

- c. Schedules (A to F) to Bid duly filled and initialed, in accordance with the instructions contained therein & in accordance with Sub-Clause IB14.3. (As per BSD/NIT)
- d. Bid Security furnished in accordance with Clause IB.13 as well as bid solicitation documents fee as per Clause IB 3.1. (As per BSD/NIT)
- e. Power of Attorney in accordance with Sub-Clause IB 14.5. (Where applicable)
- f. Documentary evidence in accordance with Clause IB.11. (Where applicable)
- g. Documentary evidence in accordance with Clause IB.12. (Where applicable)

**IB.9 SUFFICIENCY OF BID**

- 9.1 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, which rates and prices shall except in so far as it is otherwise expressly provided in the Contract, cover all his obligations under the Contract and all matters and things necessary for the proper completion of the Works.
- 9.2 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.

**IB.10 BID PRICES, CURRENCY OF BID & PAYMENT**

- 10.1 The bidder shall fill up the Schedule of Prices (Schedule A to Bid) indicating the premiums/unit rates and prices of the Works to be performed under the Contract. Unit rate offered for an item shall be considered upto two significant decimal places (if applicable) for evaluation purposes by the Procuring Entity. Prices in the Schedule of Prices shall be entered keeping in view the instructions contained in the Preamble to Schedule of Prices.
- 10.2 Even if stipulated in the Conditions of Contract, prices/premiums quoted by the bidder shall remain fixed during the bidder's performance of the Contract and not subject to variation on any account.
- 10.3 The unit rates and prices in the Schedule of Prices shall be quoted by the bidder in the currency/premium as stipulated in Bidding Data.

**IB.11 DOCUMENTS ESTABLISHING BIDDER'S ELIGIBILITY AND QUALIFICATIONS**

- 11.1 Pursuant to Clause IB.8, 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.
- 11.2 Bidder/Manufacturer must possess and provide evidence of its capability and the experience as stipulated in Bidding Data and the Qualification Criteria stipulated in the Bidding Documents.

**IB.12 DOCUMENTS ESTABLISHING WORKS CONFORMITY TO BIDDING DOCUMENTS**

- 12.1 The documentary evidence of the Works' conformity to the Bidding Documents may be in the form of literature, drawings and data and the bidder shall furnish documentation as set out in Bidding Data.
- 12.2 The bidder shall note that standards for workmanship, material and equipment and references to brand names or catalogue numbers if any, designated by the Procuring Entity in the Technical Provisions are intended to be descriptive only and not restrictive.

## **IB.13 BIDDING SECURITY**

- 13.1 Each bidder shall furnish, as part of his bid, at the option of the bidder, a Bid Security in the amount stipulated in NIT in Pak. Rupees in the form of Deposit at Call [Deleted]<sup>1</sup> in favour of the Procuring Entity. [The bid security shall be submitted from the account of the firm/bidder/contractor who submits the bid]<sup>2</sup> (KPPRA Notification No. S.R.O. (14)/Vol: 1-24/2021-22, Dated Peshawar, the 10<sup>th</sup> May 2022 /6058-71) shall be applicable.
- 13.2 Any bid not accompanied by an acceptable Bid Security shall be rejected by the Procuring Entity as non-responsive. (KPPRA rules 2014 as amended up to dated)
- 13.3 The bid securities of unsuccessful bidders will be returned as promptly as possible and top three retained till seven (7) days after award of contract to the successful bidder or on the expiry of validity of Bid Security whichever is earlier. (As per BSD/NIT)
- 13.4 [“The bid security of successful bidder be retained with the Procuring Entity till completion of the defect liability period and the amount of guarantee will be reduced by an equivalent amount”.]<sup>3</sup>
- 13.5 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 16.4 (b) 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.21, or
    - ii. sign the Contract Agreement, in accordance with Sub-Clauses IB.20.2 & 20.3.
    - iii. Submit additional security as per KPPRA Notification No. S.R.O. (14)/Vol: 1-24/2021-22, Dated Peshawar, the 10<sup>th</sup> May 2022 /6058-71

## **IB.14 VALIDITY OF BIDS, FORMAT, SIGNING AND SUBMISSION OF BIDS**

- 14.1 Bids shall remain valid for the period stipulated in the Bidding Data after the date of bid opening.
- 14.2 All Schedules to Bid are to be properly completed and signed.
- 14.3 No alteration is to be made in the Form of Bid 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.
- 14.4 Each bidder shall prepare Original and number of copies specified in the Bidding Data of the documents comprising the bid as described in Clause IB.8 and clearly mark them “ORIGINAL” and “COPY” as appropriate. In the event of discrepancy between them, the
- 1 Inseted by KPPRA Notification No. KPPRA/M&E/Estt:/1-12/2017-18 dated April 05, 2018.  
2 Substituted by KPPRA Notification No. KPPRA/M&E/Estt:/1-4/2016 dated May 24, 2016.  
original shall prevail. (As original will be suffice)
- 14.5 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 official seal be affixed by the person or persons signing the bid.

- 14.6 The Bid shall be delivered in person, through courier service or sent by registered mail, or as specifically instructed by the Procuring Entity otherwise, at the address to Procuring Entity as given in Bidding Data. (As per NIT)

#### **D. SUBMISSION OF BID**

##### **IB.15 DEADLINE FOR SUBMISSION, MODIFICATION & WITHDRAWAL OF BIDS**

- 15.1 Bids must be received by the Procuring Entity at the address/provided in Bidding Data not later than the time and date stipulated therein & NIT. In the event of the specified date for the submission of bids declared a holiday for the Employer, the Bids will be received up to the appointed time on the next working day.
- 15.2 The bid will be received through courier as per NIT time, date and venue. Further Bids submitted through telegraph, telex, fax or e-mail shall not be considered.
- 15.3 Any bid received by the Procuring Entity after the deadline for submission prescribed in Bidding Data will be returned unopened to such bidder.
- 15.4 Any bidder may modify or withdraw his bid after bid submission provided that the modification or written notice of withdrawal is received by the Procuring Entity prior to the deadline for submission of bids.
- 15.5 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 Sub-Clause IB.13.5(a).

#### **E. BID OPENING AND EVALUATION**

##### **IB.16 BID OPENING, CLARIFICATION AND EVALUATION**

- 16.1 The Procuring Entity will open the bids, in the presence of bidders' representatives who choose to attend, at the time, date and location stipulated in the Bidding Data.
- 16.2 The bidder's name, Bid Prices, any discount, the presence or absence of Bid Security, and such other details as the Procuring Entity at its discretion may consider appropriate, will be announced by the Procuring Entity at the bid opening. The Procuring Entity will record the minutes of the bid opening. Representatives of the bidders who choose to attend shall sign the attendance sheet. 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.
- 16.3 To assist in the examination, evaluation and comparison of Bids the Engineer/Procuring Entity 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.
- 16.4 a. Prior to the detailed evaluation, pursuant to Sub-Clauses IB.16.7 to 16.9, the Engineer/Procuring Entity 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. It will include to determine the requirements listed in Bidding Data.

- b.** 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 Procuring Entity 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.

16.5 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.

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

16.7 The Engineer/Procuring Entity will evaluate and compare only the bids previously determined to be substantially responsive pursuant to Sub-Clauses IB.16.4 to 16.6 as per requirements given hereunder. Bids will be evaluated for complete scope of works. The prices will be compared on the basis of the Evaluated Bid Price pursuant to Sub-Clause 16.8 herein below.

- a. Technical Evaluation**  
It will be examined in detail whether the Works offered by the bidder complies with the Technical Provisions of the Bidding Documents. For this purpose, the bidder's data submitted with the bid in Schedule B to Bid will be compared with technical features/criteria of the Works detailed in the Technical Provisions. Other technical information submitted with the bid regarding the Scope of Work will also be reviewed. (Bid will be evaluated as per BSD)

- b. Financial 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 material deviation/stipulation shall be taken by the bidders.

16.8 **Evaluated Bid Price**  
In evaluating the bids, the Engineer/Procuring Entity 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 arithmetic errors pursuant to Sub-Clause 16.4 hereof.
- ii. Making an appropriate price adjustment for any other acceptable variation or deviation.
- iii. Making an appropriate price adjustment for deviations in terms of Payments (if any and acceptable to the Procuring Entity).
- iv. Discount, if any, offered by the bidders as also read out and recorded at the time of bid opening.

16.9

### **Evaluation Methods**

Pursuant to Sub-Clause 16.8, Para (ii), and (iii) following evaluation methods for price adjustments will be followed:

- i. **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/Procuring Entity.
- ii. **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/Procuring Entity will be added to the Corrected Total Bid Price for comparison purpose only. Adjustment for commercial compliance will be added to the Corrected Total Bid Prices.
- iii. Price Adjustment for Deviation in Terms of Payments Refer to Bidding Data

## **IB.17 PROCESS TO BE CONFIDENTIAL**

- 17.1 Subject to Sub-Clause IB.16.3 heretofore, no bidder shall contact Engineer/Procuring Entity 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 Procuring Entity. The evaluation result may be announced at least ten (10) days prior to award of Contract. The announcement to all bidders will be Tentative E-bid Comparative Statement.
- 17.2 Any effort by a bidder to influence Engineer/Procuring Entity 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 procurement process.

## **F. AWARD OF CONTRACT**

### **IB.18 QUALIFICATION**

- 18.1 The Procuring Entity, 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 therefore in writing. They shall form part of the records of that bid evaluation report.
- 18.2 The determination will take into account the bidder's financial and technical capabilities. It will be based upon an examination of the documentary evidence of the bidders' qualifications submitted under Clause IB.11, as well as such other information required in the Bidding Documents.

## **IB.19 AWARD CRITERIA & PROCURING ENTITY’S RIGHT**

- 19.1 Subject to Sub-Clause IB.19.2, the Procuring Entity 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.18.
- 19.2 Notwithstanding Sub-Clause IB.19.1, the Procuring Entity 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 (acceptance of a bid or proposal rule 47(1)), without thereby incurring any liability to the affected bidders or any obligation to inform the affected bidders of the grounds for the Procuring Entity’s action except that the grounds for its rejection of all bids shall upon request be communicated, to any bidder who submitted a bid, without justification of the grounds. Notice of the rejection of all the bids shall be given promptly to all the bidders.

## **IB.20 NOTIFICATION OF AWARD & SIGNING OF CONTRACT AGREEMENT**

- 20.1 Prior to expiration of the period of bid validity prescribed by the Procuring Entity, the Procuring Entity will notify the successful bidder in writing (“Letter of Acceptance”) that his bid has been accepted.
- 20.2 Within seven (7) days from the date of furnishing of acceptable Performance Security under the Conditions of Contract, the Procuring Entity will send the successful bidder the Form of Contract Agreement provided in the Bidding Documents, incorporating all agreements between the parties.
- 20.3 The formal Agreement between the Procuring Entity and the successful bidder shall be executed within seven (7) days of the receipt of Form of Contract Agreement by the successful bidder from the Procuring Entity.

## **IB.21 PERFORMANCE SECURITY**

(As per KPPRA Rules 2014)

## **IB.22 INTEGRITY PACT**

The Bidder shall sign and stamp the Form of Integrity Pact provided at Schedule-F to Bid in the Bidding Document for all procurement contracts exceeding Rupees ten (10) million. Failure to provide such Integrity Pact shall make the bid non-responsive.

# BIDDING DATA

## INSTRUCTIONS TO BIDDERS

### Clause Reference

1.1 **Name of Procuring Entity**

Executive Engineer, Tube wells Irrigation Division Peshawar.

**Brief Description of Works**

Developmental

5.1 a. **Procuring Entity's address:**

Executive Engineer, Tube wells Irrigation Division Peshawar.

b. **Engineer's address:**

Executive Engineer, Tube wells Irrigation Division Peshawar  
Phone No. 091-9222731, Email: tidpeshawar001@gmail.com

10.3 Bid shall be quoted entirely in Pak. Rupees (Above/Below) on applicable schedule and non-Schedule items. The payment shall be made in Pak. Rupees for work done on release of funds, subject to fulfillment of Codal Formalities, Technical Sanction, Agreement sanction, complying of Material & Technical specifications.

11.2 The bidder/manufacturer has the financial, technical and production capability necessary to perform the Contract i.e., Registration with PEC in relevant category & financial limit as noted in NIT and BSD, Registration with KPRA, Enlistment with Irrigation Department Khyber Pakhtunkhwa, has been issued E-bidding Login & Password.

