IRRIGATION DEPARTMENT
GOVERNMENT OF BALOCHISTAN

BIDDING DOCUMENT

FOR

PROCUREMENT OF GOODS FOR CONSTRUCTION OF NIMMI AND GANDACHA WATER SUPPLY SCHEME

SOLAR SYSTEMS AND MACHINERY

BALOCHISTAN INTEGRATED WATER RESOURCES MANAGEMENT AND DEVELOPMENT PROJECT (BIWRMDP)

NCB NO.	**:**	**PK-PMU-BIWRMDP-325884-GO-RFB**
PURCHASER	**:**	**PROJECT DIRECTOR BALOCHISTAN INTEGRATED WATER RESOORCES MANAGEMENT AND DEVELOPMENT PROJECT**
ISSUED ON	**:**	**NOVEMBER 2022**
COUNTRY	**:**	**PAKISTAN**

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Instructions to Bidders

A. Introduction

1. Source of Funds

1.1 The Borrower named in the Bid Data Sheet has applied for or received a loan or Grant (hereinafter called "loan") from the International Bank for Reconstruction and Development or from the International Development Association (as identified in the Bid Data Sheet and hereinafter interchangeably called "the Bank") in various currencies equivalent to the U.S. dollar amount indicated in the Bid Data Sheet towards the cost of the Project specified in the Bid Data Sheet. The Borrower intends to apply a portion of the proceeds of this loan to eligible payments under the contract for which this Invitation for Bids is issued.

1.2 Payment by the Bank will be made only at the request of the Borrower and upon approval by the Bank in accordance with the terms and conditions of the Loan Agreement, and will be subject in all respects to the terms and conditions of that agreement. The Loan Agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the loan proceeds.

2. Eligible Bidders

2.1 This Invitation for Bids is open to all suppliers from eligible source countries as defined in *Guidelines: Procurement under IBRD Loans and IDA Grants*, dated January 1995, hereinafter referred as the *IBRD Guidelines for Procurement*, except as provided hereinafter.

2.2 Bidders should not be associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Purchaser to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods to be purchased under this Invitation for Bids.

2.3 Government-owned enterprises in the Purchaser's country may participate only if they are legally and financially autonomous, if they operate under commercial law, and if they are not a dependent agency of the Purchaser.

2.4 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Bank in accordance with sub-cause 34.1.

3. Eligible Goods and Services

3.1 All goods and related services to be supplied under the contract shall have their origin in eligible source countries, defined in the *IBRD Guidelines for Procurement*, and all expenditures made under the contract will be limited to such goods and services.

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

3.3 The origin of goods and services is distinct from the nationality of the Bidder.

4. Cost of Bidding

4.1 The Bidder shall bear all costs associated with the preparation and submission of its bid, and the Purchaser named in the Bid Data Sheet, hereinafter referred to as "the Purchaser," will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

B. The Bidding Documents

5. Content of Bidding Documents

5.1 The goods required, bidding procedures, and contract terms are prescribed in the bidding documents. In addition to the Invitation for Bids, the bidding documents include:

(a) Instructions to Bidders (ITB)
(b) Bid Data Sheet
(c) General Conditions of Contract (GCC)
(d) Special Conditions of Contract (SCC)
(e) Schedule of Requirements
(f) Technical Specifications
(g) Bid Form and Price Schedules
(h) Bid Security Form
(i) Contract Form
(j) Performance Security Form
(k) Bank Guarantee for Advance Payment Form
(l) Manufacturer's Authorization Form

5.2 The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding documents. Failure to furnish all information required by the bidding documents or to submit a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in the rejection of its bid.

6. Clarification of Bidding Documents

6.1 A prospective Bidder requiring any clarification of the bidding documents may notify the Purchaser in writing or by cable (hereinafter, the term *cable* is deemed to include telex and facsimile) at the Purchaser's address indicated in ITB Clause 19.1. The Purchaser will respond in writing to any request for clarification of the bidding documents which it receives no later than twenty (20) days prior to the deadline for the submission of bids prescribed in the Bid Data Sheet. Written copies of the Purchaser's response (including an explanation of the query but without identifying the source of inquiry) will be sent to all prospective bidders that have received the bidding documents.

7. Amendment of Bidding Documents

7.1 At any time prior to the deadline for submission of bids, the Purchaser, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, may modify the bidding documents by amendment.

7.2 All prospective bidders that have received the bidding documents will be notified of the amendment in writing or by cable, and will be bidding on them.

7.3 In order to allow prospective bidders reasonable time in which to take the amendment into account in preparing their bids, the Purchaser, at its discretion, may extend the deadline for the submission of bids.

C. Preparation of Bids

8. Language of Bid

8.1 The bid prepared by the Bidder, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Purchaser, shall be written in the language specified in the Bid Data Sheet. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the Bid Data Sheet, in which case, for purposes of interpretation of the Bid, the translation shall govern.

9. Documents Comprising the Bid

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

(a) a Bid Form and a Price Schedule completed in accordance with ITB Clauses 10, 11, and 12;

(b) documentary evidence established in accordance with ITB Clause 13 that the Bidder is eligible to bid and is qualified to perform the contract if its bid is accepted;

(c) documentary evidence established in accordance with ITB

Clause 14 that the goods and ancillary services to be supplied by the Bidder are eligible goods and services and conform to the bidding documents; and

(d) bid security furnished in accordance with ITB Clause 15.

10. Bid Form

10.1 The Bidder shall complete the Bid Form and the appropriate Price Schedule furnished in the bidding documents, indicating the goods to be supplied, a brief description of the goods, their country of origin, quantity, and prices.

11. Bid Prices

11.1 The Bidder shall indicate on the appropriate Price Schedule the unit prices (where applicable) and total bid price of the goods it proposes to supply under the contract.

11.2 Prices indicated on the Price Schedule shall be delivered duty paid (DDP) prices. The price of other (incidental) services, if any, listed in the Bid Data Sheet will be entered separately.

11.3 The term DDP (Delivered Duty Paid), shall be governed by the rules prescribed in the current edition of *Incoterms* published by the International Chamber of Commerce, Paris.

11.4 The Bidder's separation of price components in accordance with ITB Clause 11.2 above will be solely for the purpose of facilitating the comparison of bids by the Purchaser and will not in any way limit the Purchaser's right to contract on any of the terms offered.

11.5 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account, unless otherwise specified in the Bid Data Sheet. A bid submitted with an adjustable price quotation will be treated as nonresponsive and will be rejected, pursuant to ITB Clause 24. If, however, in accordance with the Bid Data Sheet, prices quoted by the Bidder shall be subject to adjustment during the performance of the contract, a bid submitted with a fixed price quotation will not be rejected, but the price adjustment would be treated as zero.

12. Bid Currencies

12.1 Prices shall be quoted in Pak Rupees unless otherwise specified in the Bid Data Sheet.

13. Documents Establishing Bidder's Eligibility and Qualification

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

13.2 The documentary evidence of the Bidder's eligibility to bid shall establish to the Purchaser's satisfaction that the Bidder, at the time of

submission of its bid, is from an eligible country as defined under ITB Clause 2.

13.3 The documentary evidence of the Bidder's qualifications to perform the contract if its bid is accepted shall establish to the Purchaser's satisfaction:

(a) that, in the case of a Bidder offering to supply goods under the contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized by the goods' Manufacturer or producer to supply the goods in the Purchaser's country;

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

(c) that, in the case of a Bidder not doing business within the Purchaser's country, the Bidder is or will be (if awarded the contract) represented by an Agent in that country equipped, and able to carry out the Supplier's maintenance, repair, and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications; and

(d) that the Bidder meets the qualification criteria listed in the Bid Data Sheet.

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

14.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, documents establishing the eligibility and conformity to the bidding documents of all goods and services which the Bidder proposes to supply under the contract.

14.2 The documentary evidence of the eligibility of the goods and services shall consist of a statement in the Price Schedule of the country of origin of the goods and services offered which shall be confirmed by a certificate of origin issued at the time of shipment.

14.3 The documentary evidence of conformity of the goods and services to the bidding documents may be in the form of literature, drawings, and data, and shall consist of:

(a) a detailed description of the essential technical and performance characteristics of the goods;

(b) a list giving full particulars, including available sources and current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the goods for a period to be specified in the Bid Data Sheet, following commencement of the

use of the goods by the Purchaser; and

(c) an item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications, or a statement of deviations and exceptions to the provisions of the Technical Specifications.

14.4 For purposes of the commentary to be furnished pursuant to ITB Clause 14.3(c) above, the Bidder shall note that standards for workmanship, material, and equipment, as well as references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications, are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand names, and/or catalogue numbers in its bid, provided that it demonstrates to the Purchaser's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications.

15. Bid Security

15.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, a bid security in the amount specified in the Bid Data Sheet.

15.2 The bid security is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture, pursuant to ITB Clause 15.7.

15.3 The bid security shall be in Pak. Rupees and shall be in one of the following forms:

(a) a bank guarantee or an irrevocable letter of Grant issued by a reputable bank located in the Purchaser's country, in the form provided in the bidding documents or another form acceptable to the Purchaser and valid for thirty (30) days beyond the validity of the bid; or
(b) a cashier's or certified check.
(c) irrevocable encashable on-demand Bank call-deposit.

15.4 Any bid not secured in accordance with ITB Clauses 15.1 and 15.3 will be rejected by the Purchaser as nonresponsive, pursuant to ITB Clause 24.

15.5 Unsuccessful bidders' bid security will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiration of the period of bid validity prescribed by the Purchaser pursuant to ITB Clause 16.

15.6 The successful Bidder's bid security will be discharged upon the

Bidder signing the contract, pursuant to ITB Clause 32, and furnishing the performance security, pursuant to ITB Clause 33.

15.7 The bid security may be forfeited:

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Form; or

(b) in the case of a successful Bidder, if the Bidder fails:

(i) to sign the contract in accordance with ITB Clause 32;
or
(ii) to furnish performance security in accordance with ITB Clause 33.

16. Period of Validity of Bids

16.1 Bids shall remain valid for the period specified in the Bid Data Sheet after the date of bid opening prescribed by the Purchaser, pursuant to ITB Clause 19. A bid valid for a shorter period shall be rejected by the Purchaser as nonresponsive.

16.2 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing (or by cable). The bid security provided under ITB Clause 15 shall also be suitably extended. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request will not be required nor permitted to modify its bid, except as provided in ITB Clause 16.3.

16.3 In the case of fixed price contracts, if the award is delayed by a period exceeding sixty (60) days beyond the expiry of the initial bid validity, the contract price will be adjusted by a factor specified in the request for extension.

17. Format and Signing of Bid

17.1 The Bidder shall prepare an original and the number of copies of the bid indicated in the Bid Data Sheet, clearly marking each "ORIGINAL BID" and "COPY OF BID," as appropriate. In the event of any discrepancy between them, the original shall govern.

17.2 The original and the copy or copies of the bid shall be typed or written in indelible ink and shall be signed by the Bidder or a person or persons duly authorized to bind the Bidder to the contract. All pages of the bid, except for unamended printed literature, shall be initialed by the person or persons signing the bid.

17.3 Any interlineation, erasures, or overwriting shall be valid only if they are initialed by the person or persons signing the bid.

17.4 The Bidder shall furnish information as described in the Form of Bid on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

D. Submission of Bids

18. Sealing and Marking of Bids

18.1 The Bidder shall seal the original and each copy of the bid in separate envelopes, duly marking the envelopes as "ORIGINAL" and "COPY." The envelopes shall then be sealed in an outer envelope.

18.2 The inner and outer envelopes shall:

(a) be addressed to the Purchaser at the address given in the Bid Data Sheet; and

(b) bear the Project name indicated in the Bid Data Sheet, the Invitation for Bids (IFB) title and number indicated in the Bid Data Sheet, and a statement: "DO NOT OPEN BEFORE," to be completed with the time and the date specified in the Bid Data Sheet, pursuant to ITB Clause 2.2.

18.3 The inner envelopes shall also indicate the name and address of the Bidder to enable the bid to be returned unopened in case it is declared "late".

18.4 If the outer envelope is not sealed and marked as required by ITB Clause 18.2, the Purchaser will assume no responsibility for the bid's misplacement or premature opening.

19. Deadline for Submission of Bids

19.1 Bids must be received by the Purchaser at the address specified under ITB Clause 18.2 no later than the time and date specified in the Bid Data Sheet.

19.2 The Purchaser may, at its discretion, extend this deadline for the submission of bids by amending the bidding documents in accordance with ITB Clause 7, in which case all rights and obligations of the Purchaser and bidders previously subject to the deadline will thereafter be subject to the deadline as extended.

20. Late Bids

20.1 Any bid received by the Purchaser after the deadline for submission of bids prescribed by the Purchaser pursuant to ITB Clause 19 will be rejected and returned unopened to the Bidder.

21. Modification and Withdrawal of Bids

21.1 The Bidder may modify or withdraw its bid after the bid's submission, provided that written notice of the modification, including substitution or withdrawal of the bids, is received by the Purchaser prior to the

deadline prescribed for submission of bids.

21.2 The Bidder's modification or withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of ITB Clause 18. A withdrawal notice may also be sent by cable, but followed by a signed confirmation copy, postmarked not later than the deadline for submission of bids.

21.3 No bid may be modified after the deadline for submission of bids.

21.4 No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid Form. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security, pursuant to the ITB Clause 15.7.

E. Opening and Evaluation of Bids

22. Opening of Bids by the Purchaser

22.1 The Purchaser will open all bids in the presence of bidders' representatives who choose to attend, at the time, on the date, and at the place specified in the Bid Data Sheet. The bidders' representatives who are present shall sign a register evidencing their attendance.

22.2 The bidders' names, bid modifications or withdrawals, bid prices, discounts, and the presence or absence of requisite bid security and such other details as the Purchaser, at its discretion, may consider appropriate, will be announced at the opening. No bid shall be rejected at bid opening, except for late bids, which shall be returned unopened to the Bidder pursuant to ITB Clause 20.

22.3 Bids (and modifications sent pursuant to ITB Clause 21.2) that are not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances. Withdrawn bids will be returned unopened to the bidders.

22.4 The Purchaser will prepare minutes of the bid opening.

23. Clarification of Bids

23.1 During evaluation of the bids, the Purchaser 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 prices or substance of the bid shall be sought, offered, or permitted.

24. Preliminary Examination

24.1 The Purchaser will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.

24.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the 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 the Supplier does not accept the correction of the errors, its bid will be rejected, and its bid security may be forfeited. If there is a discrepancy between words and figures, the amount in words will prevail.

24.3 The Purchaser may waive any minor informality, nonconformity, or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

24.4 Prior to the detailed evaluation, pursuant to ITB Clause 25 the Purchaser will determine the substantial responsiveness of each bid to the bidding documents. For purposes of these Clauses, a substantially responsive bid is one which conforms to all the terms and conditions of the bidding documents without material deviations. Deviations from, or objections or reservations to critical provisions, **such as** those concerning Bid Security (ITB Clause 15), Applicable Law (GCC Clause 30), and Taxes and Duties (GCC Clause 32), will be deemed to be a material deviation. The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself without recourse to extrinsic evidence.

24.5 If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the nonconformity.

25. Evaluation and Comparison of Bids

25.1 The Purchaser will evaluate and compare the bids which have been determined to be substantially responsive, pursuant to ITB Clause 24.

25.2 The Purchaser's evaluation of a bid will be on delivered duty paid (DDP) price inclusive of prevailing duties and will exclude any allowance for price adjustment during the period of execution of the contract, if provided in the bid.

25.3 The Purchaser's evaluation of a bid will take into account, in addition to the bid price quoted in accordance with ITB Clause 11.2, one or more of the following factors as specified in the Bid Data Sheet, and quantified in ITB Clause 25.4:

(a) incidental costs

(b) delivery schedule offered in the bid;

(c) deviations in payment schedule from that specified in the Special

Conditions of Contract;

(d) the cost of components, mandatory spare parts, and service;

(e) the availability in the Purchaser's country of spare parts and after-sales services for the equipment offered in the bid;

(f) the projected operating and maintenance costs during the life of the equipment;

(g) the performance and productivity of the equipment offered; and/or

(h) other specific criteria indicated in the Bid Data Sheet and/or in the Technical Specifications.

25.4 For factors retained in the Bid Data Sheet pursuant to ITB 25.3, one or more of the following quantification methods will be applied, as detailed in the Bid Data Sheet:

(a) Incidental costs provided by the bidder will be added by Purchaser to the delivered duty paid (DDP) price at the final destination.

(b) *Delivery schedule.*

(i) The Purchaser requires that the goods under the Invitation for Bids shall be delivered at the time specified in the Schedule of Requirements which will be treated as the base, a delivery "adjustment" will be calculated for bids by applying a percentage, specified in the Bid Data Sheet, of the DDP price for each week of delay beyond the base, and this will be added to the bid price for evaluation. No Grant shall be given to early delivery.

or

(ii) The goods covered under this invitation are required to be delivered (shipped) within an acceptable range of weeks specified in the Schedule of Requirement. No Grant will be given to earlier deliveries, and bids offering delivery beyond this range will be treated as nonresponsive. Within this acceptable range, an adjustment per week, as specified in the Bid Data Sheet, will be added for evaluation to the bid price of bids offering deliveries later than the earliest delivery period specified in the Schedule of Requirements.

or

(iii) The goods covered under this invitation are required to be delivered in partial shipments, as specified in the Schedule of Requirements. Bids offering deliveries earlier or later

than the specified deliveries will be adjusted in the evaluation by adding to the bid price a factor equal to a percentage, specified in the Bid Data Sheet, of DDP price per week of variation from the specified delivery schedule.

(c) *Deviation in payment schedule.*

(i) Bidders shall state their bid price for the payment schedule outlined in the SCC. Bids will be evaluated on the basis of this base price. Bidders are, however, permitted to state an alternative payment schedule and indicate the reduction in bid price they wish to offer for such alternative payment schedule. The Purchaser may consider the alternative payment schedule offered by the selected Bidder.

or

(ii) The SCC stipulate the payment schedule offered by the Purchaser. If a bid deviates from the schedule and if such deviation is considered acceptable to the Purchaser, the bid will be evaluated by calculating interest earned for any earlier payments involved in the terms outlined in the bid as compared with those stipulated in this invitation, at the rate per annum specified in the Bid Data Sheet.

(d) *Cost of spare parts.*

(i) The list of items and quantities of major assemblies, components, and selected spare parts, likely to be required during the initial period of operation specified in the Bid Data Sheet, is annexed to the Technical Specifications. The total cost of these items, at the unit prices quoted in each bid, will be added to the bid price.

or

(ii) The Purchaser will draw up a list of high-usage and high-value items of components and spare parts, along with estimated quantities of usage in the initial period of operation specified in the Bid Data Sheet. The total cost of these items and quantities will be computed from spare parts unit prices submitted by the Bidder and added to the bid price.

or

(iii) The Purchaser will estimate the cost of spare parts usage in the initial period of operation specified in the Bid Data Sheet, based on information furnished by each Bidder, as well as on past experience of the Purchaser or other purchasers in similar situations. Such costs shall be added to the bid price for evaluation.

(e) *Spare parts and after sales service facilities in the Purchaser's country.*

The cost to the Purchaser of establishing the minimum service facilities and parts inventories, as outlined in the Bid Data Sheet or elsewhere in the bidding documents, if quoted separately, shall be added to the bid price.

(f) *Operating and maintenance costs.*

Since the operating and maintenance costs of the goods under procurement form a major part of the life cycle cost of the equipment, these costs will be evaluated in accordance with the criteria specified in the Bid Data Sheet or in the Technical Specifications.

(g) *Performance and productivity of the equipment.*

(i) Bidders shall state the guaranteed performance or efficiency in response to the Technical Specification. For each drop in the performance or efficiency below the norm of 100, an adjustment for an amount specified in the Bid Data Sheet will be added to the bid price, representing the capitalized cost of additional operating costs over the life of the plant, using the methodology specified in the Bid Data Sheet or in the Technical Specifications.

or

(ii) Goods offered shall have a minimum productivity specified under the relevant provision in the Technical Specifications to be considered responsive. Evaluation shall be based on the cost per unit of the actual productivity of goods offered in the bid, and adjustment will be added to the bid price using the methodology specified in the Bid Data Sheet or in the Technical Specifications.

(h) *Specific additional criteria indicated in the Bid Data Sheet and/or in the Technical Specifications.*

The relevant evaluation method shall be detailed in the Bid Data Sheet and/or in the Technical Specifications.

Alternative 25.4 Merit Point System:

The following merit point system for weighing evaluation factors can be applied if none of the evaluation methods listed in 25.4 above has

been retained in the Bid Data Sheet. The number of points allocated to each factor shall be specified in the Bid Data Sheet.

Evaluated price of the goods	60 to 90
Cost of common list spare parts	0 to 20
Technical features, and maintenance and operating costs	0 to 20
Availability of service and spare parts	0 to 20
Standardization	0 to 20
Total	100

The bid scoring the highest number of points will be deemed to be the lowest evaluated bid.

26. Contacting the Purchaser

26.1 Subject to ITB Clause 23, no Bidder shall contact the Purchaser on any matter relating to its bid, from the time of the bid opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Purchaser, it should do so in writing.

26.2 Any effort by a Bidder to influence the Purchaser in its decisions on bid evaluation, bid comparison, or contract award may result in the rejection of the Bidder's bid.

F. Award of Contract

27. Post-qualification

27.1 In the absence of prequalification, the Purchaser will determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated responsive bid is qualified to perform the contract satisfactorily, in accordance with the criteria listed in ITB Clause 13.3.

27.2 The determination will take into account the Bidder's financial, technical, and production capabilities. It will be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 13.3, as well as such other information as the Purchaser deems necessary and appropriate.

27.3 An affirmative determination will be a prerequisite for award of the contract to the Bidder. A negative determination will result in rejection of the Bidder's bid, in which event the Purchaser will proceed to the next lowest evaluated bid to make a similar determination of that Bidder's capabilities to perform satisfactorily.

28. Award Criteria

28.1 Subject to ITB Clause 30, the Purchaser will award the contract to the successful Bidder whose bid has been determined to be substantially responsive and has been determined to be the lowest evaluated bid, provided further that the Bidder is determined to be qualified to perform the contract satisfactorily.

29. Purchaser's Right to Vary Quantities at Time of Award

29.1 The Purchaser reserves the right at the time of contract award to increase or decrease, by the percentage indicated in the Bid Data Sheet, the quantity of goods and services originally specified in the Schedule of Requirements without any change in unit price or other terms and conditions.

30. Purchaser's Right to Accept any Bid and to Reject any or All Bids

30.1 The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to the affected Bidder or bidders or any obligation to inform the affected Bidder or bidders of the grounds for the Purchaser's action.

31. Notification of Award

31.1 Prior to the expiration of the period of bid validity, the Purchaser will notify the successful Bidder in writing by registered letter or by cable, to be confirmed in writing by registered letter, that its bid has been accepted.

31.2 The notification of award will constitute the formation of the Contract.

31.3 Upon the successful Bidder's furnishing of the performance security pursuant to ITB Clause 33, the Purchaser will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to ITB Clause 15.

32. Signing of Contract

32.1 At the same time as the Purchaser notifies the successful Bidder that its bid has been accepted, the Purchaser will send the Bidder the Contract Form provided in the bidding documents, incorporating all agreements between the parties.

32.2 Within thirty (30) days of receipt of the Contract Form, the successful Bidder shall sign and date the contract and return it to the Purchaser.

33 Performance Security

33.1 Within twenty (20) days of the receipt of notification of award from the Purchaser, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, in the Performance Security Form provided in the bidding documents, or in another form acceptable to the Purchaser.

