



BIDDING DOCUMENTS

For

**SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF
SOLAR SYSTEM AT RESIDENTIAL FACILITY QUEENS ROAD,
LALAZAR KARACHI.**

Technical Proposal

Volume-I

Jul-25



PART-A

BIDDING PROCEDURE & REQUIREMENTS

SECTION I: INVITATION TO BIDS





SBP BANKING SERVICES CORPORATION Engineering Department Karachi

ITB No. ED/PROC-HOK/958705/2025/270

INVITATION TO e-BID

1. State Bank of Pakistan Banking Services Corporation, invites electronic bids from the suppliers/ contractors'/ service providers, who are registered with PPRA for E-Procurement on "e-Pak Acquisition and Disposal system (EPADS)", having Income Tax registration and are on Active Taxpayers List (ATL) of FBR.

Sr. No.	Tender No	Title of Procurement	Date & Time of		Bid Security (Rs.)
			Bid Submission	Bid Opening	
1.	270	Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi.	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	300,000/-

2. The Bidding shall be conducted in line with the Rule 36 (b) Single Stage - Two Envelope procedure. E-bidding documents as per regulations, containing detailed terms and conditions, specifications and requirements etc. are available for the registered bidders on EPADS at (www.eprocure.gov.pk).
3. Bid(s) must be accompanied by a Bid Security as mentioned in above table. The bidders shall upload scanned copy of Bid Security on EPADS. Original bid security must be submitted at PA to Director Engineering (A), 1st Floor, Engg. Department, SBP-BSC Bolton Market Building, M.A. Jinnah Road Karachi, Phone: 92-21-3245 4122/05/71 on or before schedule mentioned in above table, failing which bid shall be rejected.
4. The electronic bids, must be submitted by using EPADS on or before schedule mentioned in above table. Manual bids, shall not be accepted. Electronic Bids will be opened on the same day at schedule mentioned in above table. In case the bid opening date falls on a public holiday, the bids will be opened on the next working day at the same time.

Sd/-

Director Engineering (A)
SBP Banking Service Corporation – Engineering Department
1st Floor, Engg. Department, SBP-BSC Bolton Market Building, M.A.
Jinnah Road Karachi
Phone: 92-21-3245 4122/05/71, Facsimile: 92-21-99221176
Website: www.sbp.org.pk





SBP BANKING SERVICES CORPORATION ENGINEERING DEPARTMENT KARACHI

Reference No: ED/Proc-HOK/958705/2025

INVITATION TO E-BID FOR HEAD OFFICE & FIELD OFFICES

1. State Bank of Pakistan Banking Services Corporation, invites electronic bids from the suppliers/contractors/service providers, who are registered with PPRA for E-Procurement on "e-Pak Acquisition and Disposal system (EPADS)", having Income Tax registration and are on Active Taxpayers List (ATL) of FBR. Procurement details are listed in below table:

Sr No.	Tender No.	Title of Procurement	Date & Time of Bid Submission	Date & Time of Technical bid opening	Bid security to be Enclosed with Technical Bid (Rs.)	Address of Submission of Bid Security as per para-3 below
1.	262	Upgradation of Medium Voltage Panels (MV), 1500KVA Oil Type Transformer and Changeover Low Voltage (LV) Panels at Electrical Substation, SBP Head Office Karachi	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	1,000,000/-	PA to Director Engineering, 1st Floor, SBP Bolton Market Building, M.A. Jinnah Road, Karachi. Ph: 021-3245 4122/05
2.	263	Supply of Energy efficient LED lights for 3rd, 4th, 5th and 6th Floor and Boundary Wall of Main Building, LRC, BMB Building, P-3, P-4 KDA, at SBP Head office Karachi	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	170,000/-	
3.	264	Replacement of Lift Ropes and Sheaves for two Cargo Lifts in the Main Building and One Passenger Lift in the BSC Building, SBP Head Office Karachi	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	130,000/-	
4.	265	Miscellaneous Electrical & Telecommunication works at Main Building Complex, SBP Head Office Karachi	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	130,000/-	
5.	266	Lot-1: Supply of Split AC Units at Head Office Karachi and SBP-BSC field offices	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	500,000/-	
6.	267	Lot-2: Supply of Split AC Units at Head Office Karachi and SBP-BSC field offices	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	400,000/-	
7.	268	Supply of Fan Coil Unit (FCU) at SBP Head Office Karachi	13-Aug-2025 till 12:00 PM	13-Aug-2025 at 12:30 PM	150,000/-	
8.	269	Repair works of Air Handling Units installed at Main Bank Building, SBP Head Office Karachi	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	150,000/-	
9.	270	Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi.	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	300,000/-	
10.	271	Providing and Fixing of metallic safety Grill in missing portions under the slab and beams along with structural repair works in Banking Hall Main Building, SBP Head Office Karachi	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	150,000/-	
11.	272	Replacement of Damaged False Ceiling at 4th Floor, Main Building, SBP Head Office Karachi	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	100,000/-	
12.	273	Replacement of Damaged False Ceiling at 2nd Floor, BSC House SBP Head Office Karachi	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	70,000/-	
13.	274	Miscellaneous repair works at BMB, KDA Bungalows, Bank House & huts Karachi	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	80,000/-	
14.	275	Supply and Application of Solar Heat Rejecting Film on Windows Glass of SBP BSC Field offices at North Nazimabad Karachi, Lahore And Multan	21-Aug-2025 till 12:00 PM	21-Aug-2025 at 12:30 PM	800,000/-	
15.	FSB-1	Providing and Applying External Paint to SBP BSC Office Building at Faisalabad	13-Aug-2025 till 03:00 PM	13-Aug-2025 at 03:30 PM	230,000/-	PA to Chief Manager at 2nd Floor, SBP BSC (Bank), Faisalabad 041-9200444
16.	MUZ-1	Upgradation and Reconstruction of Washrooms at SBP BSC (Bank) Muzaffarabad	13-Aug-2025 till 03:00 PM	13-Aug-2025 at 03:30 PM	60,000/-	PA to Chief Manager, 1st Floor, SBP BSC (Bank), Upper Chattar, Muzaffarabad 05822-921927
17.	MUZ-2	External & Internal Paint Works of Main Building at SBP BSC (Bank), Muzaffarabad	13-Aug-2025 till 03:00 PM	13-Aug-2025 at 03:30 PM	120,000/-	
18.	MUZ-3	Water Proofing Work at Rooftop of Banking Hall SBP BSC Bank Muzaffarabad	13-Aug-2025 till 03:00 PM	13-Aug-2025 at 03:30 PM	80,000/-	
19.	NN-1	Establishment of SBP Innovation Hub at SBP BSC North Nazimabad, Karachi	21-Aug-2025 till 03:00 PM	21-Aug-2025 at 03:30 PM	1,800,000/-	PA to Chief Manager, 1st Floor, SBP BSC (Bank), North Nazimabad, Karachi. 021-99005219

2. The Bidding shall be conducted in line with the Rule 36 (b) Single Stage - Two Envelope procedure. E-bidding documents as per regulations, containing detailed terms and conditions, specifications and requirements etc. are available for the registered bidders on EPADS at (www.eprocure.gov.pk).
3. Bid(s) must be accompanied by a Bid Security as mentioned in above table. The bidders shall upload scanned copy of Bid Security on EPADS. Original Bid Security must be submitted at the address as mentioned in above table on or before schedule mentioned in above table, failing which the bid shall be rejected.
4. The electronic bids, must be submitted by using EPADS on or before schedule mentioned in above table. Manual bids, shall not be accepted. Electronic Bids will be opened on the same day at schedule mentioned in above table. In case the bid opening date falls on a public holiday, the bids will be opened on the next working day at the same time.

PID(K)00000

Sd/-
Director Engineering

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SECTION II: INSTRUCTION TO BIDDERS (ITBs)

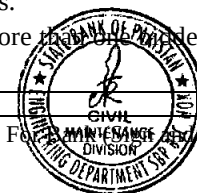


Section II. Instructions to Bidders (ITBs)

A. Introduction	
1. Scope of Application	1.1 The Procuring Agency (PA), as indicated in the Bid Data Sheet (BDS) invites Bids for the provision of Goods as specified in the BDS and Section V - Technical Specifications & Schedule of Requirements. The successful Bidders will be expected to supply and install the machine within the specified period and timeline(s) as stated in the BDS.
2. Sources of Funds	2.1 Source of funds is referred in Clause-2 of Invitation to Bids.
3. Eligible Bidders	3.1 A Bidder may be natural person, company or firm or public or semi-public agency of Pakistan or of any foreign country, or any combination of them with a formal existing agreement (on Judicial Papers) in the form of a joint venture, consortium, or association. In the case of a joint venture, consortium, or association, all members shall be jointly and severally liable for the execution of the Contract in accordance with the terms and conditions of the Contract. The joint venture, consortium, or association shall nominate a Lead Member as nominated in the BDS, who shall have the authority to conduct all business for and on behalf of any and all the members of the joint venture, consortium, or association during the Bidding process, and in case of award of contract, during the execution of contract. 3.2 The appointment of Lead Member in the joint venture, consortium, or association shall be confirmed by submission of a valid Power of Attorney to the Procuring Agency. 3.3 Verifiable copy of the agreement that forms a joint venture, consortium or association shall be required to be submitted as part of the Bid. 3.4 Any bid submitted by the joint venture, consortium or association shall indicate the part of proposed contract to be performed by each party and each party shall be evaluated (or post qualified if required) with respect to its contribution only, and the responsibilities of each party shall not be substantially altered without prior written approval of the Procuring Agency and in line with any instructions issued by the Authority. 3.5 The invitation for Bids is open to all prospective supplier, manufacturers or authorized agents/dealers subject to any provisions of incorporation or licensing by the respective national incorporating agency or statutory body established for that particular trade or business. 3.6 Foreign Bidders must be locally registered with the appropriate national incorporating body or the statutory body, before participating in the national/international competitive tendering with the exception of such procurements made by the foreign missions of Pakistan. For such purpose the bidder must have to initiate the registration process before the bid submission and the necessary evidence shall be submitted to the procuring agency along with their bid, however, the final award will be subject to the complete registration process. 3.7 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidders may be considered to have a conflict of interest with one or more parties in this Bidding process, if they: - are 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 Procuring Agency to provide consulting services for the preparation of the design, specifications and other documents to be used for the procurement of goods and related services to be procured under this Invitation for Bids. - have controlling shareholders in common; or - receive or have received any direct or indirect subsidy from any of them; or - have the same legal representative for purposes of this Bid; or - have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about



	or influence on the Bid of another Bidder, or influence the decisions of the Procuring Agency regarding this Bidding process; or f. Submit more than one Bid in this Bidding process. 3.8 A Bidder may be ineligible if – a. he is declared bankrupt or, in the case of company or firm, insolvent; b. payments in favor of the Bidder is suspended in accordance with the judgment of a court of law other than a judgment declaring bankruptcy and resulting (in accordance with the national laws) in the total or partial loss of the right to administer and dispose of its property; c. legal proceedings are instituted against such Bidder involving an order suspending payments and which may result, in accordance with the national laws, in a declaration of bankruptcy or in any other situation entailing the total or partial loss of the right to administer and dispose of the property; d. the Bidder is convicted, by a final judgment, of any offence involving professional conduct; e. the Bidder is blacklisted and hence debarred due to involvement in corrupt and fraudulent practices, or performance failure or due to breach of bid securing declaration. f. The firm, supplier and contractor is blacklisted or debarred by a foreign country, international organization, or other foreign institutions for the period defined by them. 3.9 Bidders shall provide to the Procuring Agency evidence of their eligibility, proof of compliance with the necessary legal requirements to carry out the contract effectively. 3.10 Bidders shall provide such evidence of their continued eligibility to the satisfaction of the Procuring Agency, as the Procuring Agency shall reasonably request. 3.11 Bidders shall submit proposals relating to the nature, conditions and modalities of sub-contracting wherever the sub-contracting of any elements of the contract amounting to the more than ten (10) percent of the Bid price is envisaged.
4. Eligible Goods and Related Services	4.1 All the goods and related services to be supplied under the contract shall have their origin in eligible source countries, and all expenditures made under the contract will be limited to such goods and services. For purpose of this Bid, ineligible countries are stated in the section-4 titled as “Eligible Countries”. 4.2 For purposes of this Clause, “origin” means the place where the goods are mined, grown, cultivated, produced, manufactured, or processed, or through manufacture, procession, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components or the place from where the related services are/to be supplied. 4.3 The nationality of the supplier that supplies and install the goods shall not determine the origin of the goods. 4.4 To establish the eligibility of the Goods and the related services, Bidders shall fill the country of origin declarations included in the Form of Bid. 4.5 If so required in the BDS, the Bidder shall demonstrate that it has been duly authorized by the manufacturer of the goods to deliver in Pakistan (or in respective country in case of procurement by the Pakistani Missions abroad), the goods indicated in its Bid.
5. One Bid per Bidder	5.1 A bidder shall submit only one Bid, in the same bidding process, either individually as a Bidder or as a member in a joint venture or any similar arrangement. 5.2 No bidder can be a sub-contractor while submitting a Bid individually or as a member of a joint venture in the same Bidding process. 5.3 A person or a firm cannot be a sub-contractor with more than one Bidder in the same bidding process.



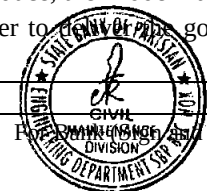
6. Cost of Bidding	6.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Procuring Agency shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
B. Bidding Documents	
7. Contents of Bidding Documents	7.1 The goods required, bidding procedures, and terms and conditions of the contract are prescribed in the Bidding Documents. In addition to the Invitation to Bids, the Bidding Documents which should be read in conjunction with any addenda issued in accordance with ITB 9.2 include: Section I - Invitation to Bids Section II Instructions to Bidders (ITBs) Section III Bid Data Sheet (BDS) Section IV Eligible Countries Section V Schedule of Requirements and Technical Specifications Section VI Standard Forms Section VII General Conditions of Contract (GCC) Section VIII Special Conditions of Contract (SCC) Section IX Contract Forms 7.2 The number of copies to be completed and returned with the Bid is specified in the BDS. 7.3 The Procuring Agency is not responsible for the completeness of the Bidding Documents and their addenda, if they were not obtained directly from the Procuring Agency or the signed pdf version from downloaded from the website of the Procuring Agency. However, Procuring Agency shall place both the pdf and same editable version to facilitate the bidder for filling the forms. 7.4 The Bidder is expected to examine all instructions, forms, terms and specifications in the Bidding Documents. Failure to furnish all the information required in the Bidding Documents will be at the Bidder's risk and may result in the rejection of his Bid.
8. Clarification of Bidding Documents	8.1 A prospective Bidder requiring any clarification of the Bidding Documents may notify the Procuring Agency in writing or in electronic form that provides record of the content of communication at the Procuring Agency's address indicated in the BDS. 8.2 The Procuring Agency will within three (3) working days after receiving the request for clarification, respond in writing or in electronic form to any request for clarification provided that such request is received not later than three (03) days prior to the deadline for the submission of Bids as prescribed in ITB 23.1. However, this clause shall not apply in case of alternate methods of Procurement. 8.3 Copies of the Procuring Agency's response will be forwarded to all identified Prospective Bidders through an identified source of communication, including a description of the inquiry, but without identifying its source. In case of downloading of the Bidding Documents from the website of PA, the response of all such queries will also be available on the same link available at the website. 8.4 Should the Procuring Agency deem it necessary to amend the Bidding Documents as a result of a clarification, it shall do so following the procedure under ITB 9. 8.5 If indicated in the BDS, the Bidder's designated representative is invited at the Bidder's cost to attend a pre-Bid meeting at the place, date and time mentioned in the BDS. During this pre-Bid meeting, prospective Bidders may request clarification of the schedule of requirement, the Evaluation Criteria or any other aspects of the Bidding Documents. 8.6 Minutes of the pre-Bid meeting, if applicable, including the text of the questions asked by Bidders, including those during the meeting (without identifying the source) and the responses given, together with any responses prepared after the meeting will be transmitted promptly to all prospective Bidders who have obtained the Bidding Documents. Any modification to the Bidding Documents that may become necessary as a result of the pre-Bid meeting shall be made by the Procuring Agency exclusively through the use of an Addendum pursuant to ITB 9. Non-attendance at the pre-Bid meeting will not be a cause for disqualification of a Bidder.



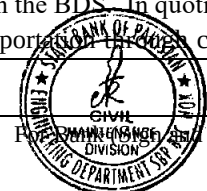
9. Amendment of Bidding Documents	9.1 Before the deadline for submission of Bids, the Procuring Agency for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder or pre-bid meeting may modify the Bidding Documents by issuing addenda. 9.2 Any addendum issued including the notice of any extension of the deadline shall be part of the Bidding Documents pursuant to ITB 7.1 and shall be communicated in writing or in any identified electronic form that provide record of the content of communication to all the bidders who have obtained the Bidding Documents from the Procuring Agency. The Procuring Agency shall promptly publish the Addendum at the Procuring Agency's web page identified in the BDS: Provided that the bidder who had either already submitted their bid or handed over the bid to the courier prior to the issuance of any such addendum shall have the right to withdraw his already filed bid and submit the revised bid prior to the original or extended bid submission deadline. 9.3 To give prospective Bidders reasonable time in which to take an addendum/corrigendum into account in preparing their Bids, the Procuring Agency may, at its discretion, extend the deadline for the submission of Bids: Provided that the Procuring Agency shall extend the deadline for submission of Bid, if such an addendum is issued within last three (03) days of the Bid submission deadline.
C. Preparation of Bids	
10. Language of Bid	10.1 The Bid prepared by the Bidder, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Procuring Agency shall be written in the English language unless otherwise specified in the BDS. 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 pages in the English language unless specified in the BDS, in which case, for purposes of interpretation of the Bidder, the translation shall govern.
11. Documents and Sample(s) Constituting the Bid	11.1 The Bid prepared by the Bidder shall constitute the following components: - - Form of Bid and Bid Prices completed in accordance with ITB 14 and 15; - Details of the Sample(s) where applicable and requested in the BDS. - Documentary evidence established in accordance with ITB 13 that the Bidder is eligible and/or qualified for the subject bidding process; - Documentary evidence established in accordance with ITB 13.3(a) that the Bidder has been authorized by the manufacturer to deliver the goods into Pakistan, where required and where the supplier is not the manufacturer of those goods; - Documentary evidence established in accordance with ITB 12 that the goods and related services to be supplied by the Bidder are eligible goods and services, and conform to the Bidding Documents; - Bid security or Bid Securing Declaration furnished in accordance with ITB 18; - Duly Notarized Power of Attorney authorizing the signatory of the Bidder to submit the bid; and - Any other document required in the BDS 11.2 Where a sample(s) is required by a procuring agency, the sample shall be: - submitted as part of the bid, in the quantities, dimensions and other details requested in the BDS; - carriage paid; - received on, or before, the closing time and date for the submission of bids; and - evaluated to determine compliance with all characteristics listed in the BDS. 11.3 The Procuring Agency shall retain the sample(s) of the successful Bidder. A Procuring Agency shall reject the Bid if the sample(s)- - do(es) not conform to all characteristics prescribed in the Bidding documents; and



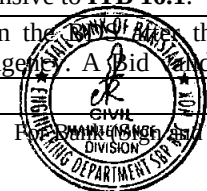
	(b) is / are not submitted within the specified time clearly mentioned in the Bid Data Sheet. 11.4 Where it is not possible to avoid using a propriety article as a sample, a Bidder shall make it clear that the propriety article is displayed only as an example of the type or quality of the goods being Bided for, and that competition shall not thereby be limited to the extent of that article only. 11.5 Samples made up from materials supplied by a Procuring Agency shall not be returned to a Bidder nor shall a Procuring Agency be liable for the cost of making them. 11.6 All samples produced from materials belonging to an unsuccessful Bidder shall be kept by the Procuring Agency till thirty (30) days from the date of award of contract or exhaust of all the grievance forums (including those pending at Authority's Level or in some Court of Law).
12. Documents Establishing Eligibility of the Goods and Related Services and Conformity to Bidding Documents	12.1 Pursuant to ITB 11, the Bidder shall furnish, as part of its Bid, all those documents establishing the eligibility in conformity to the terms and conditions specified in the Bidding Documents for all goods and related services which the Bidder proposes to deliver. 12.2 The documentary evidence of the eligibility of all goods and related services shall consist of a statement in the Price Schedule of the country of origin of the goods and related services offered which shall be confirmed by a certificate of origin issued at the time of shipment. 12.3 The documentary evidence of conformity of the goods and related services to the Bidding Documents may be in the form of literature, drawings, and data, and shall consist of: - a detailed description of the essential technical specifications and performance characteristics of the Goods; - an item-by-item commentary on the Procuring Agency'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; - any other procurement specific documentation requirement as stated in the BDS. 12.4 The Bidder shall also furnish a list giving full particulars, including available sources and current prices of goods, spare parts, special tools, etc., necessary for the proper and continuing functioning of the Goods during the period specified in the BDS following commencement of the use of the goods by the Procuring Agency. 12.5 For purposes of the commentary to be furnished pursuant to ITB 12.3(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 Procuring Agency 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 Procuring Agency's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications. 12.6 The required documents and other accompanying documents must be in English. In case any other language than English is used the pertinent translation into English shall be attached to the original version.
13. Documents Establishing the Eligibility and Qualification of the Bidder	13.1 Pursuant to ITB 11, the Bidder shall furnish, as part of its Bid, all those documents establishing the Bidder's eligibility to participate in the bidding process and/or its qualification 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 satisfaction of the Procuring Agency that the Bidder, at the time of submission of its bid, is from an eligible country as defined in Section-4 titled as "Eligible Countries". 13.3 The documentary evidence of the Bidder's qualifications to perform the contract if its Bid is accepted shall establish to the satisfaction of Procuring Agency that: in the case of a Bidder offering deliver the goods under the contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized by the Manufacturer or producer to deliver the goods in Pakistan;



	b) The Bidder has the financial, technical, and supply/production capability necessary to perform the Contract, meets the qualification criteria specified in BDS. c) in the case of a Bidder not doing business within Pakistan, the Bidder is or will be (if awarded the contract) represented by an Agent in Pakistan 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. d) That the Bidder meets the qualification criteria listed in the Bid Data Sheet.
14. Form of Bid	14.1 The Bidder shall fill the Form of Bid furnished in the Bidding Documents. The Bid Form must be completed without any alterations to its format and no substitute shall be accepted.
15. Bid Prices	15.1 The Bid Prices and discounts quoted by the Bidder in the Form of Bid and in the Price Schedules shall conform to the requirements specified below in ITB Clause 15 or exclusively mentioned hereafter in the bidding documents. 15.2 All items in the Schedule of requirement must be listed and priced separately in the Price Schedule(s). If a Price Schedule shows items listed but not priced, their prices shall be construed to be included in the prices of other items. 15.3 Items not listed in the Price Schedule shall be assumed not to be included in the Bid, and provided that the Bid is still substantially responsive in their absence or due to their nominal nature, the corresponding average price of the respective item(s) of the remaining substantially responsive bidder(s) shall be construed to be the price of those missing item(s): Provided that: a) where there is only one (substantially) responsive bidder, or b) where there is provision for alternate proposals and the respective items are not listed in the other bids, The procuring agency may fix the price of missing items in accordance with market survey, and the same shall be considered as final price. 15.4 The Bid price to be quoted in the Form of Bid in accordance with ITB 15.1 shall be the total price of the Bid, excluding any discounts offered. 15.5 The Bidder shall indicate on the appropriate Price Schedule, the unit prices (where applicable) and total Bid price of the goods it proposes to deliver under the contract. 15.6 Prices indicated on the Price Schedule shall be entered separately in the following manner: a) For goods manufactured from within Pakistan (or within the country where procurement is being done in case of foreign missions abroad): i. The price of the goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable), including all customs duties and sales and other taxes already paid or payable: A. on the components and raw material used in the manufacturing or assembly of goods quoted ex- works or ex-factory; OR B. on the previously imported goods of foreign origin quoted ex-warehouse, ex-showroom, or off-the-shelf. ii. All applicable taxes which will be payable on the goods if the contract is awarded. iii. The price for inland transportation, insurance, and other local costs incidental to delivery of the goods to their final destination, if specified in the BDS. iv. The price of other (incidental or allied) services, if any, listed in the BDS. b) For goods offered from abroad: i. The price of the goods shall be quoted CIF named port of destination, or CIP border point, or CIP named place of destination, in the Procuring Agency's country, as specified in the BDS. In quoting the price, the Bidder shall be free to use transportation carriers