12.1 a. Essential technical specification as per document at the following link are required:

<https://www.finance.gkp.pk/attachments/032b21c0a37611eca4e0b55aac984a07/download>  
(Technical Specification on MRS 2020 / BOQ)

Essential Material specification as per document at the following link are required:

<https://www.finance.gkp.pk/attachments/032b21c0a37611eca4e0b55aac984a07/download>  
(Material Specification on MRS 2020 / BOQ)

b. Complete set of tentative technical specifications as per Approved PC-I/T.S/BOQ

13.1 **Amount of Bid Security**

2% of Estimated Cost & as per KPPRA Notification No. S.R.O. (14)/Vol: 1-24/2021-22: Dated Peshawar, the 10<sup>th</sup> May 2022 /6058-71

14.1 **Period of Bid Validity**

90 Days

14.4 **Number of Copies of the Bid to be submitted**

One original 01 copy

14.6 **(a) Procuring Entity's Address for the Purpose of Bid Submission**

Executive Engineer, Tube wells Irrigation Division, Peshawar.  
Phone No. 091-9222731, Email: [tidpeshawar001@gmail.com](mailto:tidpeshawar001@gmail.com)

15.1 **Deadline for Submission of Bids**

As per NIT

16.1 **Venue, Time, and Date of Bid Opening**

Executive Engineer, Tube Wells Irrigation Division Peshawar  
Warsak Road Kababian Peshawar.

Time: As per NIT

Date: As per NIT

16.4 **Responsiveness of Bids**

- i. The Bid is valid till required period,
- ii. The Bid prices are firm during currency of contract (if it is a fixed price bid)
- iii. Completion period offered is within specified limits or as noted in NIT/SBD
- iv. The Bidder/Manufacturer is eligible to Bid and possesses the requisite experience, capability and qualification. (As per SBD)
- v. The Bids are generally in order, etc.
- vi. The bid will be received through courier as per NIT time, date and venue

16.9 **Price Adjustment:**

(NOT APPLICABLE)

# **FORM OF BID AND SCHEDULES TO BID**

**FORM OF BID**  
(LETTER OF OFFER)

Bid Reference No. \_\_\_\_\_

NIT No. \_\_\_\_\_

Date of Opening No. \_\_\_\_\_

Work No. as per NIT. \_\_\_\_\_

\_\_\_\_\_  
(Name of Works)

To

**Executive Engineer,  
Tube Wells Irrigation Division,  
Peshawar.**

Gentlemen,

1. Having examined the Bidding Documents including Instructions to Bidders, Bidding Data, Conditions of Contract, Contract Data, Specifications, Drawings, if any, 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 Pakistan 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 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 of 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 Works comprised in the Contract within the time(s) stated in Contract Data.
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 Conditions of Contract for the due performance of the Contract & as per KPPRA

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.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20

Signature \_\_\_\_\_  
in the capacity of \_\_\_\_\_ duly authorized to sign bid for and on behalf of

\_\_\_\_\_  
(Name of Bidder in Block Capitals)

(Seal)

Address  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Witness:

(Signature) \_\_\_\_\_

Name: \_\_\_\_\_ NIC No. \_\_\_\_\_

Address  
\_\_\_\_\_  
\_\_\_\_\_



**SCHEDULES TO BID INCLUDE THE FOLLOWING:**

- Schedule A to Bid: Schedule of Prices
- Schedule B to Bid: Specific Works Data
- Schedule C to Bid: Works to be Performed by Subcontractors
- Schedule D to Bid: Proposed Program of Works
- Schedule E to Bid: Method of Performing Works
- Schedule F to Bid: Integrity Pact

**SCHEDULE OF PRICES**

THE BOQ SHALL BE FILLED ONLINE ON IRRIGATION DEPARTMENT WEBSITE, THE PROCURING ENTITY SHALL NOT BE LIABLE FOR THE ERRORS/MALFUNCTIONS OF THE E-BIDDING SYSTEM, LOSS OR NON-PROVISION OF EBIDDING SYSTEM LOGIN & PASSWORD

<http://www.irrigation.gkp.pk> OR <http://www.irrigation.gkp.pk/tenders.php>

**\*SPECIFIC WORKS DATA**

THE CONTRACTOR SHALL FOLLOW MATERIAL SPECIFICATIONS AS PER:  
<https://www.finance.gkp.pk/attachments/032b21c0a37611eca4e0b55aac984a07/download>  
(Material Specification on MRS 2022 / BOQ)

THE CONTRACTOR SHALL FOLLOW TECHNICAL SPECIFICATIONS AS PER:  
<https://www.finance.gkp.pk/attachments/032b21c0a37611eca4e0b55aac984a07/download>  
(Technical Specification on MRS 2022 / BOQ)

FOR SCHEDULE ITEMS AND INDUSTRY STANDARDS SHALL BE ADOPTED/  
FOLLOWED FOR NON-SCHEDULE ITEMS

**WORKS TO BE PERFORMED BY SUB CONTRACTORS**

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

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

**Note:**

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

**PROPOSED PROGRAM OF WORKS**

Bidder may provide a program in a bar-chart showing the sequence of work items by which he proposes to complete the Works of the entire Contract. The program 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 civil works, erection, testing and commissioning of Works to be supplied under the Contract.

**Signature:** \_\_\_\_\_

**Seal:** \_\_\_\_\_

**Dated:** \_\_\_\_\_

**METHOD OF PERFORMING WORKS**

**(NOT APPLICABLE)**

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 erectional plant, tools and vehicles proposed to be used in delivering/carrying out the Works at Site
- The procedure for installation of equipment and transportation of equipment and materials to the site.

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

(INTEGRITY PACT)

**DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAID 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 the Bidder] 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 Khyber Pakhtunkhwa or any administrative subdivision or agency thereof or any other entity owned or controlled by Government of Khyber Pakhtunkhwa through any corrupt business practice.

Without limiting the generality of the foregoing, [name of the Bidder] 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 Government of Khyber Pakhtunkhwa , except that which has been expressly declared pursuant hereto.

[name of the Bidder] 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 GoKP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

[name of the Bidder] 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 GoKP under any law, contract or other instrument, be voidable at the option of GoKP.

Notwithstanding any rights and remedies exercised by GoKP in this regard, [name of the Bidder] agrees to indemnify GoKP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoKP in an amount equivalent to ten time the sum of any commission, gratification, bribe, finder’s fee or kickback given by [name of the Bidder] 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 GoKP.

Name of the Procuring Entity:  
\_\_\_\_\_

Name of the Bidder:  
\_\_\_\_\_

Signature: .....

Signature: .....

[Seal]

[Seal]

# **CONDITIONS OF CONTRACT**



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**CONDITIONS OF CONTRACT**

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# CONDITIONS OF CONTRACT

## 1. GENERAL PROVISIONS

### 1.1 Definitions

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

#### **The Contract**

- 1.1.1 “Contract” means the Contract Agreement and the other documents listed in the Contract Data.
- 1.1.2 “Specifications” means the document as listed in the Contract Data, including Procuring Entity’s requirements in respect of design to be carried out by the Contractor (if any), and any Variation to such document.
- 1.1.3 “Drawings” means the Procuring Entity’s drawings of the Works as listed in the Contract Data, and any Variation to such drawings.

#### **Persons**

- 1.1.4 “Procuring Entity” means the person named in the Contract Data and the legal successors in title to this person, but not (except with the consent of the Contractor) any assignee.
- 1.1.5 “Contractor” means the person named in the Contract Data and the legal successors in title to this person, but not (except with the consent of the Procuring Entity) any assignee.
- 1.1.6 “Party” means either the Procuring Entity or the Contractor.

#### **Dates, Times and Periods**

- 1.1.7 “Commencement Date” means the date fourteen (14) days after the date the Contract comes into effect or any other date named in the Contract Data.
- 1.1.8 “Day” means a calendar day
- 1.1.9 “Time for Completion” means the time for completing the Works as stated in the Contract Data (or as extended under Sub-Clause 7.3), calculated from the Commencement Date.

#### **Money and Payments**

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

#### **Other Definitions**

- 1.1.11 “Contractor’s Equipment” means all machinery, apparatus and other things required for the execution of the Works but does not include Materials or Plant intended to form part of the Works.
- 1.1.12 “Country” means the Islamic Republic of Pakistan.
- 1.1.13 “Province” means Khyber Pakhtunkhwa.
- 1.1.14 “Procuring Entity’s Risks” means those matters listed in Sub-Clause 6.1.
- 1.1.15 “Force Majeure” means an event or circumstance which makes performance of a Party’s obligations illegal or impracticable and which is beyond that Party’s reasonable control.
- 1.1.16 “Materials” means things of all kinds (other than Plant) to be supplied and incorporated in the Works by the Contractor.
- 1.1.17 “Plant” means the machinery and apparatus intended to form or forming part of the Works.

- 1.1.18 “Site” means the places provided by the Procuring Entity where the Works are to be executed, and any other places specified in the Contract as forming part of the Site.
- 1.1.19 “Variation” means a change which is instructed by the Engineer/Procuring Entity under Sub-Clause 10.1.
- 1.1.20 “Works” means any or all the works whether Supply, Installation, Construction etc. and design (if any) to be performed by the Contractor including temporary works and any variation thereof.
- 1.1.21 “Engineer” means the person, if any, notified by the Procuring Entity to act as Engineer for the purpose of the Contract and named as such in Contract Data.

## 1.2 **Interpretation**

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

## 1.3 **Priority of Documents**

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

## 1.4 **Law**

The law of the Contract is the relevant Law of Khyber Pakhtunkhwa Province,

## 1.5 **Communications**

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

## 1.6 **Statutory Obligations**

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

## **2. THE PROCURING ENTITY**

### 2.1 **Provision of Site**

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

### 2.2 **Permits etc.**

The Procuring Entity shall, if requested by the Contractor, assist him in applying for permits, licenses or approvals which are required for the Works.

### 2.3 **Engineer’s/Procuring Entity’s Instructions**

The Contractor shall comply with all instructions given by the Procuring Entity or the Engineer, if notified by the Procuring Entity, in respect of the Works including the suspension of all or part of the Works.

### 2.4 **Approvals**

No approval or consent or absence of comment by the Engineer/Procuring Entity shall affect the Contractor’s obligations.

### **3. ENGINEER’S/PROCURING ENTITY’S REPRESENTATIVES**

#### **3.1 Authorized Person**

The Procuring Entity shall appoint a duly authorized person to act for him and on his behalf for the purposes of this Contract. Such authorized person shall be duly identified in the Contract Data or otherwise notified in writing to the Contractor as soon as he is so appointed. In either case the Procuring Entity shall notify the Contractor, in writing, the precise scope of the authority of such authorized person at the time of his appointment.

#### **3.2 Engineer’s/Procuring Entity’s Representative**

The name and address of Engineer’s/Procuring Entity’s Representative is given in Contract Data. However, the Contractor shall be notified by the Engineer/Procuring Entity, the delegated duties and authority before the Commencement of Works.

### **4. THE CONTRACTOR**

#### **4.1 General Obligations**

The Contractor shall carry out the Works properly and in accordance with the Contract. The Contractor shall provide all supervision, labour, Materials, Plant and Contractor’s Equipment which may be required.

#### **4.2 Contractor’s Representative**

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

#### **4.3 Subcontracting**

The Contractor shall not subcontract the whole of the Works. The Contractor shall not subcontract any part of the Works without the consent of the Procuring Entity.

#### **4.4 Performance Security**

As per KPRA Rules 2014

### **5. DESIGN BY CONTRACTOR**

#### **5.1 Contractor’s Design**

The Contractor shall carry out design to the extent specified, as referred to in the Contract Data. The Contractor shall promptly submit to the Engineer/Procuring Entity all designs prepared by him. Within fourteen (14) days of receipt the Engineer/Procuring Entity shall notify any comments or, if the design submitted is not in accordance with the Contract, shall reject it stating the reasons. The Contractor shall not construct any element of the Works designed by him within fourteen (14) days after the design has been submitted to the Engineer/Procuring Entity or which has been rejected. Design that has been rejected shall be promptly amended and resubmitted. The Contractor shall resubmit all designs commented on taking these comments into account as necessary.

## 5.2 **Responsibility for Design**

The Contractor shall remain responsible for his bided design and the design under this Clause, both of which shall be fit for the intended purposes defined in the Contract and he shall also remain responsible for any infringement of any patent or copyright in respect of the same. The Procuring Entity shall be responsible for the Specifications and Drawings.

## 6. **PROCURING ENTITY'S RISKS**

### 6.1 **The Procuring Entity's Risks**

The Procuring Entity's Risks are: -

- a. War, hostilities (whether war be declared or not), invasion, act of foreign enemies, within the Country;
- b. Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country;
- c. Riot, commotion or disorder by persons other than the Contractor's personnel and other employees including the personnel and employees of Sub-Contractors, affecting the Site and/or the Works;
- d. Ionizing radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly, except to the extent to which the Contractor/Sub-Contractors may be responsible for the use of any radio-active material;
- e. Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds;
- f. Use or occupation by the Procuring Entity of any part of the Works, except as may be specified in the Contract;
- g. Late handing over of sites, anomalies in drawings, late delivery of designs and drawings of any part of the Works by the Procuring Entity's personnel or by others for whom the Procuring Entity is responsible;
- h. A suspension under Sub-Clause 2.3 unless it is attributable to the Contractor's failure; and
- i. Physical obstructions or physical conditions other than climatic conditions, encountered on the Site during the performance of the Works, for which the Contractor immediately notified to the Procuring Entity and accepted by the Procuring Entity.