33.2 Failure of the successful Bidder to comply with the requirement of ITB Clause 32 or ITB Clause 33.1 shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, in which event the Purchaser may make the award to the next lowest evaluated Bidder or call for new bids.

34. Corrupt or Fraudulent Practices

34.1 The Bank requires that Borrowers (including beneficiaries of Bank loans), as well as Bidders/Suppliers/Contractors under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this

policy, the Bank:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
(ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;

(b) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

(c) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a Bank-financed contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Bank-financed contract.

34.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 5.4 and sub-clause 24.1 of the General Conditions of Contract.

Part One - Section II
General Conditions of Contract

Table of Clauses

General Conditions of Contract

1. Definitions

1.1 In this Contract, the following terms shall be interpreted as indicated:

(a) "The Contract" means the agreement entered into between the Purchaser and the Supplier, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

(b) "The Contract Price" means the price payable to the Supplier under the Contract for the full and proper performance of its contractual obligations.

(c) "The Goods" means all of the equipment, machinery, and/or other materials which the Supplier is required to supply to the Purchaser under the Contract.

(d) "The Services" means those services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training, and other such obligations of the Supplier covered under the Contract.

(e) "GCC" means the General Conditions of Contract contained in this section.

(f) "SCC" means the Special Conditions of Contract.

(g) "The Purchaser" means the organization purchasing the Goods, as named in SCC.

(h) "The Purchaser's country" is the country named in SCC.

(i) "The Supplier" means the individual or firm supplying the Goods and Services under this Contract.

(j) "The World Bank" means the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).

(k) "The Project Site," where applicable, means the place or places named in SCC.

(l) "Day" means calendar day.

2. Application

2.1 These General Conditions shall apply to the extent that they are not superseded by provisions of other parts of the Contract.

3. Country of Origin

3.1 All Goods and Services supplied under the Contract shall have their origin in the countries and territories eligible under the rules of the World Bank, as further elaborated in the SCC.

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

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

4. Standards

4.1 The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standards appropriate to the Goods' country of origin. Such standards shall be the latest issued by the concerned institution.

5. Use of Contract Documents and Information; Inspection and Audit by the Bank

5.1 The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

5.2 The Supplier shall not, without the Purchaser's prior written consent, make use of any document or information enumerated in GCC Clause 5.1 except for purposes of performing the Contract.

5.3 Any document, other than the Contract itself, enumerated in GCC Clause 5.1 shall remain the property of the Purchaser and shall be returned (all copies) to the Purchaser on completion of the Supplier's performance under the Contract if so required by the Purchaser.

5.4 The Supplier shall permit the Bank to inspect the Supplier's accounts and records relating to the performance of the Supplier and to have them audited by auditors appointed by the Bank, if so required by the Bank.

6. Patent Rights

6.1 The Supplier shall indemnify the Purchaser against all third-party

claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in the Purchaser's country.

7. Performance Security

7.1 Within twenty (20) days of receipt of the notification of Contract award, the successful Bidder shall furnish to the Purchaser the performance security in the amount specified in SCC.

7.2 The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

7.3 The performance security shall be denominated in the currency of the Contract acceptable to the Purchaser and shall be in one of the following forms:

(a) a bank guarantee or an irrevocable letter of Grant issued by a reputable bank located in the Purchaser's country, in the form provided in the bidding documents or another form acceptable to the Purchaser; or

(b) a cashier's or certified check.

7.4 The performance security will be discharged by the Purchaser and returned to the Supplier not later than thirty (30) days following the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in SCC.

8. Inspections and Tests

8.1 The Purchaser or its representative shall have the right to inspect and/or to test the Goods to confirm their conformity to the Contract specifications at no extra cost to the Purchaser. SCC and the Technical Specifications shall specify what inspections and tests the Purchaser requires and where they are to be conducted. The Purchaser shall notify the Supplier in writing, in a timely manner, of the identity of any representatives retained for these purposes.

8.2 The inspections and tests may be conducted on the premises of the Supplier or its subcontractor(s), at point of delivery, and/or at the Goods' final destination. If conducted on the premises of the Supplier or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser.

8.3 Should any inspected or tested Goods fail to conform to the Specifications, the Purchaser may reject the Goods, and the Supplier shall either replace the rejected Goods or make alterations necessary to

meet specification requirements free of cost to the Purchaser.

8.4 The Purchaser's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival in the Purchaser's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the Purchaser or its representative prior to the Goods' shipment from the country of origin.

8.5 Nothing in GCC Clause 8 shall in any way release the Supplier from any warranty or other obligations under this Contract.

9. Packing

9.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.

9.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the Purchaser.

10. Delivery and Documents

10.1 Delivery of the Goods shall be made by the Supplier in accordance with the terms specified in the Schedule of Requirements. The details of shipping and/or other documents to be furnished by the Supplier are specified in SCC.

10.2 For purposes of the Contract, DDP trade term used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of *Incoterms* published by the International Chamber of Commerce, Paris.

10.3 Documents to be submitted by the Supplier are specified in SCC.

11. Insurance

11.1 The Goods supplied under the Contract shall be delivered duty paid (DDP) under which risk is transferred to the buyer after having been delivered, hence insurance coverage is sellers' responsibility.

12. Transportation

12.1 The Supplier is required under the Contact to transport the Goods to a specified place of destination within the Purchaser's country, transport to such place of destination in the Purchaser's country, including insurance and storage, as shall be specified in the Contract, shall be

arranged by the Supplier, and related costs shall be included in the Contract Price.

13. Incidental Services

13.1 The Supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:

(a) performance or supervision of on-site assembly and/or start-up of the supplied Goods;

(b) furnishing of tools required for assembly and/or maintenance of the supplied Goods;

(c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;

(d) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and

(e) training of the Purchaser's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.

13.2 Prices charged by the Supplier for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged for other parties by the Supplier for similar services.

14. Spare Parts

14.1 As specified in SCC, the Supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the Supplier:

(a) such spare parts as the Purchaser may elect to purchase from the Supplier, provided that this election shall not relieve the Supplier of any warranty obligations under the Contract; and

(b) in the event of termination of production of the spare parts:

(i) advance notification to the Purchaser of the pending termination, in sufficient time to permit the Purchaser to procure needed requirements; and

(ii) following such termination, furnishing at no cost to the Purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

15. Warranty

15.1 The Supplier warrants that the Goods supplied under the Contract are

new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier further warrants that all Goods supplied under this Contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the Purchaser's specifications) or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination.

15.2 This warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the Contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in SCC.

15.3 The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty.

15.4 Upon receipt of such notice, the Supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective Goods or parts thereof, without costs to the Purchaser.

15.5 If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, within a reasonable period, the Purchaser may proceed to take such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

16. Payment

16.1 The method and conditions of payment to be made to the Supplier under this Contract shall be specified in SCC.

16.2 The Supplier's request(s) for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, as appropriate, the Goods delivered and Services performed, and by documents submitted pursuant to GCC Clause 10, and upon fulfillment of other obligations stipulated in the Contract.

16.3 Payments shall be made promptly by the Purchaser, but in no case later than sixty (60) days after submission of an invoice or claim by the Supplier.

16.4 The currency of payment is Pak. Rupees.

17. Prices

17.1 Prices charged by the Supplier for Goods delivered and Services

performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in SCC or in the Purchaser's request for bid validity extension, as the case may be.

18. Change Orders

18.1 The Purchaser may at any time, by a written order given to the Supplier pursuant to GCC Clause 31, make changes within the general scope of the Contract in any one or more of the following:

(a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
(b) the method of shipment or packing;

(c) the place of delivery; and/or

(d) the Services to be provided by the Supplier.

18.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the Purchaser's change order.

19. Contract Amendments

19.1 Subject to GCC Clause 18, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

20. Assignment

20.1 The Supplier shall not assign, in whole or in part, its obligations to perform under this Contract, except with the Purchaser's prior written consent.

21. Subcontracts

21.1 The Supplier shall notify the Purchaser in writing of all subcontracts awarded under this Contract if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the Supplier from any liability or obligation under the Contract.

21.2 Subcontracts must comply with the provisions of GCC Clause 3.

22. Delays in the Supplier's Performance

22.1 Delivery of the Goods and performance of Services shall be made by the Supplier in accordance with the time schedule prescribed by the Purchaser in the Schedule of Requirements.

22.2 If at any time during performance of the Contract, the Supplier or its

subcontractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of Contract.

22.3 Except as provided under GCC Clause 25, a delay by the Supplier in the performance of its delivery obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 23, unless an extension of time is agreed upon pursuant to GCC Clause 22.2 without the application of liquidated damages.

23. Liquidated Damages

23.1 Subject to GCC Clause 25, if the Supplier fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in SCC of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in SCC. Once the maximum is reached, the Purchaser may consider termination of the Contract pursuant to GCC Clause 24.

24. Termination for Default

24.1 The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate this Contract in whole or in part:

(a) if the Supplier fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 22; or

(b) if the Supplier fails to perform any other obligation(s) under the Contract.

(c) if the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this clause:

"corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

"fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition.

24.2 In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 24.1, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

25. Force Majeure

25.1 Notwithstanding the provisions of GCC Clauses 22, 23, and 24, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

25.2 For purposes of this clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

25.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

26. Termination for Insolvency

26.1 The Purchaser may at any time terminate the Contract by giving written notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

27. Termination for Convenience

27.1 The Purchaser, by written notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the

Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

27.2 The Goods that are complete and ready for shipment within thirty (30) days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:

(a) to have any portion completed and delivered at the Contract terms and prices; and/or

(b) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Services and for materials and parts previously procured by the Supplier.

28. Resolution of Disputes

28.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

28.2 If, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Supplier have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified in SCC. These mechanisms may include, but are not restricted to, conciliation mediated by a third party, adjudication in an agreed and/or arbitration.

29. Governing Language

29.1 The Contract shall be written in the language specified in SCC. Subject to GCC Clause 30, the version of the Contract written in the specified language shall govern its interpretation. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in the same language.

30. Applicable Law

30.1 The Contract shall be interpreted in accordance with the laws of the Purchaser's country, unless otherwise specified in SCC.

31. Notices

31.1 Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, telex, or facsimile and confirmed in writing to the other party's address specified in SCC.

31.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

32. Taxes and Duties

32.1 Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Purchaser.

PART TWO (PROCUREMENT SPECIFIC PROVISIONS)

- INVITATION FOR BIDS (IFB)
- BID DATA SHEET (BDS)
- SPECIAL CONDITIONS OF CONTRACT (SCC)
- SCHEDULE OF REQUIREMENTS
- TECHNICAL SPECIFICATIONS
- SAMPLE FORM
- ELIGIBILITY

PART TWO
Section I. Invitation for Bids

BALOCHISTAN INTEGRATED WATER RESOURCES MANAGEMENT & DVELOPMENT PROJECT

INVITATION FOR BIDS (IFB)

Date: 25th November, 2022.
World Bank Credit No.: IDA 58850

1. The **Government of Pakistan** has received credit from International Development Association towards the cost of Balochistan Integrated Water Resources Management and Development Project (BIWRMDP) and intends to apply part of the funds to cover eligible payments under the Contract for Supply of goods for following scheme (Contract):

Sr. No	Name of Scheme & Contract Identification No.	Scope of Supply	Completion Time (Days)
1	Procurement of Goods for Construction of Nimmi Gandacha Water Supply Scheme Solar System and Machinery PK-PMU-BIWRMDP-325884-GO-RFB	Supply & installation of solar system and pumping machinery for tube well	182 days

2. The **Project Director, BIWRMDP** now invites sealed bids from eligible bidders for supply of goods for above mentioned scheme.

3. The Procurement will be conducted through **National Competitive Bidding (NCB) method** as specified in the World Bank's Guidelines: Procurement of Goods, Works and Non-consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers dated January 2011 revised July 2014 ("Procurement Guidelines") and is open to all bidders from eligible source countries as defined in the Procurement Guidelines. In addition, please refer to paragraphs 1.6 and 1.7 setting forth the World Bank's policy on conflict of interest.

4. Interested eligible bidders may obtain further information from **Office of the Project Director, Balochistan Integrated Water Resources Management and Development Project** (BIWRMDP) at the address given below.

5. A complete set of bidding documents in English may be purchased by interested eligible bidders upon submission of a written application to the address below and upon payment of a nonrefundable fee of Rs. 3000 for each set of each scheme. The method of payment will be submission of Green Challan at National Bank of Pakistan in head of Account C03434. The document may be collected in person. Additional Charges of Rs. 500 for each set will be payable if the documents are required through courier.

6. A pre-bid conference will be held on 12th December 2022 at 12:00 noon for helping bidder to submit bids free of errors and to respond their queries. Any questions/queries may be also delivered in writing, at least 10 days before the deadline for submission of bids, at the Office of the Project Director, BIWRMDP at the address given below.

7. Bids must be delivered to the address below on or before **12:00 hours of 26th December, 2022** at which time they will be opened publicly in the presence of the bidders' designated representatives and anyone who chooses to attend at the address below. Electronic bidding will not be permitted. Late bids will be rejected.

8. Bids shall be valid for a period of **91 days** after Bid opening and must be accompanied by security of **2%** of the Bid Price.

9. All bidders shall be required to submit with their bids, qualification information specified in the bidding documents. This information shall be used to establish through post-qualification whether the bidder is qualified to supply.

10. Bids are required to be submitted on item rate basis (not on the basis of Composite Schedule of Rates with percentage premium) and the rates and amounts (in Rupees) must be filled by the bidder for each item in the Bill of Quantities and provide a total price. Non-compliance may result in rejection of bid. Bidders should give their best and final price in their bids as no negotiations are expected.

11. As provided in the bidding documents, bidders engaged in corrupt or fraudulent practices (including collusion/pooling) will be declared ineligible, either in indefinitely or for a stated period of time, to be awarded a contract financed by the World Bank.

12. The address(es) referred to above is:
Office of Project Director, Balochistan Integrated
Water Resources Management & Development Project
18-B, Jinnah Town Samungli Road Quetta.
Attn: Mr. Barkatulah, Project Director
Tel: 081-2870705
Fax: 081-2870704
E-mail: bssip@yahoo.com
Web site: biwrmdp.org.pk

Section II
Bid Data Sheet

Bid Data Sheet

The following specific data for the goods to be procured shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITB) Part One. Whenever there is a conflict, the provisions herein shall prevail over those in ITB.

Introduction		
ITB 1.1	Name of Borrower	The Borrower is: Islamic Republic of Pakistan Credit Number 5880-PK. Loan or Financing Agreement amount: 110 Million USD (United State Dollar) and a portion of the funds shall be applied to eligible payments under the contract for which these Bidding Documents are issued.
ITB 1.1	Loan Number	IDA 58850
ITB 1.1	Name of Project	Balochistan Integrated Water Resources Management and Development Project.
ITB 1.1	Name of Contract	**Procurement of Goods for Construction of Nimmi and Gandacha Water Supply Scheme – Solar System and Machinery** **PK-PMU-BIWRMDP-325884-GO-RFB**
ITB 2	Eligible Bidders	A list of firms debarred from participating in World Bank projects is available at http://www.worldbank.org/debarr
ITB 4.1	Name of Purchaser	Project Director, Balochistan Integrated Water Resources Management and Development Project.
ITB 6.1	Purchaser's Address for clarification of Bidding Documents	**Project Director, Balochistan Integrated Water Resources Management and Development Project.** Street Address: **18-B, Jinnah Town** Floor/ Room number: Not Applicable City: **Quetta** ZIP Code: **87300** Country**: Pakistan** Telephone: **+92-81-2870705** Facsimile: **+92-81-2870704** Electronic mail address: **bssip@yahoo.com** Requests for clarification should be received by the Purchaser no later than 10 days prior to the deadline for bid submission. Clarification shall be in the form of hard copy letter. The clarification shall be sent also by fax or preferably as a scan of the letter attached to an email.
ITB 8.1	Language of the Bid	The language of the bid is: English. All correspondence exchange shall be in English language. Language for translation of supporting documents and printed literature is English.
ITB 9	Additional Requirements	The Bidder shall submit the following additional documents in its bid: 1. The certification by the manufacturer that the equipment is brand new, latest and suitable for outdoor applications having ISO (International Standards Organization) Certification, CE (European Conformity) or equivalent, quality assurance certificates and references. 2. The equipment literature, catalogues/brochures and operating manuals, servicing and maintenance of each sub system including all block diagrams and detailed circuit diagrams.

		3. Brand names/manufacturers represented. 4. Schedule of Technical Data for each item of the equipment. 5. Compliance/Non-Compliance Statement: The bidder shall submit a detailed item-wise compliances/non-compliance statement referring Para- wise to the requirements given in this document. In case the original brochures do not contain the description of any of the specification, it shall be supported by a compliance undertaking by the manufacturer. Make and models of all the equipment should be given. Compliance/noncompliance statement shall be submitted with hard and soft copy.
Bid Price and Currency		
ITB 11.2	List of incidental services	Incidental services to be provided are: - (i) Installation of Hardware including any charges incurred in ware housing and accessories. (ii) Operational including emergency and routine maintenance training to Purchaser's staff.
ITB 11.5	Price shall be	Fixed
Preparation and Submission of Bids		
ITB 13.3 (d)	Qualification requirements.	For a bidder to be considered qualified, it should meet the following requirements: **a) Financial Capability** The Bidder must meet the following financial requirement(s): ▪ Bidder must have liquid assets or credit line facility amounting to Rs. 8.7 million. **b) Experience and Technical Capacity** The Bidder must meet the following experience requirement(s): ▪ Bidder must have executed at least 03 years of experience as supplier of goods. ▪ The bidder can be a supplier or a manufacturer. In case the bidder is a manufacturer, the bidder must have manufactured, tested and supplied the goods, similar to the type specified in the "Specification and Standards" up to at least 100% of the quantity indicated in Bill of Quantities in last three (3) years. Further, the bidder should be in continuous business of manufacturing products similar to that specified in the Specification and Standards during the last Three (3) years prior to bid opening. In case the bidder is not the manufacturer or producer of the goods it offers to supply and has submitted the bid in accordance with ITB clause 13.3 (a), the bidder shall include the above information about the manufacturer whose goods have been offered. ▪ The bidder who is a manufacturer or manufacturer who provided authorization to the bidder should furnish a brief write-up, backed with adequate data, explaining his available capacity and experience (both technical and commercial) for the manufacture and supply of the required goods within specified time of completion after meeting all their current commitments.

		▪ The bidder(s) must submit manufacturer's authorization on the format provided in Section VI of the bidding documents with his bid w.r.t to each item they shall offer in their bid. ▪ The bidder must be registered with local tax authorities. ▪ Training Material (operators manual etc.) and Training Professionals must be available with Bidder.
ITB 14.3b	Spare Parts	Spare parts required for **10** years of operations
ITB 15.1	Amount of bid security	The amount of Bid Security shall be minimum ***2%*** of the Bid Value in the form of an unconditional Bank Guarantee issued by a Scheduled Bank of Pakistan in local currency. Bid Security shall be valid for 28 (Twenty-Eight) days beyond the validity of the bid.
ITB 16.1	Bid Validity	The bid validity period shall be 91 days.
ITB 17.1	No. of copies.	One original & One additional Copy.
ITB 18.2 (a)	Address for bid submission.	Attention: **Project Director, Balochistan Integrated Water Resources Management and Development Project.** Street Address: **18-B, Jinnah Town** Floor/ Room number: Not Applicable City: **Quetta** ZIP Code: **87300** Country**: Pakistan** Telephone: **+92-81-2870705** Facsimile: **+92-81-2870704**
ITB 18.2 (b)	IFB title and number.	IFB Title: **Procurement of Goods for Construction of Nimmi and Gandacha Water Supply Scheme – Solar System and Machinery** IFB No. **PK-PMU-BIWRMDP-325884-GO-RFB**
ITB 19.1	Bid submission. deadline	**12:00 hours on 26th December 2022.**
ITB 22.1	Time, date, and place for bid opening.	**12:30 hours on 26h December 2022** at **Project Director, Balochistan Integrated Water Resources Management and Development Project.** Street Address: **18-B, Jinnah Town** Floor/ Room number: Not Applicable City: **Quetta** ZIP Code: **87300** Country**: Pakistan** Telephone: **+92-81-2870705** Facsimile: **+92-81-287070**
Bid Evaluation		
ITB 25.3	Criteria for bid evaluation.	Evaluation will be done on the basis of lowest evaluated responsive bid considering all BoQ items and 100% of the required quantity. A bidder has to quote one rate only. No alternate model or separate accessories will be accepted. Following provisions shall also apply: **a) Incidental costs:** These, if quoted separately by bidders shall be added to total bid price while determining lowest evaluated bidder.

		b) Delivery schedule: If a bidder offers delayed delivery schedule, its bid will be rejected. No grants shall be given for early deliveries. **c) Deviation in payment schedule:** The Purchaser may consider the alternative payment schedule offered by the selected Bidder. However, if the alternate payment schedule was not acceptable to Purchaser, bid shall be rejected. **d) Cost of spare parts:** This factor shall not be considered. **e) Spare parts and after sales service facilities in the Purchaser's country:** These should be available in purchaser's country. Bid will be liable rejection upon non-compliance. **f) Operating and maintenance costs:** This factor shall not be considered. **g) Performance and productivity of the equipment:** The goods must meet requirements illustrated in Technical Specifications. Non-compliance may result in rejection of bid.
Contract Award		
ITB 29.1	Percentage for quantity increase or decrease	The maximum percentage by which quantities may be increased is: 15% The maximum percentage by which quantities may be decreased is: 15%

Section III
Special Conditions of Contract

Table of Clauses

Special Conditions of Contract

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the GCC is indicated in parentheses.

1. Definitions (GCC Clause 1)

GCC 1.1 (g)—**The Purchaser is:** The Project Director, Balochistan Integrated Water Resources Management & Development Project.

GCC 1.1 (h)—**The Purchaser's country is:** Islamic Republic of Pakistan.

GCC 1.1 (k)—**The Project Site is:** The final destinations are:
(i) Village Gandacha, (ii) Village Langro and (iii) Village Kundi (Usman and Jani Goth).
All the villages are located in District Lasbela, Province Balochistan

2. Country of Origin (GCC Clause 3)

All countries and territories as indicated in Part Two Section VII of the bidding documents, "Eligibility for the Provisions of Goods, Works, and Services in Bank-Financed Procurement".

3. Performance Security (GCC Clause 7)

GCC 7.1—The amount of performance security, as a percentage of the Contract Price, shall be: 5 % in shape of unconditional & irrevocable Bank Guarantee from any schedule Bank of Pakistan as per the format provided in these Bidding Documents.

GCC 7.3 (b) – Deleted

GCC 7.4—After delivery and acceptance of the supplies, the performance security of 5% shall be kept by the Purchaser to cover the Supplier's warranty obligations in accordance with Clause GCC 15.2. The Bank Guarantee against performance security will be released upon expiry of the Warranty Period.

4. Inspections and Tests (GCC Clause 8)

GCC 8.1—**Inspection and tests prior to shipment of Goods and at final acceptance are as follows:** These are listed in Section V Technical Specifications. However, purchaser reserves the right to ask for any test(s) other than the listed ones.

5. Packing (GCC Clause 9)

GCC 9.2—The bidder shall deliver the supplies at the destination in scratch less condition within the manufacturer supplied packing and manufacturer's manuals, booklets, accessories etc. Manufacturer's original Operating Manual must be provided.