	registered in any eligible countries. Similarly, the Bidder may obtain insurance services from any eligible source country. Or ii. The price of the goods quoted FOB port of shipment (or FCA, as the case may be), if specified in the BDS. or iii. The price of goods quoted CFR port of destination (or CPT as the case may be), if specified in the BDS. iv. the price for inland transportation, insurance, and other local costs incidental to delivery of the goods from the port of entry to their final destination, if specified in the BDS. v. The price of (incidental) services, if any, listed in the BDS. 15.7 Prices proposed on the Price Schedule for goods and related services shall be disaggregated, where appropriate as indicated in this Clause. This desegregation shall be solely for the purpose of facilitating the comparison of Bids by the Procuring Agency. This, shall not in any way limit the Procuring Agency's right to contract on any of the terms and conditions offered: - a) For Goods: - i) the price of the Goods, quoted as per applicable INCOTERMS as specified in the BDS ii) all customs duties, sales tax, and other taxes applicable on goods or on the components and raw materials used in their manufacture or assembly, if the contract is awarded to the Bidder, and b) For Related Services i) The price of the related services, and ii) All customs duties, sales tax and other taxes applicable in Pakistan, paid or payable, on the related services, if the contract is awarded to the Bidder. 15.8 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price will be treated as non-responsive and shall be rejected, pursuant to ITB 29. 15.9 If so indicated in the Invitation to Bids and Instructions to Bidders, that Bids are being invited for individual contracts (Lots) or for any combination of contracts (packages), Bidders wishing to offer any price reduction for the award of more than one contract shall specify in their Bid the price reductions applicable to each package, or alternatively, to individual contracts (Lots) within a package.
16. Bid Currencies	16.1 Prices shall be quoted in the following currencies: a) For goods and services that the Bidder will deliver from within Pakistan, the prices shall be quoted in Pakistani Rupees, unless otherwise specified in the BDS. b) For goods and related services that the Bidder will deliver from outside Pakistan, or for imported parts or components of goods and related services originating outside Pakistan, the Bid prices shall be quoted in any freely convertible currency of another country. If the Bidder wishes to be paid in a combination of amounts in different currencies, it may quote its price accordingly but use no more than three foreign currencies. 16.2 For the purposes of comparison of bids quoted in different currencies, the price shall be converted into a single currency specified in the bidding documents. The rate of exchange shall be the selling rate, prevailing on the date of opening of (financial part of) bids specified in the bidding documents, as notified by the State Bank of Pakistan on that day. 16.3 Bidders shall indicate details of their expected foreign currency requirements in the Bid. 16.4 Bidders may be required by the Procuring Agency to clarify their foreign currency requirements and to substantiate that the amounts included in Lump Sum and in the SCC are reasonable and responsive to ITB 16.1.
17. Bid Validity Period	17.1 Bids shall remain valid for the period specified in the SCC. A Bid submitted for a



	shorter period shall be rejected by the Procuring Agency as non-responsive. The period of Bid validity will be determined from the complementary bid securing instrument i.e., the expiry period of bid security or bid securing declaration as the case may be. 17.2 Under exceptional circumstances, prior to the expiration of the initial Bid validity period, the Procuring Agency may request the Bidders' consent to an extension of the period of validity of their Bids only once, for the period not more than the period of initial bid validity. The request and the Bidders responses shall be made in writing or in electronic forms that provide record of the content of communication. The Bid Security provided under ITB 18 shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid security or causing to be executed its Bid Securing Declaration. A Bidder agreeing to the request will not be required nor permitted to modify its Bid, but will be required to extend the validity of its Bid Security or Bid Securing Declaration for the period of the extension, and in compliance with ITB 18 in all respects. 17.3 If the award is delayed by a period exceeding sixty (60) days beyond the expiry of the initial Bid validity period, the contract price may be adjusted by a factor specified in the request for extension. However, the Bid evaluation shall be based on the already quoted Bid Price without taking into consideration on the above correction.
18. Bid Security or Bid Securing Declaration	18.1 Pursuant to ITB 11, unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, a Bid Security in form of fixed amount not exceeding five percent of the estimated value of procurement determined by the procuring agency and in the amount and currency specified in the BDS or Bid Securing Declaration as specified in the BDS in the format provided in Section VI (Standard Forms). 18.2 The Bid Security or Bid Securing Declaration is required to protect the Procuring Agency against the risk of Bidder's conduct which would warrant the security's forfeiture, pursuant to ITB 18.9. 18.3 The Bid Security shall be denominated in the local currency or in another freely convertible currency, and it shall be in the form specified in the BDS which shall be in any of the following: - a bank guarantee, an irrevocable letter of credit issued by a Scheduled bank in the form provided in the Bidding Documents or another form acceptable to the Procuring Agency and valid for twenty-eight (28) days beyond the end of the validity of the Bid. This shall also apply if the period for Bid Validity is extended. In either case, the form must include the complete name of the Bidder; - a cashier's or certified cheque; or - another security if indicated in the BDS 18.4 The Bid Security or Bid Securing Declaration shall be in accordance with the Form of the Bid Security or Bid Securing Declaration included in Section VI (Standard Forms) or another form approved by the Procuring Agency prior to the Bid submission. 18.5 The Bid Security shall be payable promptly upon written demand by the Procuring Agency in case any of the conditions listed in ITB 18.9 are invoked. 18.6 Any Bid not accompanied by a Bid Security or Bid Securing Declaration in accordance with ITB 18.1 or 18.3 shall be rejected by the Procuring Agency as non-responsive, pursuant to ITB 29. 18.7 Unsuccessful Bidders' Bid Security will be discharged or returned as promptly as possible, however in no case later than thirty (30) days after the expiration of the period of Bid Validity prescribed by the Procuring Agency pursuant to ITB 17. The Procuring Agency shall make no claim to the amount of the Bid Security, and shall promptly return the Bid Security document, after whichever of the following that occurs earliest: - the expiry of the Bid Security; - the entry into force of a procurement contract and the provision of a performance security (or guarantee), for the performance of the contract if such a security (or guarantee), is required by the Bidding documents; - the rejection by the Procuring Agency of all Bids



	(d) the withdrawal of the Bid prior to the deadline for the submission of Bids, unless the Bidding documents stipulate that no such withdrawal is permitted. 18.8 The successful Bidder's Bid Security will be discharged upon the Bidder signing the contract pursuant to ITB 42, or furnishing the performance guarantee, pursuant to ITB 43. 18.9 The Bid Security may be forfeited or the Bid Securing Declaration executed: a) if a Bidder: i) withdraws its Bid during the period of Bid Validity as specified by the Procuring Agency, and referred by the bidder on the Form of Bid except as provided for in ITB 17.2; or ii) does not accept the correction of errors pursuant to ITB 31.2; or b) in the case of a successful Bidder, if the Bidder fails: i) to sign the contract in accordance with ITB 42; or ii) to furnish performance security (or guarantee) in accordance with ITB 43.
19. Alternative Bids by Bidders	19.1 Bidders shall submit offers that comply with the requirements of the Bidding Documents, including the basic Bidder's technical design as indicated in the specifications and Schedule of Requirements. Alternatives will not be considered, unless specifically allowed for in the BDS. If so allowed, ITB 19.2 shall prevail. 19.2 When alternative schedule for supply and installation of equipment is explicitly invited, a statement of that effect will be included in the BDS as will the method for evaluating different schedule for delivery of goods. 19.3 If so allowed in the BDS, Bidders wishing to offer technical alternatives to the requirements of the Bidding Documents must also submit a Bid that complies with the requirements of the Bidding Documents, including the basic technical design as indicated in the specifications. In addition to submitting the basic Bid, the Bidder shall provide all information necessary for a complete evaluation of the alternative by the Procuring Agency, including technical specifications, breakdown of prices, and other relevant details. Only the technical alternatives, if any, of the Most Advantageous Bidder conforming to the basic technical requirements (without altering the bid price) shall be considered by the Procuring Agency.
20. Withdrawal, Substitution, and Modification of Bids	20.1 Before bid submission deadline, any bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and the corresponding substitution or modification must accompany the respective written notice. 20.2 Bids requested to be withdrawn in accordance with ITB 20.1 shall be returned unopened to the Bidders.
21. Format and Signing of Bid	21.1 The Bidder shall prepare an original and the number of copies of the Bid as indicated in the BDS, clearly marking each "ORIGINAL" and "COPY," as appropriate. In the event of any discrepancy between them, the original shall prevail: Provided that except in Single Stage One Envelope Procedure, the Bid shall include only the copies of technical proposal. 21.2 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 sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for un-amended printed literature, shall be initialed by the person or persons signing the Bid. 21.3 Any interlineations, erasures, or overwriting shall be valid only if they are signed by the person or persons signing the Bidder.
D. Submission of Bids	
22. Sealing and Marking of Bids	22.1 In case of Single Stage One Envelope Procedure, 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 securely sealed in such a manner that opening and resealing cannot be achieved undetected. Note: The envelopes shall be sealed and marked in accordance with the bidding procedure adopted as referred in Rule-36 of PPH-2004.



	22.2 The inner and outer envelopes shall: - be addressed to the Procuring Agency at the address given in the BDS; and - bear the title of the subject procurement or Project name, as the case may be as indicated in the BDS, the Invitation to Bids (ITB) title and number indicated in the BDS, and a statement: “DO NOT OPEN BEFORE,” to be completed with the time and the date specified in the BDS, pursuant to ITB 23.1. 22.3 In case of Single Stage Two Envelope Procedure, The Bid shall comprise two envelopes submitted simultaneously, one called the Technical Proposal and the other Financial Proposal. Both envelopes to be enclosed together in an outer single envelope called the Bid. Each Bidder shall submit his bid as under: - Bidder shall submit his TECHNICAL PROPOSAL and FINANCIAL PROPOSAL in separate inner envelopes and enclosed in a single outer envelope. ORIGINAL and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such. - The envelopes containing the ORIGINAL and copies will be put in one sealed envelope and addressed / identified as given in Sub- Clause 21.2. 22.4 The inner and outer envelopes shall: - be addressed to the Procuring Agency at the address provided in the Bidding Data; - bear the name and identification number of the contract as defined in the Bidding Data; and provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data, pursuant to ITB 23.1. - In addition to the identification required in Sub- Clause 21.2 hereof, the inner envelope shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared “late” pursuant to Clause IB.24 If all envelopes are not sealed and marked as require by ITB 22.2, ITB 22.3 and ITB 22.4 or incorrectly marked, the Procuring Agency will assume no responsibility for the misplacement or premature opening of Bid
23. Deadline for Submission of Bids	23.1 Bids shall be received by the Procuring Agency no later than the date and time specified in the BDS. 23.2 The Procuring Agency may, in exceptional circumstances and at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with ITB 9, in which case all rights and obligations of the Procuring Agency and Bidders previously subject to the deadline will thereafter be subject to the new deadline.
24. Late Bids	24.1 The Procuring Agency shall not consider for evaluation any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 23. 24.2 Any Bid received by the Procuring Agency after the deadline for submission of Bids shall be declared late, recorded, rejected and returned unopened to the Bidder.
25. Withdrawal, of Bids	25.1 A Bidder may withdraw its Bid after it has been submitted, provided that written notice of the withdrawal of the Bid is received by the Procuring Agency prior to the deadline for submission of Bids. 25.2 Revised bid may be submitted after the withdrawal of the original bid in accordance with the provisions referred in ITB 22.
E. Opening and Evaluation of Bids	
26. Opening of Bids	26.1 The Procuring Agency will open all Bids, in public, in the presence of Bidders’ or their representatives who choose to attend, and other parties with a legitimate interest in the Bid proceedings at the place, on the date and at the time, specified in the BDS. The Bidders’ representatives present shall sign a register as proof of their attendance. 26.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding Withdrawal Notice contains a valid authorization to request the withdrawal and is read out at bid opening. 26.3 Second, outer envelopes marked “SUBSTITUTION” shall be opened. The inner envelopes containing the Substitution Bid shall be exchanged for the corresponding Original Bid being substituted, which is to be returned to the Bidder unopened. No envelope shall be substituted unless the corresponding

	Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening. 26.4 Next, outer envelopes marked “MODIFICATION” shall be opened. No Technical Proposal and/or Financial Proposal shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at the opening of the Bids. Any Modification shall be read out along with the Original Bid except in case of Single Stage Two Envelope Procedure where only the Technical Proposal, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Financial Proposal, both Original and Modification, will remain unopened till the prescribed financial bid opening date. 26.5 Other envelopes holding the Bids shall be opened one at a time, in case of Single Stage One Envelope Procedure, the Bidders names, the Bid prices, the total amount of each Bid and of any alternative Bid (if alternatives have been requested or permitted), any discounts, the presence or absence of Bid Security, Bid Securing Declaration and such other details as the Procuring Agency may consider appropriate, will be announced by the Procurement Evaluation Committee. 26.6 In case of Single Stage Two Envelope Procedure, the Procuring Agency will open the Technical Proposals in public at the address, date and time specified in the BDS in the presence of Bidders` designated representatives who choose to attend and other parties with a legitimate interest in the Bid proceedings. The Financial Proposals will remain unopened and will be held in custody of the Procuring Agency until the specified time of their opening. 26.7 The envelopes holding the Technical Proposals shall be opened one at a time, and the following read out and recorded: (a) the name of the Bidder; (b) whether there is a modification or substitution; (c) the presence of a Bid Security, if required; and (d) Any other details as the Procuring Agency may consider appropriate. 26.8 Bids not opened and not read out at the Bid opening shall not be considered further for evaluation, irrespective of the circumstances. In particular, any discount offered by a Bidder which is not read out at Bid opening shall not be considered further. 26.9 Bidders are advised to send in a representative with the knowledge of the content of the Bid who shall verify the information read out from the submitted documents. Failure to send a representative or to point out any un-read information by the sent Bidder’s representative shall indemnify the Procuring Agency against any claim or failure to read out the correct information contained in the Bidder’s Bid. 26.10 No Bid will be rejected at the time of Bid opening except for late Bids which will be returned unopened to the Bidder, pursuant to ITB 24. 26.11 The Procuring Agency shall prepare minutes of the Bid opening. The record of the Bid opening shall include, as a minimum: the name of the Bidder and whether or not there is a withdrawal, substitution or modification, the Bid price if applicable, including any discounts and alternative offers and the presence or absence of a Bid Security or Bid Securing Declaration. 26.12 The Bidders’ representatives who are present shall be requested to sign on the attendance sheet. The omission of a Bidder’s signature on the record shall not invalidate the contents and affect the record. A copy of the record shall be distributed to all the Bidders. 26.13 A copy of the minutes of the Bid opening shall be furnished to individual Bidders upon request. 26.14 In case of Single Stage Two Envelop Bidding Procedure, after the evaluation and approval of technical proposal the procuring agency, shall at a time within the bid validity period, publically open the financial proposals of the technically accepted bids only. The financial proposal of bids found technically non-responsive shall be returned un-opened to the respective bidders subject to redress of the grievances from all tiers of grievances.
27. Confidentiality	27.1 Information relating to the examination, clarification, evaluation and comparison of Bids and recommendation of contract award shall not be disclosed to Bidders or any other persons not officially concerned with such process until the time of the announcement of the respective award report.

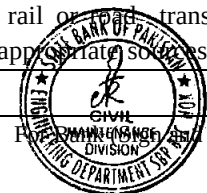


	27.2 Any effort by a Bidder to influence the Procuring Agency processing of Bids or award decisions may result in the rejection of its Bid. 27.3 Notwithstanding ITB 27.2 from the time of Bid opening to the time of contract award, if any Bidder wishes to contact the Procuring Agency on any matter related to the Bidding process, it should do so in writing or in electronic forms that provides record of the content of communication.
28. Clarification of Bids	28.1 To assist in the examination, evaluation and comparison of Bids of the Bidders, the Procuring Agency may, ask any Bidder for a clarification. Any clarification submitted by a Bidder that is not in response to a request by the Procuring Agency shall not be considered. 28.2 The request for clarification and the response shall be in writing or in electronic forms that provide record of the content of communication. In case of Single Stage Two Envelope Procedure, no change in the prices or substance of the Bid shall be sought, offered, or permitted, whereas in case of Single Stage One Envelope Procedure, only the correction of arithmetic errors discovered by the Procuring Agency in the evaluation of Bids should be sought in accordance with ITB 31. 28.3 The alteration or modification in THE BID which in any affect the following parameters will be considered as a change in the substance of a bid: - evaluation & qualification criteria; - required scope of work or specifications; - all securities requirements; - tax requirements; - terms and conditions of bidding documents. - change in the ranking of the bidder 28.4 From the time of Bid opening to the time of Contract award if any Bidder wishes to contact the Procuring Agency on any matter related to the Bid it should do so in writing or in electronic forms that provide record of the content of communication.
29. Preliminary Examination of Bids	29.1 Prior to the detailed evaluation of Bids, the Procuring Agency will determine whether each Bid: - meets the eligibility criteria defined in ITB 3 and ITB 4; - has been prepared as per the format and contents defined by the Procuring Agency in the Bidding Documents; - has been properly signed; - is accompanied by the required securities; and - is substantially responsive to the requirements of the Bidding Documents. The Procuring Agency's determination of a Bid's responsiveness will be based on the contents of the Bid itself. 29.2 A substantially responsive Bid is one which conforms to all the terms, conditions, and specifications of the Bidding Documents, without material deviation or reservation. A material deviation or reservation is one that: - affects in any substantial way the scope, quality, or performance of the Services; - limits in any substantial way, inconsistent with the Bidding Documents, the Procuring Agency's rights or the Bidders obligations under the Contract; or - if rectified, would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids. 29.3 The Procuring Agency will confirm that the documents and information specified under ITB 11, 12 and 13 have been provided in the Bid. If any of these documents or information is missing, or is not provided in accordance with the Instructions to Bidders, the Bid shall be rejected. 29.4 The Procuring Agency may waive off 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. Explanation: A minor informality, non-conformity or irregularity is one that is merely a matter of form and not of substance. It also pertains to some



	<i>immaterial defect in a Bid or variation of a bid from the exact requirements of the invitation that can be corrected or waived without being prejudicial to other bidders. The defect or variation is immaterial when the effect on quantity, quality, or delivery is negligible when contrasted with the total cost or scope of the supplies or services being acquired. The Procuring Agency either shall give the bidder an opportunity to cure any deficiency resulting from a minor informality or irregularity in a bid or waive the deficiency, whichever is advantageous to the Procuring Agency. Examples of minor informalities or irregularities include failure of a bidder to –</i> (a) <i>Submit the number of copies of signed bids required by the invitation;</i> (b) <i>Furnish required information concerning the number of its employees;</i> (c) <i>The firm submitting a bid has formally adopted or authorized, before the date set for opening of bids, the execution of documents by typewritten, printed, or stamped signature and submits evidence of such authorization and the bid carries such a signature.</i> 29.5 Provided that a Technical Bid is substantially responsive, the Procuring Agency may request the Bidder to submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any such aspect of the technical Proposal linked with the ranking of the bidders. Failure of the Bidder to comply with the request may result in the rejection of its Bid. 29.6 Provided that a Technical Bid is substantially responsive, the Procuring Agency shall rectify quantifiable nonmaterial nonconformities or omissions related to the Financial Proposal. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of the missing or nonconforming item or component. 29.7 If a Bid is not substantially responsive, it will be rejected by the Procuring Agency and may not subsequently be evaluated for complete technical responsiveness.
30. Examination of Terms and Conditions; Technical Evaluation	30.1 The Procuring Agency shall examine the Bid to confirm that all terms and conditions specified in the GCC and the SCC have been accepted by the Bidder without any material deviation or reservation. 30.2 The Procuring Agency shall evaluate the technical aspects of the Bid submitted in accordance with ITB 22, to confirm that all requirements specified in Section V – Schedule of Requirements, Technical Specifications of the Bidding Documents have been met without material deviation or reservation. 30.3 If after the examination of the terms and conditions and the technical evaluation, the Procuring Agency determines that the Bid is not substantially responsive in accordance with ITB 29, it shall reject the Bid.
31. Correctness of Errors	31.1 Bids determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows: - a. if there is a discrepancy between unit prices 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, unless in the opinion of the Procuring Agency there is an obvious misplacement of the decimal point in the unit price, in which the total price as quoted shall govern and the unit price shall be corrected; b. if there is an error in a total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and the total shall be corrected; and c. where there is a discrepancy between the amounts in figures and in words, the amount in words will govern. d. Where there is discrepancy between grand total of price schedule and amount mentioned on the Form of Bid, the amount referred in Price Schedule shall be treated as correct subject to elimination of other errors. 31.2 The amount stated in the Bid will, be adjusted by the Procuring Agency in accordance with the above procedure for the correction of errors and, with,

		the concurrence of the Bidder, shall be considered as binding upon the Bidder. If the Bidder does not accept the corrected amount, its Bid will then be rejected, and the Bid Security may be forfeited or the Bid Securing Declaration may be executed in accordance with ITB 18.9 .
32. Conversion to Single Currency	32.1	To facilitate evaluation and comparison, the Procuring Agency will convert all Bid prices expressed in the amounts in various currencies in which the Bid prices are payable. For the purposes of comparison of bids quoted in different currencies, the price shall be converted into a single currency specified in the bidding documents. The rate of exchange shall be the selling rate, prevailing on the date of opening of (financial part of) bids specified in the bidding documents, as notified by the State Bank of Pakistan on that day.
	32.2	The currency selected for converting Bid prices to a common base for the purpose of evaluation, along with the source and date of the exchange rate, are specified in the BDS .
33. Evaluation of Bids	33.1	The Procuring Agency shall evaluate and compare only the Bids determined to be substantially responsive, pursuant to ITB 29 .
	33.2	In evaluating the Technical Proposal of each Bid, the Procuring Agency shall use the criteria and methodologies listed in the BDS and in terms of Statement of Requirements and Technical Specifications. No other evaluation criteria or methodologies shall be permitted.
	33.3	The Procuring Agency's evaluation of a Bid will take into account: a. in the case of goods manufactured in Pakistan or goods of foreign origin already imported in Pakistan, Income Tax, General Sales Tax and other similar/applicable taxes, which will be payable on the goods if a contract is awarded to the Bidder; b. in the case of goods of foreign origin offered from abroad, customs duties and other similar import taxes which will be payable on the goods if the contract is awarded to the Bidder; and
	33.4	The comparison shall be between the EXW price of the goods offered from within Pakistan, such price to include all costs, as well as duties and taxes paid or payable on components and raw material incorporated or to be incorporated in the goods, and named port of destination, border point, or named place of destination) in accordance with applicable INCOTERM in the price of the goods offered from outside Pakistan. In evaluating the Bidders, the evaluation committee will, in addition to the Bid price quoted in accordance with ITB 15.1, take account of one or more of the following factors as specified in the BDS , and quantified in ITB 32.5: a. Cost of inland transportation, insurance, and other costs within the Pakistan incidental to delivery of the goods to their final destination. 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 Pakistan) 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 TBS and/or in the Technical Specifications.
	33.5	For factors retained in BDS , pursuant to ITB 33.4 one or more of the following quantification methods will be applied, as detailed in the BDS : a. <i>Inland transportation from EXW/port of entry/border point, Insurance and incidentals:</i> Inland transportation, insurance, and other incidental costs for delivery of the goods from EXW/port of entry/border point to Project Site named in the BDS will be computed for each Bid by the PA on the basis of published tariffs by the rail or road transport agencies, insurance companies, and/or other appropriate sources. To



	facilitate such computation, Bidder shall furnish in its Bid the estimated dimensions and shipping weight and the approximate EXW or as per applicable INCOTERM value of each package. The above cost will be added by the Procuring Agency to EXW or as per applicable INCOTERM price. b. <i>Delivery Schedule</i> i) The Procuring Agency requires that the goods under the Invitation for Bids shall be delivered (shipped) at the time specified in the Schedule of Requirements. The estimated time of arrival of the goods at the Project Site will be calculated for each Bid after allowing for reasonable international and inland transportation time. Treating the Bid resulting in such time of arrival as the base, a delivery “adjustment” will be calculated for other Bids by applying a percentage, specified in the BDS, of the EXW or as per applicable INCOTERM price for each week of delay beyond the base, and this will be added to the Bid price for evaluation. No credit 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 credit will be given to earlier deliveries, and Bids offering delivery beyond this range will be treated as non-responsive. Within this acceptable range, an adjustment per week, as specified in the BDS, 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 (shipped) 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 BDS, of EXW or as per applicable INCOTERM price per week of variation from the specified delivery schedule. c. <i>Deviation in Payment Schedule</i> 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 Procuring Agency may consider the alternative payment schedule offered by the selected Bidder. OR ii) The SCC stipulates the payment schedule offered by the Procuring Agency. If a Bid deviates from the schedule and if such deviation is considered acceptable to the Procuring Agency, 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 BDS. d. <i>Cost of Spare Parts</i> i) The list of items and quantities of major assemblies, components, and selected spare parts, like  required during the initial period of operation specified in the BDS, is
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	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 Procuring Agency 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 BDS. 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 Procuring Agency will estimate the cost of spare parts usage in the initial period of operation specified in the BDS, based on information furnished by each Bidder, as well as on past experience of the Procuring Agency or other Procuring Agency's in similar situations. Such costs shall be added to the Bid price for evaluation e. <i>Spare parts and after sales service facilities in Pakistan</i> The cost to the Procuring Agency of establishing the minimum service facilities and parts inventories, as outlined in the BDS or elsewhere in the Bidding Documents, if quoted separately, shall be added to the Bid price. f. <i>Operating and maintenance costs</i> 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 BDS or in the Technical Specifications. g. <i>Performance and productivity of the equipment.</i> (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 BDS 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 BDS 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 BDS or in the Technical Specifications. h. <i>Specific Additional Criteria</i> Other specific additional criteria to be considered in the evaluation and the evaluation method shall be detailed in the BDS and/or the Technical Specifications. 33.6 If these Bidding Documents allow Bidders to quote separate prices for different Lots, and the award to a single Bidder of multiple Lots, the methodology of evaluation to determine the lowest evaluated Lot combinations, including any discounts offered in the Form of Bid, is specified in the BDS.
34. Domestic Preferences	34.1 If the BDS so specifies, the Procuring Agency will grant a margin of preference to certain goods in line with the rules, regulations, regulatory guides or instructions issued by the Authority from time to time.
35. Determination of Most Advantageous Bid	35.1 In case where the Procuring Agency adopts the Cost Based Evaluation Technique and, the Bid with the lowest evaluated price is the most advantageous.