## 7. **TIME FOR COMPLETION**

### 7.1 **Execution of the Works**

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

### 7.2 **Program**

Within the time stated in the Contract Data, the Contractor shall submit to the Engineer/Procuring Entity a program for the Works in the form stated in the Contract Data.

### 7.3 **Extension of Time**

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

### 7.4 **Late Completion**

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

## **8. TAKING-OVER**

### 8.1 **Completion**

The Contractor may notify the Engineer/Procuring Entity when he considers that the Works are complete.

### 8.2 **Taking-Over Notice**

Within fourteen (14) days of the receipt of the said notice of completion from the Contractor the Procuring Entity/Engineer shall either takeover the completed Works and issue a Certificate of Completion to that effect or shall notify the Contractor his reasons for not taking-over the Works. While issuing the Certificate of Completion as aforesaid, the Procuring Entity/Engineer may identify any outstanding items of work which the Contractor shall undertake during the Maintenances Period.

## **9. REMEDYING DEFECTS**

### 9.1 **Remedying Defects**

The Contractor shall for a period of 120 days from the date of issue of the Certificate of Completion carries out, at no cost to the Procuring Entity, repair and rectification work which is necessitated by the earlier execution of poor quality of work or use of below specifications material in the execution of Works and which is so identified by the Procuring Entity/Engineer in writing within the said period. Upon expiry of the said period, and subject to the Contractor's faithfully performing his aforesaid obligations, the Procuring Entity/Engineer shall issue a Maintenance Certificate whereupon all obligations of the Contractor under this Contract shall come to an end. Failure to remedy any such defects or complete outstanding work within a reasonable time shall entitle the Procuring Entity to carry out all necessary works at the Contractor's cost. However, the cost of remedying defects not attributable to the Contractor shall be valued as a Variation.

### 9.2 **Uncovering and Testing**

The Engineer/Procuring Entity may give instruction as to the uncovering and/or testing of any work. Unless as a result of an uncovering and/or testing it is established that the Contractor's design, Materials, Plant or workmanship are not in accordance with the Contract, the Contractor shall be paid for such uncovering and/or testing as a Variation in accordance with Sub-Clause 10.2.

## **10. VARIATIONS AND CLAIMS**

### **10.1 Right to Vary**

The Procuring Entity/Engineer may issue Variation Order(s) in writing, where for any reason it has not been possible for the Procuring Entity/Engineer to issue such Variations Order(s), the Contractor may confirm any verbal orders given by the Procuring Entity/Engineer in writing and if the same are not refuted/denied by the Procuring Entity/Engineer within seven (7) days of the receipt of such confirmation the same shall be deemed to be a Variation Orders for the purposes of this Sub-Clause.

### **10.2 Valuation of Variations**

Variations shall be valued as follows:

- a. At a lump sum price agreed between the Parties, or
- b. where appropriate, at rates in the Contract, or
- c. in the absence of appropriate rates, the rates in the Contract shall be used as the basis for valuation, or failing which
- d. at appropriate new rates, as may be agreed or which the Engineer/Procuring Entity considers appropriate, or
- e. if the Engineer/Procuring Entity so instructs, at day work rates set out in the Contract Data for which the Contractor shall keep records of hours of labour and Contractor's Equipment, and of Materials, used.

### **10.3 Early Warning**

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

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

### **10.4 Valuation of Claims**

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

### **10.5 Variation and Claim Procedure**

The Contractor shall submit to the Engineer/Procuring Entity an itemized make-up of the value of variations and claims within twenty-eight (28) days of the instruction or of the event giving rise to the claim. The Engineer/Procuring Entity shall check and if possible, agree the value. In the absence of agreement, the Procuring Entity shall determine the value.

## **11. CONTRACT PRICE AND PAYMENT**

### **11.1 a. Terms of Payments**

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 7.4 of Conditions of Contract (CoC) 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 11.5 of CoC, 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 in 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 12.2 CoC. (N/A)

**b. Valuation of the Works**

The Works shall be valued as provided for in the Contract Data, subject to Clause 10.

**11.2 Monthly Statements**

The Contractor shall be entitled to be paid at monthly intervals:

- a.** The value of the Works executed; and the percentage of the value of Materials and Plant reasonably delivered to the Site, as stated in the Contract Data, subject to any additions or deductions which may be due.
- b.** The Contractor shall submit each month to the Engineer/Procuring Entity a statement showing the amounts to which he considers himself entitled.

**11.3 Interim Payments**

Within a period not exceeding seven (7) days from the date of submission of a statement for interim payment by the Contractor, the Engineer / Procuring Entity shall verify the same and within a period not exceeding thirty (30) days from the said date of submission by the Contractor, the Procuring Entity shall pay to the Contractor the sum verified by the Engineer less retention money at the rate stated in the Contract Data.

**11.4 Retention**

Retention money shall be paid by the Procuring Entity to the Contractor within fourteen (14) days after either the expiry of the period stated in the Contract Data, or the remedying of notified defects, or the completion of outstanding work, all as referred to in Sub-Clause 9.1, whichever is the later.

**11.5 Final Payment**

Within twenty-one (21) days from the date of issuance of the Maintenance Certificate the Contractor shall submit a final account to the Engineer to verify and the Engineer shall verify the same within fourteen (14) days from the date of submission and forward the same to the Procuring Entity together with any documentation reasonably required to enable the Procuring Entity to ascertain the final contract value. Within sixty (60) days from the date of receipt of the verified final account from the Engineer, the Procuring Entity shall pay to the Contractor any amount due to the Contractor. While making such payment the Procuring Entity may, for reasons to be given to the Contractor in writing, withhold any part or parts of the verified amount.

**11.6 Currency**

Payment shall be in the currency stated in the Contract Data.



## **12. DEFAULT**

### **12.1 Default by Contractor**

If the Contractor abandons the Works, refuses or fails to comply with a valid instruction of the Engineer/Procuring Entity or fails to proceed expeditiously and without delay, or is, despite a written complaint, in breach of the Contract, the Procuring Entity may give notice referring to this Sub-Clause and stating the default. If the Contractor has not taken all practicable steps to remedy the default within fourteen (14) days after receipt of the Procuring Entity's notice, the Procuring Entity may by a second notice given within a further twenty-one (21) days, terminate the Contract. The Contractor shall then demobilize from the Site leaving behind any Contractor's Equipment which the Procuring Entity instructs, in the second notice, to be used for the completion of the Works at the risk and cost of the Contractor.

### **12.2 Default by Procuring Entity**

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

If the default is not remedied within twenty-eight (28) days after the Procuring Entity's receipt of the Contractor's notice, the Contractor may by a second notice given within a further twenty-one (21) days, terminate the Contract. The Contractor shall then demobilize from the Site.

### **12.3 Insolvency**

If a Party is declared insolvent under any applicable law, the other Party may by notice terminate the Contract immediately. The Contractor shall then demobilize from the Site leaving behind, in the case of the Contractor's insolvency, any Contractor's Equipment which the Procuring Entity instructs in the notice is to be used for the completion of the Works.

### **12.4 Payment upon Termination**

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

- a.** Any sums to which the Contractor is entitled under Sub-Clause 10.4,
- b.** Any sums to which the Procuring Entity is entitled,
- c.** if the Procuring Entity has terminated under Sub-Clause 12.1 or 12.3, the Procuring Entity shall be entitled to a sum equivalent to twenty percent (20%) of the value of parts of the Works not executed at the date of the termination, and
- d.** if the Contractor has terminated under Sub-Clause 12.2 or 12.3, the Contractor shall be entitled to the cost of his demobilization together with a sum equivalent to ten percent (10%) of the value of parts of the Works not executed at the date of termination.

The net balance due shall be paid or repaid within twenty-eight (28) days of the notice of termination.

## **13. RISKS AND RESPONSIBILITIES**

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

Subject to Sub-Clause 9.1, the Contractor shall take full responsibility for the care of the Works from the Commencement Date until the date of the Procuring

Entity's/Engineer's issuance of Certificate of Completion under Sub-Clause 8.2. Responsibility shall then pass to the Procuring Entity. If any loss or damage happens to the Works during the above period, the Contractor shall rectify such loss or damage so that the Works conform with the Contract.

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

### 13.2 **Force Majeure**

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

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

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

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

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

## 14. **INSURANCE**

### 14.1 **Arrangements**

The Contractor shall, prior to commencing the Works, effect insurances of the types, in the amounts and naming as insured the persons stipulated in the Contract Data except for items (a) to (e) and (i) of the Procuring Entity's Risks under Sub-Clause 6.1. The policies shall be issued by insurers and in terms approved by the Procuring Entity. The Contractor shall provide the Engineer/Procuring Entity with evidence that any required policy is in force and that the premiums have been paid.

### 14.2 **Default**

If the Contractor fails to effect or keep in force any of the insurances referred to in the previous Sub-Clause, or fails to provide satisfactory evidence, policies or receipts, the Procuring Entity may, without prejudice to any other right or remedy, effect insurance for the cover relevant to such as a default and pay the premiums due and recover the same plus a sum in percentage given in Contractor Data from any other amounts due to the Contractor.

## 15. **RESOLUTION OF DISPUTES**

### 15.1 **Engineer's Decision**

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

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

**15.2 Notice of Dissatisfaction**

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

**15.3 Arbitration**

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

**15.4 Resolution of Dispute in Absence of The Engineer.**

In case no Engineer has been appointed, the dispute, if any, between the Procuring Entity and the Contractor in connection with the Works, shall first be tried to be resolved amicably. In case the dispute could not be resolved amicably, it shall be settled as per provision of Arbitration Act-1940.

**16. INTEGRITY PACT**

16.1 If the Contractor, or any of his Sub-Contractors, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Contractor as Schedule-F 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 Sub-Contractors, 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 Sub-Contractors, agents or servants.

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

# CONTRACT DATA

(Note: Except where otherwise indicated, all Contract Data should be filled in by the Procuring Entity prior to issuance of the Bidding Documents.)

## Sub-Clauses of Conditions of Contract

1.1.3 **Procuring Entity's Drawings, if any**  
As per PC-I / T.S / B.O.Q

1.1.4 **Procuring Entity**  
Means **Executive Engineer, Tube wells Irrigation Division Peshawar.**

1.1.5 **The Contractor**  
Means M/S \_\_\_\_\_ **Govt: Contractor**

1.1.7 **Commencement Date**  
Means the date of issue of Engineer's Notice to Commence which shall be issued within fourteen (14) days of the signing of the Contract Agreement.

1.1.9 **Time for Completion**  
As per Work order

1.1.20 **Engineer,**  
**Executive Engineer (Concerned)**

1.3 **Documents forming the Contract listed in the order of priority:**

- a. The Contract Agreement
- b. Letter of Acceptance
- c. The completed Form of Bid
- d. Contract Data
- e. Conditions of Contract
- f. The completed Schedules to Bid including Schedule of Prices
- g. The Drawings, if any
- h. The Specifications
- i. \_\_\_\_\_
- j. \_\_\_\_\_

(The Procuring Entity may add, in order of priority, such other documents as form part of the Contract. Delete the document, if not applicable)

2.1 **Provision of Site:**  
On the Commencement Date by the Sub Divisional Officer (Concerned)

3.1 **Authorized person:**  
**Executive Engineer, Tube wells Irrigation Division Peshawar.**

3.2 **Name and address of Engineer's/Procuring Entity's representative**  
Executive Engineer, Tube Wells Irrigation Division, Peshawar.  
Warsak Road Kababian Peshawar.