6. Delivery and Documents (GCC Clause 10)

GCC 10.3—Upon shipment, the Supplier shall notify the Purchaser the full details of the shipment, including Contract number, description of Goods, quantity and usual transport document. The Supplier shall mail the following documents to the Purchaser:

(i) copies of the Supplier's invoice showing Goods' description, quantity, unit price, and total amount;

(ii) original and two copies of the usual transport document (for example, a negotiable bill of lading, a non-negotiable sea waybill, an inland waterway document, an air waybill, a railway consignment note if the Supplier is importing items for supplying to Programme or a road consignment note, or a multimodal transport document, if applicable any) which the buyer may require to take the goods;

(iii) Manufacturers or Supplier's warranty certificate;

(iv) Manufacturer's inspection certificate issued by the manufacturer.

(v) Delivery inspection certificate.

(vi) Export License

(vii) Electronic Export Information Filing

(viii) Commercial Invoice

(ix) Certificate of Origin

(x) Insurance Certificate

(xi) Export Packing List

(xii) Any other document as required by the Purchaser

7. Insurance (GCC Clause 11)

GCC 11.1— The Goods supplied under the Contract shall be delivered duty paid (DDP) under which risk is transferred to the buyer after having been delivered, hence insurance coverage is sellers' responsibility. Since the Insurance is seller's responsibility, they may arrange appropriate coverage but Programme shall require no documentation.

8. Incidental Services (GCC Clause 13)

CC 13.1 – Incidental services to be provided are: -

(i) Installation of Hardware and
(ii) Operational including emergency and routine maintenance training to Purchaser's staff.

CC 13.2 – The bidder shall include the price of incidental services in its bid. The purchaser shall not pay any amount separately on account of incidental services if not included in the contract price.

9. Warranty (GCC Clause 15)

GCC 15.2—In partial modification of the provisions, the warranty period of the supplied Hardware shall be the 12 months from date of acceptance of the supplies. The Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the Contract. If, for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall, at its discretion, either:

(a) Make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests in accordance with SCC 4,

or

(b) Pay liquidated damages to the Purchaser with respect to the failure to meet the contractual guarantees. The rate of these liquidated damages shall be 0.5 % per week up-to maximum 10 % of the total price.

GCC 15.4 & 15.5—**The period for correction of defects in the warranty period is** 30 (Thirty) days.

10. Payment (GCC Clause 16)

GCC 16.1—The method and conditions of payment to be made to the Supplier under this Contract shall be as follows:

Payment for Goods supplied:

Payment for Goods supplied shall be made in Pak Rupees as per following schedule:

(i) **Advance Payment:** Ten (10) percent of the Contract Price of Goods shall be paid to the Supplier within thirty (30) days of signing of the Contract against a receipt of invoice and an unconditional bank guarantee valid until delivery date for the equivalent amount and in the form provided in the bidding documents or another form acceptable to the Purchaser. If advance payment is not availed by the Supplier, this 10% amount shall be due to be paid on delivery. A Bank Guarantee will not be required in that case.

(ii) **On Delivery:** Forty (40) percent of the Contract Price of Goods shall be paid on receipt of the Goods at respective installation sites and upon submission of the documents specified in GCC Clause 11.

(iii) **On Installation:** Twenty-five (25) percent of the Contract Price of Goods shall be paid to the Supplier on Installation of the equipment at respective sites.

(iv) **On Acceptance:** Fifteen (15) percent of the Contract Price of Goods shall be paid to the Supplier within thirty (30) days after the date of the acceptance certificate for the respective delivery issued by the Purchaser.

(v) **On Completion of Defect Liability Period**: Remaining Ten (10) percent of the Contract Price of Goods shall be paid to the Supplier within 30 days after the expiry date of completion of the Defect Liability Period (Warranty Period).

All applicable taxes shall be deducted at source as per applicable taxation laws, while making the payments.

Payment for Related Services:
Payment for Related Services shall be made in Pak Rupees as per following schedule:

(i) **On Delivery:** Ninety percent (90%) payment of Contract Price of Related Services shall be paid on successful installation, testing and commissioning of the supplied goods after issuance of joint inspection certificate by the inspection committee constituted by the Purchaser and upon submission of the documents specified in GCC Clause 13.

(ii) **On Acceptance:** Remaining Ten (10) percent of the Contract Price of Related Services shall be paid to the Supplier within 30 days after the expiry date of completion of the Defect Liability Period (Warranty Period).

All applicable taxes shall be deducted at source as per applicable taxation laws, while making the payments.

11. Prices (GCC Clause 17)

GCC 17.1—**Prices shall be:** Fixed, will not be subject to any variation at any stage of bidding and/or supply & installation.

12. Liquidated Damages (GCC Clause 23)

GCC 23.1—**Applicable rate:** Applicable rates shall not exceed one half (0.5) % per week and the maximum shall not exceed 10 % of the contract price.

13. Resolution of Disputes (GCC Clause 28)

GCC 28.3—**The dispute resolution mechanism to be applied pursuant to GCC Clause 28.2 shall be as follows:**

In the case of a dispute between the Purchaser and the Supplier, the dispute shall be referred to adjudication or arbitration in accordance with the laws of the Islamic Republic of Pakistan.

14. Governing Language (GCC Clause 29)

GCC 29.1—**The Governing Language shall be:** English.

15. Applicable Law (GCC Clause 30)

GCC 30.1—The Contract shall be interpreted in accordance with the laws of Islamic Republic of Pakistan which includes the following legislation**:**

The Employment of Children (ECA) Act 1991
The Bonded Labour System (Abolition) Act of 1992
The Factories Act 1934

The Secretary, Department of Law, Justice and Human Rights or his nominees shall act as the sole arbitrator.

16. Notices (GCC Clause 31)

GCC 31.1—**Purchaser's address for notice purposes:**

Attention: **Project Director, Balochistan Integrated Water Resources Management and Development Project.**

Street Address: **18-B, Jinnah Town, Samungli Road Quetta.**
Floor/ Room number*:* Not Applicable
City: **Quetta**
Post Code: **87300**
Country: **Pakistan**
Telephone: **+92-81-2870705**
Facsimile number: **+92-81-2870704**
Electronic mail address*:* **bssip@yahoo.com**

—Supplier's address for notice purposes:

Section IV
Schedule of Requirements

1. List of Goods and Delivery Schedule

Line Item No	Description of Goods	Qty	Physical unit	Final (Project Site) Destination	Delivery Date		
					Earliest Delivery Date following the date of effectiveness the Contract	**Latest Delivery Date** following the date of effectiveness the Contract	**Bidder's offered Delivery date [*to be provided by the bidder*]**
A	***B***	***C***	***D***	***E***	***F***	***G***	***H***
1.1 to 1.13	Delivery of PV modules with mounting accessories, submersible pump, solar panel, battery with charger, earthing system with accessories, etc. wiring, fans and light, valves, energy meter and other related items complete according to price schedule and specifications.	As defined in Price Schedule	Per Site	Village Gandacha	90 days	182 days	
1.14 to 1.26	Delivery of PV modules with mounting accessories, submersible pump, solar panel, battery with charger, earthing system with accessories, etc. wiring, fans and light, valves, energy meter and other related items complete according to price schedule and specifications.	As defined in Price Schedule	Per Site	Village Langro	90 days	182 days	
1.27 to 1.39	Delivery of PV modules with mounting accessories, submersible pump, solar panel, battery with charger, earthing system with accessories, etc. wiring, fans and light, valves, energy meter and other related items complete according to price schedule and specifications.	As defined in Price Schedule	Per Site	Village Kundi (Jani Goth and Usman Goth)	90 days	182 days	

2. List of Related Services and Completion Schedule

Service No.	Description of Service	Quantity	Physical Unit	Place where Services shall be performed	Final Completion Date(s) of Services
1.	Submission of detailed design report including all detailed design features of Supplier's proposed Solar System with mounting accessories, Submersible motor-pump sets and earthing system as per requirements of the contract.	As per Specifications	All Sites Combine	To be submitted to the Purchaser	30 & 45 days respectively after effective date for draft and final design reports
2.	Establishment of necessary management facilities, physical facilities for installation services, and trained staffing for Installation Services	As per requirements	All Sites Combine	As per Requirements	As per requirements
3.	Complete Installation, erection and Related Services of Solar System, Submersible Pump, Earthing Protection System etc. complete in all respect according to specifications.	As per Price Schedules & Specifications	Per Site	Village Gandacha as shown in Drawing.	182 days after effective date
4.	Complete Installation, erection and Related Services of Solar System, Submersible Pump, Earthing Protection System, etc. complete in all respect according to specifications.	As per Price Schedules & Specifications	Per Site	Village Langro as shown in Drawing.	182 days after effective date
5.	Complete Installation, erection and Related Services of Solar System, Submersible Pump, Earthing Protection System, etc. complete in all respect according to specifications.	As per Price Schedules & Specifications	Per Site	Village Kundi Usman Goth as shown in Drawing.	182 days after effective date
6.	Defect identification and removal by the Supplier during the Defect Notification Period (Warranty Period).	As per Price Schedules & Specifications	All Sites Combine	As per Specifications	One year after final completion date

Section V.
Technical Specifications

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PART 1 - SPECIAL PROVISIONS

PART II - SOLAR POWER SYSTEM

PART III - PUMPING EQUIPMENT AT PUMPHOUSE

TECHNICAL SPECIFICATIONS

PART I - SPECIAL PROVISIONS

1 General

1.1 The Requirement

It is required to supply machinery and equipment and complete related services such as design, installation, erection, testing, commissioning and maintenance in accordance with the stipulated Conditions of the Contract, and this technical specification (special and technical provisions) and the drawings under the Contract for Procurement of Goods for the Construction of Nimmi Gundacha Water Supply Scheme.

All matters omitted from the documents, which may be inferred to the supplies and related services shall be deemed to be included.

The whole of the machinery, equipment, apparatus and structures shall be arranged generally as shown as on the Drawings and in accordance with the specification

The rating given is estimated only and the Supplier shall ensure that all equipment being supplied is adequately rated to meet the requirements of the specification and the duties thereon.

The Supplier shall supply complete Machinery and Equipment including solar panels, battery backup, turbine pumps, motors, motor control panels, spare parts and other to complete the job including operation and maintenance equipment to be provided as specified.

1.2 Location

The Project area is situated in Gandacha and Nimmi, District Lasbela, Province Balochistan of Pakistan. The Supplier shall be responsible for the supply of machinery and equipment and execute related services at the following location of district Lasbela;

- Village Gandacha
- Village Langro and
- Village Kundi (Usman Goth)

1.3 Contract Packages

The complete scope of work of the Nimmi Gundacha Water Supply Scheme is divided in following Contracts. The minimum but not limited scope of works and responsibilities of the Supplier are described below.

Contract for Procurement of Civil Works for Construction of Nimmi Gundacha Water Supply Scheme (Already Awarded)

The following Civil Works are covered in the above Contract:

Works at Gandacha

- Construction of boundary wall fencing
- Construction of Pump House (*Excluding Solar Pumping Equipment)*
- Construction of surface water tank 20000 gallons – (1 nos)
- Construction of surface water tank 3000 gallons – (4 nos)
- Development of tube well by drilling bore (400 ft) 122 m of 22" dia
- Laying and Fixing of HPDE pipe line *(Excluding supply and installation of HPDE Pipelines)*
- Construction of Tap Stands for Public – (19 nos)
- Repair and Maintenance of Existing Water Tanks Public – (5 nos)

Works at Nimmi

1) Works at Langro

- Construction of surface reservoir (20,000 gallons) – (1 nos)
- Construction of surface reservoir (3,000 gallons) – (2 nos)
- Construction of boundary wall fencing
- Construction of pump house *(Excluding Solar Pumping Equipment)*
- Development of tube well by drilling bore (400 ft) 122 m of 22" dia
- Laying and installation of HDPE pipeline *(Excluding supply and installation of HPDE Pipelines)*
- Construction of Tap Stands for Public – (15 nos)

2) Works at Kundi (Usman Goth)

- Construction of boundary wall fencing
- Construction of pump house **(optional)** (*Excluding Solar Pumping Equipment)*
- Construction of surface water tank 3000 gallons – (1 nos)
- Development of tube well by drilling bore (400 ft) 122 m of 22" dia

3) Works at Kundi (Jani Goth)

- Construction of surface water tank 3000 gallons – (1 nos)

Contract for Procurement of Goods for Construction of Nimmi and Gandacha Water Supply Scheme – Solar System and Machinery (this Contract)

The Contractor for Civil Works shall firstly carry out the activities related to the development of bore holes, construction of pump house including electrical works for lighting and other general purposes. The Supplier shall then supply and install the equipment for solar power system and pumping machinery. The Supplier shall keep close liaison with the Purchaser and Contractor for Civil Works in order to prepare an agreed program for the supply of machinery & equipment and execution of the related services. The Supplier shall not bring the machinery and plant at the Site before prior approval

of the Purchaser. No extra payment shall be made to the Supplier on account of storage, damage, lost and or security of the equipment.

2 Climate

The Supplier shall be deemed to have taken into account all possible weather conditions when preparing his Tenders and his program of Works, and he will not be entitled to any additional payments whatsoever as a result of meteorological phenomena.

The Supplier shall make suitable arrangements to protect the Goods, Temporary Works, Constructional Plant and materials stored on site against the effects of the weather.

No work will be performed by the Supplier when in the opinion of the Purchaser such work is liable to be affected by the weather. The Supplier shall not be entitled to any additional payment on account of loss alleged to have been sustained as a result of the Purchaser declining to permit such work to start or to continue or ordering any work which has been affected by the weather to be removed, and re-executed, or made good.

3 Site Description

The site will include public and private roads, alleyways and lands and shall mean the minimum extent of each such public and private lands as in the opinion of the Purchaser is necessary or practicable for the supply of goods and related services.

The Supplier shall make records to be agreed by the Purchaser of the condition of the surfaces of the Site immediately before entering upon them for the purpose of execution of the supplies and related services.

3.1 Site in Public and Private Land

The Purchaser will serve the necessary notices to permit installation to be laid in public and private lands in accordance with the agreed program of work and the Supplier shall not enter on those lands until given permission by the Purchaser. The Supplier shall temporarily fence the Site where the supplies and related services are to be or are being rendered to the satisfaction of the Purchaser and the Supplier shall confine all the works plant, labour, materials and transport within the Site so fenced. The Supplier shall use the Site only for the supply of Goods and execution of the related services.

3.2 Right of Way

Right of way shall be the area (s) allocated to the Supplier to enable execution of the Supplies and related services in accordance with the Contract. Due to physical statutory other special conditions the working width of Right of Way may be restricted (including restricted access to working sites). The Supplier is deemed to have included in Contract Price all costs encountered for complying with such restrictions.

In general, the maximum working width (Right of Way) for any section of pipeline work in agricultural land, garden, etc shall be not more than 6 meters. For isolated compact sites an all around width of 12m beyond the net sizes of the units will allowed, unless the area is otherwise defined by the Purchaser.

In case the Supplier requires areas outside the allocated Right of Way he may, with the prior agreement of the Purchaser, negotiate these on his own behalf and shall be responsible for all costs involved and for the restatement after completion of permanent work.

All fences, walls structures, buildings, etc affected by the Supplier's work shall be reinstated to the satisfaction of the owner and the Purchaser.

3.3 Security of the Works & Persons

Watching and security of the Goods shall be provided by the Supplier at his own expense. If the Purchaser considers it necessary, he will order in writing that additional watchmen be provided all at the Supplier's expense to ensure proper security of Goods and persons associated with the project.

The Supplier shall provide to the Goods and Installations an adequately supported temporary screen or fence in accordance with local bye-laws and to the approval of the Purchaser.

All excavation shall be adequately lit at night complete with hazard warning lights to pedestrians and traffic in accordance with applicable Traffic Police Regulations.

Unfenced openings and surface obstructions shall be attended by days and night and shall be adequately lit at night.

3.4 Closing of Roads

The Supplier shall not close any road unless the Authority having charge of the road surfaces shall have previously given the appropriate notice or made the appropriate order and without the Supplier having first obtained the written consent of the Police and of the said Authority to close the same. In the event of such consent being refused the Supplier shall have no claim for any additional payment. In the event of such consent being given the Supplier shall give warning in advance of the date of the commencement of the road closure to all Statutory Local or other Authorities and public service undertakers as may be affected by such closure and shall provide fix and maintain all warning signs and diversion notices as may be required by the said Authority, by the Police and by the Purchaser.

3.5 Roads and Site to be kept Clean

The Supplier shall take great care and all reasonable precautions to ensure that roads and thoroughfares used by him either for the construction of the Works or for the transport of plant, labour and material are not made dirty as a result of such construction or transport and in the event of their becoming thus dirtied in the opinion of the Purchaser the Supplier shall take all necessary and immediate steps to clean them.

Each individual site must be kept clean during the work and must be thoroughly cleaned up on completion.

4. Codes and Specifications

Material, equipment and workmanship shall conform with all applicable British Standards, or such other standards as may be specified herein or approved by the Purchaser.

If the Supplier proposes the use of alternative standards, he shall allow sufficient time for the Purchaser to check such standards and for carrying out any tests as directed by the Purchaser in order to confirm that materials and equipment to be supplied under alternative standards are of equivalent standard. No claim for testing expenses and for delays arising as a result of time required for carrying out such tests will be accepted.

Whenever requested by the Purchaser, in writing, the Supplier shall procure and provide to the Purchaser two English copies of any standards used in the Supply, Installation, commissioning, testing of equipment.

5. Setting Out of Works

It shall be the Supplier's responsibility to obtain from the Purchaser before commencing the installation work co-ordinates and levels of setting out points, which have already been established by the Purchaser. The Supplier shall use these to establish additional temporary bench marks as necessary throughout the project area. These shall be of a form approved by the Purchaser and maintained until the completion of related services.
The Supplier shall be responsible for the setting out of the installation works. All dimensions and levels shown on the drawings or referred to in any document forming part of the Contract shall be verified by the Supplier on Site. He shall be responsible for pointing out promptly any discrepancy or error in such dimensions or levels.

The Supplier shall prepare detailed setting out drawings and data sheets as necessary and submit them to the Purchaser or his Representative for approval. Any modification of these drawings or data sheets required by the Purchaser shall be made by the Supplier and resubmitted for final approval.

6. Water Supply (Temporary)

The Supplier shall provide at his own expense a temporary supply of potable and other water required, for execution, installation, testing and related services. He shall provide, operate and maintain the supply throughout the duration of the Contract. Quality of water shall be to the satisfaction of the Purchaser.

7. Electricity Supply for Power and Lighting (Temporary)

The Supplier shall arrange for and pay all costs in connection with the temporary supply of electricity he may need for the duration of the Contract. If the Supplier intends to provide his own electricity

supply, the regulations of the Pakistan WAPDA are to be observed and the permission of this Authority is to be obtained.

8. Other Services

The Supplier shall make his own arrangements for and shall provide and pay for any services required during the duration of the Contract.

9. Site Conditions

Where pipelines are to be laid close to public highways, the Supplier shall ensure that installations are properly protected at all times, including the provision of day and night traffic signals when necessary.

10. Working Hours

The Supplier shall perform his work only during the standard working hours on construction sites which are 48 hours, distributed over 6 days per weeks, except on holidays.

Should the Supplier wish to carry out works outside normal working hours or on Sunday and public holidays; he shall comply with related requirements and shall do so only after the Supplier has given the Purchaser at least 48 hours notice in writing.

11. Materials

11.1 Quality of Materials and Workmanship

All materials and equipment to be used in the supplies shall be new and of the required specifications. The workmanship shall also be of the specified quality, all to the approval of the Purchaser.

11.2 Approval of Suppliers of Materials

Before entering into any sub-Contract for the supply of any materials or goods the Supplier shall obtain the Purchaser's approval in writing of the sub-supplier from whom he proposes to obtain such materials or goods. Should the Purchaser at any time be dissatisfied with such materials or goods or with the methods of operation carried out at such sub-supplier's works or place of business, he shall be empowered to cancel his previously given approval of such sub-supplier and to specify and other suppliers whom he may choose or to approve another sub-supplier for the supply of such materials or goods. The Supplier shall then obtain the said materials or goods from such other supplier and shall bear any additional cost thereof.

11.3 Copies of Orders

The Supplier shall provide the Purchaser with three copies of all orders for the Supply of materials and goods required for the Contract.

11.4 Samples

In addition to specific provisions in the Specifications for sampling and testing of materials, the Supplier shall submit to the Purchaser, as he may require, samples of all materials which he proposes to use under the Contract. When approved, these will be retained by the Purchaser.

Samples to be submitted shall be accompanied by an approved form on which all information about specifications, description, location of use, manufacturers etc. are stated.

The Supplier is advised to submit a "Materials Procurement Program" for all materials and equipment which are deemed to be used in the permanent works indicating dates for sampling, approval, ordering, delivering to site.

The Purchaser may reject any materials or goods, which in his opinion are inferior, to the samples submitted.
The Purchaser's approval of manufacturers or materials for the Goods, whenever required by the Specifications, shall not relieve the Supplier of his responsibilities under the Contract.

11.5 Tests

The Purchaser may examine and may require testing of any materials or goods to be supplied at any place inside or outside Pakistan. The Supplier shall give the Purchaser unrestricted access to his and his Sub-supplier's premises and suppliers for such purposes at all times.

The Supplier shall afford the Purchaser all facilities, assistance, labour and appliances necessary for the convenient examination, testing, weighing or analysis of all materials and goods. The Supplier shall prepare test samples, which the Purchaser may require.

Tests carried out off the site shall not relieve the Supplier of the responsibility of ensuring that the materials pass any required tests when they are incorporated in the Equipment.

The costs of all tests prescribed in the Specifications are to be borne by the Supplier and are deemed to be included in his contract prices. The costs for any additional tests required by the Purchaser shall be borne by the Purchaser.

11.6 Test Certificates

The Supplier shall obtain Test Certificates from his supplier and forward three copies of such certificates to the Purchaser. Such certificates shall certify that the material or goods have been tested in accordance with the Specifications and British Standards, and shall give the results of the tests which have been carried out. As regards the major project equipment the Supplier shall ensure that the tests are carried out in the presence of the Purchaser's representative.

The Supplier shall provide adequate means on site to identify the materials or goods with their respective test certificates.

12. Pollution of Drains and Waterways

The Supplier shall take all necessary precautions to secure the efficient protection of all waterways against pollution including spillage of oil or concrete mixer wastes, site drainage or any other harmful materials. The Supplier shall seek the Purchaser's approval before discharging any substance that may degrade groundwater quality. If nevertheless, such spillage occurs, the Supplier shall clean the waterway at his own expenses, and keep the Purchaser indemnified against any claim arising from such pollution during the execution of the Supplies and Related Services and the Period of Maintenance.

13 Damage to Services

The Supplier will be held responsible and shall pay all costs related to damages to private property or roads, bridges, irrigation ditches, mains, pipes, electric cables, lines or services of any kind caused by him or any of his sub-suppliers during the execution of the Contract.

The Supplier shall make good or arrange to make good at his own expense any damage without delay, and shall carry out any further remedial work ordered by the Purchaser.

The Supplier shall make good at his own expenses any damage without delay to the pipes during the installation works. Lining should be repaired according to manufactures instructions.

14 Drawings

14.1 Bid Drawings

Drawings provided with the Biddings Documents are Bid drawings. Bid Drawings show the scope of the work to be performed by the Supplier. The Bid Drawings shall not be used as a basis for fabrication or installation but may be used as a basis for placing preliminary orders for materials, subject to corrections based on the future issue of drawings issued for Construction. Any other drawings if issued through Addenda, before opening of Bids, shall be part of the Bid Drawings.

Copies of Contract Drawings, Construction Drawings and Specifications

One complete set of Contracts Documents, Construction Drawings and Specifications will be issued to the Supplier free of charge. The Supplier may make further copies to suit to his requirements.