	which are eligible, compliant and substantially responsive shall be the Most Advantageous Bid. 35.2 The Procuring Agency may adopt the Quality & Cost Based Selection Technique due to the following two reasons: - Where the Procuring Agency knows about the main features, usage and output of the products; however not clear about the complete features, technical specifications and functionalities of the goods to be procured and requires the bidders to submit their proposals defining those features, specifications and functionalities; or - Where the Procuring Agency, in addition to the mandatory requirements and mandatory technical specifications, requires parameters specified in Evaluation Criteria to be evaluated while determining the quality of the goods: In such cases, the Procuring Agency may allocate certain weightage to these factors as a part of Evaluation Criteria, and may determine the ranking of the bidders on the basis of combined evaluation in accordance with provisions of Rule 2(1)(h) of PPR-2004.
36. Post qualification of Bidder and/or Abnormally Low Financial Proposal	36.1 After determining the Most Advantageous Bid, if neither the pre-qualification was undertaken separately nor any qualification parameters were undertaken as part of determining the Most Advantageous Bid, the Procuring Agency shall carry out the post-qualification of the Bidder using only the requirements specified in the BDS. In case of International Tendering, the parameters for incorporation or licensing within Pakistan may be fulfilled as part of post qualification. 36.2 Where the Bid price is considered to be abnormally low, the Procuring Agency shall perform price analysis either during determination of Most Advantageous Bid or as a part of the post-qualification process. The following process shall apply: - The Procuring Agency may reject a Bid if the Procuring Agency has determined that the price in combination with other constituent elements of the Bid is abnormally low in relation to the subject matter of the procurement (i.e. scope of the procurement or ancillary services) and raises concerns as to the capability and capacity of the respective Bidder to perform that contract - Before rejecting an abnormally low Bid the Procuring Agency shall request the Bidder an explanation of the Bid or of those parts which it considers contribute to the Bid being abnormally low; take account of the evidence provided in response to a request in writing; and subsequently verify the Bid or parts of the Bid being abnormally low; - The decision of the Procuring Agency to reject a Bid and reasons for the decision shall be recorded in the procurement proceedings and promptly communicated to the Bidder concerned; - The Procuring Agency shall not incur any liability solely by rejecting abnormally Bid; and - An abnormally low Bid means, in the light of the Procuring Agency's estimate and of all the Bids submitted, the Bid appears to be abnormally low by not providing a margin for normal levels of profit. <u>Guidance for Procuring Agency:</u> In order to identify the Abnormally Low Bid (ALB) following approaches can be considered to minimize the scope of subjectivity: - Comparing the bid price with the cost estimate; - Comparing the bid price with the bids offered by other bidders submitting substantially responsive bids; and - Comparing the bid price with prices paid in similar contracts in the recent past either government- or department- or partner-funded.



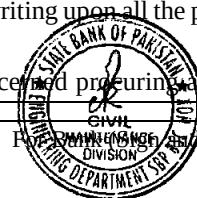
	36.3 The Procuring Agency will determine to its satisfaction whether the Bidder that is selected as having submitted the most advantageous Bid is qualified to perform the contract satisfactorily, in accordance with the criteria listed in ITB 13.3. 36.4 The determination will take into account the Bidder's 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 13.3, as well as such other information as the Procuring Agency deems necessary and appropriate. Factors not included in these Bidding Documents shall not be used in the evaluation of the Bidders' qualifications. 36.5 Procuring Agency may seek "Certificate for Independent Price Determination" from the Bidder and the results of reference checks may be used in determining award of contract. Explanation: The Certificate shall be furnished by the bidder. The bidder shall certify that the price is determined keeping in view of all the essential aspects such as raw material, its processing, value addition, optimization of resources due to economy of scale, transportation, insurance and margin of profit etc. 36.6 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 Procuring Agency will proceed to the next ranked bidder to make a similar determination of that Bidder's capabilities to perform satisfactorily.
F. Award of Contract	
37. Criteria of Award	37.1 Subject to ITB 36 and 38, the Procuring Agency will award the Contract to the Bidder whose Bid has been determined to be substantially responsive to the Bidding Documents and who has been declared as Most Advantageous Bidder, provided that such Bidder has been determined to be: a) eligible in accordance with the provisions of ITB 3; b) is determined to be qualified to perform the Contract satisfactorily; and c) Successful negotiations have been concluded, if any.
38. Negotiations	38.1 Negotiations may be undertaken with the Most Advantageous Bid relating to the following areas: (a) a minor alteration to the technical details of the statement of requirements; (b) reduction of quantities for budgetary reasons, where the reduction is in excess of any provided for in the Bidding documents; (c) a minor amendment to the special conditions of Contract; (d) finalizing payment arrangements; (e) delivery arrangements; (f) the methodology for provision of related services; or (g) clarifying details that were not apparent or could not be finalized at the time of Bidding; 38.2 Where negotiation fails to result into an agreement, the Procuring Agency may invite the next ranked Bidder for negotiations. Where negotiations are commenced with the next ranked Bidder, the Procuring Agency shall not reopen earlier negotiations.
39. Procuring Agency's Right to reject All Bids	39.1 Notwithstanding ITB 37, the Procuring Agency reserves the right to reject all the bids, and to annul the Bidding process at any time prior to award of contract, without thereby incurring any liability to the affected Bidder or Bidders. However, the Authority (i.e. PPRA) may call from the Procuring Agency the justification of those grounds. 39.2 Notice of the rejection of all Bids shall be given promptly to all Bidders that



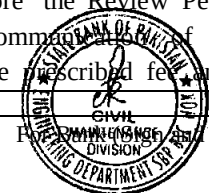
	have submitted Bids. 39.3 The Procuring Agency shall upon request communicate to any Bidder the grounds for its rejection of its Bids, but is not required to justify those grounds
40. Procuring Agency's Right to Vary Quantities at the time of Award	40.1 The Procuring Agency reserves the right at the time of contract award to increase or decrease the quantity of goods or related services originally specified in these Bidding Documents (schedule of requirements) provided this does not exceed by the percentage indicated in the BDS, without any change in unit price or other terms and conditions of the Bid and Bidding Documents.
41. Notification of Award	41.1 Prior to the award of contract, the Procuring Agency shall issue a Final Evaluation Report giving justification for acceptance or rejection of the bids. 41.2 Where no complaints have been lodged, the Bidder whose Bid has been accepted will be notified of the award by the Procuring Agency prior to expiration of the Bid Validity period in writing or electronic forms that provide record of the content of communication. The Letter of Acceptance will state the sum that the Procuring Agency will pay the successful Bidder in consideration for the execution of the scope of works as prescribed by the Contract (hereinafter and in the Contract called the "Contract Price). 41.3 The notification of award will constitute the formation of the Contract, subject to the Bidder furnishing the Performance Security (or guarantee) in accordance with ITB 43 and signing of the contract in accordance with ITB 42.2. 41.4 Upon the successful Bidder's furnishing of the performance security (or guarantee) pursuant to ITB 43, the Procuring Agency will promptly notify each unsuccessful Bidder, the name of the successful Bidder and the Contract amount and will discharge the Bid Security or Bid Securing Declaration of the Bidders pursuant to ITB 18.7.
42. Signing of Contract	42.1 Promptly after notification of award, Procuring Agency shall send the successful Bidder the draft agreement, incorporating all terms and conditions as agreed by the parties to the contract. 42.2 Immediately after the Redressal of grievance by the GRC, and after fulfillment of all conditions precedent of the Contract Form, the successful Bidder and the Procuring Agency shall sign the contract. 42.3 Where no formal signing of a contract is required, purchase order issued to the bidder shall be construed to be the contract.
43. Performance Security (or Guarantee)	43.1 After the receipt of the Letter of Acceptance, the successful Bidder, within the specified time, shall deliver to the Procuring Agency a Performance Security (or Guarantee) in the amount and in the form stipulated in the BDS and SCC, denominated in the type and proportions of currencies in the Letter of Acceptance and in accordance with the Conditions of Contract. 43.2 If the Performance Security (or Guarantee) is provided by the successful Bidder and it shall be in the form specified in the BDS which shall be in any of the following: (a) certified cheque, cashier's or manager's cheque, or bank draft; (b) irrevocable letter of credit issued by a Scheduled bank or in the case of an irrevocable letter of credit issued by a foreign bank, the letter shall be confirmed or authenticated by a Scheduled bank. (c) bank guarantee confirmed by a reputable local bank or, in the case of a successful foreign Bidder, bonded by a foreign bank; or (d) surety bond callable upon demand issued by any reputable surety or insurance company. Any Performance Security (or guarantee) submitted shall be enforceable in Pakistan. 43.3 Failure of the successful Bidder to comply with the requirements of ITB



	43.1 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security, in which event the Procuring Agency may make the award to the next ranked Bidder or call for new Bids.
44. Advance Payment	44.1 The advance payment will not be provided in normal circumstances. However, in case where international incoterms are involved, the same will be dealt with standard international practices and in the manner as prescribed in ITB 44.2. 44.2 The Procuring Agency will provide an Advance Payment as stipulated in the Conditions of Contract, subject to a maximum amount, as stated in the BDS. The Advance Payment request shall be accompanied by an Advance Payment Security (Guarantee) in the form provided in Section IX. For the purpose of receiving the Advance Payment, the Bidder shall make and estimate of, and include in its Bid, the expenses that will be incurred in order to commence Delivery of Goods. These expenses will relate to the purchase of equipment, machinery, materials, and on the engagement of labor during the first month beginning with the date of the Procuring Agency's "Notice to Commence" as specified in the SCC.
45. Arbitrator	45.1 The Arbitrator shall be appointed by mutual consent of both parties as per the provisions specified in the SCC .
46. Corrupt and Fraudulent Practices	46.1 Procuring Agencies (including beneficiaries of Government funded projects and procurement) as well as Bidders/Suppliers/Contractors under Government financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts, and will avoid to engage in any corrupt and fraudulent practices.
G. Grievance Redressal & Complaint Review Mechanism	
47. Constitution of Grievance Redressal Committee	47.1 Procuring agency shall constitute a Grievance Redressal Committee (GRC) comprising of odd number of person with proper power and authorization to address the complaint. The GRC shall not have any of the members of Procurement Evaluation Committee. The committee must have one subject specialist depending the nature of the procurement.
48. GRC Procedure	48.1 Any party can file its written complaint against the eligibility parameters or any other terms and conditions prescribed in the prequalification or bidding documents found contrary to provision of Procurement Regulatory Framework, and the same shall be addressed by the GRC well before the bid submission deadline. 48.2 Any Bidder feeling aggrieved by any act of the procuring agency after the submission of his bid may lodge a written complaint concerning his grievances not later than seven days of the announcement of technical evaluation report and five days after issuance of final evaluation report. 48.3 In case, the complaint is filed against the technical evaluation report, the GRC shall suspend the procurement proceedings. 48.4 In case, the complaint is filed after the issuance of the final evaluation report, the complainant cannot raise any objection on technical evaluation of the report: Provided that the complainant may raise the objection on any part of the final evaluation report in case where single stage one envelop bidding procedure is adopted. 48.5 The GRC, in both the cases shall investigate and decide upon the complaint within ten days of its receipt. 48.6 Any bidder or the procuring agency not satisfied with the decision of the GRC may file Appeal before the Appellate Committee of the Authority on prescribed format after depositing the prescribed fee. 48.7 The Committee, upon receipt of the Appeal against the decision of the GRC complete in all respect shall serve notices in writing upon all the parties to Appeal. 48.8 The committee shall call the record from the concerned procuring agency



	or the GRC as the case may be, and the same shall be provided within prescribed time. 48.9 The committee may after examination of the relevant record and hearing all the concerned parties, shall decide the complaint within fifteen (15) days of receipt of the Appeal. 48.10 The decision of the Committee shall be in writing and shall be signed by the Head and each Member of the Committee. The decision of the committee shall be final.
H. MECHANISM OF BLACKLISTING	
49. Mechanism of Blacklisting	49.1 The Procuring Agency shall bar for not more than the time prescribed in Rule-19 of the Public Procurement Rules, 2004, from participating in their respective procurement proceedings, bidder or contractor who either: i. Involved in corrupt and fraudulent practices as defined in Rule-2 of Public Procurement Rules; ii. Fails to perform his contractual obligations; and iii. Fails to abide by the id securing declaration; 49.2 The show cause notice shall contain: (a) precise allegation, against the bidder or contractor; (b) the maximum period for which the Procuring Agency proposes to debar the bidder or contractor from participating in any public procurement of the Procuring Agency; and (c) the statement, if needed, about the intention of the Procuring Agency to make a request to the Authority for debarring the bidder or contractor from participating in public procurements of all the procuring agencies. 49.3 The procuring agency shall give minimum of seven days to the bidder or contractor for submission of written reply of the show cause notice. 49.4 In case, the bidder or contractor fails to submit written reply within the requisite time, the Procuring Agency may issue notice for personal hearing to the bidder or contractor/ authorize representative of the bidder or contractor and the procuring agency shall decide the matter on the basis of available record and personal hearing, if availed. 49.5 In case the bidder or contractor submits written reply of the show cause notice, the Procuring Agency may decide to file the matter or direct issuance of a notice to the bidder or contractor for personal hearing. 49.6 The Procuring Agency shall give minimum of seven days to the bidder or contractor for appearance before the specified officer of the Procuring Agency for personal hearing. The specified officer shall decide the matter on the basis of the available record and personal hearing of the bidder or contractor, if availed. 49.7 The procuring Agency shall decide the matter within fifteen days from the date of personal hearing unless the personal hearing is adjourned to a next date and in such an eventuality, the period of personal hearing shall be reckoned from the last date of personal hearing. 49.8 The Procuring Agency shall communicate to the bidder or contractor the order of debarring the bidder or contractor from participating in any public procurement with a statement that the bidder or contractor may, within thirty days, prefer a representation against the order before the Authority. 49.9 Such blacklisting or barring action shall be communicated by the procuring agency to the Authority and respective bidder or bidders in the form of decision containing the grounds for such action. The same shall be publicized by the Authority after examining the record whether the procedure defined in blacklisting and debarment mechanism has been adhered to by the procuring agency. 49.10 The bidder may file the review petition before the Review Petition Committee Authority within thirty days of communication of such blacklisting or barring action after depositing the prescribed fee and in



	accordance with “Procedure of filing and disposal of review petition under Rule-19(3) Regulations, 2021”. The Committee shall evaluate the case and decide within ninety days of filing of review petition 49.11 The committee shall serve a notice in writing upon all respondent of the review petition. The notices shall be accompanied by the copies of review petition and all attached documents of the review petition including the decision of the procuring agency. The parties may file written statements along with essential documents in support of their contentions. The Committee may pass such order on the representation may deem fit. 49.12 The Authority on the basis of decision made by the committee either may debar a bidder or contractor from participating in any public procurement process of all or some of the procuring agencies for such period as the deemed appropriate or acquit the bidder from the allegations. The decision of the Authority shall be final.
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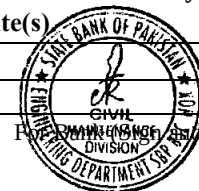


SECTION III: BID DATA SHEET



Section III. Bid Data Sheet (BDS)

BDS Clause Number	ITB Number	Amendments of, and Supplements to, Clauses in the Instruction to Bidders
1. INTRODUCTION		
1.	1.1	Name of Procuring Agency: SBP Banking Service Corporation – Engineering Department The Description (as specified in IFB) of the Goods is: Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi. Period for Contract: 350 days. Commencement date for delivery: To be notified in work order.
2.	2.1	Financial year for the operations of the Procuring Agency: [2025-26] Name of Project: Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi. Name of financing institution: Own Funding Name and identification number of the Contract: ED/PROC-HOK/958705/2025/270
3.	3.1	Joint Venture is NOT Applicable
4.	4.1	Ineligible country(s) are [<i>as per Section IV of the Bidding Documents</i>]
5.	4.5	Demonstration of authorization by manufacturer/distributor: Manufacturer's Authorization Form is not required.
2. BIDDING DOCUMENTS		
6.	7.2	Copy of bid is not required. Bid shall be submitted through EPADS.
7.	8.1	A prospective Bidder requiring any clarification of the Bidding Documents may approach Procuring Agency through EPADS.
	8.2 & 8.3	The Procuring Agency will respond in writing to any request for clarification of the Bidding Documents that it receives no later than seven (07) days before the deadline of submission of bids. Copies of the Procuring Agency's response (including an explanation of the query but not identifying its source) will be uploaded on EPADS within three days prior to closing date of Bids.
	8.5	Pre-Bid Meeting is not required.
	9.2	Any addendum issued including the notice of any extension of the deadline shall be part of the Bidding Documents pursuant to ITB 7.1 and shall be communicated through EPADS.
3. PREPARATION OF BIDS		
8.	10.1	The Language of all correspondences and documents related to the Bid is English / Urdu.
9.	11.1(h)	Documents required under Eligibility Criteria / Qualification Criteria.
10.	12.3 (c)	Other procurement specific documentation requirements are Not Required
11.	12.4	Not Required
12.	13	The eligibility and qualification criteria required from Bidders in ITB 13.3(b) is modified as provided in "Bidder's Eligibility / Qualification Criteria".
13.	15.6 (b)	For goods offered from abroad the price quoted shall be: Not Applicable
14.	15.7 (a) (i)	For goods manufactured or delivered from within Pakistan the price quoted shall be on a Delivered Duty Paid (DDP) basis, inclusive of all taxes, stamps, duties, levies, fees, transportation, insurance, incidental services imposed till the delivery location specified in the Schedule of Requirements. No separate payment shall be made for the incidental services to delivery of the goods to their final destination i.e. Procuring Agency's Site(s)
15.	15.8	The price shall be fixed.



16.	15.9	Bidder may offer any price reduction which shall be specified in their Bid the price reductions applicable to this tender.
17.	16.1 (a)	a) For goods and related services originating in Pakistan the currency of the Bid shall be Pakistani Rupees ; b) For goods and related services that the Bidder will deliver from outside Pakistan, the currency of the Bid shall be Pakistani Rupees .
18.	17.1	The Bid Validity period shall be 180 days.
19.	18.1	The amount of Bid Security shall be Rs.300,000/- . The currency of the Bid Security shall be: Pakistani Rupees
20.	18.3	The Bid Security shall be in favor of 'SBP Banking Services Corporation' in the form of: <i>either Payment Order/Bank Draft in Pakistan</i>
21.	18.3 (c)	Another Security: Not Applicable .
22.	19.1	Alternative and conditional Bids to the requirements of the Bidding Documents is not permitted and bid will be held non-responsive.
23.	21.1	Bidding shall be conducted using the National Competitive Bidding Procedure specified in the PPR-2004, Rule 36 (b) Single Stage - Two Envelope procedure through EPADS.
24.	21.2	Letter of authorization to sign contract on behalf of bidding company.
4. SUBMISSION OF BIDS		
25.	22.2 (a)	Address of the Procuring Agency; Director Engineering (A) SBP Banking Service Corporation – Engineering Department 1st Floor, Engg. Department, SBP-BSC Bolton Market Building, M.A. Jinnah Road Karachi Phone: 92-21-3245 4122/05/71, Facsimile: 92-21-99221176 Website: www.sbp.org.pk
26.	23.1	Bids must be submitted through EPADS, no later than the bid submission deadline specified in the ITB. Bids submitted through hard form, telegraph, telex, fax or e-mail shall not be considered. In case of receipt of original bid security by the Procuring Agency after the bid submission deadline specified in the ITB, Bid will be rejected.
5. OPENING AND EVALUATION OF BIDS		
27.	26.1	As specified in published ITB
28.	26.14	The opening date of Financial Proposal will be communicated through EPADS.
29.	27	Information relating to evaluation of bids and recommendations concerning to award of the contract shall not be disclosed by the Procuring Agency to the bidders or to any other person who is not officially concerned with the process, until the announcement of the result of evaluation. The Bidder shall not disclose or attempt to make public any information relating to the bidding documents, bidding process and award of the contract to any person or entity without the Procuring Agency's prior written consent. In case of any disclosure related to the bidding process and contractual obligations at any stage by any bidder, the Procuring Agency may reject its bid and/or terminate the contract.
30.	32.2	The currency that shall be used for Bid evaluation and comparison purposes is: Pakistani Rupees .
31.	33.4 (h)	Other specific criteria are Nil
32.	33.5 (b)	Delivery schedule: The goods covered under this invitation are required to be delivered within time specified in the Schedule of Requirement. No credit will be given to earlier deliveries, and Bids offering delivery beyond this range will be treated as non-responsive.
33.	33.5 (c) (i & ii)	Alternate payment & Deviation in payment schedule are Not Applicable .
34.	33.5 (d)	Cost of spare parts : Not applicable
35.	33.5 (e)	Spare parts and after sales service facilities in Pakistan : Not applicable
36.	33.5 (f)	Operating and maintenance costs : Not applicable



37.	33.5 (g)	Performance and productivity of Equipment Goods offered shall have a minimum productivity specified under the relevant provision to be considered responsive as specified in the Technical Specifications.
38.	33.5 (h)	Specific additional criteria to be used in the evaluation and their evaluation method or reference to the Technical Specifications is Not Applicable .
39.	33.6	The contract will be awarded to the Bidder offering the lowest evaluated cost, subject to the selected Bidder meeting the required qualification criteria for which they were qualified.
40.	34.1	Domestic preference Not Applicable .
41.	35	Evaluation Techniques Least Cost Based Selection (LCBS) After meeting the requirements of eligibility, qualification and substantial responsiveness, the bid in compliance with all the mandatory (technical) specifications/requirements and/or requisite quality threshold (if any), and having lowest evaluated cost (or financial proposal) shall be considered highest ranked bid (Most Advantageous Bid).
6. AWARD OF CONTRACT		
42.	39.2	Notice of the rejection of all the bids shall be given to all the bidders through EPADS.
43.	40.1	Percentage for quantity increase or decrease is 15% .
44.	43.1	a. The amount of performance security (or guarantee), as a percentage of the Contract Price, shall be 10% of the Contract Price state in the Letter of Acceptance / Award in favour of SBP-Banking Services Corporation. OR In case, the cost of the Contract is less than four million, the Bid Security of the successful bidder shall be retained as Performance Security. b. Notwithstanding anything contained in the Contract and / or applicable law the Performance Security shall be forfeited if the Supplier fails to perform its obligations under the Contract.
45.	43.2	a. The Performance Security (Guarantee) shall be in in the form of Pay Order / Demand Draft / unconditional Bank Guarantee enforceable in Pakistan as per Performance Security (Guarantee) form specified in the Bidding Documents. b. The Performance Security shall be valid till successful completion of Defect Liability Period / Warranty Period and will be released after successful expiry of Defect Liability Period / Warranty Period.
46.	44.1	The Advance Payment is Not Applicable .
47.	44.2	The Advance Payment is Not Applicable .
48.	45.1	In case of any dispute arises between the procuring agency and bidder (hereinafter referred to as parties) in connection with or arising out of the contract or the bid, the dispute shall be resolved amicably by the parties. In case if the parties fail to resolve the dispute amicably, such dispute shall be resolved through Arbitration in accordance with Arbitration Act, 1940.
7. REVIEW OF PROCUREMENT DECISIONS		
49.	48.1	Any bidder feeling aggrieved may lodge complain through EPADS before Grievance Redressal Committee and deal in accordance with E-Pak Procurement Regulations, 2023.



SECTION IV: ELIGIBLE COUNTRIES

All the bidders are allowed to participate in the subject procurement without regard to nationality, except bidders of some nationality, prohibited in accordance with policy of the Federal Government.