- 4.4 **Performance Security:**  
As per KPPRA Rules 2014.
- 5.1 **Requirements for Contractor's design (if any):**  
Specification Clause No's N/A
- 7.2 **Program:**  
**Time for submission:**  
Within fourteen (14) days\* of the Commencement Date.  
**Form of program:**  
(Bar Chart)
- 7.4 Amount payable due to failure to complete shall be 0.05% per day up to a maximum of (10%) \* of sum of Contract Price.  
(Usually, the liquidated damages are set between 0.05% and 0.10 percent per day.)
- 9.1 **Period for remedying defects**  
24 Months after final measurement date
- 10.2 (e) **Variation procedure:**  
Daywork rates N/A (details)
- 11.1 \*(a) **Terms of Payments**  
Payment of Contract Price shall be made in the following manners:  
-----N.A-----
- \* (b) **Valuation of the Works:**
- i. Lump sum price \_\_\_\_\_ (details), or
  - ii. Lump sum price with schedules of rates \_\_\_\_\_ (details), or
  - iii. Lump sum price with bill of quantities \_\_\_\_\_ (details), or
  - iv. Re-measurement with estimated/bid quantities in the Schedule of Prices \_\_\_\_\_ (details), or/and
  - v. Cost reimbursable \_\_\_\_\_ (details)
- 11.2 (b) **Percentage of value of Materials and Plant (for day work if applicable):**  
Materials eighty (80%)\*  
Plant ninety (90%)\*
- 11.3 **Percentage of retention:**  
Eight (08%)
- 11.6 **Currency of payment:**  
Pak. Rupees
- 14.1 **Insurances:**
- i. **Type of cover**  
The Works
  - ii. **Amount of cover**  
The sum stated in the Letter of Acceptance plus fifteen percent (15%)
  - iii. **Type of cover**  
Contractor's Equipment:
  - iv. **Amount of cover**  
Full replacement cost

\* (Procuring Entity to amend as appropriate)

**Type of cover**

Third Party-injury to persons and damage to property

\_\_\_\_\_  
(The minimum amount of third-party insurance should be assessed by the Procuring Entity and entered).

**Workers:**

\_\_\_\_\_  
\_\_\_\_\_

**Other cover\*:**

\_\_\_\_\_  
(In each case name of insured is Contractor and Procuring Entity)

14.2

**Amount to be recovered**

Premium plus \_\_\_\_\_ percent (\_\_\_\_%).

15.3

**Arbitration**

Place of Arbitration: The Grievance redressal mechanism as per KPPRA shall be applicable, only./ Arbitration Act 1940 & place shall be Peshawar, KP.

## **STANDARD FORMS**

(Note: Standard Forms provided in this document for securities are to be issued by a bank. In case the bidder chooses to issue a bond for accompanying his bid or performance of contract or receipt of advance, the relevant format shall be tailored accordingly without changing the spirit of the Forms of securities).

# FORM OF BID SECURITY

(Bank Guarantee)

Guarantee No. \_\_\_\_\_

Executed on \_\_\_\_\_

(Letter by the Guarantor to the Procuring Entity)

Name of Guarantor (Scheduled Bank in Pakistan) with address: \_\_\_\_\_

Name of Principal (Bidder) with address: \_\_\_\_\_

Penal Sum of Security (express in words and figures): \_\_\_\_\_

Bid Reference No. \_\_\_\_\_ Date of Bid \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS, that in pursuance of the terms of the Bid 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 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 principal has submitted the accompanying Bid numbered and dated as above for \_\_\_\_\_ (Particulars of Bid) to the said Procuring Entity; and WHEREAS, the Procuring Entity has required as a condition for considering the said Bid that the principal furnishes a Bid Security in the above said sum to the Procuring Entity, conditioned as under:

- (1) that the Bid Security shall remain valid for a period of twenty-eight (28) days beyond the period of validity of the bid;
- (2) that in the event of;
  - (a) The principal withdraws his Bid during the period of validity of Bid, or
  - (b) The principal does not accept the correction of his Bid Price, pursuant to Sub-Clause 16.4 (b) of Instructions to Bidders, or
  - (c) failure of the successful bidder to
    - (i) furnish the required Performance Security, in accordance with Sub-Clause IB-21.1 of Instructions to Bidders, or
    - (ii) sign the proposed Contract Agreement, in accordance with Sub-Clauses IB-20.2 & 20.3 of Instructions to Bidders,

The entire sum be paid immediately to the said Procuring Entity for delayed completion and not as penalty for the successful bidder's failure to perform.

NOW THEREFORE, if the successful bidder shall, within the period specified therefore, on the prescribed form presented to him for signature enter into a formal Contract Agreement with the said Procuring Entity in accordance with his Bid as accepted and furnish within fourteen (14) days of receipt of Letter of Acceptance, 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 fulfilment of the said Contract or in the event of non-withdrawal of the said Bid within the time specified then this obligation shall be void and of no effect, but otherwise to remain in full force and effect.



PROVIDED THAT the Guarantor shall forthwith pay to the Procuring Entity the said sum stated above 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 Guarantor at its address given above.

PROVIDED ALSO THAT the Procuring Entity shall be the sole and final judge for deciding whether the principal 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 Guarantor shall pay without objection the sum 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 bounded Guarantor has executed the instrument under its seal on the date indicated above, the name and 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. \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

2. \_\_\_\_\_

\_\_\_\_\_  
(Name, Title & Address)

1. Signature \_\_\_\_\_

2. Name \_\_\_\_\_

3. Title \_\_\_\_\_

Corporate Guarantor (Seal)

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

Guarantee No. \_\_\_\_\_  
Executed on \_\_\_\_\_

(Letter by the Guarantor to the Procuring Entity)

Name of Guarantor (Scheduled Bank in Pakistan) with  
address: \_\_\_\_\_

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 accepted 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 the 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 9, Remedying Defects, of Conditions of Contract are fulfilled.

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

We, \_\_\_\_\_ (the Guarantor), waiving all objections and defences under the Contract, do hereby irrevocably and independently guarantee to pay to the 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, for 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 bounded 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. \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

2. \_\_\_\_\_

\_\_\_\_\_  
(Name, Title & Address)

1. Signature \_\_\_\_\_

2. Name \_\_\_\_\_

3. Title \_\_\_\_\_

\_\_\_\_\_  
Corporate Guarantor (Seal)

# FORM OF CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (hereinafter called the "Agreement") made on the \_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_ between Executive Engineer, Tube Wells Irrigation Division, Peshawar. (Hereinafter called the "Procuring Entity") of the one part and

\_\_\_\_\_ (hereinafter called the "Contractor") of the other part.

WHEREAS the Procuring Entity is desirous that certain Work/s, 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 Letter of Acceptance;
  - b. The completed Form of Bid along with Schedules to Bid;
  - c. Conditions of Contract & Contract Data;
  - d. The priced Schedule of Prices;
  - e. The Specifications; and
  - f. The Drawings
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 within 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 Contract Agreement to be executed on the day, month and year first before written in accordance with their respective laws.

Signature of the Contactor \_\_\_\_\_ (Seal)

Signature of the Procuring Entity \_\_\_\_\_ (Seal)

Signed, Sealed and Delivered in the presence of:

Witness:

\_\_\_\_\_

(Name, Title and Address)

Witness:

\_\_\_\_\_

(Name, Title and Address)

# FORM OF BANK GUARANTEE FOR ADVANCE PAYMENT

Guarantee No. \_\_\_\_\_

Executed on \_\_\_\_\_

(Letter by the Guarantor to the Procuring Entity)

WHEREAS the Executive Engineer, Tube Well Irrigation Division, Peshawar. (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 Rs. \_\_\_\_\_ Rupees \_\_\_\_\_) 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 advance payment for the performance of his obligations under the said Contract.

AND WHEREAS \_\_\_\_\_ (Scheduled Bank) (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, as aforesaid, 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 come into force as soon as the advance payment has been credited to the account of the Contractor.

This Guarantee shall expire not later than \_\_\_\_\_ by which date we must have received any claims by registered letter, telegram, telex or e-mail.

It is understood that you will return this Guarantee to us on expiry or after settlement of the total amount to be claimed hereunder.

\_\_\_\_\_  
Guarantor (Bank)

Witness:

1. \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary (Seal)

2. \_\_\_\_\_

\_\_\_\_\_  
(Name, Title & Address)

\_\_\_\_\_  
Corporate Guarantor (Seal)

# **SPECIFICATIONS**

## **Note for Preparing the Specifications**

Standard technical specification as per document at the following link are required:

<https://www.finance.gkp.pk/attachments/032e8420a37611ec83c625b66397c1ee/download>

(Technical Specification on MRS 2022 / BOQ) for the following sub works.

Standard material specification as per document at the following link are required:

<https://www.finance.gkp.pk/attachments/032b21c0a37611eca4e0b55aac984a07/download>

(Material Specification on MRS 2022 / BOQ) for the following sub works.

## Bill of Quantity

### Work N0.8

Name of Work: - Rehabilitation/ improvement of canals and other Irrigation infrastructure in Khyber Pakhtunkhwa. ADP No.2214/210665. dg: 2022-23.

Sub/work: - Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 23 (Solar work)

S.No	MRS-2022	Description	Unit	Qty	Rate	Amount (Rs.)
1	03-25-b	Excavation in foundation of building, bridges etc complete.in ordinary soil.	M <sup>3</sup>	3.31	268.98	890.32
2	06-05-f	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4).	M3	4.97	9299.67	46219.36
3	26-01-m-01	Supply and Erection 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.	Watt	17250.00	22.19	382777.50
4	26-01-d-01	Supply and Erection of Solar PV Module (Solar Panel) Mono-crystalline A-Grade (per Watt) (As per Approved Specifications)	Watt	17250.00	104.17	1796932.50
5	15-09-e	Supply and Erection MS sheet box of 16 SWG, 4" deep with 3/16" thick Bakelite sheet top etc. complete: 10"x12".	Each	3.00	495.14	1485.42
6	15-71-d	Supply and Erection single phase imported auto circuit breaker 30Amp.	Each	2.00	950.40	1900.80
7	26-01-g-03	Supply and Erection 1x6 sq.mm single core (XPLE/ XPLO insulated/ PVC sheathed) flexible copper cable.	M	14.63	300.28	4393.10
8	26-01-g-04	Supply and Erection 1x10 sq.mm flexible copper cable.	M	18.29	460.93	8430.41
9	26-01-g-05	Supply and Erection 1x16 sq.mm flexible copper cable.	M	18.29	714.03	13059.61
10	26-01-b-02	Supply and Erection PVC flexible pipe: 1.5" i/d.	M	25.83	363.34	9385.07
11	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	11000.00	20.39	224290.00
12	15-70-b	Supply and Erection trans power auto circuit breaker 3-phase, 400V fungus moisture proofing: 60 Amp.	Each	1.00	2055.60	2055.60
13	24-50-c-03	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x25 mm <sup>2</sup> .	M	57.91	1724.66	99875.06

14	N.S.I	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewindable 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 & power cable with appropriate Head & Discharge: 12.5 HP,	Job	1.00	374408.00	374408.00
15	24-56-a	Supply and Fixing MS Column pipe with flanges for submersible pump: 4" (100 mm) Nominal Pipe Size (NPS), 3/16" thick, 10' length.	M	54.86	3570.32	195867.76
16	27-48	Rubber packing 1/32" to 1/16" thick.	No	22.00	106.51	2343.22
17	15-72-f	Supply & erection of Nut & Bolt (2"x5/8").	No	176.00	219.00	38544.00
18	24-39-g	Supplying and Fixing MS Suspension Clamp 3/8" thick for housing pipe: 4" i/d.	Each	2.00	697.16	1394.32
19	N.S.I	Supply and fixing bore cover plate ( 2 pieces) 3/8" thick arrangement holes for column and cable, hole one inches i/c for inspection of water level in Tube well.	Job	1.00	2300.00	2300.00
20	15-53	Special earthing of iron/metal clad switches etc with copper wire No. 8 SWG in GI pipe 1/2" dia.	No	1.00	18086.96	18086.96
Total in Rs. =						3224639
Total In Million =						3.2246

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

Contractor Premium S.I.....% Above / Below  
Contractor Premium N.S.I.....% Above / Below

Contractor Signature.....

.....  
(Seal)

Sub Divisional Officer,  
Tubewell Irrigation Sub Division,  
Peshawar.

Sub Engineer,



## Bill of Quantity

### Work N0.9

Name of Work: - Rehabilitation/ improvement of canals and other Irrigation infrastructure in Khyber Pakhtunkhwa. ADP No.2214/210665. dg: 2022-23.