15 Working Drawings

The Supplier shall incorporate in the drawings all openings, ducts, recesses, anchor holes, etc. as required for the mechanical and electrical installations. All related costs are considered included in the Contract Price.

The title block shall be as on the Tender Drawings. And shall show in addition the Supplier's name and the descriptive name of the Works shown on the drawing. Materials and material Standards shall be indicated on the drawings.

Drawings from Sub-Suppliers shall be checked signed and stamped by the Supplier being forwarded to the Purchaser, who shall deal in all respects only with the Supplier.

When the Purchaser or his representative approves a Working Drawings, he shall return a copy marked "Approved" to the Supplier, who shall then insert the date of approval on the tracing and furnish the purchaser with three prints of the working drawings as approved.

Approval of a working drawing by the Purchaser will only signify his general approval of the design and shall not make him liable for any error of the Supplier in details or lack of strength or efficiency of any part. Where errors, deviations and / or omissions are discovered later, they shall be made good by the Supplier at his own expense irrespective of any approval by the Purchaser.

16 Technical Records

The Supplier shall submit to the Purchaser not later than one month before commissioning draft copies in English of technical data as the following:

- Information on suppliers (address, fax, telephone) of pipes, solar system, pumps, fittings, etc. for water supply, solar and pump systems.
- Full technical documentation for the above items.
- Step-by-step description of the preparation and setting to work of the whole of the water supply system including pipes, valves etc.

Not later than the time at which the works are taken over, the Supplier shall provide four copies of instruction manuals in English to the approval of the Purchaser to cover all details of normal operation of each item and requirements regarding its functional relation with the plant as a whole and of all the individual items, together with routine maintenance instructions.

17 Record Drawings and Manuals

Prior to commissioning the Supplier shall provide for use by the Purchaser.

i. Three draft copies of the operating and Maintenance Manual for all sections of the Equipment complete with-up-to date drawings together with draft of the board mounted schedules.

ii. Six copies of recommendations giving type and quality of consumable supplies e.g., packing's, lubricants, etc., for the equipment installed.

The works shall not be considered to be complete until the above information has been supplied to and approved by the Purchaser.

After Equipment erection has been completed, the Supplier shall submit to the Purchaser four copies of the following 'As Erected' and 'As Fitted' drawings for approval.

i. Drawings showing the internal construction of the major items, with parts list and reference numbers for ordering spares.
ii. Complete assembly drawings of machinery and ancillary equipment showing all pipework, connections and fittings, etc.
iii. General arrangement drawings showing all mechanical and electrical equipment include cabling, conduiting/ tray work, etc.
iv. Detailed arrangement of any conduit work buried in floors, walls, ceilings, in any structure.
v. Detailed wiring, overhead line and underground cable routes and electrical layout and schematic diagrams of the main circuits.
vi. Control gear general arrangement, schematic and wiring diagrams.
vii. Diagrams of connections between all items of equipment (e.g. main and auxiliary switchboards, control boards, motors, starters, meters, instruments, relays, electronic and allied equipment's, etc., with component values and types suitably marked thereon).
viii. Detailed revised specification and schedules of the plant as actually installed.

The above requirements shall be fulfilled to the satisfaction of the Purchaser before the Completion Certificate is issued. When items (i) to (viii) inclusive have been approved by the Purchaser, the Supplier shall provide two black and white prints of each on thick paper for the use of the Purchaser together with one full plate negative of each.

All reproducible record drawings shall be on durable and unbearable plastic film or linen.
The Supplier shall also provide, suitably framed and protected for wall mounting.

i. One copy of drawings showing the location and position of all pipe runs and valve positions, all correctly numbered with matching numbers on the equipment.
ii. One copy of site overhead line and underground cable diagrams showing the location and position of all cable runs and termination positions all suitably numbered.

18. Operating and Maintenance Instruction Manuals

The Supplier shall submit to the Purchaser not later than one month before commissioning, triplicate draft copies of the Operating and Maintenance Instructions in English for all sections of the Equipment.

The draft operating instructions shall be prepared in such a way as to provide a step-by-step description of the preparation and setting to each part of equipment and its shutting down.

The draft instruction manuals prepared by the Supplier and manuals relating to equipment supplied by any sub-suppliers shall be printed (not duplicated) and shall be bound into suitable loose-leaf binders A4 size.

Following successful commissioning and not later than one months after the Purchaser has accepted the equipment, the draft copies, suitably corrected where necessary, shall be assembled into their final from and shall be submitted to the Purchaser for approval prior to handing to the Purchaser.

The Supplier shall provide six copies of the final instruction manuals, in English, operating, maintenance and safety procedure necessary for the routine operation of the works.

Any additions, alterations or deletions which may be required by the Purchaser following the experience gained during the periods of running and further maintenance shall be incorporated in these six copies in the form of additional or complete replacement pages and the cost of these amendments shall be deemed to be included.

The Purchaser's attention is drawn to the need to ensure that the following items are included in the Operating and Maintenance instruction Manuals:

i. Schedule of equipment supplied giving manufacturers name and appropriate Make / Model No. / Cat. No.

ii. Schedule of routine maintenance for all equipment supplied.

iii. Schedule of spares supplied.

iv. Schedule of tools and lubricants supplied.

v. Sectional arrangement drawings of major items of equipment i.e. pumps, valves, etc., with dismantling instructions.

vi. Equipment layout drawings showing the "As Erected" installation.

vii. General arrangement and schematic diagrams of the "As Installed" control panels.

viii. "As wired diagrams of all electrical connections, between the control panel and installed equipment.

ix. Full and comprehensive instructions for all items of equipment supplied.

x. Test certificates for both works and site tests of equipment including motors, pumps, and other electrical equipment where appropriate.

xi. Pump performance curves as tested.

xii. System Curves.

xiii. Schedule of recommended lubricants their equipment's which must be readily obtainable on the nearby market in Quetta.

At each location for each type of equipment there shall be supplied and mounted on the wall in a conspicuous position as determined by the purchaser, the following schedules.

1.No. Board mounted schedule of Routine Maintenance to be carried out on equipment.
1 No. Board mounted set of Instructions for Operation of the plant.

The print on each board is to be of large clear type in Arabic and English.

Boards shall be neatly finished plywood and shall be suitably protected by clear varnish or other approved material.

The issue of the Completion Certificate shall be subject to receipt and approval by the Purchaser of the draft Operating and Maintenance Instruction Manual and of draft of the above-board mounted schedules.

19 Supplier's Monthly Reports

19.1 Progress Reports

The Supplier shall report monthly progress to the Purchaser on charts submitted in triplicate showing actual work done superimposed on copies of his agreed program. He shall provide an explanation for any deviation from his program and shall in the case of delays propose strategies for improving progress.

The reports shall be delivered to the Purchaser within one week after the end of each month.

19.2 Labour and Plant Returns

The Supplier shall include with his monthly reports details of all equipment, (including their values) and labour force employed on the Site together with a description of their deployment. He shall also provide list of all materials and equipment intended for use at the Site related to the supply of goods and to execute the related services.

19.3 Photographic Records

The Supplier shall provide a photographic record of the supply of goods at the site and execution of the related services by having photographs taken during the delivery of equipment at site, installation, testing, commissioning and inspections of the equipment, etc. as the purchaser may specify from time to time. The number of such photographs shall not exceed ten per month.

The Supplier shall supply three sets of colour prints, size 9x13 cm mounted on album sheets, dated and described.

All the costs related to the preparation and submission of progress report and photographic records shall be deemed to be covered in the contract price.

20. Supplier's Compounds

No separate item is provided in the price schedules to cover the cost to the Supplier of providing and maintaining the offices, compounds, workshop and housing necessary for the proper organization and

superintendence of the supplies of goods and execution of related services. These are deemed to be included in all other items of works. The Supplier shall be responsible to arrange the necessary land for the compounds at his own expense.

The Supplier has to submit to the Purchaser the layout and design of his compounds showing areas required for workshops, garages, concrete yards, stores, housing etc., for his approval.

The compounds and their contents shall be dismantled and cleared away by the Supplier at the completion of the Contract.

The Supplier shall provide, erect and maintain sign boards at his own expense at locations to be indicated by the Purchaser. They shall be lettered in Balochi and English and be not smaller than 3 m x 2 m in size. The wording shall be as directed by the Purchaser.

21. Control of Construction Noise

The Supplier shall employ the best practical means to minimize noise and vibration produced by his operations. These shall include but not be limited to the following:

(a) All vehicle and mechanical plant shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order.

(b) All compressors shall be "sound reduced" models fitted with lined and sealed acoustic covers which shall be kept closed whenever the machines are in use and all ancillary pneumatic percussion tools shall be fitted with mufflers or silencers. Dampened bits shall be fitted to percussion tools.

(c) Machines in intermittent use shall be turned off or throttled down when not in use.

(d) All pumps shall be fitted with effective exhaust silencers where appropriate, and maintained in good and efficient working order. Pumps running overnight shall be effectively silenced. Alliteratively the Supplier shall use electrically driven pumps if necessary.

(e) All stationary plant shall be screened where possible.

22. Entry to Private Land

Where it is necessary to enter on privately owned land for the purpose of making temporary road diversions, or for any other reason, the landowner or occupier shall first be consulted by the Supplier and his written permission obtained.

The Supplier shall ensure that, in case the landowner or occupier refuses access, the Purchaser is informed at least 6 weeks before the intended start of work in the area concerned.

Care shall be taken that no undue damage is caused to land, and at the completion of the work, the land shall be left in a tidy and restored (if appropriate) condition to the satisfaction of the landowner or occupier and the Purchaser.

23. Safety Measures and Services

The Supplier shall be responsible for the safety and health of the all workmen and other persons in or around the Installation and related works, to the satisfaction of the Purchaser. Such measures shall include, but not be limited to, the following:

- Provision of proper safety and emergency regulations, fire, gas and electric shock prevention, stretchers and first aid box together with rescue facilities generally at each place of work.
- Adequate supports and braces for all excavations.
- Provision of sufficient safety helmets for all personnel including the Purchaser, his staff, and any authorized visitor to the Site.
- Safe control of water including the provision of standby pumping plant.
- Provision and maintenance of safe, sound ropes, slings, pulleys and other lifting equipment, each having an up-to-date test certificate.
- Provision and maintenance of safe, sound mechanical frames, hoists, cranes, and vehicles for transporting materials, with an up-to-date test certificate for each item.
- Provision of good and safe access to the Works.
- Provision of warning notices to the public in English, Balochi and Urdu warning them of the existence of any dangers from the Works.

The Supplier shall ensure that employees are available at each site to administer emergency first aid and that all employees are aware of their names. The Supplier shall provide for the transport of serious cases to hospital. All medical facilities shall also be to the satisfaction of any properly appointed medical officer authorized by the Government of the Balochistan to inspect medical facilities at Site.

The Supplier shall ensure that all his employees are fully conversant with regulations and emergency procedures, and shall enforce the rule that any employee committing a serious breach of such regulations shall be immediately dismissed and shall not be re-employed.

24. Sanitary Arrangements

The Supplier shall provide and maintain sufficient sanitary conveniences for all operatives and site staff engaged on the supplies of goods, installation and related services. These shall be in accordance with any requirements and regulations of the Government of the Pakistan and subject to the approval of the Purchaser. The ground shall be disinfected at the end of the Contract.

The Supplier shall ensure that all operatives and staff are aware that the sanitary conveniences of must be used by all personnel, and the Purchaser reserves the right to require dismissal of any person committing a nuisance on or about the site by failing to use the conveniences provided.

25. Working Programme

Before commencing installation services, the Supplier shall record any existing damage to adjacent buildings and notify the Purchaser thereof. Failing to do so, the Supplier may become liable to make good such damage at his own expense as it may be considered a result of result of his activities.

26. Training of Staff

The Purchaser will delegate to the Supplier a team of Operation engineers and technicians to be trained on various sections of the operation, testing and commissioning of the equipment.

The Supplier shall submit for the approval of the Purchaser a training program and shall report to the Purchaser in writing in monthly intervals detailing the activities, attendance, performance and ability of each member of the team.

27. Fencing of the Works

The Supplier shall fence the Works in a manner sufficient for the protection of the public and livestock and property during the progress of the installation works and shall satisfy the Purchaser or his Representative in this respect.
The Supplier shall erect and maintain adequate safety measures a round all trenches and other open excavations in a manner sufficient to provide maximum safety to pedestrians and vehicles at all times.

Temporary bridges shall be provided across trenches to maintain reasonable and safe access for pedestrians and vehicles to land and property on provide side of trenches.

28. Language of Records

All time sheets, records, notes, drawings, documents, etc. shall be in the English language. If the original documents are in another language a certified translation in English shall be submitted to the Purchaser.

29. Connection to Public Services

The Supplier shall be responsible to obtain in time all necessary approvals from the relevant Balochistan / Federal Government Authorities to connect the works in such a manner as required and approved by these Authorities. The costs involved are deemed to be included in the Contract Price.

30 Supplier's Design Report

Within one month after the effective date of the contract, the Supplier shall prepare and submit a draft detailed design report to the purchaser. The draft detailed design report shall include detailed design aspects, calculations, standards, manufactures details, warranty certificates, type test reports, performance certificates, specifications for the all items of the equipment related to the solar power

systems and pumping machinery as per requirements stipulated in the price schedules and specifications.

The Purchaser shall review the draft design report and provide comments. The Supplier shall incorporate all the comments of the Purchaser and submit the final design report to the Purchaser within 45 days after the effective date of the contract. The approval of the Supplier design report shall not limit any responsibility and liability of the Supplier in accordance with the Contract. The Supplier shall be responsible to complete the supply, installation and all related services according to Specifications and as directed by the Purchaser.

The costs for preparing and submitting the detailed design reports shall be deemed to be included in the contract price.

30.1 General Design Considerations

The Purchaser shall conduct site visit of all four sites at his expense and collect the requisite data which he may require in the preparation of designs. The Purchaser shall provide all the data which is readily available with the Purchaser. However, the Supplier shall be responsible for any additional data and information at his own costs.

The Supplier shall design in all respects to conform to current engineering practice.

The Goods shall be designed in all respects to conform to current engineering practice.

The philosophy of the design shall be simplicity and reliability such that the equipment will give long trouble free service with low maintenance costs. Particular attention should be paid to ease of access to facilitate inspection, cleaning, maintenance and repair.

All equipment supplied shall be designed to meet the needs for satisfactory operation under all variations of operating loads, pressures and temperatures including variation in the ambient temperature.

All materials shall be new and of the best quality and shall be selected to withstand the stresses imposed by the working and ambient conditions without distortion or deterioration affecting the efficiency and reliability of the plant.

It shall be the responsibility of the Supplier to ensure that the electrical equipment is completely satisfactory for use with the mechanical equipment offered.

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Each component or assembly proposed in the design report shall have been proven in service in a similar application and under conditions no less arduous than those specified herein. The Supplier shall have the right to request the Supplier justify his selection of equipment. Where it is show that material of equipment are of a standard lower than that necessary to comply with the Specification, the Supplier shall modify or replace the equipment concerned at no extra cost to the Purchaser.

The choice of materials and finishes shall take into account the dry tropical conditions, the frequency of dust storms and the high temperatures encountered at the site Equipment shall be protected against the entry of vermin, termites, insects of other small animals.

Outdoor equipment shall be weatherproof and designed to prevent the collection of water at any point. Metal-to-metal joints will not be permitted and all external bolts or screws shall be provided with blind tapped holes where a through hole would permit the ingress of moisture.

Mechanisms shall be constructed of materials, which will not stick due to rust, corrosion, brine or dust. Bearings exposed operating shafts shall be designed to prevent moisture seeping along the shaft into the interior of the equipment.

Equipment and instruments shall not be located in positions where they are vulnerable to falling objects or water drips. Weather shields shall be provided where necessary to protect equipment and instruments from the sun.

30.2 Interchangeability

All equipment performing similar duties shall be of a single type and make and fully interchangeable in order to limit the stock of spare parts required.

This is to apply particularly to such items as motors, instruments, controls, valves, etc.

30.3 Materials

All materials proposed in the design report shall be the most suitable for the duty concerned and shall be new and of first class commercial quality, free from imperfections, and selected for long life and minimum maintenance to withstand without distortion the stresses imposed by the working and ambient conditions to be met on site.

31 Compensation included in the Contract price

The rates and prices entered in the Priced Schedules for Goods and Related Services constitute the Contract Price.

The Contract Price shall, except insofar as it is otherwise provided under the Contract include all costs of Supplier’s plant, labour, supervision, materials, equipment, machinery, transportation, erection, electricity and fuel, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract.

The Contract Price shall include the maintenance costs during Defects Notification Period (Warranty Period) of one year and training of Purchaser’s staff.

The Schedules do not generally give a full description of the equipment to be supplied and the related services to be performed under each item. Bidders shall be deemed to have read the Schedule of Requirements and other sections of the Bidding Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.

TECHNICAL SPECIFICATIONS

PART II - SOLAR POWER SUPPLY SYSTEM

1. Scope of Work

The scope of work includes design, supply, installation, integration, testing and commissioning and initial maintenance of the Solar Power Supply (SPS) in accordance with the functional, technical and special provisions lay down herein. In case of conflict in the provisions herein with those present in the balance of the Bidding Documents, the requirement of the Price Schedules will take precedence. A typical baseline solution is described herein. Supplier may propose alternate solutions provided that they are better technically and economically. Supplier shall in this case provide adequate justifications. It may be noted that Supplier must provide the Schedule of Technical Data (STD) duly filled in for each of their proposed equipment.

2. VFD Unit with Power Conditioner DV/DT (for Source Pump)

The VDF (variable frequency drive) unit characteristics shall be compatible to characteristics of source submersible borehole pumps and shall be operable from solar power supply.

- The submersible motors used with VFD shall be of class F insulation with class B temperature rise or higher as per VFD requirement.
- Each VFD shall be equipped with swinging choke (factory installed and tested) capable of reducing total harmonics distortion by up to 25 % or alternatively 5 % impedance line reactor shall be installed ahead of each VFD to reduce the effects of current & voltage harmonics. The choke or line reactor in each VFD shall be sized such that it does not reduce the driving motor performance.
- Each VFD shall be provided with surge arrester in order to protect it against the surges created due to the abrupt changes in water flow or speed of the pump or systems voltages (Solar).
- The following codes & standards of latest editions shall be applicable: -

a)	IEC 61800-3	Adjustable speed electrical power drive systems
b)	IEC 61000 3-4	Harmonic mitigation for AC variable frequency pump drives
c)	IEEE-519	Harmonic mitigation Hardware
d)	IEC 60099	Surge arrestors

3. Solar Power Supply System (SPS)

Solar power systems shall be proposed for the operation of Tube well Pumps. These tube-well pumps shall be operational during the day time only.

The Solar pump system shall be installed to operate the onsite pump loads. The system shall have Off grid operation mode.

Pumps and PV modules shall meet the design constraints resulting in an efficient and economical system but still meeting the daily watering requirements. The system shall be designed to be efficient such as to minimize the system losses and capital expenditure without compromising on quality and performance of the proposed system.

3.1 System Configuration

Each pump can be powered by independent Solar system, driven by a MPPT Solar Variable Frequency Drive panel.

4. Design Considerations for Solar Power Supply

The following paragraphs lay down the design considerations for the solar power supply systems.

Supplier shall clearly explain the design, scheme of their system(s) and identify estimated system(s) output in watts and expected hours of operation per day for Pumps taking into consideration the total electrical demand (based on water requirement), load patterns, available solar insulation and other relevant factors.

Power supply ratings shall be determined on the basis of steady state load. As a safety factor, the capacity of the solar power supply system shall typically be (minimum) 30% higher than the connected load and shall be done in accordance with IEC 61727.

The scheme and the capacity of the solar power systems is left upon the Supplier's choice being the most knowledgeable on his specific solution for the tube well pumps. However, VFD based solar pump system(s) is to be proposed for this specific pump(s) load.

Following parameters shall be considered for the design of pump systems and shall be stated in the design report.

- Flow Rate/Daily Water Requirement (L/h).
- Type (Submersible).
- Total Dynamic Head (Static Lift + Static Head).
- Diameter of the pump.
- Mode of Operation (Solar).
- Efficiency.

Following parameters shall be considered for the design of pump systems and shall be stated in the design report.

- Total energy requirement to be generated per day
- System losses
- Mode of Operation (Solar).
- Efficiency.

In addition to the above, the Supplier's design will also consider provision of following documents (as a minimum) for Pumping:

1- Scheme of the proposed system
2- Capacity of System designed against given load.

- Total PV Array capacity
- Rating of the proposed Inverter(s)
- Average daily Output in kWh (yearly)
- Footprint (area required) for the installation of PV Array

3- System design sheets with detailed steps incorporating different stages system losses computing the overall system capacity
4- Monthly energy yield/ performance estimate sheets.
5- Detailed description of Tool, methodology & procedures used to ensure accuracy & calibration of performance modeling, including but not limited to weather assumptions.
6- Complete electrical and structural engineering services including labeled single line diagrams.
7- System operation, safety manuals.
8- Final PV system "as-built" schematics.
9- Specification sheets of proposed equipment
10- The performance assessment of installed systems will be carried out with respect to the provided energy yield estimates.

a) Energy Consumption of the Pumps

The estimated energy consumption per day for each tube well station is to be computed by the Supplier and will be submitted.

Solar Power Supply shall be designed with the consideration of the following important factors like equipment & system losses, Solar PV panel output power de-rating at NOTC, system design optimization and solar insulation on site.

b) Meteorological Analysis

A detailed Meteorological analysis shall be carried out to determine the amount of energy provided by the sun incident upon the solar panels. Multiple factors shall be considered including but not limited to: average sunny days, average sun duration / day, averaged carryover ambient temperature, extreme maximum/minimum recorded temperature, Carryover averaged precipitation and evaporation, Carryover averaged wind speed, carryover highest wind speed and occurrence time, prominent wind direction, clearness of the skies & latitude. Data on carryover and yearly monthly radiation incident, and data on the radiation incident (direct radiation, diffuse radiation and total radiation).

Based on above data specific to the site, a monthly insolation shall be computed for the site which should correlate with any of the internationally recognized irradiance data bases e.g. Meteonorm, NASA etc. This calculation shall encompass the change in sunlight due to cloudy or partially cloudy days.

Other parameters and their effect on system sizing shall also be considered. Monthly and yearly variations of these factors shall be considered to ensure sufficient output of the Solar Power Systems under the worst conditions. All calculations shall be put up for vetting by the Purchaser in the Supplier's design report.

c) System Sizing

The size of the Solar Power System shall depend upon the amount of power that is required (watts), the amount of time it is to be used (hours), and the amount of energy available from the sun in a particular area (sun-hours per day). Supplier shall state the rating (watts) of their solar power systems and the estimated energy yield after incorporating losses. The rating shall commensurate as a minimum the electrical load of the filtration plant site plus a safety factor of 30%. The system losses must clearly be indicated during the detail design process. Supplier shall provide detailed design calculations showing that the SPS has sufficient capacity to power the water pump. All factors for the optimization of system design are to be considered.

d) Location and Orientation of PVPs (Photo Voltaic Panels)

A survey will be undertaken by the Supplier to identify the location and orientation adequate for placing the solar panels. The survey shall identify the cable routes and lengths. Solar panels shall be placed in an area that receives maximum sunlight and can securely support the PV panels. The area should preferably be clear of tall trees and foliage that could obstruct the exposure of the Panels to the sun. The shadows from trees, neighboring building or other structures shall also be considered such that the entire lot of PV Panels once installed shall not be subject to shadows at all times of the day throughout the year.

e) PVP Footprint (Area Determination)

Sufficient space has to be allocated at site for the installation of PV Array. The scheme of mounting structure is to be proposed by the Supplier. Panels can be ground mounted or pole mounted as the roof space won't be sufficient enough for the entire PV Array installation.