Following countries are ineligible to participate in the procurement process:

1. India
2. Israel

Ministry of Interior, Government of Pakistan has notified List of Business Friendly Countries (BVL). Information can be accessed through following link:

<http://www.dgip.gov.pk/Files/Visa%20Categories.aspx#L>



SECTION V: SCHEDULE OF REQUIREMENTS, TECHNICAL SPECIFICATIONS



Schedule of Requirement

Completion / Delivery Time: 350 days

BOQ items / Quantities will be executed if need arises. Separate Work Order(s) with appropriate timeline for completion, will be issued during contract period as per the requirement of Bank from time to time.



Construction Schedule

Completion / Delivery Time: 350 days

Bidder shall provide a program in a bar-chart showing the sequence of items by which the bidder proposes to complete the Works of the entire Contract. The program should indicate the sequence of work items and the period of time during which he proposes to complete the Works including the activities like designing, schedule of submittal of drawings, ordering and procurement of materials, manufacturing, delivering, construction of civil works, erection, testing and commissioning of Works to be supplied under the Contract. The proposed sequence of execution of various sections of the project shall be according to the given Key Performance Indicators (KPIs) as following:

Months	Months-1	Months-2	Months-3	Months-4	Months-5	Months-6	Months-7	Months-8	Months-9	Months-10	Months-11	Months-12
Site Sruvey / Mobilizatipm												
Detail Design & Engineering												
Technical Submittals & Shop Drawings												
Material Procurement												
Installation & Eretion												
Testing & Commisiong												
Hand Over												

The above given timeline is basic and a detailed work schedule plan to be submitted by the bidder upon successful selection, incorporating all the builder / civil works as well.



Technical Specifications

As specified in the Bill of Quantities.



Bidder's Eligibility / Qualification Criteria

Qualification will be based on all the criteria given below. Employer reserves the right to waive minor deviations, if these don't materially affect the capability of an applicant to perform the contract. Joint Venture or consortium is not allowed. The Employer reserves the right to seek further information and / or verify the information furnished by the applicants. In this regard, Employer reserve the right to have site visit to verify the previous installation /work experience etc. The Employer may reject any application for any misrepresentation knowingly made by any applicant in, or pursuant to, their application or for any statement furnished in connection therewith, and intended to be relied upon by the Employer, which is incorrect in any respect. Evaluation criteria is mentioned as under:

Parameters of Bid Evaluation & Qualification:

Sr. No.	Eligibility / Qualification Criteria	Annexure / Page
1.	Bid Security Bid Security in original is required to be submitted through sealed envelope before opening of Bid.	
2.	ATL FBR Bidder must be registered with FBR in Income Tax and must active taxpayer as per Federal Board of Revenue (FBR's) revenue Data base i-e Active Tax Payer List. (NTN & GST).	
3.	Relevant Revenue Authority The Bidder should also be registered with relevant / concerned Revenue Authority. If not registered, the 100% tax shall be deducted at source as per applicable law and credited to relevant account.	
4.	PEC Valid Registration The bidder should have valid registration with Pakistan Engineering Council at least in Category of C-6 or above with specialization category in EE-04.	
5.	Bidding Documents Volume-I of the Bidding document including all required Forms.	
6.	Undertaking (As per Format attached) The bidder is required to submit an undertaking as per format attached.	
7.	Experience Bidder must have at least two works awarded of Rs. 5.0 Million or above pertaining to supply / installation of solar power system works during last 05 years. (Copies of work orders/ completion certificates/ contract agreements or equivalent documents).	
8.	Financial Capability/Liquid Assets Available Financial Capability of Rs.4 Million or above. (Submit copy of Bank statement as evidence showing required balance at any one instant in the statement of last three months before date of publication of tender notice). OR Available Bank Credit Line facility Rs.10 Million or above during same period or Liquid Assets) OR Annual Sales volume or Gross Turnover of at least Rs.20.0 Million in any of the last three years. Attach Copy(s) of Audited Financial Statements / Income tax return filed in FBR.	
9.	The bidder shall be an active approved AEDB Vendor in the relevant category, as listed on the PPIB website.	



Scope of Works

1. Major Items of Contract:

- a. Supply and installation of Solar PV Panels over the designated roof top with complete accessories
- b. Supply, Installation, testing and commissioning of inverters to designated location within the premises.
- c. Supply, Installation, testing and commissioning of LV cables in existing/proposed Cable trays/underground pvc pipes/underground cable trench as per site requirements
- d. Submission of drawings and schematics in hardcopy and softcopy form detailing operating procedure and showing system failure scenarios.
- e. The samples shall be submitted to the Engineer at his office in Karachi as specified in Preamble to Conditions of Contract. The rejected sample(s) shall be recollected by the Contractor and fresh sample(s) shall be submitted. The Engineer shall formally intimate the Employer and the Contractor of the reasons of rejection of sample(s).
- f. The Contractor shall submit one set in form of softcopy and two sets in hard form of shop drawings to the Engineer, under intimation to the Procuring Agency. The Engineer shall retain one set of the commented/approved shop drawing for his record and return the other set to the Contractor.
- g. The scope is not limited to the above stated major items, and the supplier is responsible to provide a completely functional, operational, fit to use PV Solar power generation system compatible with the existing power distribution network. The installation of this system shall not result in any disturbance in the existing power network.



Technical Specifications

(to be signed by the Bidder)

1. Brand Names

Equipment and materials specified with brand names have been provided to establish a standard of performance and do not necessarily indicate a preference for a particular manufacturer or material.

The names of manufacturers given below are to indicate the level of quality and performance anticipated by the Procuring Agency. Other makes may be accepted provided that the quality and performance of such equipment, in the sole opinion of the Procuring Agency, are at least equal to or better than the equipment offered by the recommended manufacturer listed hereunder.

2. List of Manufacturers Recommended

The acceptance of equipment/ materials offered by these manufacturers will be subject to compliance of offered models/ materials with the specifications, capacity and/ or performance requirements.

All other items not included in the list hereunder will be approved by the Procuring Agency in accordance to their compliance with the specifications, capacity and/ or performance requirements.

Onus lies with the Contractor / supplier for establishing the genuineness of any material/ product.

Following are the specification of material. Bidder can also offer equivalent products, however, adequate documentation in the form of technical data sheets and type test certificates from independent laboratories stating the standards to which the product complies with shall be furnished in the support of their being equivalent. The procuring agency reserves the right to ask the bidder of additional documentation in the regard.

Product	Standards	Recommended Manufacturers
PV Panels (Tier 1 BNEF)	As per standards and specifications mentioned in technical specifications and the Bill of Quantities (BOQ)	Longi Jinko Trina JA Canadian Solar Or Approved equivalent
Inverters		Huawei Sungrow Growatt Power Edge OR approved equivalent
Electric Panels, Distribution Boards		Hussain and Co. HRA Switchgears RA Engineering OR approved equivalent
Circuit Breakers: MCCB & MCB	As per standards and specifications mentioned in technical specifications and the Bill of Quantities (BOQ)	ABB Schneider Terasaki Chint (DC only) OR approved equivalent
Surge Protection Device (SPD)		Dehn Schneider Chint Phoenix OR approved equivalent



Product	Standards	Recommended Manufacturers
AC / DC Cables		Pakistan Cables Fast Cables Newage Cables Kuka Solar cable (DC only) OR approved equivalent
Earthing		Furse GCEM Dehn OR approved equivalent
Lightning Protection System		LPS France Indelec Application Technologies OR approved equivalent
Wiring Devices		Schnieder Orange Legrand OR approved equivalent
<u>PVC Conduits and Accessories</u>		Galco Dadex Jeddah Polymer Civic OR approved equivalent
<u>Cable Tray / Trunking</u>		Electroline Ezzi Engineering HMI Hussain & Co. OR approved equivalent
Fixing Accessories / Anchor bar & bolts etc		Hilti Mungo Fischer OR approved equivalent



Technical Specifications

SECTION -E-01

WIRING & WIRING ACCESSORIES

1.1 GENERAL

The Contractor shall furnish and install all wires and cables along with the accessories as specified herein, in Bill of Quantities and Drawings. Apart from the material specified, the Contractor shall provide, the necessary material for termination or fixing of wires and cables such as lugs, solder, supports, bushes, brass and PVC glands for a complete wiring installation. Miscellaneous materials, like filing compound, identification tags, markers and earthing strips shall be furnished for completion of works in accordance with the best engineering standards and practices. The wiring installation shall be carried out in strict accordance with the scheme, cable sizes and circuit details shown on the drawings or as specified. The contractor is to produce purchase certificate from recommended manufacturers.

1.2 L.V. CABLES AND WIRING

Cable and conductors shall be PVC insulated, PVC sheathed with copper conductors, single / multi-core, unarmored 450/750 volts grade for light and socket circuits and 600/1000 grade for motor power circuits, to BS 6004 and BS 6346.

The neutral and phase conductors shall be colored black and red/yellow/blue respectively. The circuit protective conductors shall be of green having same cross-sectional area as that of phase and neutral upto 16 sqmm or as specified in BOQ and drawings.

Each circuit shall have its own separate neutral, and the "looping in" system for wiring shall be used. Joints shall be made at main switches, distribution boards and panels, sockets outlets, light fan points and switch boxes only; no joints shall be made in joint boxes, nor will any "through joints" be allowed.

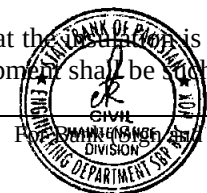
PVC/PVC 3-core flexible cords, shall be used for connection to the luminaries and fixtures from the ceiling rose/outlet box, through 3-terminal PVC connectors. Soldered or crimped tinned copper lugs, shall be used on the termination of cables and conductors 10sq.mm and larger. All multi-core cables shall be provided with compression glands, of the correct size and type, at panel entry positions.

1.3 INSTALLATION

The wiring through exposed or concealed conduit shall be started only after the conduit system is completely installed and all junction boxes, outlet boxes, switch boards, etc. have been fixed in proper position. For outdoor installation, where specified the cables shall be run direct in ground or in pipes as specified. The cables shall be pulled through conduit or pipes with care to prevent any damage to cables. To facilitate pulling, lubrication only as recommended by cable manufacturer may be used for decreasing friction. Under no circumstances shall oil or soap be used for cable pulling. Where several wires are to occupy the conduit or pipes they shall be pulled along together with earth continuity conductor. In general, the wires shall not be bend to radius less than ten times the overall diameter of the wire, or as otherwise recommended by cable manufacturer. The contractor shall furnish all installation material and labor for installation, testing and commissioning of cable system.

The wiring to power circuit and 15 amperes single phase socket outlet shall be run in conduit separate from light wiring conduits. Care shall be taken to ensure that all phase conductors are connected to the proper terminals and correct phase sequence is maintained. Wherever the size of conduit is not stated on drawings, it shall be in accordance with the Table based on I.E.E. Regulations.

The wires or cables shall be terminated at light points, switchboard, etc. such that the cable is always led into the equipment to which connection is made. The cable entry hole in equipment shall be such as not



to damage the cable. Inside the switchboards or control boards, the wires or cables shall be securely fanned out in a neat arrangement and laced with wax cord. The wires of different phases shall preferably be bunched separately. Identification tags or ferrules shall be provided at termination of wires in switchboards with respect to connected equipment for ease of installation and maintenance.

1.4 POWER, LIGHTING AND CONTROL CABLES

PVC Cable for underground installation shall also be PVC insulated and PVC sheathed.

1.4.1 Surface Cables

Cables for distribution system on surface shall be either single-core or multi-core, as specified in drawings or BOQ. The cables shall be PVC insulated and PVC sheathed.

1.4.2 Cables in Conduits

All cables/wires, in conduits shall be of copper, PVC sheathed or PVC insulated as specified in design drawings or BOQ.

1.5 PHASE IDENTIFICATION

All cables shall have phase identification colors on insulation of each phase. The color code for three phase circuits shall be red, yellow and blue for phase conductor and black for neutral conductor.

Single phase circuits shall have red for phase and black for neutral conductor.

1.6 CABLE ACCESSORIES

Best quality cable accessories should be used with the approval of the Engineer. The cable accessories, include, cable tray, cable trunking, floor trunking, clips, saddles (all galvanized). Cable glands made of brass should be used when cable enters/leaves a panel/Distribution Board. Identification tags made of engraved brass plates to be used for all cables. All the cables should be securely fixed to cable tray or trunking with help of plastic ties. Cable lugs should be compression type. Lugs should be pressed with help of compression machine approved by the Engineer.

1.7 CONDUIT WIRING-INSTALLATION

The wiring through conduit shall be started only after the conduit system is completely installed and all outlet boxes, junction boxes, etc. are fixed in position.

The wires shall be pulled in conduit with care and, to facilitate pulling, the cable manufacturer's recommended lubricant shall be used. Use of any kind of oil or soap will not be permitted.

Where several wires are to be drawn in the same conduit, they shall be pulled together. The wires shall not be bent to a radius less than ten times the overall diameter of the wire, unless otherwise recommended by the manufacturer.

The wiring shall be continuous between terminations. The looping in system shall be followed throughout. Any joint in wires will not be allowed. The use of connectors will only be allowed at location where looping-in is rendered difficult. The consent of the Engineer in writing, will be required for using connectors.

The connector shall be of suitable rating having porcelains body, sunk-in screw terminals and terminal strips. The connector shall be wrapped with PVC insulation tape after its installation. A minimum of 150 mm extra length of cable/wire shall be provided at each termination to facilitate repairs in future.

1.8 INSULATION RESISTANCE TESTS



Insulation resistance tests shall be made on all electrical equipment by using a megger tester of 500V for circuits up to 250 Volts and 1000V for circuits upto 500 volts.

The insulation resistance values of cables and switchgear etc., shall be as per B.S.S. and Pakistan Electricity Rules.

Before making connections at the ends of each cable run, the insulation resistance measurement test of each cable shall be made. If insulation resistance test readings are found to be less than the specified minimum, the cable shall be replaced and the new cable installed and tested.

All switchgears shall be given an insulation resistance measurement test after installation, before any wiring is connected. Insulation tests shall be made between open contacts of circuit breakers, switches and between each phase and earth.

If the insulation resistance of the circuit under test is less than the specified value, the cause of the low reading shall be determined and removed. Corrective measures shall include dry-out procedure by means of heaters if equipment is found to contain moisture. After all tests have been made, the equipment shall be reconnected as required.

1.9 CONTINUITY TEST

Continuity test on all the sub and main circuits should be performed for phase, neutral & earth wires.

END OF SECTION



SECTION-E-02 CONDUIT & PIPES

1.1 GENERAL

The work under this section consists of supplying, installing, and commissioning of all material and services of the complete conduit & pipe system as specified herein and/or shown on Tender Drawings and stated in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at site with other services for exact route, location and position of the electrical lines.

1.2 PVC CONDUITS

All wiring for light, power, control and other circuits shall be carried out in PVC pipe otherwise as stated in BOQ, minimum 25mm dia. The conduits and pipes shall be supplied complete with all accessories including bends, sockets, junction boxes of identical material as that of conduit and all cutting, repair, excavation backfilling, etc., required for complete installation. The conduits for internal wiring to lights, sockets and power circuit shall be of approved brand.

Manufactured smooth bends shall be used wherever conduit changes direction. The sharp 90-degree bends or tees shall not be allowed. All conduit accessories shall conform to same material specification as given above for conduit.

The bends shall have enlarged ends to receive conduit without any reduction in the internal diameter at joints.

The round junction box for ceiling light points shall be of PVC having minimum dimensions of 63 mm diameter and 63mm deep. The outlet box at wall light points shall be general purpose type having minimum dimensions of 75mm x 75mm and 38 mm deep. Pull boxes and inspection boxes shall be installed in conduit runs where required to limit the pulling of the cables or for inspection purposes. The pull boxes shall be square having minimum dimension of 100mm and 50 mm deep. In all cases, the minimum length of inspection boxes shall be not less than four times the cable manufacturers recommended bending radius of the cable. These dimensions are minimum only and the Contractor shall determine the exact size keeping in view ease of maintenance and installation. In general the use of pull boxes and inspection boxes shall be avoided. The pull boxes and inspection boxes shall be of 16SWG. sheet steel provided with anti-rust paint and finished in gray enamel paint or orange powder coated paint. The face plate shall be secured to the box by means of flat head galvanized screw.

1.3 INSTALLATION

1. Conduits

The conduit shall be installed concealed in wall, column ceiling or under floor, on surface, above the false ceiling or as stated on the drawings. The drawings are diagrammatic and do not indicate the location of junction boxes, pull boxes or inspection boxes which shall be provided to suit site conditions.

The concealed conduits shall have a minimum of 25 mm concrete cover, when concealed in R.C.C works. The conduits in R.C.C works shall be laid before pouring of concrete. Chisels shall not be made in R.C.C structure for conduits and accessories after pouring of concrete. In slab, conduits shall be laid over the bottom reinforcement steel and tied firmly to it. The conduit outlet boxes shall be held firmly to finish with the surface of the slab or beam. At expansions joints, flexible conduits or alternate arrangement shall be provided.

Where conduits have to be concealed in cement concrete work after concreting or in block masonry, chisels shall be made with appropriate tools and of required depth. The conduit shall then be firmly recessed and covered after plastering. All chisels for concealing conduits shall be carried out by the Contractor. The Contractor will be responsible for bringing back the general finish to the condition that it was before the cutting and chiseling by the Contractor.

The work of conduit installation and cutting in cement concrete work or masonry work shall be coordinated with civil construction so as not to cause any undue hindrances and delays.



in progress. The Contractor shall obtain approval of the Engineer for route, etc. to suit the site conditions before starting chiseling and cutting. All junction boxes, outlet boxes, pull boxes etc., shall be installed concealed so as to finish with the surface.

Conduits installed on surface shall be fixed by means of black enameled steel saddles and clamps having thickness of 3 mm or as mentioned in BOQ. The clamps shall be installed at a distance of not more than 600 mm.

All conduit bends shall be made with an approved conduit bending machine or hickory.

The radius of curvature of the inner edge of any bend shall not be less than the following table:

Conduit size	Radius
25 mm(1")	Not less than 150 mm.
32 mm (1-1/4")	Not less than 200 mm.
38 mm (1-1/2")	Not less than 255 mm.
50 mm (2")	Not less than 305 mm
70 mm (2-1/2")	Not less than 380 mm
82 mm (3")	Not less than 460 mm.
100 mm (4")	Not less than 610 mm

After completion of conduit installation, the system shall be checked for any charred or twisted portion prior to the pulling of wire. At all joints, PVC jointing solution or cement must be used.

The termination of conduits is shown diagrammatically on the drawings. The exact final location of the termination shall be coordinated with the equipment to be installed. Conduit ends pointing upwards or downwards shall be properly plugged, in order to prevent the entry of foreign materials. All openings through which concrete may leak shall be carefully plugged and boxes shall be suitably protected against filling with concrete. At all termination of conduit, soft bushes shall be fixed to prevent sharp edges of conduit ends from cutting or damaging the wires or cables to be pulled through them. Brass glands of appropriate sizes (as per size of conduit) with proper chuck nuts shall be used for fixing of conduits in junction boxes.

The entire conduit system shall be installed and tested before wiring is carried out. Any obstruction found shall be cleared by use of a cutting or other approved device and the conduit be cleaned out before the installation of cable.

1.4 OTHER ACCESSORIES

Outlet boxes, pull boxes, inspection boxes, switch and socket outlet boxes, fan regulator boxes, shall be of 16 SWG sheet steel, de-rusted, degreased, rust-proof with two coats of zinc chromate primer and painted with enamel, complete with earthing terminal. All boxes shall have ample wiring space, and boxes used outdoors shall be weather-proof.

All the pull boxes are to be properly labeled according to the type of services for which it is installed.

END OF SECTION



SECTION-E-03 CABLE TRAY & LADDER

1.0 CABLE TRAY & LADDERS

1.1 SCOPE OF WORKS

1. Under this section of the specification cable tray shall be installed to support distribution cables, communication cables and all wiring cables not generally installed in conduit and or trunking.
2. The cable tray shall be installed in such a manner to enable easy access for cable installation.
3. The cable tray shall vary in type, i.e: where large cables are installed, ladder rack type cable tray shall be permitted. Where smaller type communication cables are installed, bottom perforated type cable tray shall be permitted in compliance with item # 6.
4. Cable trays / Ladder shall be as follows for different areas or as specified in BoQ.
5. Cable ladders shall be installed in risers for the full length of the risers unless otherwise instructed by the Engineer.
- 6.
7. The Selected Cable Tray / Cable Ladder Accessories shall be as per List of Approved Manufacturers.
8. The Selected Cable Tray / Cable Ladder supports shall be with tool less seismic bracing cable with all required accessories
9. The selected thread rods and accessories shall be M12 as per DIN 975 or Equivalent.

1.2 QUALITY ASSURANCE

1. Acceptable Manufacturers
2. Subject to compliance with the requirements of the Contract Documents, acceptable manufacturers are to be firms regularly engaged in manufacturer of all materials specified in this section of types and sizes required, whose products have been in satisfactory use under similar service conditions for not less than ten years.

1.3 SUBMITTALS

1. Submit the standards to which the cable tray is manufactured to.
2. Submit shop drawings and data in accordance with the general requirements of the contract.
3. Indicate the various types of cable tray with terminology used in Part 2.
4. Show actual cable tray installation details, size and suspension system.

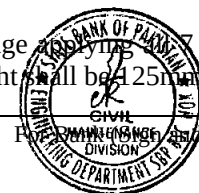
1.4 PRODUCTS

GENERAL

1. The cable tray system shall be of one manufacturer and shall include factory made trays, tray fittings, connections, complete with accessories and supports to form a complete tray support system.
2. The cable tray system shall include the following factory-made tray elements. Straight trays and ladders, fittings and horizontal and vertical bends of various angles crosses, tees, wyes, reducers, vertical riser elements, connectors, joint plates and all necessary fixing accessories including supports. No local or site fabrication of any cable tray system including ceiling and wall supports are acceptable. Threaded rods for ceiling supports are not acceptable.

1.5 CABLE TRAY

1. The whole of the tray work, fittings and supports shall be of mild steel after manufacture as per DIN 975, all the accessories other than C-Channel, thread M12 rods shall be cadmium plated/stainless steel made such as nuts, screws, bolts, wire etc.
2. Cable trays shall be constructed from MS of minimum thickness 12 gauge HDG process, The Height shall be 100mm or as specified in BOQ. Flange height shall be 25mm or as



- indicated in drawings and documents.
3. Insert elements, bolts, screws, pins etc., shall be cadmium plated/stainless steel.
 4. Tray work shall have oval perforations. Ladder type trays shall be used as required and/or approved by the Engineer.
 5. All trays (straight and fittings) to be heavy duty returned flanged type unless specified otherwise.
 6. Tray components are to be accurately rolled or formed to close tolerance and all edges rounded. Flanges are to have full round smooth edges.
 7. Unless indicated otherwise on drawings, cable trays shall be used in the range and 150mm to 750mm wide, in five preferred standard sizes: 150, 300, 450, 600 and 750mm.
 8. Other sizes shall be used where specified or previously agreed with the Engineer.
 9. Return flanges shall be a minimum of 10mm deep, unless otherwise specified.
 10. Minimum radii at side rails, horizontal, and vertical tees and crosses shall be in accordance with the Manufacturer's standard.

1.6 EXECUTION

INSTALLATION

1. Install all cable trays and ladder racks strictly in accordance with IEE and local authorities' requirements.
2. Drilling, machining or cutting shall not be carried out after application of protective coat, unless previously agreed by the Engineer. If cutting or drilling is necessary, edges shall be cleaned up and painted with zinc based paint before erection.
3. Provision shall be made when installing all cables and cable trays for the expansion and settlement of the building.
4. Cables shall be fixed to the trays/ladders by means of PVC cleats and flame retardant cleats for flame/fireproof cables with galvanized bolts, nuts and washers. Use galvanized metal trefoil cleats with rubber pad for single core cables
5. Control cables run and clipped in groups shall not exceed twelve in number and shall be not more than double banked. Power cables shall be laid in a single layer except with the prior approval of the Engineer. Power cables should be spaced 2D between centres of cables throughout the run of cables. Submit calculations for voltage drop for cables and increase the size if necessary.
6. Vertical distances between trays mounted horizontally shall be minimum of 250mm. Local reduction of distances between trays will be allowed to a minimum of 150mm with approval from the Engineer.
7. Trays shall be adequately supported to prevent sagging by more than 3 Deg. between fixed points. All supporting steelwork shall be fixed at not more than 1 meter centers unless otherwise specified.
8. Where cable tray passes through floor arrange for 100mm concrete curb around opening and fire sealants shall be provided.
9. The Contractor shall submit calculations relating to tray / ladder work and tray / ladder supports demonstrating acceptable mechanical stresses and sag.
10. Where cable tray must pass below a beam a short length of tray shall be installed on the underside of the beam with 25mm spacers between the tray and the beam underside surface. Cables shall be strapped rigidly to the tray to prevent any possible sag in the cables.
11. Where cable tray is intended to cross a series of beams the tray shall be supported from each beam it crosses by metal supports suspended from below the underside of the beam - the space between the tray and the beam underside surface shall not exceed three times the diameter of the largest cable to be carried on the tray.
12. Cable tray covers are only required on roofs or outdoor where cables are installed exposed to weather conditions.