Sub/work: - Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 29 (Solar work)

S.No	MRS-2022	Description	Unit	Qty	Rate	Amount (Rs.)
1	03-25-b	Excavation in foundation of building, bridges etc complete.in ordinary soil.	M <sup>3</sup>	3.31	268.98	890.32
2	06-05-f	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4).	M3	4.97	9299.67	46219.36
3	26-01-m-01	Supply and Erection 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.	Watt	17250.00	22.19	382777.50
4	26-01-d-01	Supply and Erection of Solar PV Module (Solar Panel) Mono-crystalline A-Grade (per Watt) (As per Approved Specifications)	Watt	17250.00	104.17	1796932.50
5	15-09-e	Supply and Erection MS sheet box of 16 SWG, 4" deep with 3/16" thick Bakelite sheet top etc. complete: 10"x12".	Each	3.00	495.14	1485.42
6	15-71-d	Supply and Erection single phase imported auto circuit breaker 30Amp.	Each	2.00	950.40	1900.80
7	26-01-g-03	Supply and Erection 1x6 sq.mm single core (XPLE/ XPLO insulated/ PVC sheathed) flexible copper cable.	M	14.63	300.28	4393.10
8	26-01-g-04	Supply and Erection 1x10 sq.mm flexible copper cable.	M	18.29	460.93	8430.41
9	26-01-g-05	Supply and Erection 1x16 sq.mm flexible copper cable.	M	18.29	714.03	13059.61
10	26-01-b-02	Supply and Erection PVC flexible pipe: 1.5" i/d.	M	25.83	363.34	9385.07
11	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	11000.00	20.39	224290.00
12	15-70-b	Supply and Erection trans power auto circuit breaker 3-phase, 400V fungus moisture proofing: 60 Amp.	Each	1.00	2055.60	2055.60
13	24-50-c-03	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x25 mm <sup>2</sup> .	M	57.91	1724.66	99875.06

14	N.S.I	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewindable 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 & power cable with appropriate Head & Discharge: 12.5 HP,	Job	1.00	374408.00	374408.00
15	24-56-a	Supply and Fixing MS Column pipe with flanges for submersible pump: 4" (100 mm) Nominal Pipe Size (NPS), 3/16" thick, 10' length.	M	54.86	3570.32	195867.76
16	27-48	Rubber packing 1/32" to 1/16"thick.	No	22.00	106.51	2343.22
17	15-72-f	Supply & erection of Nut & Bolt (2"x5/8").	No	176.00	219.00	38544.00
18	24-39-g	Supplying and Fixing MS Suspension Clamp 3/8" thick for housing pipe: 4" i/d.	Each	2.00	697.16	1394.32
19	N.S.I	Supply and fixing bore cover plate ( 2 pieces) 3/8" thick arrangement holes for column and cable, hole one inches i/c for inspection of water level in Tube well.	Job	1.00	2300.00	2300.00
20	15-53	Special earthing of iron/metal clad switches etc with copper wire No. 8 SWG in GI pipe 1/2" dia.	No	1.00	18086.96	18086.96
Total in Rs. =						3224639
Total In Million =						3.2246

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

Contractor Premium S.I.....% Above / Below  
Contractor Premium N.S.I.....% Above / Below

Contractor Signature.....

.....  
(Seal)

Sub Divisional Officer,  
Tubewell Irrigation Sub Division,  
Peshawar.

Sub Engineer,

## Bill of Quantity

### Work N0.10

Name of Work: - Rehabilitation/ improvement of canals and other Irrigation infrastructure in Khyber Pakhtunkhwa. ADP No.2214/210665. dg: 2022-23.

Sub/work: - Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 54 (Solar work)

S.No	MRS-2022	Description	Unit	Qty	Rate	Amount (Rs.)
1	03-25-b	Excavation in foundation of building, bridges etc complete.in ordinary soil.	M <sup>3</sup>	3.31	268.98	890.32
2	06-05-f	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4).	M3	4.97	9299.67	46219.36
3	26-01-m-01	Supply and Erection 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.	Watt	17250.00	22.19	382777.50
4	26-01-d-01	Supply and Erection of Solar PV Module (Solar Panel) Mono-crystalline A-Grade (per Watt) (As per Approved Specifications)	Watt	17250.00	104.17	1796932.50
5	15-09-e	Supply and Erection MS sheet box of 16 SWG, 4" deep with 3/16" thick Bakelite sheet top etc. complete: 10"x12".	Each	3.00	495.14	1485.42
6	15-71-d	Supply and Erection single phase imported auto circuit breaker 30Amp.	Each	2.00	950.40	1900.80
7	26-01-g-03	Supply and Erection 1x6 sq.mm single core (XPLE/ XPLO insulated/ PVC sheathed) flexible copper cable.	M	14.63	300.28	4393.10
8	26-01-g-04	Supply and Erection 1x10 sq.mm flexible copper cable.	M	18.29	460.93	8430.41
9	26-01-g-05	Supply and Erection 1x16 sq.mm flexible copper cable.	M	18.29	714.03	13059.61
10	26-01-b-02	Supply and Erection PVC flexible pipe: 1.5" i/d.	M	25.83	363.34	9385.07
11	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	11000.00	20.39	224290.00
12	15-70-b	Supply and Erection trans power auto circuit breaker 3-phase, 400V fungus moisture proofing: 60 Amp.	Each	1.00	2055.60	2055.60
13	24-50-c-03	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x25 mm <sup>2</sup> .	M	57.91	1724.66	99875.06

14	N.S.I	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewindable 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 & power cable with appropriate Head & Discharge: 12.5 HP,	Job	1.00	374408.00	374408.00
15	24-56-a	Supply and Fixing MS Column pipe with flanges for submersible pump: 4" (100 mm) Nominal Pipe Size (NPS), 3/16" thick, 10' length.	M	54.86	3570.32	195867.76
16	27-48	Rubber packing 1/32" to 1/16"thick.	No	22.00	106.51	2343.22
17	15-72-f	Supply & erection of Nut & Bolt (2"x5/8").	No	176.00	219.00	38544.00
18	24-39-g	Supplying and Fixing MS Suspension Clamp 3/8" thick for housing pipe: 4" i/d.	Each	2.00	697.16	1394.32
19	N.S.I	Supply and fixing bore cover plate ( 2 pieces) 3/8" thick arrangement holes for column and cable, hole one inches i/c for inspection of water level in Tube well.	Job	1.00	2300.00	2300.00
20	15-53	Special earthing of iron/metal clad switches etc with copper wire No. 8 SWG in GI pipe 1/2" dia.	No	1.00	18086.96	18086.96
Total in Rs. =						3224639
Total In Million =						3.2246

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

Contractor Premium S.I.....% Above / Below  
Contractor Premium N.S.I.....% Above / Below

Contractor Signature.....

.....  
(Seal)

Sub Divisional Officer,  
Tubewell Irrigation Sub Division,  
Peshawar.

Sub Engineer,

## Bill of Quantity

### Work N0.11

Name of Work: - Rehabilitation/ improvement of canals and other Irrigation infrastructure in Khyber Pakhtunkhwa. ADP No.2214/210665. dg: 2022-23.

Sub/work: - Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. MPA-11 (Solar work)

S.No	MRS-2022	Description	Unit	Qty	Rate	Amount (Rs.)
1	03-25-b	Excavation in foundation of building, bridges etc complete.in ordinary soil.	M <sup>3</sup>	3.31	268.98	890.32
2	06-05-f	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4).	M3	4.97	9299.67	46219.36
3	26-01-m-01	Supply and Erection 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.	Watt	17250.00	22.19	382777.50
4	26-01-d-01	Supply and Erection of Solar PV Module (Solar Panel) Mono-crystalline A-Grade (per Watt) (As per Approved Specifications)	Watt	17250.00	104.17	1796932.50
5	15-09-e	Supply and Erection MS sheet box of 16 SWG, 4" deep with 3/16" thick Bakelite sheet top etc. complete: 10"x12".	Each	3.00	495.14	1485.42
6	15-71-d	Supply and Erection single phase imported auto circuit breaker 30Amp.	Each	2.00	950.40	1900.80
7	26-01-g-03	Supply and Erection 1x6 sq.mm single core (XPLE/ XPLO insulated/ PVC sheathed) flexible copper cable.	M	14.63	300.28	4393.10
8	26-01-g-04	Supply and Erection 1x10 sq.mm flexible copper cable.	M	18.29	460.93	8430.41
9	26-01-g-05	Supply and Erection 1x16 sq.mm flexible copper cable.	M	18.29	714.03	13059.61
10	26-01-b-02	Supply and Erection PVC flexible pipe: 1.5" i/d.	M	25.83	363.34	9385.07
11	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter (MPPT) 7.5 KW and above	Watt	11000.00	20.39	224290.00
12	15-70-b	Supply and Erection trans power auto circuit breaker 3-phase, 400V fungus moisture proofing: 60 Amp.	Each	1.00	2055.60	2055.60
13	24-50-c-03	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x25 mm <sup>2</sup> .	M	57.91	1724.66	99875.06

14	N.S.I	Supply & Installation, testing and commissioning of Submersible Pump (ISO – 9906 Certified) Coupled with Submersible rewindable 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 & power cable with appropriate Head & Discharge: 12.5 HP,	Job	1.00	374408.00	374408.00
15	24-56-a	Supply and Fixing MS Column pipe with flanges for submersible pump: 4" (100 mm) Nominal Pipe Size (NPS), 3/16" thick, 10' length.	M	54.86	3570.32	195867.76
16	27-48	Rubber packing 1/32" to 1/16"thick.	No	22.00	106.51	2343.22
17	15-72-f	Supply & erection of Nut & Bolt (2"x5/8").	No	176.00	219.00	38544.00
18	24-39-g	Supplying and Fixing MS Suspension Clamp 3/8" thick for housing pipe: 4" i/d.	Each	2.00	697.16	1394.32
19	N.S.I	Supply and fixing bore cover plate ( 2 pieces) 3/8" thick arrangement holes for column and cable, hole one inches i/c for inspection of water level in Tube well.	Job	1.00	2300.00	2300.00
20	15-53	Special earthing of iron/metal clad switches etc with copper wire No. 8 SWG in GI pipe 1/2" dia.	No	1.00	18086.96	18086.96
Total in Rs. =						3224639
Total In Million =						3.2246

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

Contractor Premium S.I.....% Above / Below  
Contractor Premium N.S.I.....% Above / Below

Contractor Signature.....

.....  
(Seal)

Sub Divisional Officer,  
Tubewell Irrigation Sub Division,  
Peshawar.

Sub Engineer,

## Bill of Quantity

### Work N0.14

Name of Work: - Rehabilitation/ improvement of canals and other Irrigation infrastructure in Khyber Pakhtunkhwa. ADP No.2214/210665. dg: 2022-23.

Sub/work: - Construction of boundary wall & Solarization for Irrigation tube well No. JSU-24 (Solar & Civil Work)

S.No	MRS-2022	Description	Unit	Qty	Rate	Amount (Rs.)
1	03-25-b	Excavation in foundation of building, bridges etc complete.in ordinary soil.	M <sup>3</sup>	32.81	268.98	8825.23
2	06-03-b	Cement concrete (brick/stone ballast,1.5" to 2"/nullah shingle well graded & cleaned) in foundation & plinth ( Ratio 1:4:8).	M <sup>3</sup>	7.47	6633.94	49555.53
3	07-04-a-05	1st class brick work in foundation and plinth in Cement, sand mortar 1:6.	M <sup>3</sup>	16.73	11383.56	190446.96
4	06-26-b-02	Damp proof course of cem. conc. 1:2:4 including bitumen coat, 1 layer polythene &2 coats bitumen (2" thick).	M <sup>2</sup>	19.06	1081.70	20617.20
5	07-05-a-05	1st class brick work in ground floor Cement, sand mortar 1:6.	M <sup>3</sup>	33.58	12166.67	408556.78
6	25-45-a	Supplying and Fixing 18 SWG MS Sheet Door with angle iron frame (1.5"x1.5"x1/8"), bolt, hinges, paint etc complete.	M <sup>2</sup>	5.57	8364.18	46588.48
7	06-05-h	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:3:6).	M <sup>3</sup>	0.96	7806.53	7494.27
8	06-05-f	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4).	M <sup>3</sup>	4.97	9299.67	46219.36
9	11-18-b	Cement pointing struck joints, on walls, upto 20 feet height Ratio(1:3).	M <sup>2</sup>	142.70	350.10	49959.27
10	28-17-a	Providing and Fixing barbed wire fencing with 4 horizontal & 2 cross wires : Without PCC base.	M	23.23	1835.77	42644.94
11	11-09-b	Cement plaster 1:4 upto 20 ft height 1/2" thick.	M <sup>2</sup>	215.53	335.14	72232.72
12	11-23-a-03	White washing: New surface: Three coats.	M <sup>2</sup>	356.38	54.24	19330.05
13	26-01-m-01	Supply and Erection 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.	Watt	17750.00	22.19	393872.50
14	26-01-d-01	Supply and Erection of Solar PV Module (Solar Panel) Mono-crystalline A-Grade (per Watt) (As per Approved Specifications)	Watt	17750.00	104.17	1849017.50

15	15-09-e	Supply and Erection MS sheet box of 16 SWG, 4" deep with 3/16" thick bakelite sheet top etc. complete : 10"x12".	Each	3.00	495.14	1485.42
16	15-71-d	Supply and Erection single phase imported auto circuit breaker 30Amp.	Each	2.00	950.40	1900.80
17	26-01-g-03	Supply and Erection 1x6 sq.mm single core (XPLE/ XPLO insulated/ PVC sheathed) flexible copper cable.	M	17.07	300.28	5125.78
18	26-01-g-04	Supply and Erection 1x10 sq.mm flexible copper cable.	M	18.29	460.93	8430.41
19	26-01-g-05	Supply and Erection 1x16 sq.mm flexible copper cable.	M	18.29	714.03	13059.61
20	26-01-b-02	Supply and Erection PVC flexible pipe : 1.5" i/d.	M	25.99	363.34	9443.21
21	26-01-i-04	Supply and Erection of 3 Phase 220/380V Solar Pump inverter ( MPPT ) 7.5 KW and above	Watt	11000.00	20.39	224290.00
22	15-70-b	Supply and Erection transpower auto circuit breaker 3-phase, 400V fungus moisture proofing : 60 Amp.	Each	1.00	2055.60	2055.60
23	24-50-c-03	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x25 mm <sup>2</sup> .	M	48.77	1724.66	84111.67
24	N.S.I	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 & power cable with appropriate Head & Discharge: 12.5HP,	Job	1.00	374408.00	374408.00
25	24-56-a	Supply and Fixing MS Column pipe with flanges for sub,merssible pump : 4" ( 100 mm) Nominal Pipe Size (NPS), 3/16" thick, 10' length.	M	45.72	3570.32	163235.03
26	27-48	Rubber packing 1/32" to 1/16"thick.	No	19.00	106.51	2023.69
27	15-72-f	Supply & erection of Nut & Bolt (2"x5/8").	No	152.00	219.00	33288.00
28	24-39-g	Supplying and Fixing MS Suspension Clamp 3/8" thick for housing pipe : 4" i/d.	Each	2.00	697.16	1394.32
29	N.S.I	Supply and fixing bore cover plate ( 2 pieces) 3/8" thick arangement	Job	1.00	2300.00	2300.00



		holes for column and cable, hole one inches i/c for inspection of water level in Tube well.				
30	15-53	Special earthing of iron/metal clad switches etc with copper wire No. 8 SWG in GI pipe 1/2" dia.	No	1.00	18086.96	18086.96
Total in Rs.=						4149999
Total In Million=						4.1500

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

Contractor Premium S.I.....% Above / Below  
Contractor Premium N.S.I.....% Above / Below

Sub Divisional Officer,  
Tubewell Irrigation Sub Division,  
Peshawar.