In order to highlight the best possible area for Solar array installation at site, detailed shadow analysis of the proposed site(s) must be carried out using relevant softwares to study variable sun paths & subsequent shadow projections on different times of the day, throughout the year.

This best-case scenario will act as an upper bound on the size of the system that could be installed. The final placement and distribution of the PV Array installation shall be reflected on a CAD drawing created using the set of plans and the measurements taken at site.

5. Technical Description and System Components

The Solar Power System (s) consists of the basic components;

- PV modules,
- Solar Pump Inverters (including MPPT & VFD feature)
- Cables
- Grounding equipment
- Instrumentation
- Mounting structures.
- Protection equipment shall include AC/DC circuit breakers/ switches.

The system shall be designed considerations above and the functional description herein.
Supplier shall provide specifications of his proposed solution in the Schedule of Technical Data.

a) Solar Photovoltaic Panels (PV modules) – General Characteristics

The specifications of modules are mentioned in Schedule of Technical Data (STD).
The following design factors need to be detailed in:

- Bills of Materials, BoMs: (glass, encapsulant, back sheet, ribbon, adhesives, cable, junction box, connector).
- Type of cells comprising the module
- Specify number of modules and total power to be provided
- Maximum rated power
- Rated power tolerance
- Cell efficiency
- Module efficiency
- Power conversion efficiency at STC
- Voltage at the maximum power point, V_{mp}
- Current at the maximum current point, I_{sc}
- Open-circuit voltage, V_{oc}
- Short-circuit current, I_{sc}
- Maximum system voltage
- Temperature coefficient of short-circuit current
- Temperature coefficient of open-circuit voltage
- Temperature coefficient of maximum power < -0.40%/ C
- Minimum efficiency at 200,600 & 800 W/m² (25°, AM 1.5)
- Minimum efficiency at 200,600 & 800 W/m² (45°, AM 1.5)
- Relative Power Conversion Efficiency reduction and I-V curves for different light intensities & temperatures
- Materials and workmanship warranty of a minimum of 10 years
- Power warranty/performance guarantee of a minimum of 25 years: the power output should not fall below 90% within 10 years, and below 80% within 25 years; linear warranty is mandatory.
- Degradation Curve from Manufacturer
- Module designed to withstand PID.
- Manufacturers confirmation for the suitability of module for specific weather conditions and the high UV-radiation
- Use of integrated bypass diodes
- Fill factor
- Series fuse rating
- Connector type
- Cable length
- Cross-sectional view of the module materials
- Tolerance to wind (maximum load) impact
- Dimensions and weight
- Type of frame with weatherproof specifications
- Junction box degree of protection
- Manufacturers installation guidelines
- Provide guarantees and data sheets (to be transferred to Purchaser upon DDP)

- Modules per box and 40 feet container
- Application Class- A
- Safety Class II
- Fire rating C.

The following module standards must be met, as applicable to crystalline silicon:

- IEC 61215
- IEC 61730 Part I and II for safety qualification testing
- IEC 61701
- ISO 9001, ISO 14001
- MCS, CE,
- Application Class: A
- Other applicable standards.

The efficiency of the PV modules should be minimum 15 % and fill factor should be more than 70%. Modules with higher power output per unit area shall be preferred and should not be less than 250 Watts.

There shall be a Name Plate fixed inside the module which should include but not limited to:

a) Name of the Manufacturer or Distinctive Logo.
b) Model Number
c) Serial Number
d) Year of manufacture

Moreover, Provide the I-V curves at different irradiance & temperature levels.

The PV modules shall be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

Panels shall be of Mono/Poly crystalline silicon (Si) cells, protected by anti-reflective glass and by a special synthetic material. The number of panels to be used in a system shall be determined by the voltage current and power ratings of the PV modules vis-a-vis the plant and respective pump electrical power requirements.

The sizing calculations to determine the number of modules, number of strings and number of arrays shall be calculated by the Supplier on the basis of design parameters, functional characteristics and the Schedule of Technical Data (STD).

Basic mechanical characteristics, such as dimensions, frame profile, and static load rating, as well as grounding and mounting locations shall be considered while designing the system.
The Solar Panels must be of renowned brand. Solar panels shall have framed module with type a junction box (rain tight) accepting PG 13.5 conduit/cable fitting.

Mounting Structure

Hot dip galvanized, mechanically robust, iron mounting structures shall be provided for mounting the modules/panels/arrays. These mounting structures shall be used to mount the modules/panels/arrays on the ground or roof tops at an angle of tilt with the horizontal in accordance with the altitude of the

place of installation. Supplier shall state the angle of tilt in his detailed design report computed on the basis of yearly optimum yield.

- The solar array shall be supported by galvanized steel pillars with concrete foundations and shall be at suitable height from the ground level.
- They shall be designed for maximum durability and corrosive resistance in all environments.

- The mounting structure should be able to withstand wind speed of 160 km/ hr.
- Moreover, there should be adequate gap between modules to ensure withstand capacity of the complete structure.

The make, type and main features of SPSs shall be in compliance with the requirements of the STD (Schedule of Technical Data) & is to be duly filled accordingly.

b) Solar Pump System Components

I. Solar Pump Inverter:

The solar inverter(s)/ Variable frequency drive(s) with Inbuilt MPPT (Maximum Power Point Tracking) shall be provided for voltage conversion and regulation of the varying amounts of DC voltages and currents generated by the solar modules. A special purpose Solar Pump inverter is to be proposed which has inbuilt MPPT feature. Solar inverter capacity shall be determined in accordance with the parameters specified and quantified in the Schedule of Technical Data (STD).

The product should have the features listed below but not limited to:

- Maximum Power Point Tracking (MPPT).
- Pure Sine wave
- Instantaneous output status display (Speed / Power /Amps) etc.
- Data logging
- Display and Metering
- Automatic Start and Stop with Solar radiation
- Self-diagnostic and self-Protection
- Dry run protection
- The inverter shall be capable to operate in Off Grid and also Grid connected mode.
- The inverter shall be of single/three phase type (configurable)
- Output voltage Filter
- Automatic Power source switching against configurable set point (Solar & Grid)
- Configurable Power source priority
- The inverter shall support multi-string input with string failure detection.
- Grid monitoring.
- Environmental protection rating / electrical connection area shall be IP65.

Maximum Power Point Tracking (MPPT) solar invertors shall be provided so as to optimize the voltage of the PV array to maximize PVP power & to optimize the hours of operation.

The variations caused by temperature *(NOCT)* and type of module used shall be considered while defining the typical control set points (the voltages at which the controller changes the charge rate) or output power.

The pump inverter shall contain (but not limited to) following protections features:

- Reverse Current Blocking.
- Overcharge Protection.
- Low Voltage Disconnect (LVD).
- Overload Protection.
- Under/Over Voltage & Over Current protection
- AC short circuit protection.
- Ground fault monitoring.

It shall be preferred to design a higher voltage system which will result in less current, reducing the gauge of the system wiring. The output of the PV Array of SPS should conform with the input of the Solar Pump inverter ensuring product compatibility. The inverter shall be certified by an independent testing laboratory.

Power capacity of the inverter including Continuous, Limited-Time and Stack rating shall be clearly stated. Detail specifications including important values like Total Harmonic Distortion (THD), RMS (Root Mean Square) Voltage and Peak Voltage (VIP) regulation shall be according to the STD.

The peak efficiency of the inverter should not be less than two thirds of its capacity.

c) Installation Cables/Wires

- Installation including wiring shall meet the requirements and recommendations given in 8.3 of IEC 62124 ed 1. IEC 61000 / EN 501-78.
- The commissioning and acceptance will be subject to the fulfilment of all requirements specified in the above-mentioned paragraphs of IEC 62124 ed.1 and additional requirements as detailed below.
- Stranded and flexible insulated copper wires and cables must be used for all outdoor and indoor installations. Indoor installation of the lighting distribution system might be performed with solid wires, if appropriate and common practice.
- The wiring that leads into the building shall be protected in a conduit.
- External cables should be specifically adapted to outdoor exposure (see IEC 60811). Especially the outer insulation must be sunlight (UV)-resistant, weatherproof and designed for underground installation. Preferably rubber- coated and PE-coated cables shall be used.
- The temperature resistance of all interconnecting wires and cables should be > 75°C. All wiring must be sized to keep line voltage losses to less than 3% between PV generator and Variable frequency drive for pump systems, battery (for battery backed system), less than 1% between battery and charge regulator, and less than 3% between battery and load, all of them at the maximum current conditions. The minimum cross-section must also allow the circuit to operate within the Amp capacity rating of the wire.
- Earth conductors, either separate or as a third wire in 3-core cables, if ‘present, must be green-yellow.
- All exposed wiring must be in UV-resistant conduits or be firmly fastened to the building and/or support structure. Cable binders, clamps and other fixing material must also be UV-resistant, preferably made of polyethylene.
- Wiring through roofing, walls and other structures must be protected through the use of bushings. Wiring through roofing must be sealed (waterproof).
- Holes through roofing materials should be avoided wherever possible. Cables through roofing shall be contained in purpose-made roof-entry boxes, or proper UV-resistant

glands, which shall form a weatherproof seal to prevent leakages. In corrugated roofs, holes for cables are to be drilled at the top of corrugations. All holes in roofing shall be thoroughly sealed and made waterproof with UV-resistant silicone sealant or an equivalent method.

- Fittings need to be fastened to suitable supports, which may need to be provided if not already present. No conduit or fitting shall be attached directly to thatch or any other non-supportive surface.
- Holes that penetrate external walls shall slope slightly upward to prevent the ingress of water and be suitably sealed.
- Cables must be joined by the use of junction boxes, screw-connectors, block-connectors. All stranded wires must be terminated with proper end-sleeves. Soldering in the field and the use of wire nuts are not allowed. The rated current-carrying capacity of each joint must not be less than the circuit current rating.
- Junction boxes or enclosures must be dust- and waterproof, non- corrosive and electrically insulated (no metal boxes). Interior junction boxes shall have an IP protection of at least IP 32, and external junction boxes a minimum of IP 55 according to IEC 60529.
- Careful attention shall be given to entries into enclosures and junction boxes, to provide good sealing, proper strain relief to ensure that the wiring connections themselves are not under tension and to prevent chafing and damage to the insulation.
- Surface-mounted cabling shall be installed using appropriate fasteners at suitable intervals (15 to 20 cm) to prevent sagging.
- Visible interior cabling or conduits shall be aesthetically tidy, and should not slant from the vertical or horizontal unless essential.
- Suspended cables shall be mounted so that the lowest point is at least 2.8 m above ground level. The cable shall be held in position by suitable brackets and strain relief to prevent mechanical wear and any strain on the electrical connections.
- Mains (230VAC) sockets and plugs are not to be used under any circumstances. Any 12 V appliances with a mains-type plug attached constitute an unacceptable safety risk to the user if the appliance is used in a 230 VAC outlet.
- A product of good quality standard material to be provided, according to the given specification and good engineering practices.
- The flexible PVC conduit should be of good quality material with minimum ½ inch size.
- A wiring for solar connected load should be separate and independent in all aspects.
- Stranded and flexible insulated copper DC wires and cables must be used for all outdoor and indoor installations.
- The cables are selected such that the voltage drop must not exceed 1 % on DC side of the power inverter and 2.5 % on AC side of the power inverter. The calculation on the basis of which cable sizes shall be selected will be submitted.
- Single line diagram of the wiring scheme shall be submitted with the detailed proposal.
- The wiring that leads into the pole shall be protected in a PVC Spiral / Flexible conduit.
- External cables should be specifically adapted to outdoor exposure as per IEC 60811. The outer insulation shall be sunlight (UV)-resistant and weather-proof.
- All wiring should be colour coded.

- All exposed wiring must be in UV-resistant conduits and firmly fastened to the support structure. Cable binders, clamps and other fixing material must also be UV-resistant. All underground cabling shall be done in metal conduits.

d) DC Cables

The main design specification is to reduce Ohmic losses, without adversely affecting the cost trade-off, to < 1% at full power (under STC conditions 1000 W/m 2,25°C module temperature). Design calculations through cable loss simulation to be provided in the design report for review & comment. The Supplier shall firmly specify manufacturer, types and number of cables to be installed.

The following design factors need to be detailed by the Supplier:

- String cable shall be of the following type: single conductor type, copper, 1000 V / Class II (according to protection class II / 1000V, IEC 61140, single core cable, tinned copper conductor, XLPE Insulation, double EVA jacket (resistant to heat and cold, resistant to ozone, UV, oil and chemicals), Temperature: 90 º C (Temperature Max. Allowable: 120 ºC), Halogen free Connectors of Modules and string cables shall be connected of self-locking type, have IP65 rating and shall be from same manufacturer and type.
- The DC main (downstream of combiner box) wiring harness shall have the quality:
- Aluminium / Copper / 1000 V / Class II
- All cables shall be capable of accommodating all electric loads without overheating. Current carrying capacity certificate shall be provided to Employer for review and comments.
- Cables shall be suitable for the environmental conditions at the project site, including UV protection (certification from manufacturer to be provided by the Supplier)
- Balance of electrical potential shall be provided by the Supplier.
- Installation to be verified by measurement-protocols
- Technical documentation of DC-UV shall be provided by the Supplier.
- Clear and systematic labelling required

Standards:

- IEC 60228
- IEC 60364-1
- IEC 60754
- IEC 61034
- IEC 60811-2
- CSN-EN-ISO-4892
- IEC 60068:2011-12
- IEC 60228 (Cable losses)
- Other applicable standards.

e) **DC Connectors**

The following design factors shall be detailed in by the Supplier:

- High current rating
- Minimal contact resistance

- Convenient handling
- Broad compatibility
- Incompatibility with AC connectors to avoid mistakes during installation
- Force required to un lock connectors from cables, whether a tool is required for it or not.
- Double insulated for outdoor Installations.
- Suitable for Operation without de-rating upto 55°C.

Standards:

- EN 50521
- IEC 60512
- Other applicable standards

MC4 is effectively an industry staple for DC connectors, if not a standard, even though it is a proprietary design. If MC4 comparable connectors are used, a combination of different manufacturers are allowed. MC4 comparable connectors have to be certified.

6. FACTORY TESTS

i. PV Panels (PVP)

Supplier shall provide complete test reports listed herein from testing labs mentioned here in demonstrating that the PV modules being proposed have passed the following tests in accordance with the *latest IEC standards or the product fully complies with IEC 61215/61646*. Note that complete test reports showing test parameters, test equipment and test procedures are required.

Requirements of Type Tests and Test Reports to Qualify Acceptable Manufacturers

In case a Supplier is unable to provide type complete test reports from laboratories listed here above, then he shall arrange at his own cost to have the said tests be performed. The Purchaser and/or his representative shall in such a case witness the tests. All costs of testing and witnessing by the Purchaser and or his representative shall be deemed to be included in the contract price.

Life Expectancy Tests

Only those Solar PV modules shall be acceptable that have undergone Life Expectancy Tests (LETs) and full reports of the procedure and results of the LETs is provided. LETs shall be conducted as per ASTM E1171, UL1703. These comprise 1,000 hours of damp heat testing at 85 Deg C and 85% RH. 200 cycles of thermal cycle testing from -40°C to +85°C and back. Minimum dwell times of 10 minutes at -40 and + 85°C and maximum temperature transition rate of 100°C per Hour. i.e. 1.67°C per minute.

7. Guaranteed Performance Tests

Following tests shall be done to establish guaranteed performance parameters. These shall be done in accordance with IEC 61215 and IEC 61724 complete type test reports shall be provided by the Supplier:

- Visual Inspection Tests
- Maximum Power Determination Test

- Insulation Test
- Measurement of Temperature Coefficients
- Measurement of NOCT
- Performance at STC and NOCT
- Performance at Low Irradiance
- Outdoor Exposure Test
- Hot-Spot Endurance Test
- UV-preconditioning Test
- Thermal Cycling Test
- Humidity Freeze Test
- Damp Heat Test
- Robustness of Terminations
- Wet Leakage Test
- Mechanical Load Test
- Hail Impact Test
- Bypass Diode Thermal Test

Additionally, the Purchaser and/or his representative shall witness the following tests at the factory or place of production, on sampling basis on each lot of panels to be shipped. The test lot shall be 100 panels and sample size shall be five percent. The maximum allowable failure rate per lot shall be *5%.* For failure rates exceeding the allowable limit the entire lot shall be rejected or tested on a 100% basis as directed by the Purchaser and/or his representative.

- Visual Inspection Tests
- Maximum Power Determination Test
- Insulation Test
- Measurement of NOCT
- Performance at STC and NOCT
- Performance at Low Irradiance
- Robustness of Terminations
- Bypass Diode Thermal Test

Testing Laboratories

All the test reports shall preferably be from the following independent laboratories.

- NREL USA
- TUVs
- CESI Italy
- Fraunhofer ISE Germany
- Intertek, UK
- Fraunhofer, Germany, U.S.A
- Florida Solar Energy Centre, U.S.A
- ScienLab Electronic Systems Germany (for Inverters Only)
- Korea Testing Laboratory, Korea (for Inverters Only)
- Japan Photovoltaic Expansion Center, Japan
- Renewable Energy Test Centre, U.S.A
- CFV (by CSA Group Canada, Fraunhofer USA, VDE Germany)
- VDE Institute, Germany
- CSA Group, (Canadian Standards Association), Canada.

Site Testing

Upon shipment and before installation, following tests shall be arranged and performed again at site before installation of modules in the presence of Purchaser and his representative personnel; selection of modules for these tests shall be in accordance with IEC standard (IEC 60410):

- Visual Inspection for major visual defects only
- Bypass Diode Thermal Test
- Wet Leakage Test
- Insulation Test
- Maximum Power Determination Test

8. TESTS ON COMPLETION OF INSTALLATION

The following tests as a minimum are required to be performed on the completion of installation.

Pre-Commissioning Tests

The pre-commissioning checks shall consist of the following (mandatory minimum):

- Information about Project
- Compliance with the system design
- General Inspection
- Compliance with relevant installation instructions/regulatory requirements
- PV Module Mounting Structure & Civil foundation
- DC Junction Box or String Monitoring Box
- Earthing & Lightning Arrestor
- PV Module
- Inverter
- AC Distribution Box
- Cable identification and cable routing inspection
- The provision of adequate ventilation for system components electrical safety
- Cable insulation test
- The security and integrity of system components
- Fuse continuity and string open circuit voltage test
- String DC short circuit current test
- Isolation device functional test
- Electrical over-current protection arrangements

Commissioning Tests

After completion of all visual inspections from the checklist, the service provider must perform commissioning tests to ensure all inter-connections of the components are satisfactory.

The commissioning tests comprise the following:

- PV module
- PV array
- Cable and wiring

- Inverter
- Array Junction Box/String Monitoring Box
- AC Distribution Box
- Weather Monitoring Station and PV Monitoring System
- Cable insulation test
- String fuse continuity & String Open circuit voltage test
- Isolation device functional test
- Inverter functional test
- DC Current test

Trial Run

Upon successful completion of testing and commissioning, the reliability of the system shall be tested using Performance Ratio (PR) test

During the Performance Ratio (PR) test, the following real time parameters must be sampled at one-minute intervals for at least seven consecutive days:

- Solar irradiance
- Ambient temperature
- Module temperature
- Wind speed
- DC voltage of each string
- DC current of each string
- AC voltage from each inverter
- AC current from each inverter

Following in-factory tests shall be witnessed by the Purchaser and/or his representative. Applicable standard G 59/2 BS EN 61000-3-3.

- Harmonic current emissions
- Voltage fluctuations and flicker
- Power factor
- DC Injection
- Under/over Frequency tests
- Under over voltage tests
- Loss of mains test
- Reconnection times

Following standards as a minimum:

EN 62109-1 2010 (Safety)
EN 61000-6-2:2005 (EMC compatibility)

TECHNICAL SPECIFICATIONS

PART III – PUMPING EQUIPMENT AT PUMPHOUSE

1. Works to be Included

The works to be included in this section shall comprise the design, manufacture, works witness testing, delivery, storage, installation, site testing and commissioning and maintenance of:-

a) Submersible borehole pumping units having VFD features shall be selected for operation on solar energy system Piping, Fittings and Allied Works.

2. Reference Standards

ASTM - A 27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM - A 210	Heat Resisting Chromium and Chromium - Nickel Stainless Steel Plates
ASTM - A 276	Standard Specification for Stainless Steel Bars and Shapes
ANSI/ HI 11.6	Submersible Pump Tests
ASTM - A 743	Castings, Iron - Chromium, Iron – Chromium - Nickel, Corrosion Resistant, for General Application
ASTM- A 213	Alloy-Steel and Stainless-Steel Bolting for High Temperature or High Pressure Service
ASTM- A 214	Specification for Carbon and Alloy Steel Nuts & Bolts for High Pressure Or High Temperature Service

3. Brief Description of works

3 No Submersible pumps to be installed at pumping station in different villages having discharge of 0.25 cusecs and dynamic head of about 91m.

A. The pumps shall be designed, installed and tested in accordance with applicable requirements of ASTM and Hydraulic Institute Standards.

B. The Supplier shall check the design functions of each equipment; analyze system pressure loss, hydraulic transients for normal and emergency conditions at minimum and maximum flow.

C. Each equipment shall be suitable for rendering intended functions individually as well as part of the system under the Project's climatic and environmental conditions.

D. The submersible borehole pumps shall have VFD features considering the minimum & maximum speed as well as torque requirements.

E. Anti-thrust bearings along with journal bearings shall be used in submersible borehole pumps.

4. Pump Requirements

The Supplier shall carefully select the pumps to ensure that have a stable characteristic under all suction heads.

5. Submittals for Pumping Units

A. Shop drawings: Indicate general assembly, components, dimensions, weights, clearances and methods of assembly before shop tests.

B. Product Data: Provide manufacturer's literature including general assembly, certified pump curves showing performance with VFD characteristics of pump and system, operating point indicated, NPSH curve, controls, connection diagrams and service factor.

C. System design and pressure loss calculations at different speeds.

D. Proposed system operation and contract description.

E. Manufacturer's Installation Instructions: Including handling, storage and start-up instructions for pumping system.

F. Manufacturers recommended spare parts and tools list.

G. Manufacturer's Certificate: Certifying that pumps shall meet or exceed specified requirements at specified operating conditions.

H. Field Reports: Submit as directed by the Purchaser.

I. Pumping Unit Brands: Grundfos, KSB, Sulzer & Goulds or equivalent

6. Materials

1. The entire pumping unit parts, unless otherwise specified shall be of standard materials of the manufacturer, suitable for the specified operating conditions and contents of the well water.
2. All materials shall be new and of first-class quality, suitable for the purpose, free from defects and imperfections. Furbished pumping units will not be accepted.
3. Materials for pumping units coming in contact with pumped water shall be selected such that no part renders any harmful effect to the water for human consumption.
4. Materials of pumping units and valve parts shall be compatible with the corrosive and / or abrasive properties of the pumped water.
5. All materials or parts used in the equipment shall be tested, unless otherwise directed in conformity with applicable methods prescribed by the ASTM for mechanical, fracture, corrosion, fatigue, erosion, effect of water temperature, metallography and chemical analysis, or such other organization as may be specifically required, and generally in accordance with the best commercial methods. When requested, tests shall be made in the presence of the Purchaser; stocked material may be used, provided evidence is furnished to show that such material meets the requirements as specified herein.