1.7 EARTHING

1. The entire cable tray and ladder system shall be bonded using 12mm x 1.5mm braided tin copper, which shall be bolted across each joint in the system by means of galvanized nuts and bolts, complete with flat and spring washers.
2. Tray systems shall be bonded to the main building earthing system as required or directed by the Engineer.

1.8 FIRE BARRIERS



1. Arrange for opening in fire rated walls, and floor for width and depth of cable tray to run through in addition to the specified clearance of the above cable trays.
2. Arrange and make good fire rating of floors or walls after cables have been installed. For all floor openings of all risers (telephone, power) except vertical telecom cable risers where grating shall be provided.
3. All openings / sleeves within floor slabs and fire rated walls shall be sealed with proper fire rated material.

END OF SECTION



SECTION-E-04:**SWITCHES & SOCKETS****1.0 LOCAL SWITCHES**

- 1.1 The local switches shall be 10/16/20 amp. Gang type, one-way, two-way, intermediate or double pole as indicated on the drawings. Where more than one switch is indicated at any position multiple gang units shall be used.
- 1.2 Switches shall be of the quick start make, slow break type specially designed for AC circuits to BS Standards. The operation of the switch shall not depend wholly on the action of the spring. The switches shall generally be of the rocker operated type.
- 1.3 All switch boxes shall be supplied with adjustable steel grids and earthing terminals.
- 1.4 Generally, switch units shall be of the adjustable grid pattern and to be secured to the adjustable grid by means of screws. For flush mounting switches the switch-plate shall overlap all edges of the box by not less than 7mm. For surface mounting switches the switch plate shall finish flush with the edges of the switch boxes. Switches for water heaters and fan coil units shall be complete with neon indicator lights.
- 1.6 Local switches shall be arranged in convenient positions for switching the various circuits and generally as indicated on the drawings.
- 1.7 The switches shall be of the same manufacture for a particular type of switch throughout the installation. All accessories in wet and damp areas shall be of the splash-proof type to IP54 protection standard.
- 1.8 All switch boxes should be galvanized steel.
- 1.9 To ensure easy and correct connection of the conductors during installation, the necessary terminal shall be easily identified, grouped in line, upward facing, captive and backed out prior to the installation.

2.0 POWER OUTLETS

- 2.1 The switch socket outlets, shall be in accordance with BS1363 Standard as appropriate and shall be of the three pin grounding type.
- 2.2 Switch socket outlet in the different areas shall comply with section 607 BS7671 :2001
- 2.3 Live contact of the socket shall be completely shuttered such that it is not possible to engage any pin of the plug into a live contact whilst any other pin of the plug is exposed.
- 2.4 All floor mounted socket outlets shall be fixed as part of the under floor trunking service boxes.
- 2.5 These outlets shall be of the same manufacturer throughout the installation.
- 2.6 The sockets should provide a double earth terminal as per latest BS7671, 2001, Section 607.

3.0 FUSE CONNECTION UNITS / DP SWITCHES

- 3.1 These shall be of flush or surface mounting type as manufactured in compliance with BS Standard as appropriate. The fuse connection units shall incorporate integral switch, neon indicator and 20-amp fuse links. The DP switches supplied for water heaters shall be incorporated with neon indicator lights, and these also shall be engraved 'Water Heater'.
- 3.2 These shall be of the same manufacturer for a particular type of switch throughout the installation and shall be complete with the other accessories installed.
- 3.3 Fuse selection shall be based on actual requirement of equipment.

4.0 GI BOXES

GI boxes to be provided with brass earth terminal to facilitate earth wire connection. The boxes to have sufficient number of 20mm and 25mm knockout. The boxes thickness shall be 1.5mm minimum and shall comply with BS 4662. Boxes to have adjustable lug for proper installations of wiring accessories. Extension ring to be used along with GI boxes, in places where the box is deep inside the wall, marble or concrete.

5.0 ISOLATORS

All external isolators must have IP-65 protection with aluminum alloy or die-cast aluminum or polycarbonate housing with bolt on drip proof body. Isolators must be de-rated for 50 deg. Ambient temperature. Internal isolators shall be IP 54 / IP 65 depending on the location with polycarbonate housing for non-armoured cables.

6.0 ACCESSORIES PLATE FINISH

6.1 All the wiring accessories shall be vandal proof. The accessories plate shall have the following finishes depending on the location where it is installed and on the feeding arrangement.

Switches to comply with BS 3676:2000, and sockets to BS 1363, ceiling rose to BS67 : 1999.

- a) All external outlets shall be weatherproof to IP-66.
- b) Weatherproof range should be suitable for semi recessed mounting and supplied with back boxes.
- c) All outlets above false ceiling, store, etc. shall be white plastic.
- d) Switches and outlets shall be white plastic slim type.
- e) All switch plates including SSOs are to be coordinated with civil layouts by prior agreement with the Engineer on site.

7.0 MOUNTING HEIGHTS

The mounting heights for the electrical equipment and accessories shall be coordinated with the furniture layout and shall be as per site requirements to Engineer's / ID's instruction and approval. In general, the mounting heights from FFL to center of fixtures shall be as shown in legend.

END OF SECTION



SECTION-E-05**(Not Applicable)****LIGHTING FIXTURES****1.0 SCOPE OF WORKS**

The work under this section consists of supplying, installing, testing and commissioning of all material and accessories of the complete Light fixtures as specified herein and/or shown on the drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and co-ordinate at Site with other services for exact locations and positions of the light fixtures.

The lighting fixtures with accessories shall also comply with the General Specifications for Electrical Works, Section-01 and with other relevant provisions of the Tender Document.

2.0 GENERAL

The description of light fixtures is given in the bill of quantities, and stated on the drawings, and all relevant material is described in this Section. The determination of quality is based on certified photo-metric data covering the coefficient of utilization, light distribution curves, construction material, shape, finish, operation, etc.

The Contractor shall submit at least two samples of each and every light fixture specified and obtain approval of the Engineer before purchasing. The quality and finishes of the local make light fixtures (if mentioned in BOQ) shall be same as that of standard manufacturer. The accessories such as driver, holders etc., for all type of light fixtures shall be of approved equivalent. Approved equivalent against those specified will be accepted if the specified one is/will not be available. For any substitution the Engineer's approval is necessary. Engineer's decision will be binding and final.

All fixtures shall be finished in standard colour schemes as mentioned in the manufacturer's catalogue for respective fixtures, unless specifically stated in the Specifications, Drawings or Bill of Quantities or directed by the Engineer.

IP degree of protection of light fixtures shall be as per criterion laid down in general specifications. Efficacy of all lights should be equal to or greater than 105 lumens / Watt

Minimum IP ratings of all indoor lights shall be IP-20 or as stated in BoQ

3.0 APPLICABLE STANDARDS/CODES

The latest editions of the following standards/codes shall be applicable to the material specified within the scope of this section:

IEC 62031	-	LED use in Luminaries
IEC 62471	-	Photo-biological Safety
IEC 61347-1 / -2	-	LED drivers
IEC 62384	-	Independent driver Performance
IESNA LM 80:2008	-	Lumen Maintenance of LED light source
IEC 60529	-	Ingress Protection

4.0 MATERIAL**4.1 LED:**

The LED lamp / light fixture shall comply and conform the following specifications



Luminous Efficacy	:	≥ 105 lumens/Watt
CRI	:	> 90
Colour Temperature	:	4000K (as per BOQ & drawings)
UGR	:	Within the prescribed limits.
Useful Life	:	Depreciation to 70% of initial Lumen Output
Warranty	:	2 years or above

4.2 LED Light Fixtures

The LED light fixtures shall be as stated on drawings and bill of quantities. The light fixture shall be finished in standard colours unless otherwise stated on drawings or directed by Engineer. All LED light fixtures shall be of international standard and quality. The types of fixtures with manufacturer's catalogue reference are given on the fixture schedule and in bill of quantities. Equivalent fixture may be acceptable provided that the contractor submits for review all necessary data indicating photometric curves to show that the fixture proposed are of the same type, construction and quality.

The body of the light fixtures shall be minimum 18 SWG sheet steel or die cast, properly de-rusted, degreased, finished in heat resistant paint, stove enamelled. Appropriate size bushed wire entry holes, fixing holes, and earth terminal shall be provided.

The lamps for these fixtures shall be made with Light Emitting Diodes capable to emit the desired colour as mentioned in drawings or BOQ. The fixture shall be supplied with appropriate driver either fixed or detached and shall be selected according to the wattage/type as indicated on drawings/Documents.

Weatherproof light fixtures shall comprise of UV treated plastic body or aluminum body and gasketed clear glass cover secured to the body by means of wing nuts/screws to give a weatherproof and watertight fit. The gasket shall be weather resistance type.

The glass shade of the light fixtures shall be opal white or clear as furnished by the manufacturer with the light fixture unless specified and free from any air bubbles or voids. The shade may be spherical, cylindrical, flattened bottom or any other shape as specified in the drawings or BOQ.

5.0 EXTERNAL LIGHTING

- 5.1 Furnish and install external lighting fittings of the types specified and in the positions indicated on the drawings. Check all requirements regarding conduit runs and positions and the casting in of conduit.
- 5.2 The Contractor shall also be responsible for the installation and wiring of the external lighting installation as shown on the drawing and in accordance with the schedule of light fittings.
- 5.3 Each mounting bracket pole shall be fitted with a fuse unit of approved manufacturer connecting to the lighting units mounted on the bracket.

6.0 INSTALLATION

The mounting heights of light fixtures are indicated on the drawings, and positions of fixtures are according to the mentioned scale.

The Contractor must ensure that the light fixtures are installed uniformly with respect to the dimensions of the area. Any modifications due to site conditions may be made with the approval of Engineer. All fixtures shall be carefully aligned before fixing in position.

END OF SECTION



SECTION-E-06
MAIN SUBMAIN CABLES

PART 1 - GENERAL**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

- A. This Section includes requirements for 600/1000 volt cables & associated accessories.

1.3 DEFINITIONS

- A. Not used.

1.4 PERFORMANCE REQUIREMENTS

- A. Not used.

1.5 SUBMITTALS

- A. None required.

1.6 DESCRIPTION

- A. Provide 600 / 1000 volt cable in accordance with the Contract Documents.

1.7 WORK INCLUDED

- A. Supply of 600 / 1000 volt Cable.

1.8 QUALITY ASSURANCE

- A. Except as modified by applicable codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
1. General: British standard (BS) approvals service for Electric Cables (BASEC).
 2. Cross-Linked Polyethylene (XLPE) Insulated Wire and Cables:
 - a. BS6633: Cross-Linked Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 - b. BS6633: Rubber-Insulated Wires and Cables.
 - c. BS6633: Service-Entrance Cable.
 3. Annealed Copper Wire for Conductors:
 - a. BS6633: Soft or Annealed Copper Wire.

PART 2 - PRODUCTS**2.1 WIRE AND CABLE****A. General:**

1. Provide wire with minimum insulating rating of 600 volts. For control or signal systems use 300 volt minimum or 600 volt where permitted to be incorporated with power wiring systems.



B. Conductors:

1. Electrical grade, annealed copper, tinned if rubber insulated, and fabricated in accordance with British Standards.

C. Stranding and Number of Conductors:

1. Cables larger than 6 mm², stranded in accordance with KSC 3611 Class B stranding designations.
2. Control wires stranded in accordance with ASTM Class B stranding designations.
3. Cables, multi-conductor unless otherwise noted for low voltage systems.

D. Insulated Single Conductors (Single Core):

1. Type XLPE - Thermoplastic insulation suitable for use in wet locations up to 75°C.
2. Type XLPE - Flame Retardant: Heat-resistant thermoplastic insulation, nylon jacket rated for 90°C operation.

E. Multi-Conductor (Multi Core) and Supervisory Control Cables:

1. Suitable for direct burial, open air, duct or conduit installation.
2. Temperature Rating: 75°C Wet or Dry.
3. PVC or cross linked polyethylene conductor insulation; thickness satisfying requirements of British Standards, for cross-linked thermosetting polyethylene insulated conductors.
4. Flame retardant overall polyvinyl jacket satisfying requirements of British Standards.
5. Individual conductors bound together with overall binder tape prior to jacket application.
6. Individual conductors rating of 300 volts (instead of 600 volts) for cables designated Supervisory Control Cable.
7. Factory color coded in accordance with British Standards.

F. IDENTIFICATION

The overall jacket shall be printed at intervals not exceeding 600 mm with the following information:

1. Manufacturer's Name.
2. Plant of Manufacture (Designation Code).
3. Trade name.
4. Insulation Type and thickness.
5. Conductor size and type.
6. Maximum working voltage and insulation level.
7. Identification and designation of Cable CV.
8. Year of Manufacture.

G. Acceptable Manufacturers:

1. Products by any manufacturer meeting the performance requirements specified in the Approved Manufacturer's List may be utilized.

2.2 FIELD TESTING (IN THE SCOPE OF ELECTRICAL CONTRACTOR):

- A. Test system wiring for continuity, grounds and short circuits prior to connection of any equipment.
- B. Test final equipment connections for continuity of grounds and short circuits.
- C. Insulation Resistance of Feeders and Sub feeders:
 1. Test with megger for insulation resistance. Insulation resistance to comply with ICEA values.
 2. Correct faults and sections with faulty insulation.

END OF SECTION



SECTION-E-07**SWITCH BOARDS & PANEL BOARD****PART 1 GENERAL**

- 1.1 General Requirements
- 1.2 Scope of Work
- 1.3 Quality Assurance
- 1.4 Submittals
- 1.5 Factory Testing

PART 2 PRODUCTS & EXECUTION

- 2.1 References
- 2.2 Sleeves for Primary Service Cables
- 2.3 400/230 Volt Secondary Switchboards
- 2.4 Distribution Panel boards
- 2.5 Co-ordination Study

PART 1 GENERAL**1.1 GENERAL REQUIREMENTS**

A. The work of this Division shall be governed by the following documents:

- 1. Conditions of Contract.
- 2. Instructions to Tenderers.
- 3. Form of Agreement.
- 4. General and Special Conditions of Contract.
- 5. Form of Tender.
- 6. Appendices.
- 7. Applicable Divisions.

B. Comply with requirements of all sections of this Division.

C. It is the Contractors responsibility to be fully aware of and comply with all of the requirements of the above listed documents.

1.2 SCOPE OF WORK

- 1. The switchboards (AC & DC) shall comprise of main breakers, indicating instruments and outgoing breakers to provide a complete service and distribution system for the whole PV System.
- 2. Modification of existing LV Panel for the addition of required breakers, module and all the other related equipment.

1.3 QUALITY ASSURANCE

- 1. Acceptable Manufacturers
 - i. Subject to compliance with the requirements of the Contract Documents, acceptable manufacturers are to be firms regularly engaged in manufacture of switchboards, whose products have been in satisfactory use under similar service conditions for not less than ten years, and independently certified to ISO 9000/BS.
 - ii. Regulatory Requirements
 - a. All components shall meet all local standards listed and labeled, and comply with BS 5750 Part
 - b. All components and complete assemblies shall be rated for and capable to withstand ambient conditions of 50°C and 100% R.H.

1.4 SUBMITTALS

1. Reference Applicable Divisions - Submittals.
2. Reference Applicable Divisions - Shop Drawings, Product Data & Samples.
3. Shop Drawings.
 - i. Switchboards
 - ii. Indicate on shop drawings:
 - a. Floor anchoring method and foundation template.
 - b. Dimensioned cable and bus duct entry and exit locations.
 - c. Dimensioned position and size of bus.
 - d. Overall length, height and depth of complete switchgear.
 - e. Dimensioned layout of internal and front panel mounted components.
 - iii. Indicate on product data:

Time current characteristic curves for all circuit breakers.

1.5 FACTORY TESTING

- i. All panels shall be factory witnessed and tested by the Engineer in presence of Employer representatives,
- ii. Notify the inspection team 4 weeks in advance of final factory tests of the switchboards. The inspection team shall be entitled to witness all or any of the factory tests.
- iii. Submit copies of certified test results.

PART 2 PRODUCTS

2.1 REFERENCES

- i. Refer to Technical Specifications, Wiring & Wiring Accessories
- ii. Refer to Technical Specifications,, Main Submain Cables
- iii. Refer to Technical Specifications, Earthing & Grounding

2.2 SLEEVES FOR PRIMARY SERVICE CABLES

- i. Heavy duty treated flanged metallic sleeves complete with all required fittings and bell end terminations, as shown on drawings and satisfying the requirements of authorities having jurisdiction.

2.3 400/230 VOLT SWITCHBOARDS

- i. Provide switchboards as specified hereinafter and as detailed on the drawings.
- ii. General Switchboard Criteria.
- iii. Switchboards shall be 400/230 volt, 3 phase, 4 wire 50 cycle AC, IP 42, metal enclosed for use on solidly grounded systems. The switchboard shall be in accordance with BS 5486: Part 1, Form 2B (Type 1) or equal to IEC 61439-1 and having a minimum class 3 protection IP-42. The switchboards shall incorporate all of the following:
 - a. Air circuit breakers complying with IEC 60947-2 and as specified hereinafter.
 - b. Current limiting and standard type non-fused moulded case circuit breakers and as specified hereinafter.
 - c. Tin plated copper bus bars.
- iv. Casings & Enclosures
 - a. All switchboards shall be of indoor construction, dead front, metal enclosed multi-cubicle type, free standing, dust and vermin protected, front operated and of clean and modern appearance. All equipment shall be completely enclosed and the construction of each cell shall be in such a manner as to permit front and rear access to the interior of any cell by isolating the particular switch.
 - b. All switchboard sections shall be assembled and co-ordinated by manufacturer.. Provide mimic diagram on the facia of the switchboards. Indicating lamps shall be LED



type and provide lamp test button. Provide audiovisual alarm for trip indication with mute button. Space heaters shall be provided with humidistat and thermostat control , on/off switch and indicating lamp.

- c. The main switchboard sections shall be completely made of folded steel construction, minimum 2 mm thickness, fully rust proofed and epoxy powder painted inside and outside. Any sheets not painted or any other materials such as Alu.Zinc etc. shall not be acceptable. Overall maximum height shall not exceed that shown on the drawings.
- d. All external bolts or screw heads shall be brass or cadmium plated, complete with required washers.
- e. All doors and removable covers or plates shall be provided with high quality neoprene gaskets to prevent the ingress of dust, vermin and insects. Doors shall have key type locks for faster open/close but not screws/bolts.
- f. All switchboard sections shall be of IP 42 construction in accordance with IEC 61439.
- g. Each unit of the switchboards shall be housed in its own cell fittings with a hinged door mechanically interlocked in such a manner that the cell door can only be opened when the switch is in the 'OFF' position.
- h. Switching units shall be arranged in separate compartments or sections to protect against accidental contact with adjacent equipment when handling the elements in the section and to prevent the spreading of faults from one section to the other. Bushings shall be provided for all outgoing cables including control and BMS cables.
- i. Adequate cable ways shall be provided in switchboards accessible by hinged lids or removable covers. Arrangement shall be such that maximum accessibility is provided to all parts, incoming and outgoing wires and cables. They shall be factory assembled.
- j. The equipment in switchboards shall be accessible with indicating instruments mounted not higher than 1.8m and the centre lines of operating devices not higher than 1.8m above switchboard base. Drawout breakers (400amps and above) mounting height shall not exceed 1.4m from FFL. Switchboards shall be properly fixed to the floor with foundation bolts grouted in the floor / fixed to channel on trench wherever trench is available.
- k. All switchboards shall have top or bottom cable/busduct entry as required. Basically main incoming cables shall be bottom entry and outgoing cables or busducts top entry, through suitable termination boxes and gland plates, all accessible from front or rear of panel. The Contractor shall ensure that adequate access and termination provision is incorporated in complete switchboards for all incoming and outgoing cables and busducts specified.
- l. All panels and equipment shall be certified typed-tested, suitably rated for operation in the ambient conditions and supply characteristics stated.
- m. Switchboards sections shall contain withdrawable type air circuit breakers, busbars, MCCBs, instruments, earth bus, etc., as specified with ratings and arrangements as shown on the Drawings and shall be complete with all internal wiring and connections.
- n. All switchboards shall be tested at the manufacturer's premises as well as after installation.
- o. The Contractor shall submit all technical details, wiring diagrams and interlocking arrangements to the Engineer for review prior to ordering. Detailed constructions and general arrangements shall be agreed with the Engineer during construction stage.
- p. All doors and removable covers shall be provided with a flexible earth conductor connected to the switchboard frame.
- q. BMS marshalling compartment of adequate size shall be provided in every switchboard and motor control centre wired to units.
- r. Battery and battery chargers for the control of PLC's and breakers shall be provided with 100% redundancy in separate enclosures with all failures, overcharge, under voltage, overvoltage alarms being monitored by BMS.

v. Busbars

Main bus bars shall be constructed of high strength, high conductivity, flat tin plated hard drawn copper throughout, fully braced by means of colour code injection moulded glass filled polyester insulation with joints bolted using high strength 12mm cadmium plated steel bolts and extra wide, extra thick washers to ensure maximum pressure and current distribution at each joint or fully insulated with colour coded fire retardant insulation. Bolts shall be tightened to torque wrench prescriptions.



The busbars shall be designed so that maximum temperature rise in any part of the switchboard will not exceed 35 degree C over 50 degree C ambient at full load. Reduced size neutral busbars shall not be permitted. Bus bars current density shall not be less than 1000 A/Sq. inch. 'T' type connection units shall be used for connection between main busbars and branching busbars. Busbars end shall be tinned. Compartment temperature rise shall be within the limits to comply with latest BS / IEC Standards.

vi. Ground Bus

A continuous ground bus, not less than 50% of the main bus cross section area shall be provided for the length of each switchboard and solidly bolted to the steel framework. The ground bus shall be constructed of the same materials as the main bus and shall be complete with suitable lugs for grounding connections outlined on the drawings. The ground bus shall have momentary current rating equal to or greater than that of the apparatus in the switchboard. Removable link is required between the neutral bus and ground bus .

vii. Control and Instrumentation Wiring

- a. Control wiring will be with PVC insulated stranded copper conductors rated for 750V and 90 Deg. C.
- b. Connectors to be vinyl insulated compression terminals manufactured in one piece from pure electro tin plated copper. Insulation to be colour coded with separate colours for the following applications:
 - 400 volts.
 - 230 volts.
 - Run wiring from current transformer to instruments or relays via terminal blocks with shorting links for maintenance. CTs for transducers shall be separate. CTs or PTs used for metering protections, signaling, interlocking shall be separate and shall not be used for multi-purpose.
 - Identify all wires at each end with wire tags. Wires in all switchboards to have a unique identification.

viii. Digital Metering System

A digital metering system complete with all CTs and PTs for customer's use shall be installed and factory wired in locations in each switchboard as specified hereinafter. All PT secondaries shall be for 24V, and all CT secondaries shall be 5A. The system shall be an integrated micro-processor based metering package, capable of displaying phase voltage, line volts for all phase , current for each phase, power factor, frequency, kilovolt amperes, kilovolt amperes reactive, kilowatts , Kilowatts hours, megawatt hours, , maximum kilowatts demand, and display overflow. A standard banan jack test block shall allow testing of the meter by injecting 230V and 5A while the phase display indicates T. Three set point dry contacts for load shedding or alarm shall be provided, each being field programmable to suit Employer requirements. The meter shall be designed to include provisions for communication with external monitoring devices via an RS232C port or better. All parameters shall be available on LCD display only by selection button provided on meter.

The metering system and associated software shall be manufactured by the switchboard manufacturer.

The Contractor shall include for all hardware and software as required and recommended by the meter manufacturer for remote monitoring at the BMS terminals for kilowatt-hour meter readings and failure alarm.

xi. Indication, Controls and Auxillaries



All indication and controls shall be grouped together on the front of the ACBs and shall be accessible on the front door of the Cubicle through a suitable cut out on the cubicle door. The arrangement shall be flush, neat aesthetic and modern.

The item shall generally comprise;

- Manual Spring charging lever
- Indication of spring charged - yellow
- Indication of Circuit breaker - Tripped
- Closing Push Button
- Opening Push Button
- Open / Closed Indication of ACB
- Racking in/ out device with door closed
- Release lever for moving part of ACB
- Service/Test/Isolator Position indicator
- Lamp test button.
- Microprocessor based control with LCD display and all adjustable settings displayed.

a. Interconnections

Interconnections shall be very short and neat using air insulated, tinned copper bars.

b. Termination

Unless otherwise indicated, cable entry shall be from bottom only, cabling access is from the front or rear as applicable. A platform shall be built within mechanical room to elevate MCC's and allow bottom entry and easy access to compartments.