Contractor Signature.....

Sub Engineer,

.....  
(Seal)

# **SPECIFICATIONS**

## **SPECIAL PROVISIONS**

(To be prepared and incorporated by the Employer)

## **SPECIFICATIONS - SPECIAL PROVISIONS (Sample Clauses)**

SP-1	WORK BY CONTRACTOR
SP-2	WORK BY OTHERS
SP-3	FACILITIES PROVIDED BY THE EMPLOYER
SP-4	DESCRIPTION OF THE PROJECT
SP-5	ACCESS TO SITE
SP-6	SITE CONDITIONS
SP-7	STANDARDS AND DESIGN
SP-8	DRAWINGS AND INFORMATION
SP-9	INSTRUCTION MANUALS
SP-10	CONTRACTOR TO COOPERATE WITH OTHERS
SP-11	INSTRUCTIONS AND TRAINING OF EMPLOYER'S STAFF
SP-12	ERECTION AND TESTING EQUIPMENT AND MAINTENANCE TOOLS
SP-13	SPARE PARTS
SP-14	PACKING
SP-15	ERECTION MARKS
SP-16	PROGRAMME
SP-17	PROGRESS REPORTS AND MEETINGS
SP-18	PHOTOGRAPHS
SP-19	SECTIONS OF THE WORKS
SP-20	QUALITY ASSURANCE
SP-21	SUBCONTRACTS
SP-22	INSPECTION AND TESTING
SP-23	TESTS ON COMPLETION
SP-24	TAKING OVER
SP-25	TRANSPORTATION AND HANDLING OF PLANT
SP-26	DEFECTS AFTER TAKING OVER
SP-27	DIRECTED AND REQUIRED
SP-28	PAYMENT FOR WORK REQUIRED BY SPECIAL PROVISIONS
SP-29	SAFETY AND HEALTH
SP-30	RATING PLATES, NAMEPLATES AND LABELS

**Check List**

Yes	No	Check list
<input type="checkbox"/>	<input type="checkbox"/>	Valid PEC Certificate(s) in required category
<input type="checkbox"/>	<input type="checkbox"/>	Copy of valid dealer ship certificate
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-1), General Information
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-2), General Experience Record
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-3), Joint Venture Summary
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-4), Particular Experience (Record List of Solar based pumping machinery projects of similar nature and complexity completed in last five years and complexity in-hand.)
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-5), Detail of Contracts of Similar Nature and Complexity (Supply & Installation of Solar based pumping machinery)
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-6) Current Contract Commitments/Works in Progress
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-7), Personnel Capabilities
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-8) Candidate Summary (List of B.Sc. Engineers having relevant experience with their CVs and PEC Reg. No.& List of Associates Engineers (DAE) with their CVs having relevant experience)
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-9), Equipment capabilities
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-10), Financial Capability
<input type="checkbox"/>	<input type="checkbox"/>	Application form (A-11), Litigation History
<input type="checkbox"/>	<input type="checkbox"/>	Undertaking that all equipment listed in this document for qualification will be made available for the subject Project
<input type="checkbox"/>	<input type="checkbox"/>	Audited balance sheets for at least last three years and Bank statements
<input type="checkbox"/>	<input type="checkbox"/>	Undertaking that the Applicant has not been declared bankrupt
<input type="checkbox"/>	<input type="checkbox"/>	Original affidavit that the firm has not been black listed
<input type="checkbox"/>	<input type="checkbox"/>	Applicants' legal status
<input type="checkbox"/>	<input type="checkbox"/>	Principal place of Business
<input type="checkbox"/>	<input type="checkbox"/>	Place of incorporation or registration
<input type="checkbox"/>	<input type="checkbox"/>	Certificate of registration with Income Tax & Sales Tax Department
<input type="checkbox"/>	<input type="checkbox"/>	Enlistment record with Government organizations and other agencies
<input type="checkbox"/>	<input type="checkbox"/>	Location of workshop facility, if any
<input type="checkbox"/>	<input type="checkbox"/>	Equipment's sole agencies represented by the Contractor
<input type="checkbox"/>	<input type="checkbox"/>	Written description of internal quality control program for specified works

## **EVIDENCE OF BIDDER'S CAPABILITY**

**Name of work: Construction/ Installation of Augmentation of Irr: Tube Wells in District Charsadda ADP No: 2177/160276  
System Design For Auto Sun Tracker Solar Based Irrigation Tube Wells In District Charsadda (Package - 94)**

Sr. #	Scheme Name	Discharge (iGPH)	Head (ft)	Pump Setting (ft)	Water Horse Power (WHP) / Hydraulic Power	Pump Efficiency (%) (70% -- 80% )	Motor Efficiency (%)	Shaft Power (Pump HP)	BREAK HOURSE POWER (BHP with 20% safety factor)	Say Motor Horse Power	Motor Basic Input Power (W)	PV Derating Factor (%) (30% -- 90%)	Total PV Power (Watt) with Safety Factor	PV Generator Peak Power (Watts)				Motor Model Make, & HP	Pump Model, Make, HP & DN	Inverter Make, Model & K.Watt	PV Module Make & Watt		
														No of String in Parallel	No of String in Series	Single PV Module Size (Watts)	Total PV Generation						
1.	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 23 (Solar work)	12000	130	170																			
2.	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 29 (Solar work)	12000	130	170																			
3.	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. 54 (Solar work)	12000	130	170																			
4.	Construction of Pump house, operator quarter, Solarization & boundary wall for Irrigation tube well No. MPA-11 (Solar work)	12000	130	170																			
5.	Construction of boundary wall & Solarization for Irrigation tube well No. JSU-24 (Solar & Civil Work)	14000	100	140																			

**General Information**

All individual firms and each partner of a joint venture applying for qualification are requested to complete the information in this form. Nationality information is also to be provided for foreign owners or applicants who are forming part of the Joint Ventures as required under the PEC By-Laws as a Partnership/Joint Venture.

Where the Applicant proposes to use named subcontractors for critical components of the works or for work contents in excess of 10 percent of the value of the whole works, the following information should also be supplied for the specialist subcontractor(s).

1.	Name of Firm	
2.	Head Office Address	
3.	Telephone	Contact Person: Name: Title:
4.	Fax	
5.	Place of Incorporation/Registration	Year of Incorporation/Registration

<b>NATIONALITY OF OWNERS</b>		
	<b>NAME</b>	<b>NATIONALITY</b>
1.		
2.		
3.		
4.		
5.		

**General Experience Record**

Name of Applicant or partner of a joint venture

All individual firms and all partners of a joint venture are requested to complete the information in this form. The information supplied should be the annual turnover of the Applicant (or each member of a joint venture), in terms of the amounts billed to clients for each year for work in progress or completed over the past three years.

Use a separate sheet for each partner of a joint venture.

<b>Annual Turnover</b>		
<b>Year</b>	<b>Turnover (In actual currency)</b>	<b>Equivalent Rupees in Millions</b>
1.		
2.		
3.		



**Joint Venture Summary**

<b>Names of all Partners of a Joint Venture</b>	
1.	Lead Partner
2.	Partner
3.	Partner

Total value of annual turnover, in terms of work billed to clients,

<b>Partner</b>	<b>Form A-2 Page No.</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
1. Lead Partner				
2. Partner				
3. Partner				
<b>Total:</b>				

## Particular Experience Record

Name of Applicant or partner of a joint venture

On a separate page, using the format of Application Form A-5, each applicant or partner of a Joint Venture is required to list all contracts of a similar nature and complexity (Supply & Installation of Solar Based Pumping Machinery in any Public Work/NGOs) to the contract for which the Applicant wishes to qualify, undertaken during the last five years. The information is to be summarized, using Application Form A-5, for each contract completed or under execution by the Applicant or by each partner of a Joint Venture.

Where the Applicant proposes to use named subcontractor(s) for critical components of the works or for work contents in excess of 10 percent of the value of the whole works, the information in the afore-mentioned forms should also be supplied for each specialist subcontractor.

**Details of Contracts of Similar Nature & Complexity**

Name of Applicant or partner of a joint venture

Use a separate sheet for each contract.

1	Name of Contract
	Country
2	Name of Employer
3	Employer Address.....
4	Nature of works and special features relevant to the contract for which the Applicant wishes to pre-qualify ..... .....
5	Contract Role (Tick One) (a) Sole Contractor    (b)Sub- Contractor    (c)Partner in a Joint Venture
6	Value of the total contract (in specified currencies) at completion, or at date of award for current contract  Currency .....                      Currency .....                      Currency .....
7	Equivalent in Pak/Rs.
8	Date of Award
9	Date of Completion
10	Contract Duration (Years and Months)  _____Years                      _____Months
11	Specified Requirements <sup>1</sup> ..... .....

<sup>1</sup>Insert any specific criteria required for particular operations, such as annual volume of earth-moving, underground excavation, or placing concrete etc.

**Summary Sheet: Current Contract Commitments/Works in Progress**

Name of Applicant or partner of a joint venture

Applicants and each partner to an application should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which substantial Completion Certificate has yet to be issued.

<b>Name of Contract</b>	<b>Value of Outstanding work (Equivalent Pak Rs. Millions)</b>	<b>Estimated Completion Date</b>
1.		
2.		
3.		

**Personnel Capabilities**

Name of Applicant

For specific positions essential to contract implementation, Applicants should provide the names of at least two candidates qualified to meet the specified requirements stated for each position. The data on their experience should be supplied on separate sheets using one Form for each candidate (Application Form A-8).

1.	Title of Position
	Name of Prime Candidate
	Name of Alternate Candidate
2.	Title of Position
	Name of Prime Candidate
	Name of Alternate Candidate
3.	Title of Position
	Name of Prime Candidate
	Name of Alternate Candidate
4.	Title of Position
	Name of Prime Candidate
	Name of Alternate Candidate

**Candidate Summary**

Name of Applicant

<b>Position</b>		<b>Candidate</b> [Tick appropriate one] <input type="checkbox"/> Prime <input type="checkbox"/> Alternate
Candidate information	1. Name of Candidate	2. Date of Birth
	3. Professional Qualification	4. PEC Registration No.
Present employment	5. Name of employer	
	Address of employer	
	Telephone	Contact (manager/personnel officer)
	Fax	
	Job title of candidate	Years with present employer

Summarize professional experience over the last 03 years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the Project.

Month/ Dates/Years		Company/Project/Position/Relevant technical and management experience
From	To	

**Equipment Capabilities**

Name of Applicant

The Applicant shall provide adequate information to demonstrate clearly that he has the capability to meet the requirements for each and all items of equipment listed in the Evaluation Criteria 1.2 (v). A separate Form shall be prepared for each item of equipment listed or for alternative equipment proposed by the Applicant.

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

Omit the following information if it is owned by the Applicant or partner.

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

**Financial Capability**

Name of Applicant or Partner of a Joint Venture

Applicants, including each partner of a joint venture, should provide financial information to demonstrate that they meet the minimum requirements that the lead partner shall meet not less than 40 percent of all qualifying criteria and each of the partners shall meet not less than 25 percent of all the qualifying criteria given in Evaluation Criteria. All the above figures will be added together to arrive at JV's total capacity. Each applicant or partner of a joint venture must fill-in this form. If necessary, use separate sheets to provide complete banker information. A copy of the audited balance sheets should be attached.