6. Certified material test reports shall be furnished as soon as possible after the tests are made. The test certificates shall identify the component for which the material is to be used and shall contain all information necessary to verify compliance with the Contract Documents.
7. All the submersible pumping units shall have manufacturer brands of pump strainer. Their material and size shall be compatible to the raw or source water from the well.

7. Friction Loss

The friction losses have been assessed from a point 1.0 meters outside the pumping station wall and have been calculated at the duty flow and are based on the charts contained in the United Kingdom Hydraulics Research Station, Hydraulics Research Paper No.2 (charts for the hydraulic design of channels and pipes) Third Edition (metric units) using a roughness value as stated in the above table. The Supplier shall make his own assessment of the mains friction losses over all other conditions of operation.

The Supplier shall add to the external head stated above his own allowance for friction and other losses within the confines of the pumping station.

The friction losses stated in the tables may not coincide with the Supplier's own calculations and he should comment accordingly. However, for purposes of his Tender he should base his figures on data given herein.

8. Characteristic Curves

Characteristic and system curves for the pumps shall be supplied to scale which shall enable the Purchaser to identify the capacity of the pumps under single and multi pump operation at the duty point.

When tested through their complete range of working head at the Supplier's premises, all the pumps shall give results which conform to the curves submitted with the Tender or any other curves subsequently approved by the Purchaser. Curves showing pump efficiency and KW loading shall also be submitted to the Purchaser for his consideration.

9. Description of Pumps

The pumps shall be submersible split case, frame mounted, multistage and shall conform to the following construction or as decided and approved by the Purchaser.

Type		Submersible borehole
Design Head		150 m (or as per site conditions)
Design discharge		25.5 cubic meter/ hour (0.25 Cusec)
Operating Pressure		4 bar
Maximum Pressure		10 bar
Efficiency of Pumps	:	Not less than 70 % at min & max speeds

R.P.M. Range	1740 rpm to 3000rpm
Rated Power of motor pump set	20 hp (or as selected by the manufacturer) on solar
Material	
Casing	AISI 304 or equivalent
Impeller (Brass)	AISI 304 or equivalent
Shaft	AISI 304 or equivalent

The Supplier shall confirm that the above materials are suitable for the typical analysis of water samples.

Each pump shall be designed to give a continuous falling head/quantity characteristic to allow parallel operation. Impeller diameters shall be at least 5% less than the maximum diameter than can be fitted into the casing. Each pump shall be fitted with a stainless-steel wire rope or space-lay cable of adequate strength and length to permit raising the pump for inspection.

The stator casing, oil casing, and impeller shall be of grey iron construction, with all parts coming into contact with water protected by a coat of rubber-asphalt paint. All external bolts and nuts shall be of stainless steel. A replaceable wear ring designed for abrasion resistance shall be installed at the inlet of the pump to provide protection against wear to the impeller. The impeller shall be of a non-clog design, capable of passing solids and constructed with long throughway with no acute turns.
Each pump shall be provided with a tandem double mechanical seal running in an oil reservoir, composed of two separate lapped face seals. The lower consisting of one stationary and one rotating tungsten-carbide ring, with each pair held in contact by separate spring. The seals shall require neither maintenance nor adjustment, and shall be easily replaceable. The rotating half shall be positively driven by a spring and ball arrangement. Friction fit to the shaft is not acceptable. Conventional double mechanical seals with a single or double spring between the rotating faces, requiring constant differential pressure to effect sealing and subject to opening and penetration by pumping forces shall not be considered equal to the tandem seal specified.

A sliding guide bracket shall be an integral part of the pumping unit and the pump casing shall have a machined connecting flange to connect with the cast iron discharge connection, which shall be bolted to the floor of the sump and so designed as to receive the pump connecting flange without the need of any bolts or nuts.

Sealing of the pumping unit to the discharge connection shall be accomplished by a simple linear downward motion of the pump with the entire weight of the pumping unit guided by no less than two (2) guide bars to and pressing tightly against the discharge connection; no portion of the pump shall bear directly on the floor of the borehole and no rotary motion of the pump shall be required for sealing. Sealing at the discharge connection by means of a diaphragm, O-ring, or similar method of sealing will not be accepted as an equal to a metal contact of the pump discharge and mating discharge connection specified.

Pump motor shall be housed in an air-filled watertight casing and shall have Class F insulated windings which shall be moisture resistant. The motor shall be NEMA Design B rated 155° C

maximum. Pump motors shall have cooling characteristics suitable to permit continuous operation, in a totally, partially, or non-submerged condition. The pump shall be capable of running dry continuously in a totally dry condition. Before final acceptance, a field running test demonstrating this ability, with twenty-four (24) hours of continuous operation under the above conditions, shall be performed for all pumps being supplied, if required. Cable junction box and motor shall be separated by a stator-lead sealing gland or terminal board which shall isolate motor from any water or solids gaining access through pump cable.

Pump motor cable shall be suitable for submersible pump applications which statement shall be permanently embossed on the cable.

10. Pump Drive (Submersible Motor) and Flat Cable

All Electric motors for pumps shall be 3 phase, 400v, 50-60 Hz having VFD features, insulation class F with class B temperature rise or higher, IP 68, suitable for prime operation on Solar Energy.

The pumping unit will be provided with manufacturer`s recommended flat cable 4G (3 phase + N) and spliced with round cable as per cable splicing standards using manufacturer`s recommended splicing kit.

11. Submersible Power Cable (Round)

Electrolytic circular copper conductor, class 5 or 6 (flexible) based on EN 602228, PVC nitrile flexible or thermosetting insulation rubber (E14), PVC nitrile flexible or thermosetting rubber (Type EM 2) outer sheath.

Color code (4G) Brown+ Black+ Grey+ Yellow/ Green, round jacked shape. The product to be marked as “Submersible Pump Cable” with rated voltage ”600/ 1000 V “. The insulation and sheath material to be selected as per raw water temperature in the well sites.

The applicable standards for submersible power cable (round & flat) are: -

I) IEC 60332-1 Flame retardant or fire rate cables
II) IEC 60228 Conductors of insulated cables
III) IEEE 1018 Recommended practice for specifying electric submersible pump cable. Ethylene-Propylene rubber insulation
IV) IEEE 1021 Recommended practice for specifying electric submersible pump cable. Propylene rubber insulation

12. Operation and Maintenance Data

A. Operation Data: Include manufacturer's instructions, start-up data, and trouble-shooting check lists for submersible borehole & centrifugal pumps, pump VFD motors and controls.

B. Maintenance Data: Include manufacturer's literature, cleaning procedures, replacement parts lists, and repair data for submersible borehole & centrifugal pumps, VFD motors and VFD controls.

13. Quality Assurance

A. Perform work in accordance with manufacturer’s recommendation.

B. Maintain one copy of document on Site.

14. Test for Pumping Units

14.1. Shop Tests

The submersible borehole pumps shall be assembled completely in the shop to ensure correct fitting of all parts and shall be match marked before shipment, unless the pump is shipped completely assembled, to ensure correct assembly in the field. The pump casing shall be tested hydrostatically under a pressure equal to 150 percent of either the sum of the pump shut off head plus the maximum suction head or the maximum working pressure whichever is greater.

The hydrostatic test pressure shall be held for not less than 30 minutes after all leaks have been stopped.

The pumps shall be tested by and at the expense of the Supplier to establish that the performance requirements of these Specifications and the Supplier's guarantees have been fulfilled. The pumps shall be tested in the manufacturer's shop and the performance tests shall be made with the entire pumping unit at different speeds. Readings shall be taken at a minimum of five capacity points, including one point with plus or minus 2 percent of capacity specified.

The tests shall be conducted in accordance with the accepted practices at minimum speed, full speed, maximum speed and unless otherwise specified, the procedure and instruments used shall conform to the latest applicable standards.

The test shall be carried out in the presence of the representatives of the Purchaser.

The test shall cover:

A. Determination of the total head.

B. Determination of rate of water pumped.

C. Measurement of input power to the pump or output power of the motor.

D. Determination of pump efficiency at different speeds.

E. Preparation of characteristic curve with VFD showing pump efficiency, flow and head.

F. Measurement of reverse runaway speed.

G. Determination of NPSH required.

H. Minimum submergence required.

14.2. Operational Tests

Operational tests may be performed by the Purchaser on the pump before the pump is placed in service. If so desired by the Purchaser, the tests shall be repeated one month before the expiry of the defect liability period or guarantee/ maintenance Period.

14.3. Performance Tests, Capacity and Efficiency

A. General: Within two weeks after the operation of the submersible borehole & centrifugal pump with VFD features has been approved by Purchaser, as provided in the Contract, the pumping units shall be tested by and at the expense of the Purchaser to determine whether the equipment meets the guarantees as given. If so desired by the Purchaser, the tests shall be repeated one month before the expiry of the Maintenance Period.

B. Provision in Case of Damage or Wear: Prior to the tests, the submersible borehole & centrifugal pumps having VSD features will be inspected by the Purchaser and the Supplier. Should such inspection disclose any damage or wear has taken place the Supplier shall rectify such damages at his own cost.

C. Capacity and Efficiency Tests: The capacity and efficiency of the submersible borehole & centrifugal pump with VSD features will be determined for as many different heads within the range of operating heads as possible. The capacities and efficiency at the guaranteed conditions will be determined from smooth curves drawn through the test points.

D. Conduction of the Tests: The tests will be conducted in accordance with latest applicable Hydraulic Institute Standards.

E. Determination of Rate of Flow: The rate of flow of water through the submersible borehole & forwarding centrifugal pump will be determined by the properly calibrated flow meter to be installed at well station.

F. Determination of Total Head: Total head on submersible borehole the pump (H) will be the difference between the pressure elevation at the pump discharge and the pressure elevation near the entrance to the suction elbow, both corrected for velocity head.

G. Determination of Power: The electrical input to the motor will be measured by using accurate, sensitive and calibrated, test instruments connected to the permanently installed instrument transformers or as directed by the Purchaser. The input to the pump will be the measured input to the motor minus the mechanical and electrical losses in the motor. The losses in the motor will be determined by separate tests in accordance with the latest standards and test codes of the Institute of Electrical and Electronic Engineers, Inc; and the American National Standards Institute.

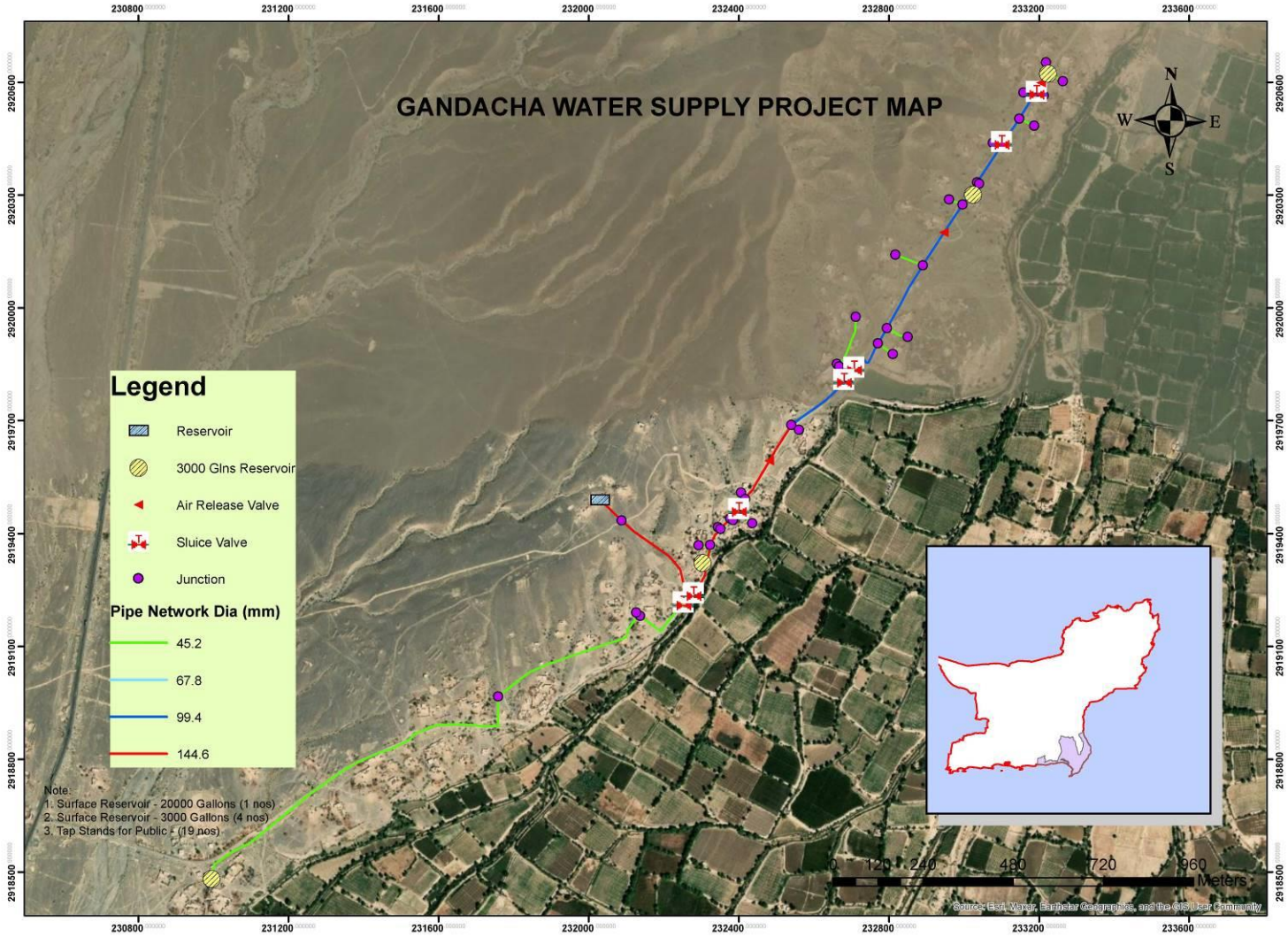
H. Determination of Efficiency Curve: The efficiency curve of the submersible borehole pump will be determined at various frequencies of the input, head and rate of flow of water, all as determined in accordance with the above sub-paragraphs.

I. Runaway Tests: The submersible borehole pumps will be subject to runaway tests & witnessed by the Purchaser. The tests will be performed under normal operating conditions by interrupting the power supply.

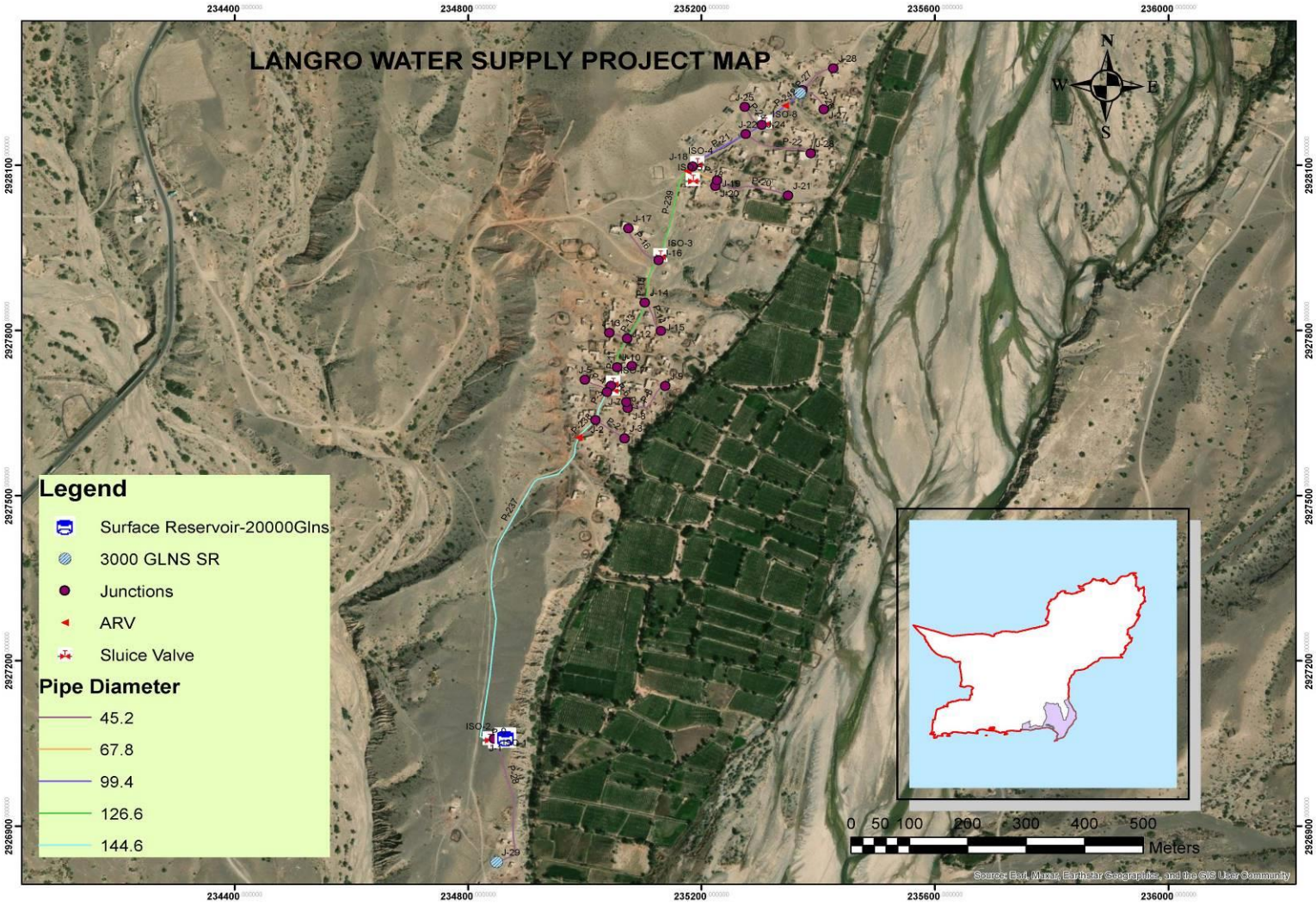
4. Drawings

The Bidding Documents includes *the following* drawings

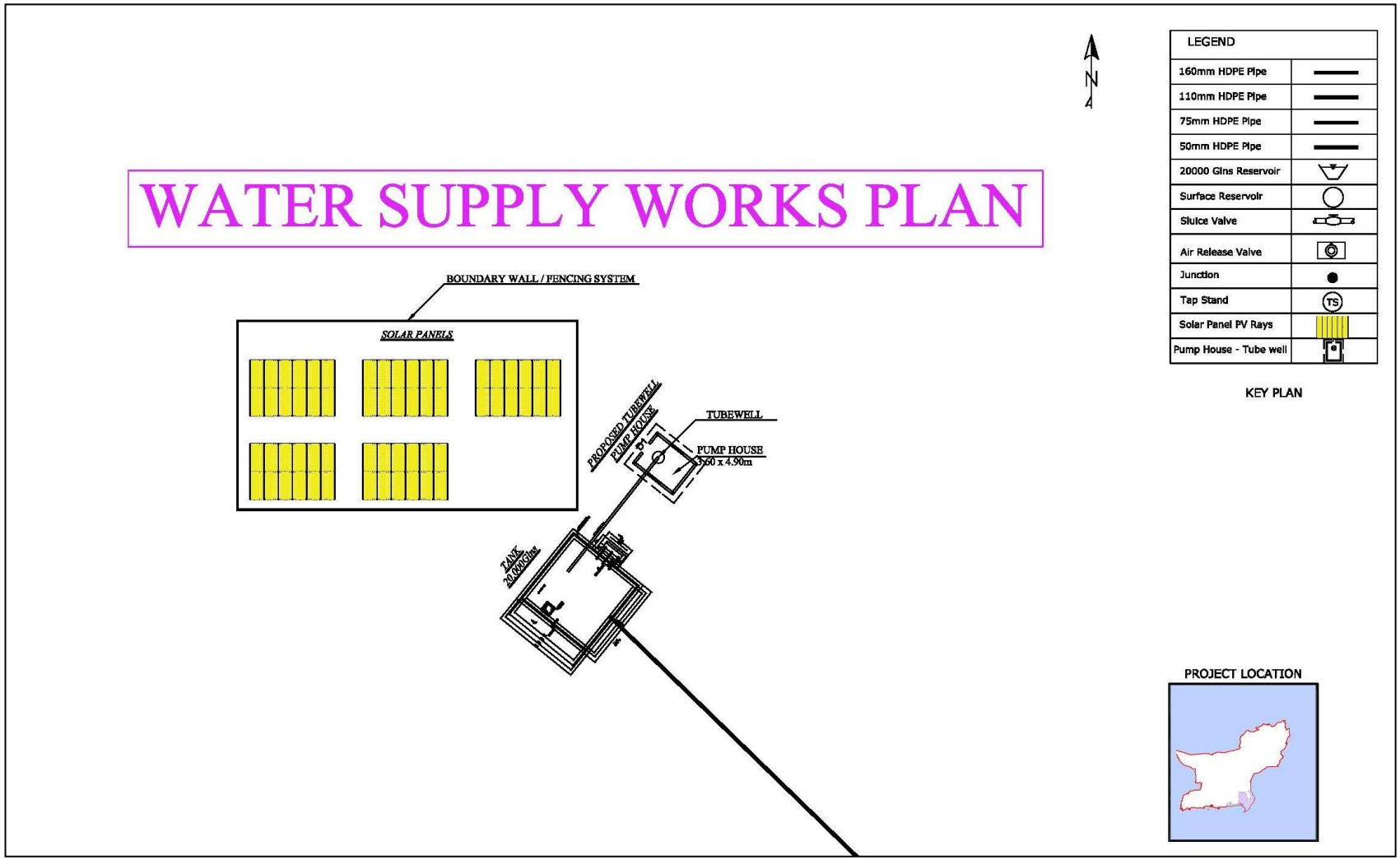
List of Drawings	
Drawing No.	**Description and Purpose**
Drawing No.1	Location Plan – Gandacha
Drawing No.2	Location Plan – Langro
Drawing No.3	Typical Plan Pump House and Solar Panels
Drawing No.4	Typical Details of Solar System Frame (Sheet 1 of 2)
Drawing No.5	Typical Details of Solar System Frame (Sheet 2 of 2)
Drawing No.6	Typical Details of Solar System Earthing