For large power feeders suitably staggered links shall be brought out into the cabling area for easy termination of cables of sizes as shown on the drawings.

For Starter feeders power and control cables shall be brought out neatly to terminal blocks. Power and Control terminals shall be adequately segregated. Power wires shall be RYB colour coded at the termination's. Control wires shall be multi stranded copper with black insulation and ferruled. Terminal Blocks should be suitably marked for identification and easy termination of field wires.

c. Meters shall be multi function digital type. Indicating lamps, push buttons control and selector switches shall be neatly and logically flush mounted on the front of the respective equipment compartment doors to IP54. Lamp test button shall be provided.

d. Paint Finish

All steel work shall pass through a four stage finishing process, chemical spray, degreasing, iron phosphating and finally an electrostatically applied top coat of epoxy powder coating which is cured in a high temperature oven to give a strong molecular bonding with the steel. The top coat shall be RAL7035 colour.

x. Busbars

The Main Horizontal busbars shall be HDHC tinned insulated copper with phase colour sleeved running in the full switchboard. Current rating as shown on the drawings rated for the ambient specified. Supports shall be fibre glass reinforced, moulded type material with large creepage paths or as recommended by the manufacturer. They shall be totally enclosed in a separate sheet compartment and braced for the fault level specified. Temperature rise as specified earlier in this section.



The vertical busbars shall also be HCHC tinned insulated copper, suitably connected to the Main Horizontal busbar and run in a separate totally sheet steel enclosed Vertical busbar chamber. The busbars shall be supported regularly at short intervals by fibre glass reinforced moulded type material or as recommended by the manufacturer. Current ratings shall suit the loads connected on each Vertical busbar.

The Horizontal and Vertical busbars shall be ASTA Certified or equal for Specified fault level .

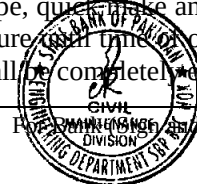
Neutral shall be of same size as the phases for Horizontal and Vertical busbar assemblies and sleeved completely black.

xi Air Circuit Breakers

- a. Air circuit breakers as listed in the switchboard arrangements shall conform to IEC 60947-2 and shall be as specified hereinafter.
Air circuit breakers shall be supplied from an approved manufacturer with a solid state microprocessor based release adjustable type, instantaneous short circuit protection, adjustable earth fault protection, excess temperature and built-in release malfunction alarm. The microprocessor shall enable building management system to monitor and control the air circuit breaker. Provide LCD display for reading all parameters.
- b. Low voltage Air circuit breakers shall be 3 or 4 pole (as indicated in the drawing) 600/1000-volt class with continuous current ratings and trip ratings as detailed on the plans. Breakers shall be rated for 50 KA interrupting capacity at 400 volt 3 phase for 3 seconds unless otherwise indicated. Breakers shall have double break main contacts, a 3 phase solid state overload relay, earth fault relay and shall be trip free in operation. Under-voltage and shunt trip release shall be provided. A compression spring stored energy in closing mechanism (electrically charged) shall be used for all ratings, with breakers being closed by means of a push button and shall have the ability to close and latch at interrupting rating at 600 volts. An emergency manual spring charging handle shall be supplied for electrically operated breakers. Handle shall be flush with the front panel of the air circuit breaker in the stored position.
- c. Breaker faceplate shall have "closed-open" indicator, spring "charged-discharged" indicator, provision to padlock manual charging handle, provision to lock breaker in "open" position, and provision to lock drawout mechanism. Drawout circuit breakers shall be suitable for 3 position (connected, test, disconnected) racking with enclosure door closed, and shall be equipped with an interlock to ensure breaker contacts are open and closing spring is discharged when racking tool is inserted. Faceplate mounted control buttons indicators interlocks etc. shall be accessible without opening enclosure door.
- d. Electrically operated breakers must have provision for emergency manual closing by inserting a special tool through the faceplate. A control isolating switch shall be provided on the faceplate to isolate the supply to the spring charging motor.
- e. Relay pick-up and time delay settings shall be selected in discrete factory calibrated values by means of detent action thumbwheel actuated switches with gold-plated contacts. The relay shall be equipped with Zone Selective Instantaneous Protection feature on short time and ground fault elements. A direct acting dedicated solenoid shall be used for initiating breaker tripping. All ACB's shall be provided with auxiliary contacts for local and remote trip alarm annunciation.
- f. All bus couplers shall be drawout type manually operated ACB with overload, short circuit and earth fault protections and shall be mechanically and electrically interlocked as shown on drawings. Removable links shall be provided in the main bus bar of each phase immediately after the incoming ACBs to enable easy maintenance and replacement of current transformers of the measuring instruments.

xii Moulded Case Circuit Breakers

- a. All breakers shall conform to IEC 60947-2 and it shall be of the same manufacturer.
- b. Moulded case circuit breakers shall be of the air break design type, quick make and quick break, having free toggle mechanism ensuring full contact pressure in the opening, whether actuated automatically or manually. The mechanism shall be completely enclosed



- in a compact moulded Bakelite case, sealed to prevent tampering. Breakers shall be drawout type for MDBs and MCCs and plugin / screw on type for OEBs and SMDBs.
- c. Circuit breakers shall have inverse time tripping characteristics with automatic release secured through action of a combination thermal magnetic trip element which shall trip free of the handle and operate in response to an overload or short circuit. Provide MCCB with adjustable overload and short circuit protections
 - d. Breaker contacts shall be non-welding and non-corrodible silver tungsten composition. Circuit breaker handle shall have three positions, 'OFF', 'ON' and 'TRIP' thus indicating clearly abnormal conditions of the circuit. Single pole circuit breakers with handle tie or bar equivalent construction are not acceptable for a multi-pole breaker. Breakers shall have ratings and breaking capacity as indicated on the Drawings.
 - e. All circuit breakers shall be as indicated under the section of the documents and as drawings. All circuit breakers feeding motors shall be of motor protector type suitable to withstand the motor starting current at the full load current trip setting.
 - f. Current limiting circuit breakers shall be no fuse type and shall be used, as specified elsewhere on the distribution system to ensure that fault levels are restricted to acceptable levels for downstream devices and equipment. The characteristics of all current limiting breakers shall be submitted to the Engineer for review.
 - g. MCCBs shall be provided with padlocking in the 'OFF' position and shall be fitted with shunt trips/undervoltage trips as required for proper operation and two sets of N/O and N/C auxiliary contacts.
 - h. Where indicated moulded case circuit breakers shall incorporate earth leakage sensors as detailed to trip the breaker and provide an alarm (except for fire pumps). The sensitivity setting of the sensors shall be as detailed on the drawings.
 - i. All MCCBs shall have the capability of communicating with the BMS. Where indicated on the drawings or BMS schedule (Sections 15900 & 15950), MCCB's shall be monitored/controlled as shown therein.
 - j. MCCB's 100A and above shall be solid state communicating type for MDBs, MCCs, OEBs & SMDBs.

xiii Outgoing Circuits and Connections

- a. All outgoing circuits shall have separate compartment and/or be screened so that equipment for any one circuit can be maintained without risk of contact with live connections on any other circuit, conforming to IEC 61439 Form 2B Type 1(c).
- b. Feeders for circuits rated up to 63A shall be connected to terminal blocks located in separate compartments at top or bottom, conveniently arranged to facilitate termination of cables and suitably identified.
- c. For feeders rated more than 63A copper links shall be suitably extended rigidly supported and covered with coloured PVC sleeves.
- d. All feeders shall be provided with cable lugs and brass cable glands.
- e. Vermin barrier and removable gland plates suitable for the glands required for the specified cables shall be provided. Where cables are single core, the gland plates shall be of a non-ferrous metal.
- f. Bushes shall be provided at every compartment for outgoing cables.

xiv Cable Glands

- a. Each panel sections shall be provided with cable glands to suit the type, size and number of low voltage cables as indicated on the Drawings.
- b. Provision shall be made for future additional cabling. Cable glands or brackets where required shall be mounted inside the panel. Sufficient space for cable connections and adjustments on site shall be provided.
- c. The Contractor shall supply approved bolted type compression terminals or equivalent for external cable connections.
- d. All openings for external cable connections shall be suitably protected to prevent ingress of dust, vermin etc.



- e. The panel sections shall be provided with proper cable fixing clamps and sweating terminal lugs as well as bonding connections.

2.4 DISTRIBUTION PANELBOARDS (SUB MAIN DISTRIBUTION BOARDS)

- i. Distribution panel boards shall be manufactured in accordance with IEC 60439 form 2B type 1 for LV Panel's and shall be ASTA certified to 35 KA RMS symmetrical for one second or as specified in the drawing. Provide dead front for outgoing breakers. Incomer shall be provided with operating handle. Ambient temperature 50 degree C. Thickness of sheet 1.6mm epoxy powder painted colour RAL 7035 inside and outside.
- ii. Panel boards shall be factory assembled floor mounted type. Moulded case circuit breakers shall be provided to withstand a fault level of 35 KA at 400 V, 3 phase, 50 Hz. Moulded case circuit breakers shall have adjustable overload and short circuit protections. All MCCBs shall be solid state type. Panel boards shall have at least 10% spare circuits.
- iii. Panel board Constructions.
 - a. Panel boards shall have 1.6 mm zinc coated sheet steel and all items shall be flush mounted in the panel. Unless otherwise specified all panels shall be so designed and constructed that all cable installation and connections, and maintenance including the replacement of any item, can be carried out from the front. Panel shall be manufactured in accordance with IP 42. Provide dead front for outgoing.
 - b. All connections between bus bars and any incoming or outgoing protective devices shall be made using copper bar or cable. All items comprising the panel shall be so segregated that maintenance, other than to bus bar connections, can be carried out on any one item without disrupting the supplies fed by other items. The whole panel shall be finished in epoxy powder coating RAL 7032.
 - c. The front face of such panels shall comprise a lockable gasketed hinged door. All internal connection cables shall be fitted with identity sleeves and all terminals with identifying tabs. The markings for identifying sleeves and tabs shall be shown on all shop and record drawings.
 - d. A main earth terminal shall be provided on all panels, the metal framework and casing of any type of panel shall be bonded together and to the main earth terminal of the panel by means of copper earth conductor of adequate size.
 - e. All panel boards shall incorporate an earthing terminal busbar sized to accommodate earth continuity conductors for each single pole, or multipole MCCB way, plus a minimum of five additional terminals for supplementary earth bonding conductors of minimum 16mm sq. size.
 - f. Removable gland plates shall be provided at the top and bottom of all panel board enclosures for raceway termination and or cable gland termination. Where cables are single core, the gland plates shall be of a non-ferrous metal.
 - g. Where contactors are incorporated in panel boards, these shall be located in a separate compartment from protective devices, and have hinged lockable door access and means of ventilation.
 - h. Low voltage LED pilot lights shall be provided to indicate phase live conditions.
- iv. Panelboard Busbars
 - a. Busbars shall be electrolytic hard drawn copper to BS 159 and tin plated with rating as indicated on the drawings, air insulated and rigidly supported by suitable non-hygroscopic, anti-tracking insulators so as to withstand forces due to thermal expansion under normal operating conditions and the fault currents at the point of installation, neatly arranged for 400V, 50 Hz, 3 phase, 4 wire operation, and fault rating not less than 35 KA sym. for 1 seconds. Busbars shall be designed for 35°C temperature rise above an ambient temperature of 50°C.
 - b. Busbars shall have the same cross section throughout.
 - c. Busbars bracing shall maintain the same mechanical strength and current carrying capacity under normal operation conditions and fault conditions.



- d. Busbars shall be colour coded.
- e. Busbars shall not be exposed unless the complete panelboard doors and dead front is removed.
- v. Moulded Case Circuit Breakers
 - a. As stated above
- vi. Miniature Circuit Breakers (MCBs)
 - a. Miniature circuit breakers shall comply with IEC-60898 have a rated trip type B or C (type 1 or 3) as required by the drawings and shall have a minimum breaking capacity of 10KA. The frame size of all MCBs shall be the same so that they can be easily interchanged. Breakers can be either plug on type or screw-on type . Circuit breaker devices shall be of the trip free pattern to prevent closing the breaker on a fault and shall be engraved to indicate 'ON' and 'OFF' positions.
 - b. MCBs shall be so arranged in the board that it shall be possible to replace a triple pole MCB with three adjacent single pole MCBs or vice versa. The boards shall be surface type unless indicated otherwise on the Contract Documents. Cable glands shall be provided where required.
 - c. All MCBs shall ensure protection against sub-circuit overloads by means of ambient temperature compensated thermal overload trips for ambient temperature 50 Deg. C and against short circuits by instantaneous magnetic overload trips.
 - d. Multi-phase MCBs shall so designed that if more than one trip mechanism operates, all poles shall open simultaneously. Three pole devices shall be installed for three phase supplies.
 - e. Particular attention shall be paid to the utilization of MCBs in respect of system characteristics, such as fault capacity and discrimination protection, and where appropriate sizes or rating are

2.5 CO-ORDINATION STUDY

- a. The coordination study shall be carried out by switchgear specialist to ensure that full electrical power distribution system has proper protection devices to achieve proper protection and to isolate minimum possible faulty section from the system in case of any fault in any part of the power system. The study shall also ensure breakers can safely handle short circuit current derived at that point. KA rating and protections shown in the drawings or specifications are minimum requirements which shall be retained. But these values has to be varied and to be changed as per coordination study by contractor to the approval of Engineer before manufacturing the switchgear without any additional cost /time to contract.

Coordination study to be conducted to ensure safe operations of the existing network after addition of this scope of work.

END OF SECTION



SECTION-E-08

EARTHING & GROUNDING

1.0 GENERAL.

An Integrated Grounding System is one that establishes a single point ground (or earthing) system that achieves an acceptably low resistance ground and provides for a low surge impedance path from any point in the system. This concept is often referred to as a Common Point Grounding (CPG) System.

2.0 DESCRIPTION OF WORK

Supply, Installation, testing, and commissioning of complete earthing system as specified hereafter and as indicated in the related electrical system drawings. Scope of work shall include but not limited to the following for each building:

1. Main earthing system of the building consists of ECC conductors, earth bars, earth pits, and all related accessories including bonding and terminations.
2. Clean earth arrangement for the Solar PV system and the LPS
3. Provision of earthing facilities to meet BS 7671 in accordance with equipment specialist / manufacturers requirements.

3.0 MAIN EARTHING SYSTEM

1. The contractor shall adequately allow in his tender for the provision and the installation of a complete earthing system required to meet the following requirements and shall ensure that the entire electrical installation is effectively bonded to earth as per BS 7430 Standards.
2. The contractor shall ensure that the whole of the electrical installation is both mechanically and electrically continuous throughout and is bonded to a suitable main earth in compliance with the IEE regulations and BS Code of Practice.
3. A test connection link shall be provided for testing purposes.
4. The nominal cross-sectional area of all earth continuity conductors shall be in accordance with the IEE regulations
5. All switchboards shall be provided with copper earth bar continuously run along the switchboard frames.
6. All switchgear, metal conduit and trunking systems, metal frames, enclosures, lighting fittings and cables sheaths shall be bonded together and connected to the earth tapes of the appropriate switchboard. Similarly, all earth pins and metallic plates of socket outlets, switches, accessories and enclosures shall be bonded to earth with earth continuity conductors. Each individual earth path shall be electrically continuous throughout its length from the farthest point of the associated part of the system back to the main earth.
7. All earthing cables shall be installed in accordance with the relevant requirements called for in the cables section of this specification.
8. All bonding leads in the form of cable having a standard conductor shall be terminated in sheathed sockets and shall be rigidly bolted to earthing terminals.
9. All earthing cables shall be insulated with a PVC sheath. Where connection of the earth lead to the main earth is made with a stranded cable, the earth lead shall be double insulated with PVC
10. Earth cable shall have same construction details as of phase cables.
11. Equipotential bonding conductors (6 mm² minimum) must be provided for metal pipes, water pipes, metal doors and other extraneous conductive parts and brought to the main earthing terminal in ground floor electrical room for final connection to the main earth pits. The cables shall be concealed in slab / wall up to final connection point.
12. The metal doors, curtain wall, building structure, door frames in electrical room, substations shall be provided with equipotential bonding and connected to the main Earthing System. Contractor should prepare and submit separate shop drawings with details for the earthing system.
13. Main equipotential bonding conductors in relation to the neutral of the supply shall be as per table 54H of BS7671 : 2001.
14. The earth rods shall be copper, corrosion resistant.
15. Provide separate earth pits as required and shown in schematic



16. Contractor shall be responsible for Substation earthing as per K-Electric requirements
17. The extraneous conductors parts in the building shall be bonded together.
18. The metal underside of raised floor and support elements shall be bonded to the common bonding network in addition to the following:
 - Trunking, Tray , Chilled water / Sprinkler / Fire Fighting Pipe Work / Ductwork / HVAC Equipment, etc.

8.0 THERMO WELD (If specified in BOQ)

1. GENERAL

This specification covers the exothermic welding system for use in making electrical connections. The system supplied under this specification shall include weld metal, molds, tools and accessories as required.

2. STANDARDS

The exothermic welding system furnished under this specification shall meet the applicable requirements of Standard for Qualifying Permanent Connections Used in Substation Grounding. Independent test data showing conformance to IEEE Std. 80 and IEEE Std. 837 shall be readily available.

The exothermic welding system supplied under this specification must be approved by the Engineer.

3. SYSTEM

The system provides the ultimate in permanent molecular bonding. The process of exothermic welding in which no outside source of heat or power is required. Exothermic welding system comprise a complete range of joints and molds to suit all electrical connection application including bar to bar, bar to earth rod, bar to steel surface, cable to bar, cable to cable, cable to earth rod, cable to rebar and cable to steel surface and electronic ignitor (control unit)

4. APPLICATION

The exothermic welding system is used for in making electrical connections of copper to copper, copper to steel or copper to cast iron for grounding and cathodic applications.

Connections shall be suitable for exposure to the elements of direct burial in earth or concrete without degradation over the lifetime of the grounding system.

5. MATERIAL

Molds shall be made from:

- a. Graphite material capable of withstanding high temperatures that are capable of providing an average life of not less than fifty separate exothermic welds.
- b. Cordierite, refractory ceramic or other material suitable for a single connection.

Starting material (where used) shall consist of aluminum and copper and iron oxides. It shall not contain phosphorous, magnesium or any caustic, toxic or explosive substances.

Low voltage battery starting (where used), shall use an electric ignition system that does not use starting material.

Weld metal used for grounding connections shall contain copper oxide, aluminum and not less than 3% tin as the wetting agent. Weld metal used for cathodic connections shall not contain tin, but shall contain vanadium.

6. QUALITY CONTROL



Weld metal shall be controlled at the factory and subjected to routing and rigid quality control inspection procedures. The batch control lot number shall be packaged with the product for shipment from the factory.

- a. Manufacturers shall be ISO9001:2000 certified.
- b. Manufacturers shall have been engaged in the design and manufacturing of exothermic connection systems for at least twenty (20) years.

END OF SECTION



SECTION-E-9

LIGHTNING PROTECTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions apply to this Section.

1.2 GENERAL

- A. Provide a functional and unobtrusive active lightning protection system in accordance with BS-EN 62305-2012-2012
- B. If any departures from the contract drawings are deemed necessary, details of such departures shall be submitted as soon as practicable to the Engineer for approval. No such departures shall be made without the prior written approval of the Engineer.
- C. The specialist contractor shall be responsible for carrying out the design through lightning protection risk assessments for all building at an early stage, and as required provide an install a lightning protection system in accordance to BS EN 62305-2012.
- D. The following specifications and standard of the latest issue form a part of this specification:
1. BS-EN 62305-2012 Standards and local regulations.
 2. Structural reinforcing steel in selected columns /piles to be used as down conductor, ensure that there is adequate electrical continuity of structural steel in these columns/piles.
- E. The Early Streamer Emission Lightning Protection System, comprising of ESE Lightening Arrestor shall be provided at top of each Tower. (Not Applicable)
The Arrestor shall be mounted on 3" dia GI pipe at least 5 meter from the top of the building.
- F. The down conductors shall be 95 sqmm bare copper conductor which shall be installed as shown in drawings welded at basement with the Earth Connecting Point. Continuity shall be checked and recorded after each floor pouring.
- G. Contractor should also include in his scope inspection by manufacturers authorized representative to ensure correct installation.
- H. All metal work on or around the building must be bonded to the lightning protection network to avoid side flashing.
- I. All materials used throughout the installation shall be either copper or copper based components which are corrosion resistant and compatible with the application.
- J. The Contractor shall submit fully detailed shop drawing for the arrestors, down conductors, earth termination network and bonding and shall be responsible to provide all the necessary accessories to integrate the system with the architectural finish of the building.

1.3 QUALITY ASSURANCE

- A. The lightning protection system shall conform to the requirements of standards for Lightning Protection Systems.
- B. The system to be provided under this specification shall be the standard product of a manufacturer regularly engaged in the production of lightning protection systems and shall be the manufacturer's latest approved design. The equipment manufacturer shall also be approved by UL or equivalent European certification body as fully certified manufacturer.
- C. Equipment should be provided with remote controlled transmitter and receiver permanently fixed to verify entire system connectivity any time post installation.

1.4 SUBMITTALS

- A. Complete shop drawings showing the type, size, and locations of all equipment, grounds, cable routings, etc., shall be submitted to the Engineer for approval prior to start of work.
- B. Samples and pertinent catalog data shall be submitted to the Engineer for approval.

1.5 COORDINATION



- A. Co-ordinate the installation of air terminations, down conductors, earth electrodes and all miscellaneous components with the Contractor.
- B. Locate earth pits in the raft with test points as shown in the layouts. Ensure adequate access for inspection, maintenance and repair is always available.
- C. Coordinate down conductors and earth electrodes within concrete columns and foundation with the Contractor.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All products should be tested as per international standards and local authority regulations in the accredited laboratory certified by the governing body with authorization.
- B. All products should be subject to the required tests following a standard sample format or procedure as per the operational performance requirements.
- C. All life safety related systems and products should be approved by the Civil Defense
- D. All Products' warranties shall be as per Employer's requirements.

2.2 MANUFACTURERS

- A. See Manufacturers lists

2.3 DESCRIPTION

- A. All equipment used in this installation shall be factory inspected, approved, and properly labeled in accordance with BS-EN 62305-2012 requirements.
- B. All equipment shall be new and of a design and construction to suit the application where it is used in accordance with accepted industry standards.
- C. All material specified for this work shall be internationally approved Lightning Protection manufacturer.

2.4 EQUIPMENT FOR AIR-TERMINALS

- A. All materials shall be copper as described below and of the size, weight, and construction to suite the application where used in accordance BS-EN 62305-2012 requirements for structures and as per manufacturer recommendations.
- B. Mostly structural reinforcing steel in selected columns to be used as down conductor as shown in the drawing, ensure that there is adequate electrical continuity of structural steel in these columns/piles. Test clamps to be provided for each down conductor. A minimum of two rebars must be used inside a column that is considered as down conductor path, which must connect together in parallel.
- C. Alternatively, if there is any down conductors from roof to ground shall be tinned high conductivity copper to BS – 1432.
- D. Air termination network shall be 25mmx3mm bare copper (or PVC coated as the case may require complying with the same) to form an air termination mesh on the upper most part of the structure and ring conductor around the structure to prevent side flashes.
- E. For earth electrode installation, The terminated head of each earth electrode shall be located in a light weight heavy duty polymer inspection pit.
- F. The earth pit shall be installed in the raft using earth electrode with water tight seals. The earth rod seal shall provide an effective, reliable and watertight seal to both the earth rod electrode and damp proof membrane. The earth rod must be such that waterproof membrane is sealed by mechanical compression between upper and lower flanges, and shall meet the requirements of IEC 62561-5, and be capable of withstanding water pressure up to 5.5 Bar.
- G. The earth seal flange shall be free from dust, debris, grease or paint before pouring of concrete. A specialist shall supervise the installation by the MEP contractor.
- H. Air terminals shall be solid, round copper bar with 15mm minimum diameter and shall project 25cm minimum above the object to be protected. Locate and space according to BS EN 62305:2012. Apply the zone of protection method calculation to protect the roof mounted equipment as per the BSEN/IS 62305 – Part 3 requirements.