<b>Banker</b>	Name of banker	
	Address of banker	
	Telephone	Contact name and title
	Fax	Telex

Summarize actual assets and liabilities in Pak Rupees (Equivalent at the current rate of exchange at the end of each year) for the previous five years, based upon known commitments, projected assets and liabilities in pak Rupees equivalent for the next one years.

S #	Financial information in Pak Rs. or equivalent	Projected next one year			
		1	2	3	4
1	Total assets				
2	Current assets				
3	Total liabilities				
4	Current liabilities				
5	Profits before taxes				
6	Profits after taxes				

Specific proposed sources of financing to meet the cash flow of the Project, net of current commitments

Source of financing	Amount (Pak Rs. or equivalent)
1.	
2.	
3.	
4.	

Attach audited financial statements for the last three years (for individual applicant or each partner of joint venture). Firms owned by individuals, and partnerships, may submit their balance sheets certified by a registered accountant, and supported by copies of tax returns, if audits are not required by the laws of their countries of origin in case of foreign firms.





# EVALUATION CRITERIA

## 1.1 Eligibility for Qualification

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

S #	Description	Yes/No
1.	Registration with Pakistan Engineering Council (PEC) in relevant category with field of specialization EE-11 ( <b>Specified for Solar Energy</b> )	If "YES" the applicant will be Eligible for further Evaluation for qualification (copy of valid PEC certificate shall be attached).
2.	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).
3.	System Design	Valid System Design must be submitted in technical bid otherwise applicant will not be Eligible for further Evaluation. <b>(Note: Over system design not valid)</b>
4.	<ul style="list-style-type: none"> <li>i. Firm must have ISO 9001-2015 certificate quality management system</li> <li>ii. Warranty period of the following items should be provided on judicial stamp papers. <ul style="list-style-type: none"> <li>a. Solar panel etc will be 20 years and Defect liability period of Electrical / Mechanical works will be 2 years.</li> <li>b. Inverter should have at least three (02) years product &amp; performance warranty.</li> <li>c. Two (02) years comprehensive free replacement, repair &amp; maintenance warranty (Free of cost) should be provided for all the components of auto tracker (including batteries).</li> </ul> </li> <li>iv. Firm must have 30 million average annual turnovers for last 3 Years in Solar Pumping System, attached Income Tax Returns, Sales Tax Returns with Financial Audited Balance Sheets &amp; the figure must correspond with each other.</li> <li>v. Goods declaration / purchase documents must be provided for relevant products.</li> <li>vi. Performance curves at STC for both solar panel, motor and pumping machinery should be provided along with original catalog for each work separately.</li> <li>vii. The PV modules offered should not be more than One (01) year old with respect to the date of manufacturing.</li> <li>viii. Brand name(s) of PV modules, the supplier intends to supply must be included in the technical proposal.</li> </ul>	Attach Valid and colored documents otherwise applicant will not be eligible for further evaluation. In case of fake documents, the applicant will be recommended for blacklisting as per KPPRA Rules.

## 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:

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

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% marks in each category for lead partner and 25% marks in each category for JV partner.

## Qualification Evaluation Criteria

### i) General Capabilities

Sr. No.	Description	Marks Assigned	Criteria for Marks Obtained
a)	Copy of valid dealership (solar panels & Submersible Pumps)	04	<ul style="list-style-type: none"> <li>No marks will be given if license is not attached and Four (04) points will be added in case of valid certificate along with import/purchase documents for each product.</li> </ul>
b)	Litigation History in which Decision has been given against the firm(s)	04	<ul style="list-style-type: none"> <li>In case the firm is involved in any litigation, - 3 will be given and 4 points will be added in case original affidavit of no litigation is attached.</li> </ul>
c)	Description of Internal Quality Control assurance program for Construction/ Erection/Maintenance	02	<ul style="list-style-type: none"> <li>2 Marks will be given if Description is provided.</li> </ul>
<b>Total Marks Allocated</b>			<b>10</b>

### 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)	05	<p><b><u>Bank Certificate (2-Marks)</u></b></p> <ul style="list-style-type: none"> <li>2 Marks are given if Original Bank Certificate is provided.</li> </ul> <p><b><u>Bank Credit Line (3-Marks)</u></b></p> <ul style="list-style-type: none"> <li>1 Marks are given if the available bank credit line limit is equal to 30 million.</li> <li>2 Marks are given if the available bank credit line limit is more than 30 million, but less than 50 million.</li> <li>3 Marks are given if the available bank credit line limit is 50 million or more.</li> </ul>
b)	Audited Balance Sheets for at least last 03 years	05	No marks will be given if Audited Balance Sheets are not attached.
c)	Working Capital in last 3 years	05	<ul style="list-style-type: none"> <li>3 Marks are given if the available average working capital for last 03 years is equal to 25 million.</li> <li>4 Marks are given if the available average working capital for last 03 years is more than 25 million, but less than 30 million.</li> </ul> <p>Full Marks are given if the available average working capital for last 03 years is 30 million or more.</p>
d)	Registration with income tax department	05	<ul style="list-style-type: none"> <li>No marks will be given if NTN Registration certificate is not attached and 4 points will be added in case of valid certificates.</li> </ul>
<b>Total Marks Allocated</b>			<b>20</b>

iii) Experience Record

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
a)	Projects of similar nature and complexity (Supply & Installation of Solar Based Pumping Machinery) completed in last five years in any Public Works Department/NGOs.	12	<ul style="list-style-type: none"> <li>• 02 marks for each project with cost of 3 million and above upto 10 million</li> <li>• 02 marks for each project with cost of 10 million and above</li> </ul>
b)	Projects of similar nature and complexity (Supply & Installation of Solar Based Pumping Machinery) in-hand in any Public Works Department/NGOs.	12	<ul style="list-style-type: none"> <li>• 02 marks for each project with cost of 3 million and above upto 10 million</li> <li>• 02 marks for each project with cost of 10 million and above</li> </ul>
c)	Enlistment record with Government Organizations & other agencies	06	<ul style="list-style-type: none"> <li>• 2 Mark for each enlistment up to maximum of three enlistments.</li> </ul>
<b>Total Marks Allocated</b>			<b>30</b>

iv) Personnel Capabilities

Sr. No.	Description	Marks Assigned	Explanation for Marks Obtained
i)	B.Sc. Engineers registered with Pakistan Engineering Council (PEC)	14	<p><b><u>Experience (6-Marks)</u></b></p> <ul style="list-style-type: none"> <li>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 03 years or above.</li> </ul> <p><b><u>Strength of Engineers (8 Marks)</u></b></p> <ul style="list-style-type: none"> <li>3 Marks will be given if the total no. of Engineers registered with PEC is 3.</li> <li>5 Marks will be given if the total no. of engineers registered with PEC is 5 or above.</li> </ul>
ii)	Associates Engineers (DAE)	6	<p><b><u>Experience (4-Marks)</u></b></p> <ul style="list-style-type: none"> <li>4 Marks will be given if the individual relevant experience of at least 1 number of Associates Engineers Electrical/Mechanical (DAE) is equal to 3 years or above.</li> </ul> <p><b><u>Strength of Associate Engineers (2 Marks)</u></b></p> <ul style="list-style-type: none"> <li>2 Marks will be given if the total no. of Associate Engineers (DAE) are 2 or above.</li> </ul>
<b>Total Marks Allocated</b>			<b>20</b>

v) **Equipment Capabilities**

<b>Sr. No.</b>	<b>Description</b>	<b>Marks Assigned</b>	<b>Explanation for Marks Obtained</b>
a)	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).	8	8 Marks for complete setup are given. (Attached Third Party Certificate), 04 Points will be given for other the then the company premises.
b)	Workshop facilities. Attach layout sketch of workshop.	4	Full marks will be given if workshop in KPK otherwise 02 Marks will be given. No marks will be given if Contractor has no workshop facilities.
c)	Flow meter	2	Valid Documents and pictures along with serial number must be provided.
d)	Water level Meter	3	Valid Documents and pictures along with serial number must be provided.
e)	PV Analyzer	3	Valid Documents and pictures along with serial number must be provided.
<b>Total Marks Allocated</b>			<b>20</b>

**Domestic Goods (Value added in Pakistan)**

**NOT USED**



# SPECIFICATION




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, 2<sup>nd</sup> 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](http://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.**

PS

### 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.	ISAHAQ AHMAD	Assistant Engineer CSR/Miscell.	C&W	
3.	Amin-Zeb	Director	Housing	
4.	Sami-ullah Kundi	Xen	Immigration	
5.	Jehanzeb Khan	SDO	Intifad.	
6.	Engr. Nasir Zaman Khan	SO (C&W)	PH&E Deptt	
7.	Engr. M. Amjad Khan	DST (C&W)	PH&E	
8.	Mahmoodulhaq Babar	Director	Appl. Engrs	
9.	Engr. Parvez Raza	Superintending Engineer	PH&E	
10.	Engr. Babar Naveem	Assistant Director	M&E System, PED	
11.	Engr. Khuram Durrani	PO	Energy & Power Dept	
12.	Engr. Salman	Dy. Director	PDAC (Elect)	
13.	SAUD KHAN	SO PBC-II	C&W D	
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15.				
16.				
17.				
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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**

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**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 Rating (Wp) and Power Tolerance Range
  - Voltage ( $V_{mp}$ ) and Current ( $I_{mp}$ ) at STC
  - Open Circuit Voltage ( $V_{oc}$ ) and Short Circuit Current ( $I_{sc}$ )
  - 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:  $P_{max}$ ,  $V_{oc}/V_{mp}$ ,  $I_{sc}/I_{mp}$  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.

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- 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<sub>DC</sub> transmission.
- d. From Inverter to batteries, the DC cable can be single insulated, Single Core and suitable for minimum 300 V<sub>DC</sub> 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.

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- 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:**

- 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.
- The Sizing of Earthing conductor will be done as per NEC Table 250.122
- 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.
- Motor, inverter, Battery / Battery Box (if required), Main Distribution Board should be connected to an adequate earth contact / Grounding.
- 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.
- Grounding / Earthing plate should be made of Copper plate of 4mm thickness & Size minimum 1.0 x 1.0 Ft.
- Grounding / Earthing conductor should be connected to the plate / Rode / GI Pipe by proper connector of minimum depth of 6 feet.
- 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.
- All nut / bolt and Earthing clamp shall be stainless steel or galvanized steel.

**5. BATTERIES:**

- 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.)
- The battery must ensure safe and reliable operation in the whole range of ambient temperatures from -5° C to + 50° C.
- The maximum permissible self-discharge rate should not be more than 5 percent of rated capacity per month at 25° C.
- The battery shall have a certificate of compliances, issued by a recognized laboratory.
- The Batteries should have three years Comprehensive replacement warranty.
- The battery shall meet the requirements and recommendations given in IEC 61427, IEC 60896 1/22 (For VRLA) or equivalent. Lab Test Reports for battery cycle life should be provided.
- 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.
- 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.
- 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.
- Battery disconnect switch / breaker of suitable size should be installed between batteries and inverter / charge controller.
- The Battery must have Low self-discharge rate, No memory effect and No gassing.

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**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

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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	Lumen s 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.

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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.

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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	<b>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)</b>

**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

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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 <b>20000N</b> axial load
7.	Mechanical Seal & 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
	Insulation Class	Insulation Class B (130°C) NEMA Insulation Class F (155°C) NEMA or above Will be given

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**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  $\geq 380\text{Vac}$  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 ( $W_p$ ) 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 ( $W_p$ ) 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 ( $W_p$ ) (Imperial Gallons) =  $\frac{Q \text{ (iGPH)} * \text{TDH (ft)} * 746 * \text{PV Loss Factor}}{60 * 3300 * \eta_{\text{pump}} * \eta_{\text{motor}}}$
- f. Total PV Power ( $W_p$ ) (US-Gallons) =  $\frac{Q \text{ (US-GPH)} * \text{TDH (ft)} * 746 * \text{PV Loss Factor}}{60 * 3960 * \eta_{\text{pump}} * \eta_{\text{motor}}}$
- g. Total PV Power ( $W_p$ ) (Metric Units) =  $\frac{Q \text{ (m}^3\text{/hr)} * \text{TDH (m)} * 9.81 * 1000 * \text{PV Loss Factor}}{3600 * \eta_{\text{pump}} * \eta_{\text{motor}}}$
- 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.

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- 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)  $\geq$  (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<sup>2</sup>) 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  $\leq$  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<sup>3</sup>.

**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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**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.