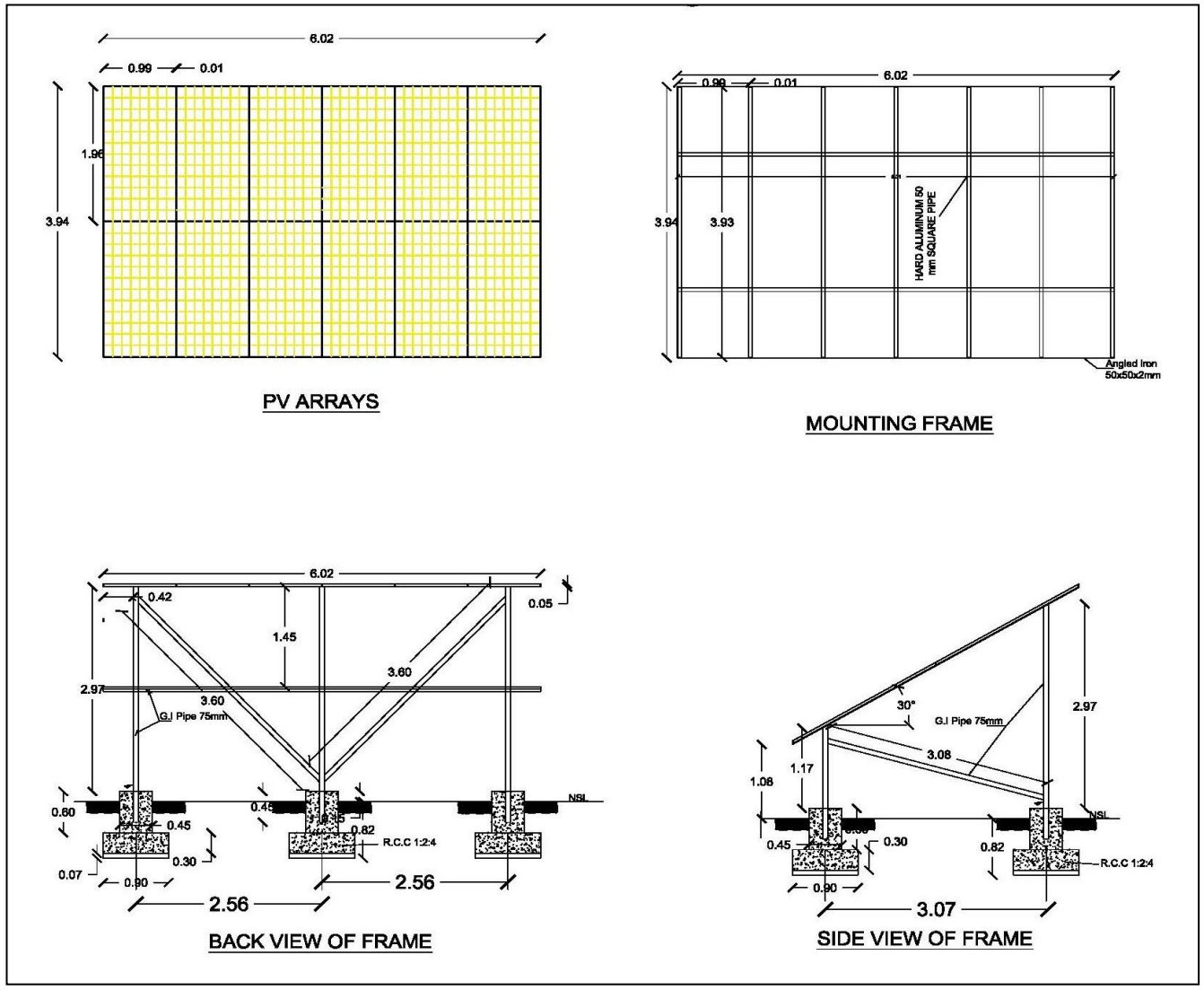
Drawing No. 1 – Location Plan– Gandacha



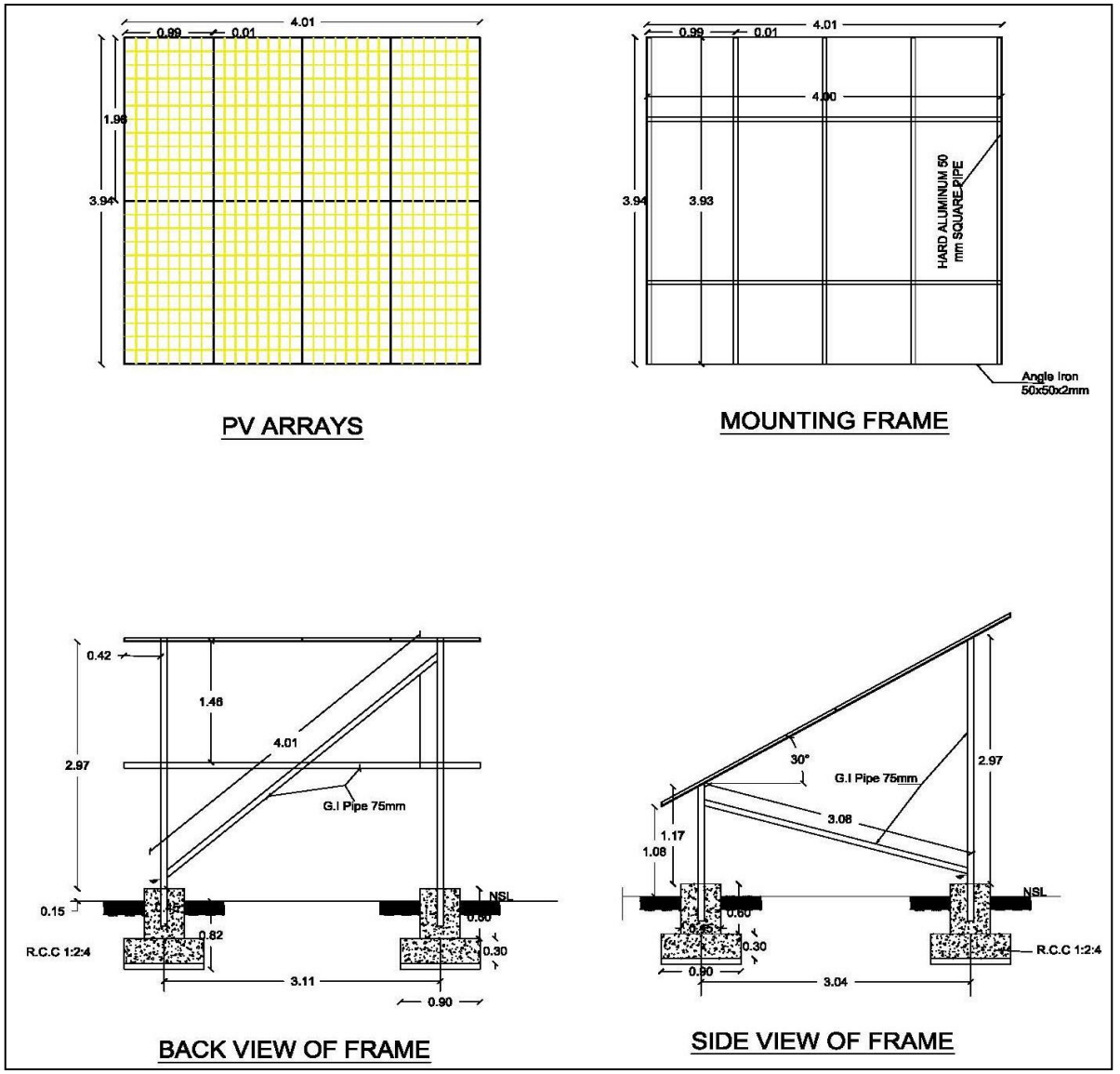
Drawing No. 2 – Location Plan– Langro



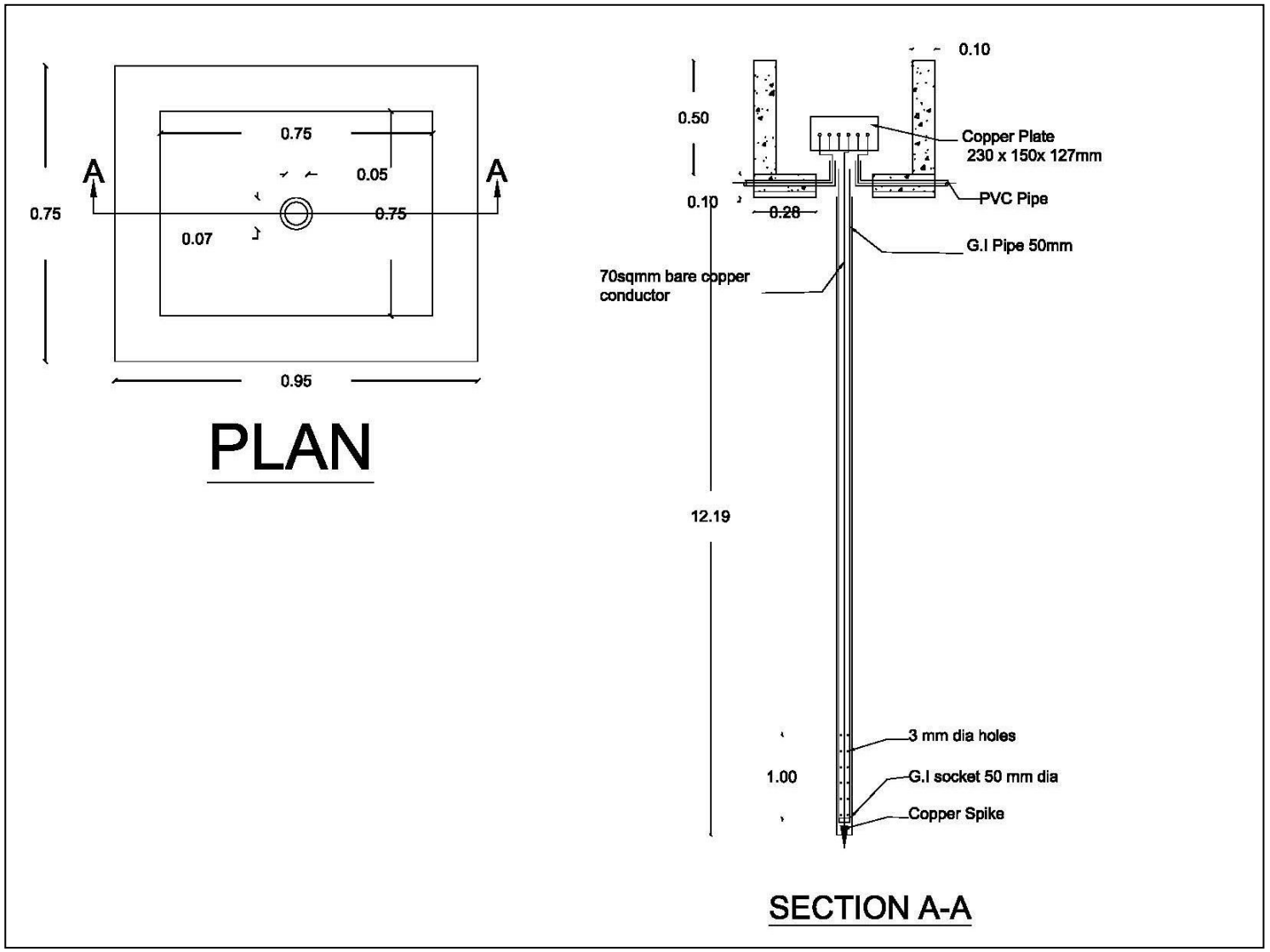
Drawing No. 3 – Typical Plan Pump House and Solar Panels



Drawing No. 4 – Typical Details of Solar System Frame (Sheet 1 of 2)



Drawing No. 5 – Typical Details of Solar System Frame (Sheet 2 of 2)



Drawing No. 6 – Typical Details of Solar System Earthing

5. Inspections and Tests

5.1 Solar PV Arrays Testing

Solar PV panels are subjected to a variety of tests. Via the solar panel tests, safety and compliance with the minimum quality standards are checked, of which passing is a precondition to getting approval for the solar modules.

Advanced performance and quality tests help the user to choose the right solar panel type.

5.1.1 Solar panel test criteria and procedures

There are two types of solar panel tests, the tests, which check the minimum requirements for the approval and the advanced testing procedures, which assess the quality of solar PV panels.

The first tests check the solar PV panels in accordance with given norms and standards.

The latter examines the quality of solar PV panels and evaluates these using advanced test criteria. These quality tests enable users to compare different solar panel types on the basis of quality or test seals.

The different testing procedures are used for the assessment and appraisal of solar PV panels. They vary in terms of their test and measurement criteria and the use of measurement methods.
In this article, we will present the most relevant tests required to get approval for solar PV panels.

5.1.2 Test procedures for the approval of solar PV panels

Certain minimum requirements must be fulfilled to get approval for a solar module. These ensure the safe operation, the suitability of the components and the functionality of solar PV panels.

5.1.3 IEC certification of solar PV panels

One of the most important solar panel testing procedures is the IEC certification. It indicates that the solar PV modules comply with individual safety, quality and durability requirements.

In these tests, the solar PV panels are subject to various loads, which are defined by the so-called ICE standards. The standards were established by the International Electrotechnical Commission (IEC) in Geneva.

The IEC certificate provides the basis for the trading of solar PV panels.

The IEC certification determines the basic solidity of solar PV panels and thereby ensures the functionality and safety of solar PV systems, and so, the essential operating requirements of solar PV panels.

The test certificate IEC 61215 applies to monocrystalline, polycrystalline and thin film solar panels.

During the tests, solar PV panels are subject to various loads. This includes, for example, the impact of external influences, which are generated artificially on the solar panel degradation, what effect mechanical loads have as well as different climatic conditions (heat, cold, humidity, climate change or the UV solar radiation) on the solar PV panels.

A successful passing of the tests is a precondition for the approval for solar PV modules. The solar PV panels have successfully passed the tests if no serious changes occur in their behavior or no significant loss of performance at different climatic conditions is reported.

In addition, when there is no damage of PV modules by mechanical loads.

The test standard IEC 61730 is a security standard for solar PV panels, which distinguishes between three classes of applications: class A for buildings, class B for energy supplier applications and class C for low-voltage applications.

The standard IEC 61730 defines the construction and the specific material requirements with regard to the fire protection of solar PV panels.

The IEC 61730 standard compliance ensures the safe operation during the expected lifetime of the solar PV system. It is also mandatory for approval of solar panel systems in Europe.

Another security standard is the IEC 61140, which concerns the protective insulation of solar PV panels. For this, the solar PV panels are subject to strength tests, such as shock and scratch tests.

The tests are made to find out the suitability of the materials used as well as the leakage currents in the components.

5.1.4 Standard Test Conditions (STC) tests

Another central solar panel test procedure is the standard test conditions-tests (STC-tests), which are run for all solar PV panels.

They enable the evaluation and comparison of different solar panel types, by determining current, voltage and power of solar PV panels under comparable test conditions.

The solar PV modules are subjected to a solar radiation of 1000 W/m², a module temperature of 25°C and an air mass coefficient of 1.5. The determined power is given in Watt peak.

In addition to laboratory tests, the solar PV panels are also exposed to real conditions. In these tests, the investigations occur at the place, where the solar PV panels will be installed, either on the roof of a building or a large open area.

In addition, other criteria become relevant to the performance examination of solar PV panels and are considered in the calculations. These include a minimal solar radiation of 800 W/m², a temperature determination and its consideration by value calculations and the angle of incidence, which is determined with the aid of inclinometer.

5.1.5 NOCT-Test

Another solar panel test procedure is the NOCT-Test. NOCT stands for Normal Operating Cell Temperature.

With the help of NOCT-Tests, loads of the materials of the solar modules are properly evaluated, and the heat radiation to the environment is determined.

NOCT is therefore considered as a standard measure for the assessment of the PV systems components.

The NOCT average values are:

Wind speed 1m/s (is the lower section of the wind strength 1 (3,6 km/h)
An irradiance of 800 W/ m²
Air Mass of 1.5
Air Temperature of 20°C
Electrical voltage at no load and in an open-circuit

NOCT is measured in the approval test of solar PV panels.

5.1.6 Carbon Footprint Verification (CFV)

A new solar panel test procedure is the Carbon Footprint Verification (CFV), which is carried out by the standards and certification organization, British Standards Institution (BSI).

The CFV procedure is based on the standards PAS 2050 and ISO 14067**.** It serves to assess and quantify the carbon footprint.

For this purpose, several stages of a product life cycle are checked, such as the procurement of raw materials, the production processes and the packaging of solar modules until the solar panel recycling.

5.2 Submersible Pumps Tests

5.2.1 Shop Tests

The submersible borehole pumps shall be assembled completely in the shop to ensure correct fitting of all parts and shall be match marked before shipment, unless the pump is shipped completely assembled, to ensure correct assembly in the field. The pump casing shall be tested hydrostatically under a pressure equal to 150 percent of either the sum of the pump shut off head plus the maximum suction head or the maximum working pressure whichever is greater.

The hydrostatic test pressure shall be held for not less than 30 minutes after all leaks have been stopped.

The pumps shall be tested by and at the expense of the supplier to establish that the performance requirements of these Specifications and the supplier’s guarantees have been fulfilled. The pumps shall be tested in the manufacturer's shop and the performance tests shall be made with the entire

pumping unit at different speeds. Readings shall be taken at a minimum of five capacity points, including one point with plus or minus 2 percent of capacity specified.

The tests shall be conducted in accordance with the accepted practices at minimum speed, full speed, maximum speed and unless otherwise specified, the procedure and instruments used shall conform to the latest applicable standards.

The test shall be carried out in the presence of the representatives of the Purchaser.

The test shall cover:

A. Determination of the total head.
B. Determination of rate of water pumped.
C. Measurement of input power to the pump or output power of the motor.
D. Determination of pump efficiency at different speeds.
E. Preparation of characteristic curve with VFD showing pump efficiency, flow and head.
F. Measurement of reverse runaway speed.
G. Determination of NPSH required.
H. Minimum submergence required.

5.2.2 Operational Tests

Operational tests may be performed by the Purchaser on the pump before the pump is placed in service. If so desired by the Purchaser, the tests shall be repeated one month before the expiry of the defect liability period or guarantee/ maintenance Period.

5.2.3 Performance Tests, Capacity and Efficiency

A. General: Within two weeks after the operation of the submersible borehole pump with VSD features has been approved by Purchaser, as provided in the Contract, the pumping units shall be tested by and at the expense of the Supplier to determine whether the equipment meets the guarantees as given. If so desired by the Purchaser, the tests shall be repeated one month before the expiry of the Maintenance Period.

B. Provision in Case of Damage or Wear: Prior to the tests, the submersible borehole pumps having VSD features will be inspected by the Purchaser and the Supplier. Should such inspection disclose any damage or wear has taken place the Supplier shall rectify such damages at his own cost.

C. Capacity and Efficiency Tests: The capacity and efficiency of the submersible borehole pump with VSD features will be determined for as many different heads within the range of operating heads as possible. The capacities and efficiency at the guaranteed conditions will be determined from smooth curves drawn through the test points.

D. Conduction of the Tests: The tests will be conducted in accordance with latest applicable Hydraulic Institute Standards.

E. Determination of Rate of Flow: The rate of flow of water through the submersible borehole pump will be determined by the properly calibrated flow meter.

F. Determination of Total Head: Total head on submersible borehole the pump (H) will be the difference between the pressure elevation at the pump discharge and the pressure elevation near the entrance to the suction elbow, both corrected for velocity head.

G. Determination of Power: The electrical input to the motor will be measured by using accurate, sensitive and calibrated, test instruments connected to the permanently installed instrument transformers or as directed by the Purchaser. The input to the pump will be the measured input to the motor minus the mechanical and electrical losses in the motor. The losses in the motor will be determined by separate tests in accordance with the latest standards and test codes of the Institute of Electrical and Electronic Engineers, Inc; and the American National Standards Institute.

H. Determination of Efficiency Curve: The efficiency curve of the submersible borehole pump will be determined at various frequencies of the input, head and rate of flow of water, all as determined in accordance with the above sub-paragraphs.

I. Runaway Tests: The submersible borehole pumps will be subject to runaway tests & witnessed by the Purchaser. The tests will be performed under normal operating conditions by interrupting the power supply.

5.3 Procedure to be implied during the Acceptance Tests

The following procedure and checks shall be implied during the inspection and tests.

- Documentation check
- Visual inspections
- Safety and component tests
- System performance tests

The details of tests above inspections and System Performance Tests shall determine whether the system is able to perform to specification in terms of water delivery relative to available solar resources on site, and pumping head conditions on site, etc.

Section VI.
Sample Forms

Sample Forms

1. Bid Form and Price Schedules

Date: _____
IFB No: _____1

To: [name and address of Purchaser]

Gentlemen and/or Ladies:

Having examined the bidding documents including Addenda Nos. *[insert numbers]*, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to supply and deliver *[description of goods and services]* in conformity with the said bidding documents for the sum of *[total bid amount in words and figures]* or such other sums as may be ascertained in accordance with the Schedule of Prices attached herewith and made part of this Bid.

We undertake, if our Bid is accepted, to deliver the goods in accordance with the delivery schedule specified in the Schedule of Requirements.

If our Bid is accepted, we will obtain the guarantee of a bank in a sum equivalent to _____ percent of the Contract Price for the due performance of the Contract, in the form prescribed by the Purchaser.

We agree to abide by this Bid for a period of 91 days from the date fixed for Bid opening under Clause 22 of the Instructions to Bidders, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, shall constitute a binding Contract between us.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the contract, are listed below:

Name and address of agent	Amount and Currency	Purpose of Commission or gratuity
_____	_____	_____
_____	_____	_____

(if none, state "none")

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

Dated this _____ day of _____ 20_____.