- I. Ensure that the distribution board that feeds the roof mounted equipment is protected using a Type 1+2 current SPD (tested to 10/350µs & 8/20 µs waveform in line with the IEC/BSEN 61643).
- J. Air terminal bases shall be of cast aluminum with bolt pressure cable connections and shall be securely mounted with stainless steel screws or bolts. Crimp type connectors are not acceptable.
- K. Cable fasteners shall be substantial in construction, electrolytic ally compatible with the conductor and mounting surface and shall be spaced according to BS EN 62305 requirements.
- L. Bonding devices, cable splicers, and miscellaneous connectors shall be of with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable.
- M. Conductor around the structure (the spacing between the ring conductors shall depend on the size of the rolling sphere) to prevent from side flashes as per the recommendation of the specialist in lightning protection design through reference to the codes and section of the prevailing standard BSEN 62305 part-3 editon-2 2011.
- N. Air termination network should be extended, and it's determined by using rolling sphere method.
- O. This method involves rolling an imaginary sphere of 20m or 30m or 45m or 60m radius (depending on the Lightning Protection Level to be used) over structure to require protection.
- P. Any roof (e.g. staircase) on top of the main roof shall have air termination network and it shall be connected to lower roof network.
- Q. All the fixing clips for the copper tape shall be metallic (complying with Class 'H' of the electrical testing based on IEC 62561 and UL96C) and shall be fixed at an interval of 500mm (1000 mm fixing distance for fixing conductors on vertical surface up to 20m from the ground level and on the horizontal surface i.e. roof).
- R. All bases for equipment shall be securely mounted to roof, parapet, etc., as directed by roofing manufacturer, and all sealers, compounds, etc., shall be compatible with roofing materials.
- S. The electrical continuity of the reinforcing bars shall be determined by electrical testing between the uppermost part and the ground level. The overall electrical resistance should not be greater than 0.2Ω, measured using test equipment suitable for this purpose
- T. The Specialist Lightning Protection Installer shall install suitable surge protectors (Type 2+3 combined) at local power distribution boards feeding vulnerable equipment, in order to protect these against transients generated downstream of the protectors in 1, above. (These transients may be the result of inductive coupling or electrical switching.)
- U. Ground rods shall be a minimum 2 cm in diameter and 3 m long. They shall be connected to the system with a two-bolt cast bronze clamp, having a minimum length of 2.5 – 4 cm and employing stainless steel cap screws.
- V. Cable fasteners shall be substantial in construction, electrolytic ally compatible with the conductor and mounting surface and shall be spaced according to BS EN 62305-2012 requirements.
- W. Bonding devices, cable splicers, and miscellaneous connectors shall be of with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable.
- X. Equipment on stacks and chimneys shall be protected from corrosion in accordance with BS 7430.
- Y. All miscellaneous bolts, nuts, and screws shall be stainless steel.
- Z. Concrete inspection pits with cover shall be installed flush with finished floor level and be fully accessible.

2.5 EQUIPMENT FOR SURGE PROTECTION

Electronic system surge protection shall be used for the, Incoming Main Power Supply:

A suitable protection should be installed in the LV Panel.

The ESP shall be connected in parallel with the supply. ESP should be installed within the LV Panel by the panel assembler.

HRC Fuses shall be provided in the connecting leads as required by the Specialist.

ESP to have neutral earth warning light, to detect if there is excessive voltage present between neutral and earth.

2.5.1 Protection shall be tested in accordance with the requirement of:

BS6651 : 1999 'Protection of Structures against lightning' (Appendix C)
BS2914 :1972 'Specification for surge diverters for alternating current power circuits'.



IEEE C62.41 – 1991 ‘Recommended practice on surge voltage in low voltage AC Power circuits.’

- 2.5.2 The protector must not interfere with or restrict the system normal operation. It should not:
- Corrupt the normal mains power supply.
 - Break or shutdown the power supply during operation.
 - Have an excessive earth leakage current.
- 2.5.3 The protector shall be rated for a peak discharge current of no less than 10 KA (8 / 20 microsecond waveform) between any two conductors (phase to neutral, phase to earth, neutral to earth).
- 2.5.4 The protector shall limit the transient voltage to below equipment susceptibility levels. Unless otherwise stated, the peak transient let-through voltage shall not exceed 600 volts. For protectors with a nominal working voltage of 230 or 240 volts, when tested in accordance with BS 6651 :1999 Category B – High (6 kV 1.2 / 50microsecond open circuit voltage, 3kA 8/20 microsecond short circuit current).
- 2.5.6 This peak transient let through voltage shall not exceed for all combinations of conductors:
- Phase to neutral
 - Phase to earth.
 - Neutral to earth.
- 2.5.7 Mains protectors (installed in shunt / parallel) should have continuous indication of its protection status and the presence of power. Status indication should clearly show per phase.
- Full protection present.
 - Reduced protection – replacement required.
 - No protection – failure of protector.
- 2.5.8 The status indication should warn of protection failure between all combinations of conductors, including neutral to earth. (Otherwise a potentially dangerous short circuit between neutral and earth could go undetected for some time). This should include early warning of excessive neutral to earth voltage.
- 2.5.9 The protector shall be supplied with detailed installation instructions. The installer must comply with the installation practice detailed by the protector manufacturer.
- 2.6.0 Protection for Data Communication and Telephone lines
- 2.6.1 Transient overvoltage protectors shall be installed on all data communication / signal / telephone lines entering or leaving the building, in order to protect equipment connected to the line, against transient over voltages. (Where data lines travel between buildings linking equipment in each building, transient overvoltage protectors should be installed at both ends of the line in order to protect both pieces of equipment).
- 2.6.2 Protectors shall conform to
- BS6651 : 1992 Protection of structures against lightning (Appendix C) CCITT LX K17
- 2.6.3 The protector must not impair the systems normal operation. It should not :
- Restrict the system bandwidth or signal frequency.
 - Introduce excessive inline resistance.
 - Cause signal reflections or impedance mismatches (on high frequency systems).
- 2.6.4 The protector will have a low transient ‘let – through’ voltage for surge currents conducted in accordance with BS6651 : 1992 Category C – High (5kV 10/700 microsecond test waveform).



2.6.5 This 'let – through' performance will be provided for all combinations of conductors:

- Signal line to signal line.
- Signal line to screen / earth.

2.6.6 The protector shall be rated for a peak discharge current of 10kA.

2.6.7 The protector shall be supplied with detailed installation instructions. The installer must comply with the installation practice detailed by the protector manufacturers.

The protector manufacturer should allow for the facility to mount and earth large numbers of protectors through an accessory combined mounting and earthing kit

PART 3 - EXECUTION

3.1 GENERAL

- A. The system shall be installed by a contractor licensed to carry out such installations and be in compliance with BS-EN 62305-2012 latest edition by an experienced installer.
- B. Install at least two dedicated down conductors with direct paths from air terminals to ground connections and for building height above 60m, four dedicated shall be used. Avoid sharp bends and narrow loops.
- C. When different metal to be connected a bimetallic clamp shall be used.
- D. On Copings: A complete network of lightning protection shall be installed utilizing parapet bases with stainless steel tech screws on copings. This screw incorporates a hex washer head of wraparound 8 cm stainless steel and a neoprene washer.
- E. On Gravel Stop Roofs, Center of the Roof Runs, and Bonding Runs: A complete network of lightning protection shall be installed utilizing flat surface bases.
- F. All equipment shall be installed in a neat workmanlike manner, as inconspicuously as possible. All cable runs shall be chalk line straight and plumb. All air terminals shall be plumbed. All adhesive fastening shall be accomplished with EPDM pourable sealer. (Use same sealer as roof manufacturer.) Air terminal bases and adhesive cable pads shall be installed in straight lines apply pourable sealer to the base and fastener and let dry for a minimum of 48 hours before inserting cable. Pouring adhesive over cable, base, and fastener is strictly prohibited. After bases are set, install swivel to insure air terminals are plumb. If, in the Engineer's opinion, cable runs are not neat and plumb (within 5 degrees), the installer shall correct cable runs at the installer's expense. It shall be the lightning protection contractor's responsibility to install the pourable sealer and fasten his equipment; the roofer or electrical contractors are prohibited from installing these items. Down conductors shall be installed exposed on inside of brick corners (as per drawings). Furnish PVC conduit guards to 2.5 m above grade. Install ground rods at a minimum of 1 m from building foundation.
- G. Coordinate installation of lightning protection system with installation of other building systems and components, including electrical wiring, supporting, metals bodies requiring bonding to lightning protection system, and building finishes.
- H. Bond each copper down conductor throughout its length to the building reinforcement bar with spacing not more than 1.5 meters (All bonding to reinforcement bar shall be using manufacture's standard materials and tools for the same).
- I. Bond roof vents, flashing and any other metal masses projecting through the roof to the grid.
- J. Thermal weld all connections between cables, aerial terminals and ground rods.
- K. Measure the resistance of the complete installation and submit for review to the engineers.

3.2 COORDINATION

- A. The lightning protection installer will work with other trades to insure a correct, neat, and unobtrusive installation. It shall be the responsibility of the lightning protection installer to assure a sound bond to the main water service, and to insure interconnection with other building ground systems.

3.3 TESTING



- A. Post completion of lightning protection, the terminal connectivity shall be tested on field using RF REMOTE.
- B. Further test the resistance of ground to BS 7430. Test employed shall be the 3 Point Fall of Potential method with a Null Balance megger. Record instrument's serial number. Date of last calibration shall be less than 1 year from date of test. Resistance to ground shall not exceed 10 ohms.
- C. Test clamps shall be provided in each inspection pit to allow for testing and commissioning.
- D. Should the ground resistance exceed 10 ohms, excavate an area approximately 1000 cm² by 2 m deep around the top of all driven ground electrodes then insert enhancement materials from an approved manufacturer. This compound shall be hydrated to a slurry-type consistency and then spread in the excavation. The area should then be left for approximately 24 hours before installation. Then retesting procedures should be performed. Record final readings.

3.4 COMPLETION

- A. The lightning protection installer shall secure and deliver the Lightning Protection system certification to the Engineer for the Owner upon completion of the installation.

END OF SECTION



SECTION-E-10**SOLAR PANELS****1.0 SPECIFICATION FOR THE SUPPLY AND INSTALLATION OF SOLAR SYSTEM****a) SOLAR PANELS:**

- The PV module(s) shall contain **mono crystalline** (Mono PERC) silicon Grade-A solar cells.
- The PV module have an ability to Works well with high-voltage input Inverters/ charge controllers
- The PV Panel must have clear anodized aluminum frame with Anti-reflection cover glass
- The power output of the module(s) under STC should be at optimum level.
- The operating voltage corresponding to the power output must be mentioned.
- The open circuit voltage of the PV modules under STC must be mentioned.
- The terminal box on the module should have a provision for opening for replacing the cable, if required and it should be waterproof
- The Solar Panel shell meet the requirement set in IEC 61215:2005, IEC61730-1:2004 and IEC 61730-2:2004 and should be duly certified by TUV.
- A strip containing Serial number should be laminated inside the module so as to be clearly visible from front side.
- Limited performance guarantee: panel power, in standard conditions, will not be less than 90% of nominal power for first 10 years of operation and at least 80% for the second 20 years of operation with 25-year limited power warranty.
- The PV Module should have over 18 % Module efficiency.
- The solar panel supplied should be in compliance with the product specifications provided in the technical bid. All the technical parameters are to be provided with each solar panel supplied

b) INVERTER/CONTROLLER:

The grid tie solar inverter / controller should have over load protection range of 40 KWP or above. The inverter offered should comply to:

- DC/DC booster
- String inverter (grid tied)
- The nominal voltage should be 3 phase, 230/415 VAC, 50 Hz.
- The total harmonics distortion should be less than 3 %.
- Protection class should be IP-65 or above.
- Operating temperature 60 °C and 100 % humidity.
- Remote monitoring App.
- DC over voltage protection.
- DC under voltage protection.
- DC over current protection.
- DC reverse polarity protection.
- Over temperature protection.
- Surge protection.
- Grid frequency under over protection.
- Ground fault protection.
- Leakage protection.
- Interface RS232/USB and RS485/Ethernet.
- LCD display.
- Local monitoring system should be life time free of cost and integrated.
- Safety Compliance as per IEC 62109- 1&2
- Efficiency measurement to comply as per IEC 61683
- CE/RoHS compliant
- Low Voltage Directive 73/23/EEC with Supplements
- EMC Directive 89/336/EEC with Supplements
- 10-year warranty.
- Compliance with K.E Requirements is a must for net metering.



The complete datasheet showing all the electrical parameters like input & output voltage ranges should be provided in the technical bid.

c) MOUNTING STRUCTURE:

The panel mounting structure should be made of Aluminum / MS hot dipped galvanized (minimum wall thickness 2.5 mm). The following instruction / guidelines must be followed:

- i. The structures will be Aluminum / MS hot – dipped galvanized all structure material with SS 316 Nut Bolts and also give enough working space for other installations on terrace.
- ii. Location and design of PV module structure should be such as that the existing infrastructure on the terrace is not disturbed.
- iii. To allow for regular cleaning of the solar module, it should be accessible for personnel.
- iv. Structures shall be supplied complete with all members to be compatible for allowing easy installation at the rooftop site.
- v. The structure shall be designed to allow easy replacement of any module.
- vi. Each structure will be capable of withstanding a wind load of 200 Km/hr and cater a gust of 3 second after grouting and installation.
- vii. The front end of PV array must be 2 ft. above the roof surface. Grouting material for PV structure shall be as per standard and **concrete specifications**.
- viii. The structure shall be designed for simple mechanical and electrical installation. There shall be no requirement of welding or complex machinery at the installation site. **Welding Specifications**
- ix. If prior civil work or support platform is absolutely essential to install the structures, Bidder shall clearly and unambiguously communicate such requirements along with their specification in the technical bid.
- x. Detailed engineering drawings and instructions for such prior civil work shall be carried out prior to the supply of goods.
- xi. The supplier shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings.

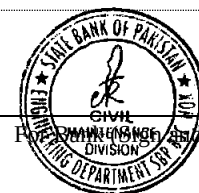
Such details shall include, but not limited to the following:

- Determination of true south at the site.
 - Array tilt angle to the horizontal with permitted tolerance.
 - Details with drawing for fixing the modules.
 - Details with drawing for fixing the junction/terminal boxes.
 - Interconnection details inside the junction /terminal boxes.
 - Structure installation details and drawing.
 - Electrical grounding (earthing).
 - Inter – panel /inter row distances with allowed tolerance.
 - Safety precaution to be take.
 - Space should be left for cleaning.
- xii. The array structure shall support PV module at a given orientation, absorb, and transfer the mechanical loads to the roof top columns properly.
 - xiii. Detailed design and drawing shall have to be submitted for acceptance and approval before execution of work.

d) DC CABLE / WIRING:

DC solar cables are designed for photovoltaic (PV) power generation systems. These cables ensure efficient and safe power transmission between solar panels, inverters, and charge controllers. They are UV-resistant, weatherproof, and have high flexibility for easy installation. The cables are specially engineered to withstand extreme environmental conditions, including high temperatures, humidity, and mechanical stress.

i. CABLE CONSTRUCTION



S.#	Component	Specification
1.	Conductor	Stranded Tinned Copper (Class 5, IEC 60228)
2.	Insulation	Cross-linked Polyolefin (XLPO)
3.	Sheath	UV-resistant XLPO/Polyolefin
4.	Color	Red (+) and Black (-)
5.	Voltage Rating	1000V / 1500V DC (IEC 62930)
6.	Temperature Range	-40°C to +90°C (Max. 120°C short circuit)
7.	Flame Retardancy	IEC 60332-1 (Flame Retardant)
8.	UV & Weather Resistance	IEC 60811-2-1
9.	Halogen-Free	IEC 60754-1

ii. ELECTRICAL PROPERTIES

S.#	Parameter	4mm ² Cable	6mm ² Cable
1.	DC Resistance (Ω /km, 20°C)	≤ 5.09	≤ 3.39
2.	Maximum Current Carrying Capacity (A)	55	70
3.	Insulation Resistance ($M\Omega \cdot km$)	≥ 1000	≥ 1000
4.	Dielectric Strength	6.5 kV	6.5 kV
5.	Voltage Drop (V/A/km)	11.09	7.39
6.	Short Circuit Current Rating (1 sec)	200A	280A

iii. MECHANICAL PROPERTIES

S.#	Parameter	Specification
1.	Minimum Bending Radius	5 × Cable Diameter
2.	Tensile Strength	≥ 8 MPa
3.	Elongation at Break	$\geq 125\%$
4.	Impact Resistance	IEC 62930 Compliant
5.	Abrasion Resistance	High
6.	Flexibility	Excellent



iv. CABLE TESTING

S.#	Test	Standard	Purpose
1.	Conductor Resistance Test	IEC 60228	Ensures low resistance for efficient power transmission
2.	Insulation Resistance Test	IEC 60502-1	Verifies insulation integrity
3.	High Voltage Test	IEC 60060-1	Confirms dielectric strength
4.	Thermal Endurance Test	IEC 60216	Ensures longevity under temperature variations
5.	UV & Weather Resistance Test	IEC 60811-2-1	Validates performance in outdoor conditions
6.	Fire Retardancy Test	IEC 60332-1	Ensures flame resistance
7.	Tensile & Elongation Test	IEC 60811-1-1	Measures mechanical durability

v. COMPLIANCE & CERTIFICATIONS

S.#	Standard / Certification
1.	IEC 62930 / EN 50618 (PV Cable Standard)
2.	TÜV Rheinland / UL 4703 Certified
3.	RoHS & REACH Compliant
4.	Fire Performance: IEC 60332-1-2
5.	Halogen-Free: IEC 60754-1
6.	Weather & UV Resistance: IEC 60811-2-1

e). General:

- a) Welding of PV panels should be free from defects; the joint is to be properly cleaned. NDT, welding as per standard.
- b) Since the work is to be done in different areas therefore deployment of men, transportation of man & machinery, consumables, welding equipment, drilling machine to various locations necessary for carrying out the job comes under contractor's purview. Power supply, if already available at site, shall be provided to contractor free of cost however if not available then contractor shall make arrangement of power supply at his own cost. Diesel / Petrol for running the mobile DG set used for welding is in the scope of the contractor
- c) The necessary tools and tackles, material and labor required for connecting new solar supply to existing panel is in the scope of the contractor. No additional payment will be made for the same.
- d) The contractor at his own cost shall visit site, before quoting the tender.
- e) The contractor is responsible for any damage caused while carrying out installation of solar panels.
 - i. Drains, pipes, electrical cables, telephone cables, and similar services encountered in the course of the works shall be guarded from injury by the contractor at his own cost, so that they may continue in full and uninterrupted to the satisfaction of the the Engineer /owner thereof.
 - ii. Should any damage be done by the contractor to any mains, pipes cables or lines (whether above or below ground etc) whether or not shown on the drawings the contractor must make at his cost good the damage without delay to the satisfaction of the the Engineer.

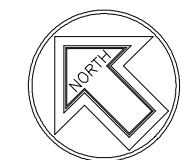
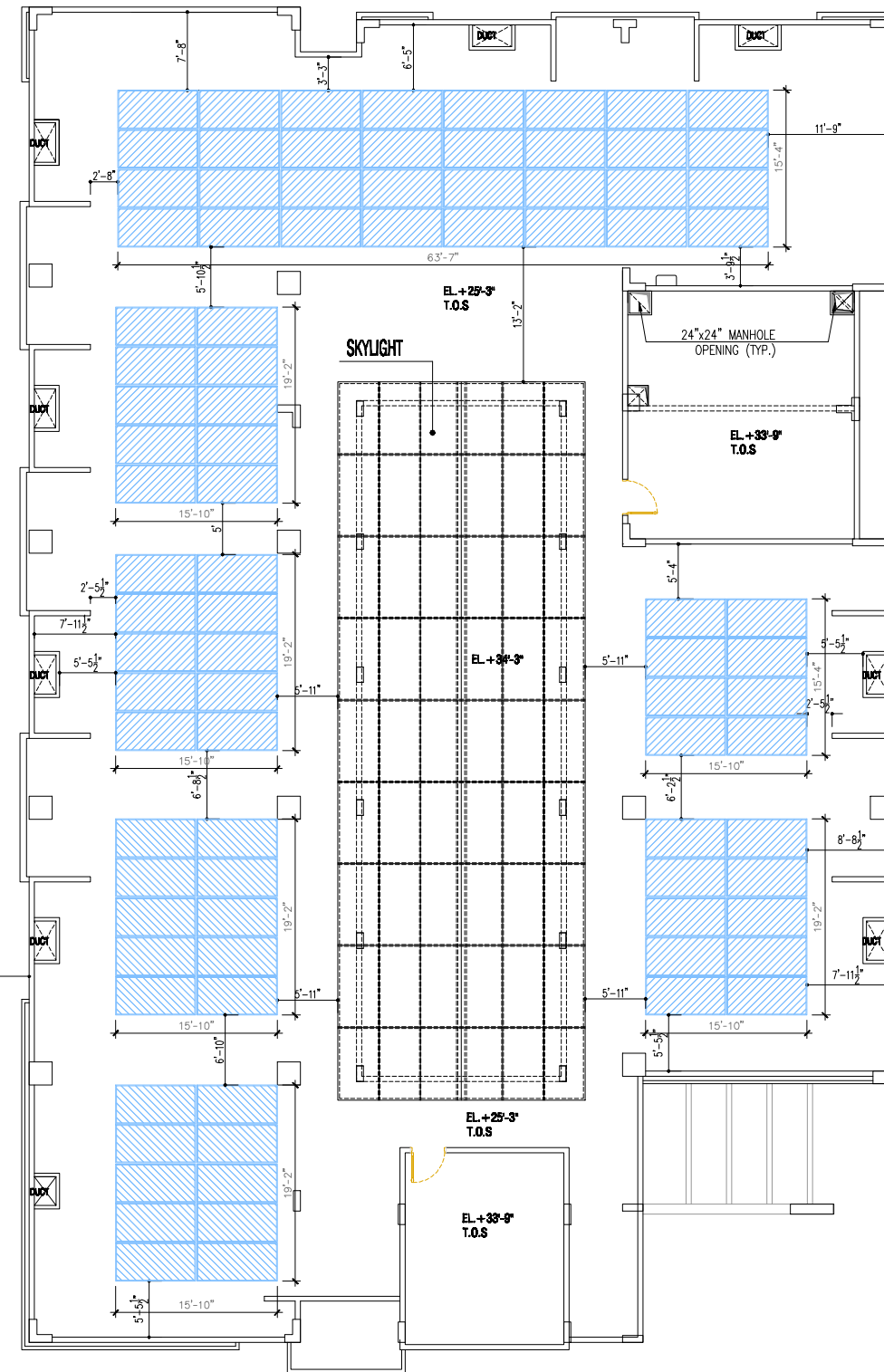
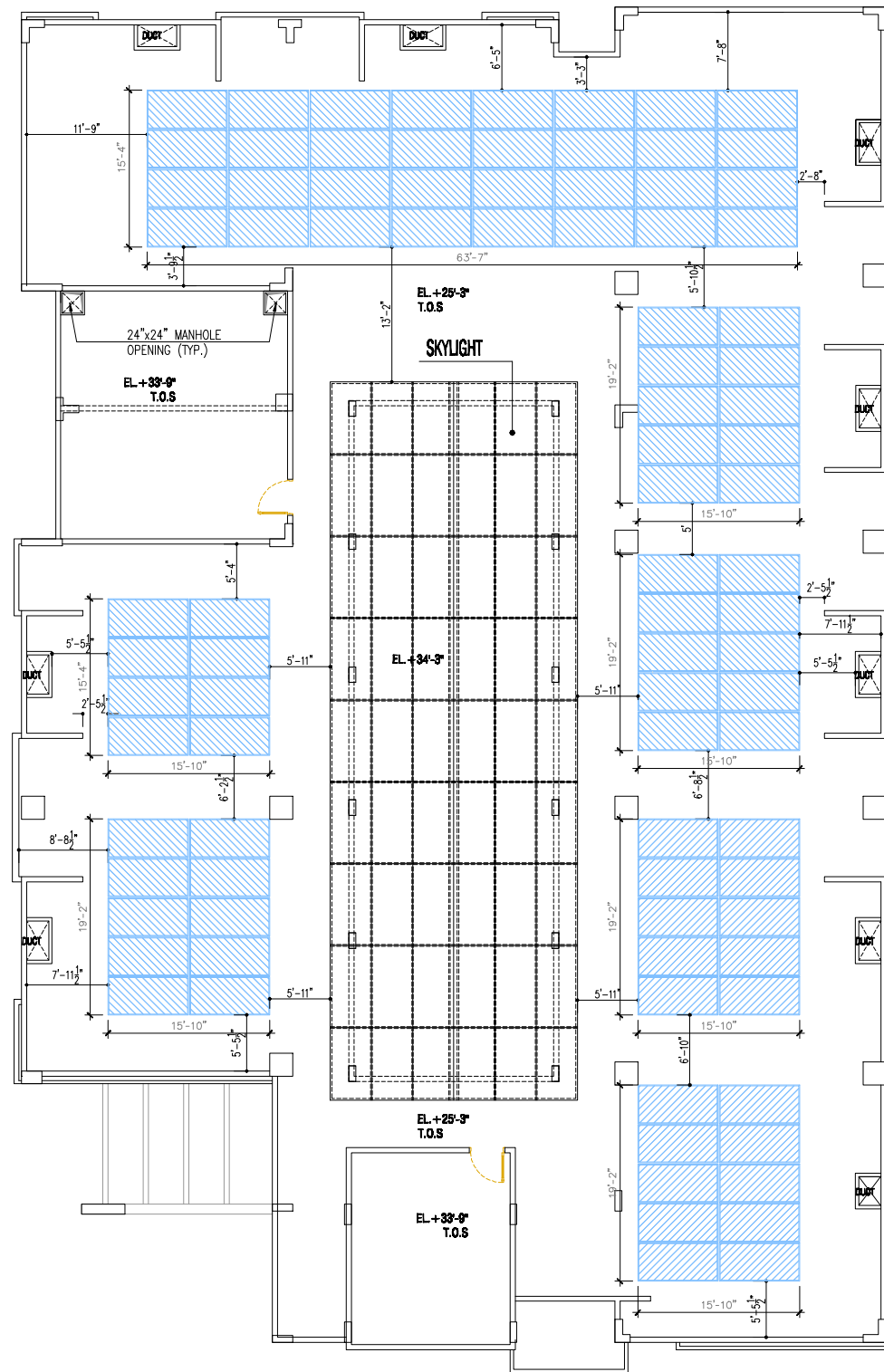