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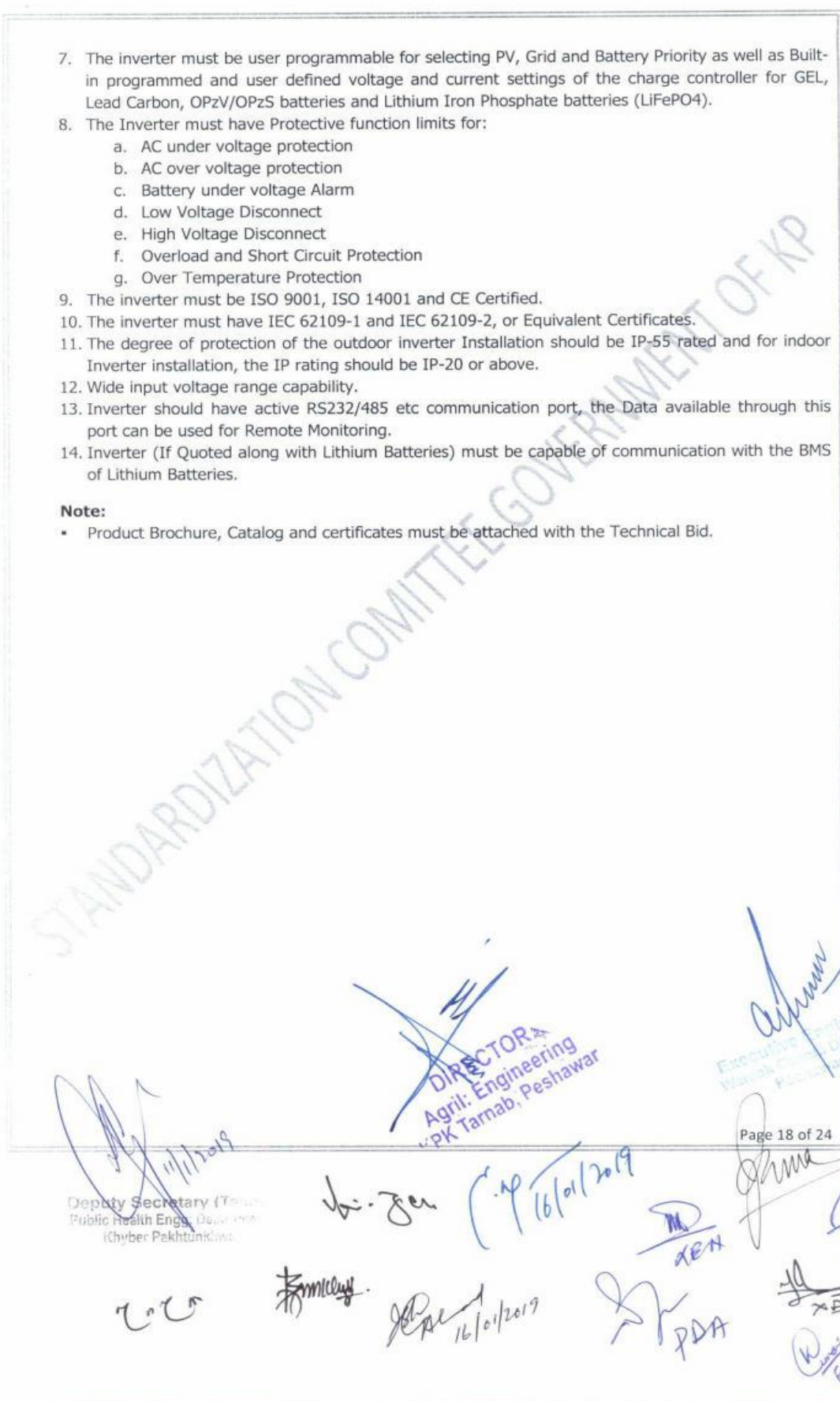
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7. The inverter must be user programmable for selecting PV, Grid and Battery Priority as well as Built-in programmed and user defined voltage and current settings of the charge controller for GEL, Lead Carbon, OPzV/OPzS batteries and Lithium Iron Phosphate 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

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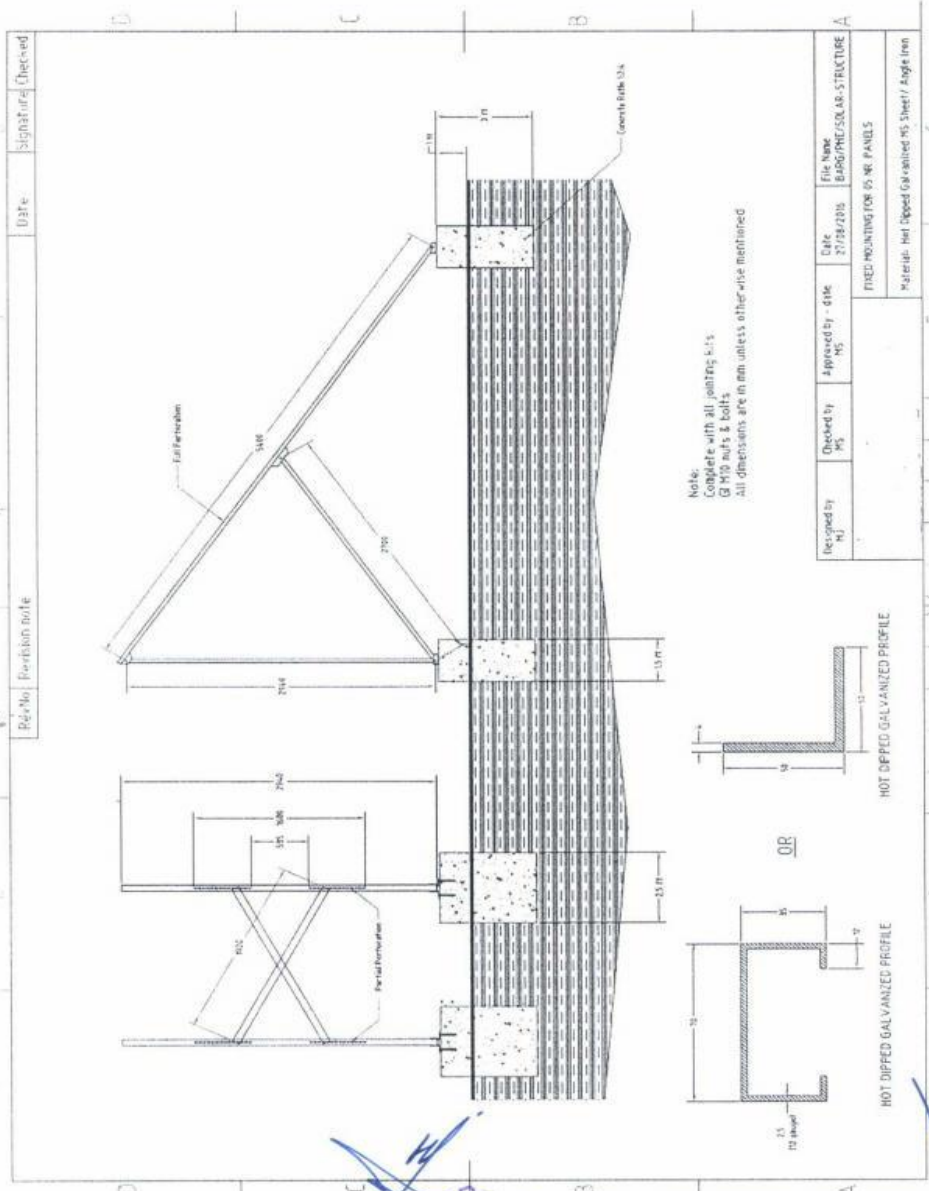
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**ANNEXURE-1 (STRUCTURE DRAWING)**



Received by HJ	Checked by MS	Approved by - dtd MS	Date 27/08/2019	File Name BAGB/PHE/SOLAR-STRUCTURE
PROJECTING FOR 05 NO. PANELS				
Material: Hot Dipped Galvanized MS Sheet/ Angle Iron				

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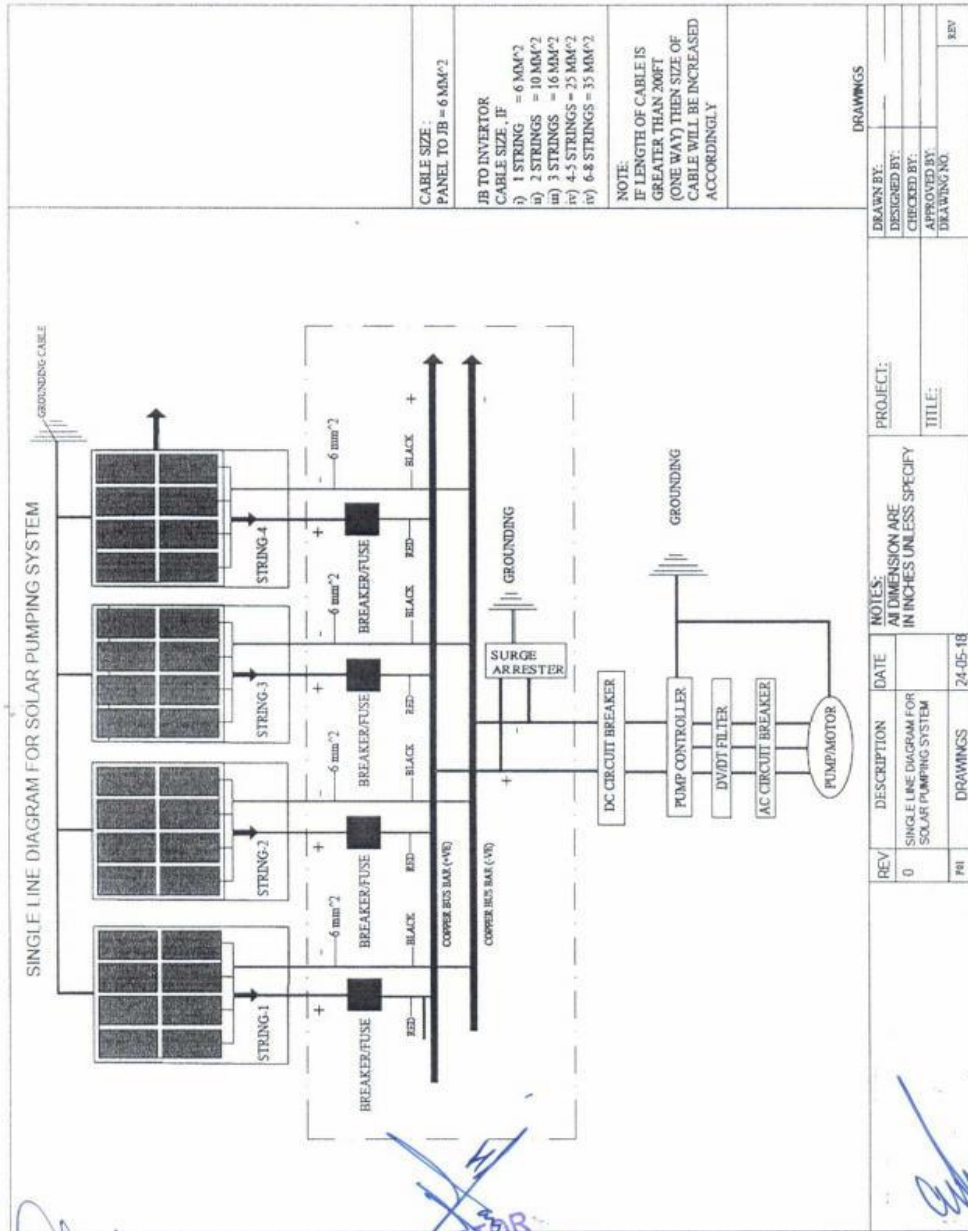
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**ANNEXURE-4 (SYSTEM SINGLE LINE DIAGRAM-PUMPING)**



**CABLE SIZE:**  
PANEL TO JB = 6 MM<sup>2</sup>

**JB TO INVERTOR**

**CABLE SIZE, IF**

- i) 1 STRING = 6 MM<sup>2</sup>
- ii) 2 STRINGS = 10 MM<sup>2</sup>
- iii) 3 STRINGS = 16 MM<sup>2</sup>
- iv) 4-5 STRINGS = 25 MM<sup>2</sup>
- v) 6-8 STRINGS = 35 MM<sup>2</sup>

**NOTE:**  
IF LENGTH OF CABLE IS GREATER THAN 200FT (ONE WAY) THEN SIZE OF CABLE WILL BE INCREASED ACCORDINGLY.

DRAWINGS	
DRAWN BY:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DRAWING NO.	
PROJECT:	
TITLE:	
NOTES:	ALL DIMENSION ARE IN INCHES UNLESS SPECIFY
DATE	24-05-18
DESCRIPTION	SINGLE LINE DIAGRAM FOR SOLAR PUMPING SYSTEM
REV	0
PRI	0
DRAWINGS	24-05-18

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