_____ _____

[signature] *[in the capacity of]*

Duly authorized to sign Bid for and on behalf of _____

BALOCHISTAN INTEGRATED WATER RESOURCES MANAGEMENT AND DEVELOPMENT PROJECT

PROCUREMENT OF GOODS FOR CONSTRUCTION OF NIMMI & GUNDACHA WATER SUPPLY SCHEME SOLAR SYSTEM AND MACHINERY

GRAND SUMMARY OF PRICE SCHEDULES

S. No.	DESCRIPTION	TOTAL PRICE (Pak Rs)
1	Total Price of Goods	
2	Total Price of Related Services	
	GRAND TOTAL (Carried Forward to Bid Form)	

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
GANDACHA VILLAGE WATER SUPPLY SYSTEM							
1.1	Supply of 6 sq. mm PVC insulated, PVC sheathed copper conductor, 300/500 volts grade cable from PV strings to the operational/ solar panel, ready and complete with all accessories for installation in all respects.		120	RM			
1.2	Supply of Solar PV Arrays/ modules of 19 kWp. The Solar PV arrays/ modules shall be "crystalline" type, IEC 61215:2005 certified by German Laboratory TUV/ VDE, ready and complete with all accessories for installation in all respects.		19,000	Per Watt			
1.3	Supply, Install, connect, test and commission of Solar Mounting Structure & accessories (Movable).		19,000	Per Watt			
1.4	Supply of Solar Panel/ Operational Panel having appropriate Inverter, MPPT, Combiner box, DC Energy Meter, DC cables, Hour meter for tube well operation, automatic/ manual control for submersible motor-pump, VFD, main Cu Bus bar (3-Phase+N+E) & TP MCCB adjustable (Main incoming Circuit Breaker) and outgoing MCBs with spares available, Motor-pump set protections (Over Current, Short circuit, Under Current, Under & Over Voltage), DC and AC incoming & outgoing Power cables & wires etc. with all other required accessories. The panel shall be properly compartmentalized and free standing ready and complete with all accessories for installation in all respects.		1	Set			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.5	Supply of 1 x 200 Ah Lead Acid, maintenance-free dry battery with 40 A charge controller, ready and complete with all accessories for installation in all respects.		1	Set			
1.6	Supply of Submersible bore hole motor-pump set (Grundfos / KSB / HMA or equivalent) with suction strainer and anti-thrust bearing having variable speed features, suitable for solar power, 20 HP, 150 m lift capacity, 0.20 Cusec discharge, 415 V, 3-Phase, 50 Hz. with standard cable, complete in all respects including all taxes. The impeller material shall be Cr Ni Steel (SS 304L), the class of insulation of motor shall be 'Class-F' with 'Class-B' temperature rise (min) and the IP Class shall be 68, ready and complete with all accessories for installation in all respects. ***(Head Depend upon Water Table)***		1	Set			
1.7	Supply of 3 Core 10mm^2 PVC/PVC Main Round Cable, Jointing Kit (for jointing flat cable and round cable), Junction Box (IP-65) and other required cable binding accessories. The round cable will be jointed to flat cable with approved jointing kit of renowned manufacturer, ready and complete with all accessories for installation in all respects.		115	RM			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.8	Supply of Wiring & Equipment:						
A	Indoor: - Wiring of light or fan point from gang switch to the point with 1.5 sq.mm & also for lights, PVC insulated, Cu conductor single core cable wires in PVC conduits concealed in walls, columns, roof and slabs including all accessories like PVC box, 10 Amp. gang switch 1 or 2 way as required, one for each light or fan.		8	Each			
B	5 Amp 2/3 pin universal flush mounting switch socket unit wired with 3x2.5 sq.mm single core PVC cable, Cu conductor from Lighting and Small power Board in PVC concealed conduits or trenching including all conduit accessories and PVC boxes as required.		1	Each			
C	15/20 A, 3-pin flush mounting switch socket unit wired with 3x4 sq.mm single core PVC insulated cable, Cu conductor wires starting from Lighting and Small power Board along with PVC concealed conduits or trenching including all conduit accessories and PVC boxes as required.		1	Each			
D	Supply of Lighting Fixtures: Indoor: - LED lights, 9 W, ceiling mounted, white light (cool), square shape, ≥ 750 lumens, 12 Vdc.		5	Each			
E	Supply of Ceiling fan 56" sweep, three blades, white color, make (Royal, Pak, Millat or approved equivalent) capacitor type complete with plastic body, dimmer, 12Vdc and other accessories etc.		1	Each			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.9	Supply of Pump (G.I) Pipe of 3" (75mm) Dia (IIL or equivalent). The pipe must be flange type and can bear maximum pressure of 4 bar. The pipe shall be installed with stainless steel nuts, bolts, double washers (preferably Cr Ni steel), ready and complete with all accessories for installation in all respects.		125	RM			
1.10	Supply of 3" (75mm) Dia, G.I Gate Valve		1	Each			
1.11	Supply of 3" (75mm) Dia, G.I Non-Return Valve		1	Each			
1.12	Supply of 3" (75mm) Dia, Water Meter		1	Each			
1.13	Supply of Earthing System and its accessories, ready and complete with all accessories for installation in all respects.						
A	Supply of G.I pipe 2" Dia (IIL or equivalent) 14 SWG (IIL or equivalent) including all accessories like tees, bends, sockets etc.		13	RM.			
B	Supply of tinned copper spike to be manufactured. Spike shall be connected/ screwed at bottom of G.I pipe (IIL or equivalent) including all accessories like nuts and bolts complete in all respect.		0.4	Kg			
C	Supply of 70 mm2 bare stranded electrolytic copper conductor including all accessories like brass nuts, bolts, washers etc complete in all respect.		45	Kg			
D	Supply of tinned earth test link in earthing pit consisting of copper plate (12"x6"x1/2") with fixing arrangement on the wall of man hole including brass nuts, bolts washers lugs etc. complete in all respect.		2	kg			
E	Supply of **Earth conductor**, PVC Insulated/ bare conductor, for earthing connections of all equipment, panels, boards and mountings with earthing test pits.		40	RM			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.	**LANGRO VILLAGE WATER SUPPLY SYSTEM**						
1.14	Supply of 6 sq. mm PVC insulated, PVC sheathed copper conductor, 300/500 volts grade cable from PV strings to the operational/ solar panel, ready and complete with all accessories for installation in all respects.		120	RM			
1.15	Supply of Solar PV Arrays/ modules of 19 kWp. The Solar PV arrays/ modules shall be "crystalline" type, IEC 61215:2005 certified by German Laboratory TUV/ VDE, ready and complete with all accessories for installation in all respects.		19,000	Per Watt			
1.16	Supply, Install, connect, test and commission of Solar Mounting Structure & accessories (Movable).		19,000	Per Watt			
1.17	Supply of Solar Panel/ Operational Panel having appropriate Inverter, MPPT, Combiner box, DC Energy Meter, DC cables, Hour meter for tube well operation, automatic/ manual control for submersible motor-pump, VFD, main Cu Bus bar (3-Phase+N+E) & TP MCCB adjustable (Main incoming Circuit Breaker) and outgoing MCBs with spares available, Motor-pump set protections (Over Current, Short circuit, Under Current, Under & Over Voltage), DC and AC incoming & outgoing Power cables & wires etc. with all other required accessories. The panel shall be properly compartmentalized and free standing ready and complete with all accessories for installation in all respects.		1	Set			
1.18	Supply of 1 x 200 Ah Lead Acid, maintenance-free dry battery with 40 A charge controller, ready and complete with all accessories for installation in all respects.		1	Set			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.19	Supply of Submersible bore hole motor-pump set (Grundfos / KSB / HMA or equivalent) with suction strainer and anti-thrust bearing having variable speed features, suitable for solar power, 20 HP, 130 m lift capacity, 0.20 Cusec discharge, 415 V, 3-Phase, 50 Hz. with standard cable, complete in all respects including all taxes. The impeller material shall be Cr Ni Steel (SS 304L), the class of insulation of motor shall be 'Class-F' with 'Class-B' temperature rise (min) and the IP Class shall be 68, ready and complete with all accessories for installation in all respects. ***(Head Depend upon Water Table)***		1	Set			
1.20	Supply of 3 Core 10mm^2 PVC/PVC Main Round Cable, Jointing Kit (for jointing flat cable and round cable), Junction Box (IP-65) and other required cable binding accessories. The round cable will be jointed to flat cable with approved jointing kit of renowned manufacturer, ready and complete with all accessories for installation in all respects.		115	RM			
1.21	Supply of Wiring & Equipment:						
A	Indoor: - Wiring of light or fan point from gang switch to the point with 1.5 sq.mm & also for lights, PVC insulated, Cu conductor single core cable wires in PVC conduits concealed in walls, columns, roof and slabs including all accessories like PVC box, 10 Amp. gang switch 1 or 2 way as required, one for each light or fan.		8	Each			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
B	5 Amp 2/3 pin universal flush mounting switch socket unit wired with 3x2.5 sq.mm single core PVC cable, Cu conductor from Lighting and Small power Board in PVC concealed conduits or trenching including all conduit accessories and PVC boxes as required.		1	Each			
C	15/20 A, 3-pin flush mounting switch socket unit wired with 3x4 sq.mm single core PVC insulated cable, Cu conductor wires starting from Lighting and Small power Board along with PVC concealed conduits or trenching including all conduit accessories and PVC boxes as required.		1	Each			
D	Supply of Lighting Fixtures: Indoor: - LED lights, 9 W, ceiling mounted, white light (cool), square shape, ≥ 750 lumens, 12 Vdc.		5	Each			
E	Supply of Ceiling fan 56" sweep, three blades, white color, make (Royal, Pak, Millat or approved equivalent) capacitor type complete with plastic body, dimmer,12Vdc and other accessories etc.		1	Each			
1.22	Supply of Pump (G.I) Pipe of 3" (75mm) Dia (IIL or equivalent). The pipe must be flange type and can bear maximum pressure of 4 bar. The pipe shall be installed with stainless steel nuts, bolts, double washers (preferably Cr Ni steel), ready and complete with all accessories for installation in all respects.		125	RM			
1.23	Supply of 3" (75mm) Dia, G.I Gate Valve		1	Each			
1.24	Supply of 3" (75mm) Dia, G.I Non-Return Valve		1	Each			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.25	Supply of 3" (75mm) Dia, Water Meter		1	Each			
1.26	Supply of Earthing System and its accessories, ready and complete with all accessories for installation in all respects.						
A	Supply of G.I pipe 2" Dia (IIL or equivalent) 14 SWG (IIL or equivalent) including all accessories like tees, bends, sockets etc.		13	RM			
B	Supply of tinned copper spike to be manufactured. Spike shall be connected/ screwed at bottom of G.I pipe (IIL or equivalent) including all accessories like nuts and bolts complete in all respect.		0.4	Kg			
C	Supply of 70 mm2 bare stranded electrolytic copper conductor including all accessories like brass nuts, bolts, washers etc complete in all respect.		45	Kg			
D	Supply of tinned earth test link in earthing pit consisting of copper plate (12"x6"x1/2") with fixing arrangement on the wall of man hole including brass nuts, bolts washers lugs etc. complete in all respect.		2	kg			
E	Supply of **Earth conductor**, PVC Insulated/ bare conductor, for earthing connections of all equipment, panels, boards and mountings with earthing test pits.		40	RM			
KUNDI (USMAN GOTH) VILLAGE WATER SUPPLY SYSTEM							
1.27	Supply of 6 sq. mm PVC insulated, PVC sheathed copper conductor, 300/500 volts grade cable from PV strings to the operational/ solar panel, ready and complete with all accessories for installation in all respects.		120	RM			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.28	Supply of Solar PV Arrays/ modules of 19 kWp. The Solar PV arrays/ modules shall be "crystalline" type, IEC 61215:2005 certified by German Laboratory TUV/ VDE, ready and complete with all accessories for installation in all respects.		19,000	Per Watt			
1.29	Supply, Install, connect, test and commission of Solar Mounting Structure & accessories (Movable).		19,000	Per Watt			
1.30	Supply of Solar Panel/ Operational Panel having appropriate Inverter, MPPT, Combiner box, DC Energy Meter, DC cables, Hour meter for tube well operation, automatic/ manual control for submersible motor-pump, VFD, main Cu Bus bar (3-Phase+N+E) & TP MCCB adjustable (Main incoming Circuit Breaker) and outgoing MCBs with spares available, Motor-pump set protections (Over Current, Short circuit, Under Current, Under & Over Voltage), DC and AC incoming & outgoing Power cables & wires etc. with all other required accessories. The panel shall be properly compartmentalized and free standing ready and complete with all accessories for installation in all respects.		1	Set			
1.31	Supply of 1 x 200 Ah Lead Acid, maintenance-free dry battery with 40 A charge controller, ready and complete with all accessories for installation in all respects.		1	Set			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.32	Supply of Submersible bore hole motor-pump set (Grundfos / KSB / HMA or equivalent) with suction strainer and anti-thrust bearing having variable speed features, suitable for solar power, 20 HP, 100 m lift capacity, 0.20 Cusec discharge, 415 V, 3-Phase, 50 Hz. with standard cable, complete in all respects including all taxes. The impeller material shall be Cr Ni Steel (SS 304L), the class of insulation of motor shall be 'Class-F' with 'Class-B' temperature rise (min) and the IP Class shall be 68, ready and complete with all accessories for installation in all respects. ***(Head Depend upon Water Table)***		1	Set			
1.33	Supply of 3 Core 10mm^2 PVC/PVC Main Round Cable, Jointing Kit (for jointing flat cable and round cable), Junction Box (IP-65) and other required cable binding accessories. The round cable will be jointed to flat cable with approved jointing kit of renowned manufacturer, ready and complete with all accessories for installation in all respects.		100	RM			
1.34	Supply of Wiring & Equipment:						
A	Indoor: - Wiring of light or fan point from gang switch to the point with 1.5 sq.mm & also for lights, PVC insulated, Cu conductor single core cable wires in PVC conduits concealed in walls, columns, roof and slabs including all accessories like PVC box, 10 Amp. gang switch 1 or 2 way as required, one for each light or fan.		8	Each			

Price Schedule: Goods

Date: _____
NCB No: _____
Alternative No: _____
Page No _____ of _____

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
B	5 Amp 2/3 pin universal flush mounting switch socket unit wired with 3x2.5 sq.mm single core PVC cable, Cu conductor from Lighting and Small power Board in PVC concealed conduits or trenching including all conduit accessories and PVC boxes as required.		1	Each			
C	15/20 A, 3-pin flush mounting switch socket unit wired with 3x4 sq.mm single core PVC insulated cable, Cu conductor wires starting from Lighting and Small power Board along with PVC concealed conduits or trenching including all conduit accessories and PVC boxes as required.		1	Each			
D	Supply of Lighting Fixtures: Indoor: - LED lights, 9 W, ceiling mounted, white light (cool), square shape, ≥ 750 lumens, 12 Vdc.		5	Each			
E	Supply of Ceiling fan 56" sweep, three blades, white color, make (Royal, Pak, Millat or approved equivalent) capacitor type complete with plastic body, dimmer, 12Vdc and other accessories etc.		1	Each			
1.35	Supply of Pump (G.I) Pipe of 3" (75mm) Dia (IIL or equivalent). The pipe must be flange type and can bear maximum pressure of 4 bar. The pipe shall be installed with stainless steel nuts, bolts, double washers (preferably Cr Ni steel), ready and complete with all accessories for installation in all respects.		100	RM			
1.36	Supply of 3" (75mm) Dia, G.I Gate Valve		1	Each			
1.37	Supply of 3" (75mm) Dia, G.I Non-Return Valve		1	Each			

Price Schedule: Goods

Date: _____
NCB No: _____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Line Item No	**Description of Goods**	**Delivery Date**	**Quantity**	**Unit**	**Unit price DDP (Pak Rs)**	**Total price (Col. *4* × 6) (Pak Rs)**	**Country of Origin**
1.38	Supply of 3" (75mm) Dia, Water Meter		1	Each			
1.39	Supply of Earthing System and its accessories, ready and complete with all accessories for installation in all respects.						
A	Supply of G.I pipe 2" Dia (IIL or equivalent) 14 SWG (IIL or equivalent) including all accessories like tees, bends, sockets etc.		13	RM			
B	Supply of tinned copper spike to be manufactured. Spike shall be connected/ screwed at bottom of G.I pipe (IIL or equivalent) including all accessories like nuts and bolts complete in all respect.		0.4	Kg			
C	Supply of 70 mm2 bare stranded electrolytic copper conductor including all accessories like brass nuts, bolts, washers etc complete in all respect.		45	Kg			
D	Supply of tinned earth test link in earthing pit consisting of copper plate (12"x6"x1/2") with fixing arrangement on the wall of man hole including brass nuts, bolts washers lugs etc. complete in all respect.		2	Kg			
E	Supply of **Earth conductor**, PVC Insulated/ bare conductor, for earthing connections of all equipment, panels, boards and mountings with earthing test pits.		40	RM			
Total Price: Goods – (Carried Forward to Grand Summary)							

Price and Completion Schedule of Related Services

Date:_____
NCB No:_____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Service No	**Description of Services**	**Country of Origin**	**Completion Date at Final destination**	**Quantity**	**Unit**	**Unit price (Pak Rs)**	**Total Price per Service (Col. *5* x *7* or estimate) (Pak Rs)**
GANDACHA VILLAGE WATER SUPPLY SYSTEM							
2.1	Design, erection, installation, testing and commissioning of Submersible motor-pump set, PV solar arrays and mounting accessories, Solar/ Operational Panel, battery, etc. wiring, fans and light, valves, energy meter and other related or specified works, complete with all accessories for installation in all respects and according to specifications.			-	LS		
2.2	Design, manufacturing, erection, installation, testing and commissioning of earthing system according to Specification including but not limited to the following works, and complete with all accessories for installation in all respects. (i) Bore type, earthing up to permanent water level/moist soil by arrangement of earth pit/point comprising of concrete/brickwork housing with lifting cover. The earthing and bonding shall be complete with fixing clamps etc. & all metal works shall be bonded to the proposed earthing network.			-	LS		

Price and Completion Schedule of Related Services

Date:_____
NCB No:_____
Alternative No: _____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Service No	**Description of Services**	**Country of Origin**	**Completion Date at Final destination**	**Quantity**	**Unit**	**Unit price (Pak Rs)**	**Total Price per Service (Col. *5* x *7* or estimate) (Pak Rs)**
	(ii) Furnishing and drilling of earth bore 3" dia with minimum 40 ft. (12.5 m) deep. (iii) Installation of G.I pipe (IIL or equivalent) in pre-made bore including all accessories like tees, bends, sockets. (iv) Installation of bare stranded electrolytic copper conductor lead in prelaid G.I pipe (IIL or equivalent) (v) Furnishing and constructing (1 number) earthing pits (manhole) of internal size 24"x18"x48" deep with 9" thick brick wall with cement mortar, internal plaster 1:4, RCC 4" thick cover with lifting hooks including all accessories complete in all respect. (vi) Any other work.						
LANGRO VILLAGE WATER SUPPLY SYSTEM							
2.3	Design, erection, installation, testing and commissioning of Submersible motor-pump set, PV solar arrays and mounting accessories, Solar/ Operational Panel, battery, etc. wiring, fans and light, valves, energy meter and other related or specified works, complete with all accessories for installation in all respects and according to specifications.			-	LS		

Price and Completion Schedule of Related Services

Date:_____
NCB No:_____
Alternative No: _____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Service No	**Description of Services**	**Country of Origin**	**Completion Date at Final destination**	**Quantity**	**Unit**	**Unit price (Pak Rs)**	**Total Price per Service (Col. *5* x *7* or estimate) (Pak Rs)**
2.4	Designing, manufacturing, erection, installing, testing and commissioning of earthing system according to specifications including but not limited to the following works, complete with all accessories for installation in all respects. (i) Bore type, earthing up to permanent water level/moist soil by arrangement of earth pit/point comprising of concrete/brickwork housing with lifting cover. The earthing and bonding shall be complete with fixing clamps etc. & all metal works shall be bonded to the proposed earthing network. (ii) Furnishing and drilling of earth bore 3" dia with minimum 40 ft. (12.5 m) deep. (iii) Installation of G.I pipe (IIL or equivalent) in pre-made bore including all accessories like tees, bends, sockets. (iv) Installation of bare stranded electrolytic copper conductor lead in prelaid G.I pipe (IIL or equivalent). (v) Furnishing and constructing (1 number) earthing pits (manhole) of internal size 24"x18"x48" deep with 9" thick brick wall with cement mortar, internal plaster 1:4, RCC 4" thick cover with lifting hooks including all accessories complete in all respect. (vi) Any other work			-	LS		

Price and Completion Schedule of Related Services

Date:_____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Service No	**Description of Services**	**Country of Origin**	**Completion Date at Final destination**	**Quantity**	**Unit**	**Unit price (Pak Rs)**	**Total Price per Service (Col. *5* x *7* or estimate) (Pak Rs)**
KUNDI VILLAGE (USMAN GOTH) WATER SUPPLY SYSTEM							
2.5	Design, erection, installation, testing and commissioning of Submersible motor-pump set, PV solar arrays and mounting accessories, Solar/ Operational Panel, battery, etc. wiring, fans and light, valves, energy meter and other related or specified works, complete with all accessories for installation in all respects and according to specifications.			-	LS		

Price and Completion Schedule of Related Services

Date:_____
NCB No:_____
Alternative No: _____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Service No	**Description of Services**	**Country of Origin**	**Completion Date at Final destination**	**Quantity**	**Unit**	**Unit price (Pak Rs)**	**Total Price per Service (Col. *5* x *7* or estimate) (Pak Rs)**
2.6	Designing, manufacturing, erection, installing, testing and commissioning of earthing system according to specifications including but not limited to the following works: complete with all accessories for installation in all respects. (i) Bore type, earthing up to permanent water level/moist soil by arrangement of earth pit/point comprising of concrete/brickwork housing with lifting cover. The earthing and bonding shall be complete with fixing clamps etc. & all metal works shall be bonded to the proposed earthing network. (ii) Furnishing and drilling of earth bore 3" dia with minimum 40 ft. (12.5 m) deep. (iii) Installation of G.I pipe (IIL or equivalent) in pre-made bore including all accessories like tees, bends, sockets. (iv) Installation of bare stranded electrolytic copper conductor lead in prelaid G.I pipe (IIL or equivalent) (v) Furnishing and constructing (1 number) earthing pits (manhole) of internal size 24"x18"x48" deep with 9" thick brick wall with cement mortar, internal plaster 1:4, RCC 4" thick cover with lifting hooks including all accessories complete in all respect. (vi) Any other work			-	LS		

Price and Completion Schedule of Related Services

Date:_____
NCB No:_____
Alternative No: _____
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1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Service No	**Description of Services**	**Country of Origin**	**Completion Date at Final destination**	**Quantity**	**Unit**	**Unit price (Pak Rs)**	**Total Price per Service (Col. *5* x *7* or estimate) (Pak Rs)**
	Total Price: Related Services (Carried Forward to Grand Summary)						

It is hereby confirmed that the specifications of offered above mentioned items, are fully compliant to the technical specifications provided in Section V of bidding document.

Name of Bidder / Firm:
_____

_____ Signature_____

_____

Date: _____ Seal:

2. Contract Form

THIS AGREEMENT made the _____ day of _____ 19_____ between *[name of Purchaser]* of *[country of Purchaser]* (hereinafter called "the Purchaser") of the one part and *[name of Supplier]* of *[city and country of Supplier]* (hereinafter called "the Supplier") of the other part:

WHEREAS the Purchaser invited bids for certain goods and ancillary services, viz., *[brief description of goods and services]* and has accepted a bid by the Supplier for the supply of those goods and services in the sum of *[contract price in words and figures]* (hereinafter called "the Contract Price").

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 referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
(a) the Bid Form and the Price Schedule submitted by the Bidder;
(b) the Schedule of Requirements;
(c) the Technical Specifications;
(d) the General Conditions of Contract;
(e) the Special Conditions of Contract; and
(f) the Purchaser's Notification of Award.

3. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the goods and services and to remedy defects therein in conformity in all respects with the provisions of the Contract

4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the goods and services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the contract at the times and in the manner prescribed by the contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, sealed, delivered by _____ the _____ (for the Purchaser)

Signed, sealed, delivered by _____ the _____ (for the Supplier)

3. Performance Security Form

To: [*name of Purchaser]*

WHEREAS *[name of Supplier]* (hereinafter called "the Supplier") has undertaken, in pursuance of Contract No. *[reference number of the contract]* dated _____ to supply *[description of goods and services]* (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a bank guarantee by a reputable bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a guarantee:

THEREFORE, WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of *[amount of the guarantee in words and figures]*, and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limits of *[amount of guarantee]* as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the _____ day of _____19_____.

Signature and seal of the Guarantors

_____

[name of bank or financial institution]

_____

[address]

_____

[date]

4. Manufacturer's Authorization Form

[See Clause 13.3 (a) of the Instructions to Bidders.]

To:

WHEREAS *[name of the Manufacturer]* who are established and reputable manufacturers of *[name and/or description of the goods]* having factories at *[address of factory]*

do hereby authorize *[name and address of Agent]* to submit a bid, and subsequently negotiate and sign the Contract with you against IFB No. *[reference of the Invitation to Bid]* for the above goods manufactured by us.

We hereby extend our full guarantee and warranty as per Clause 15 of the General Conditions of Contract for the goods offered for supply by the above firm against this Invitation for Bids.

_____

[signature for and on behalf of Manufacturer]

Note: This letter of authority should be on the letterhead of the Manufacturer and should be signed by a person competent and having the power of attorney to bind the Manufacturer. It should be included by the Bidder in its bid.

Section VII. Eligibility for the Provision of Goods, Works, and Services in Bank-Financed Procurement

Public Information Center

Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement

In accordance with paragraph 1.8, of the *Guidelines: Procurement under IBRD Loans and IDA Credits*, dated May 2004, the Bank permits firms and individuals form all countries to offer goods, works and services for Bank-financed projects. As an exception, firms of a country or goods manufactures in a country may be excluded if:

Para 1.8 (a) (i): as a matter of law or official regulation, the Borrower's Country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of the Goods or works required, or

Para 1.8 (a) (ii): by an Act of compliance with a Decision of the United Nations Security Council taken under chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods form that country or any payments to persons or entities in that country.

2. For the information of borrowers and bidders, at the present time firms, goods and services form the following countries are excluded from this bidding

(a) With reference to Paragraph 1.8 (a) (i) of the Guidelines:

As per Pakistani Government Laws and foreign policy. Specifically, the bidders from India and Israel will not be entertained.

(b) With reference to Paragraph 1.8 (a) (ii) of the Guidelines:

As per United Nations Security Council's current policy