- f) Permissions - While doing the work, it is the responsibility of the contractor to take the all the necessary permissions required from any government agencies to complete the work.
- g) In some locations, the work may be carried out near Live High voltage bus bars/lines, contractor has to follow all safety rules & regulations etc. and guide his manpower for safe working.
- h. Before procurement of any material, approval shall be taken from **the Engineer**
- i. Cable trays shall be with complete installation material.
- j. Cable trays shall be used for Power Cables.
- k. SLDs and Layouts shall be part of Contract.
- l. Cranes/Fork lift/machines/tools required at site shall be in contractor's scope.
- m. House Keeping shall be done as per requirement and satisfaction of **the Engineer**
- n. All documentation for QA/QC, SHE, Testing, etc shall be done by Contractor under the supervision **of the Engineer**
- o. The materials, design and workmanship shall satisfy the applicable standards, specifications contained herein and codes referred to. Where the technical specifications stipulate requirements in addition to contained in the standard codes and specifications, those additional requirements shall also be satisfied.
- p. All the material required to complete the entire job at site. However minimum 07 (Seven) days advance intimation before work startup will be given **by the Engineer**
- q. In case of any contradiction the decision of the Engineer will be final and binding on the contractor.
- r. Any materials damaged during execution of the job by the contractor or his personnel, shall be made good, otherwise suitable deduction from the contractor's bill shall be made as decided by **the Engineer**.
- s. The Contractor shall furnish all labor and materials, tools and equipment required to install, connect, test and commission all electrical equipment specified herein, whether or not such equipment is furnished by him or others. For all equipment to be installed by the Contractor, the Contractor shall supply and install all installation materials such as foundation bolts, leveling steel, shims, clamps, cable sockets, lugs, gland, solder, wall plugs, steel rowel bolts, washers nuts, etc. as required and without any additional costs. In general, the manufacture's instruction for installation shall be followed.
- f) **NOTE:**
 - a. For any major departure from the working drawings that are deemed necessary by the Contractor due to site conditions, he shall submit the details and obtain the **Engineer** approval before starting such works.
 - b. Upon completion of the installation, the Contractor technical team will be available during startup.
- g) **Mandatory Compliance;**
 - a. All relevant technical requirement will be follows including Requirement of K-Electric Net metering purpose.
- h) **NOTE: following documents shall be the part of Contract**
 - i. Layout and section drawings.
 - ii. SLD
 - iii. Block diagram
 - iv. Net metering Requirement (if required by Employer)
- i) **Submittal:**
 - a) All technical material along with specs to be submitted with ample in a proper name with a sample board. All detail to be mention in it.
 - b) The Engineer reserve the right to change and the specs / revise amendment without any notice.

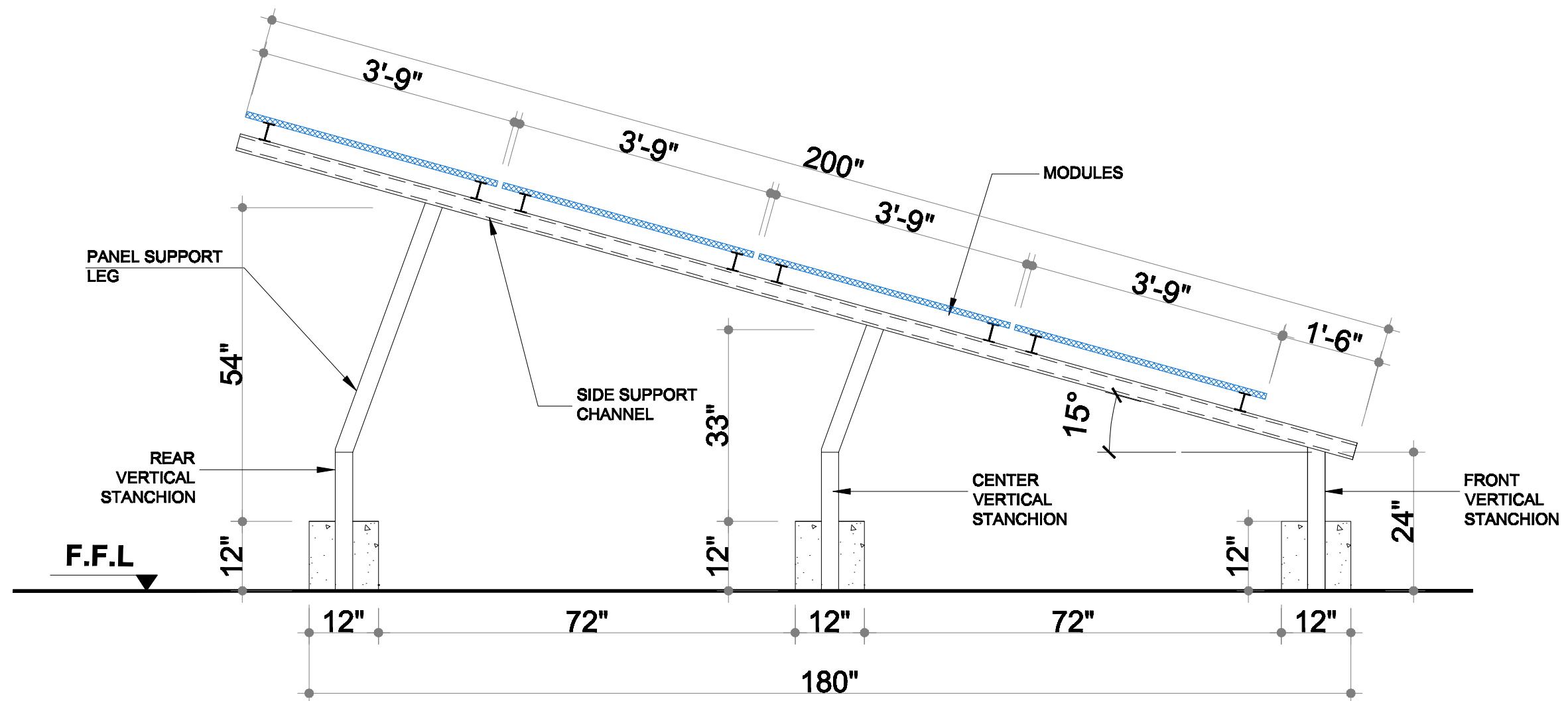


DRAWINGS





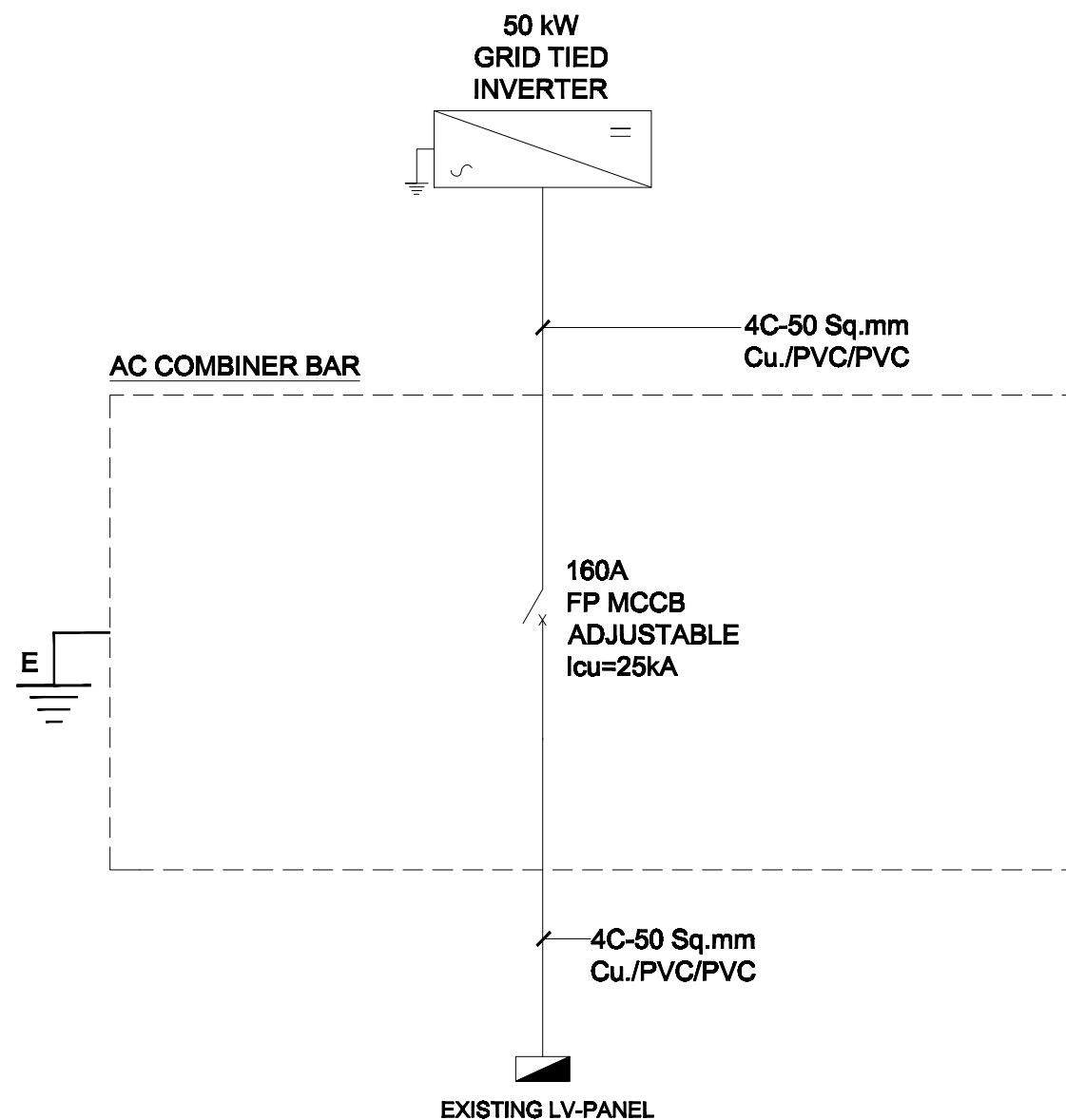
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						DRAWING STATUS:	TENDER DRAWING	CHECKED BY:		JOB NO:	SP/SBP/01	EL-00-01
01	TENDER DRAWING		07-07-2025									
REV.	DESCRIPTION		DATE									



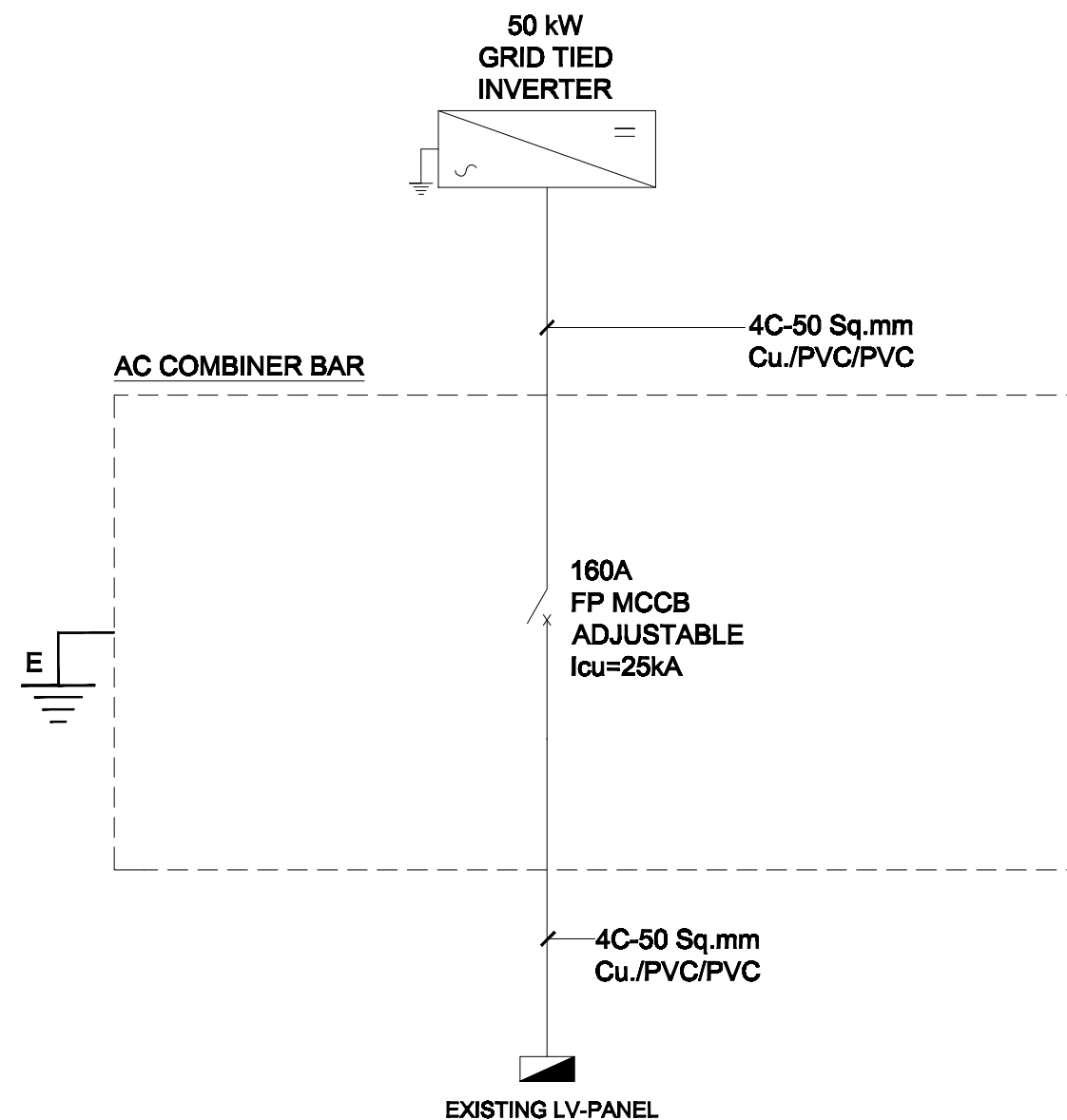
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								DESIGNED BY:	DATE: 2025		
							TENDER DRAWING	CHECKED BY:	JOB NO: SP/SBP/01		
		01		TENDER DRAWING	07-07-2025						
		REV.	DESCRIPTION		DATE						



CLIENT: STATE BANK OF PAKISTAN	PROJECT: 55 kW Grid Tied Solar System at Plot No 52A & 53A				DRAWING TITLE: DC-COMBINER SINGLE LINE DIAGRAM	DRAWN BY: K.P	SCALE: N.T.S	DRAWING TITLE: EL-00-03			
									DRAWING STATUS: TENDER DRAWING	DESIGNED BY:	DATE: 2025
01	TENDER DRAWING	07-07-2025	CHECKED BY:	JOB NO: SP/SBP/01							
REV.	DESCRIPTION	DATE									

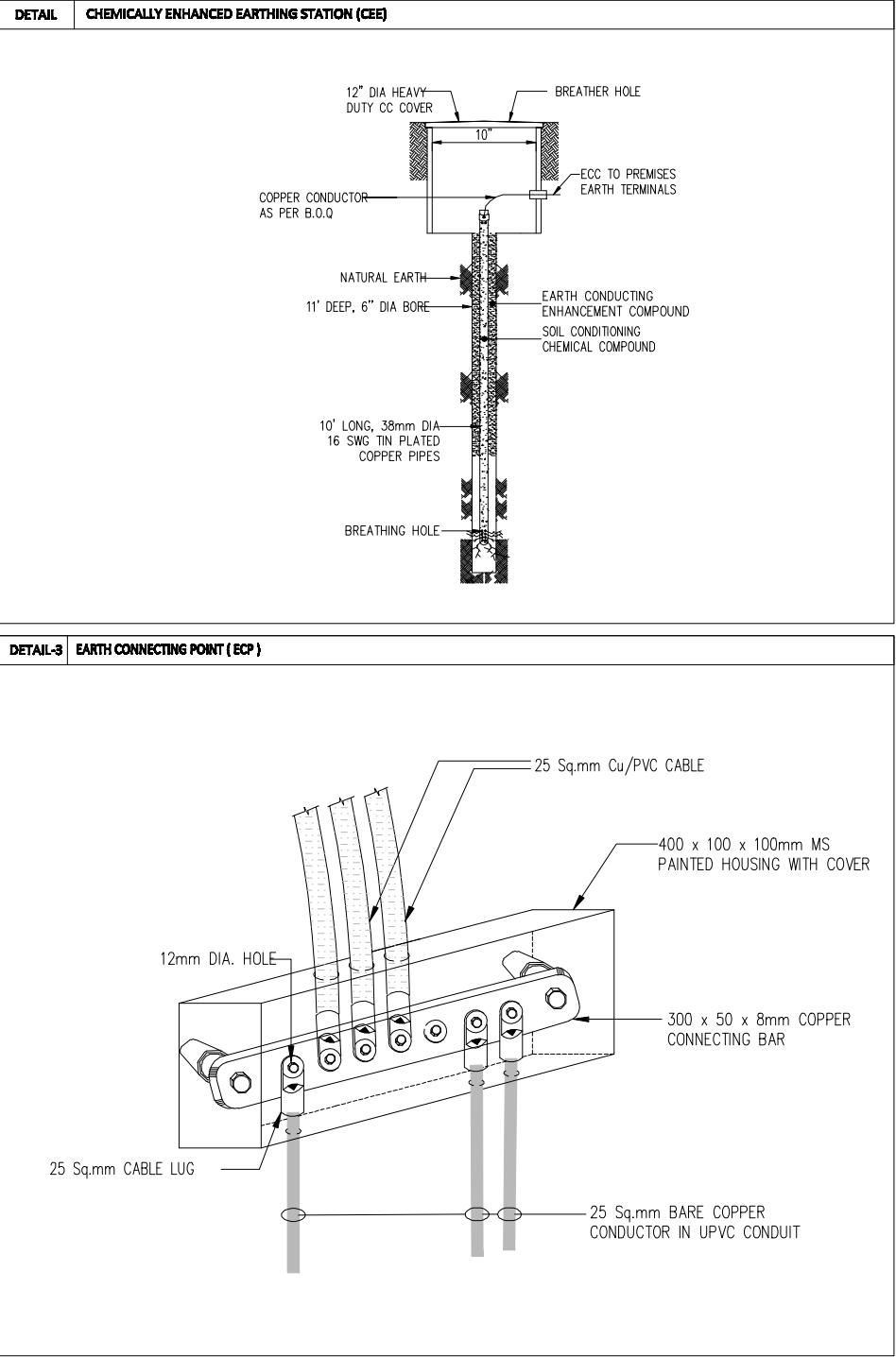
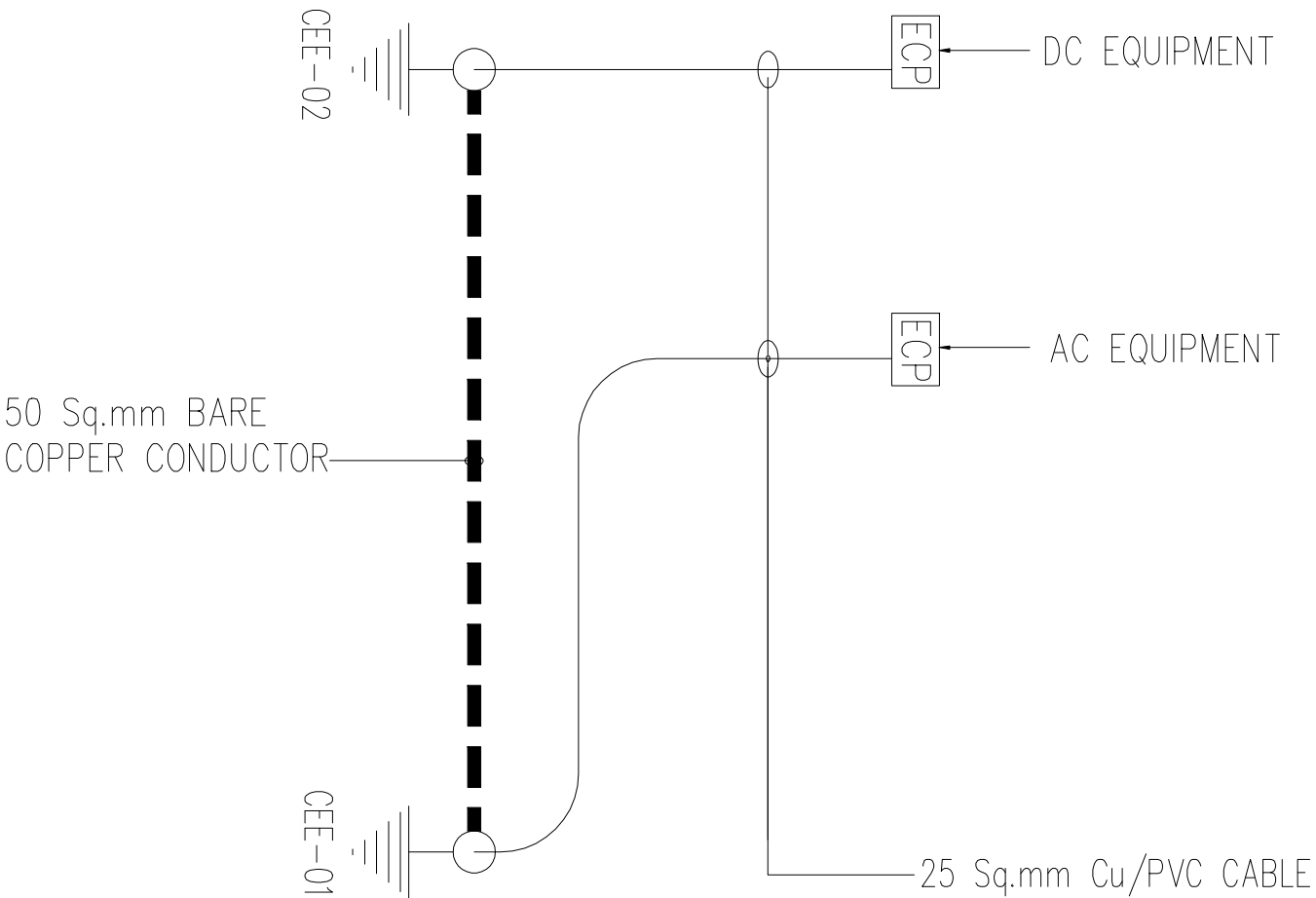


PLOT NO 52-A



PLOT NO 53-A

CLIENT: STATE BANK OF PAKISTAN	PROJECT: 55 kW Grid Tied Solar System at Plot No 52A & 53A					DRAWING TITLE: C-COMBINER & LPDB-INVERTER		DRAWN BY: K.P	SCALE: N.T.S	DRAWING TITLE: EL-00-02
						DRAWING STATUS: TENDER DRAWING		DESIGNED BY:	DATE: 2025	
								CHECKED BY:	JOB NO: SP/SBP/01	
								01	TENDER DRAWING	
		REV.	DESCRIPTION	DATE						



CLIENT: STATE BANK OF PAKISTAN	PROJECT: 55 kW Grid Tied Solar System at Plot No 52A & 53A					DRAWING TITLE:	DRAWN BY:	SCALE:	DRAWING TITLE:
						EARTHING LAYOUT	K.P	N.T.S	EL-00-04
							DESIGNED BY:	DATE:	
							2025		
						DRAWING STATUS:	TENDER DRAWING	CHECKED BY:	
01	TENDER DRAWING	07-07-2025	SP/SBP/01						
	REV.	DESCRIPTION		DATE					

Contractor's Representative and Key Personnel

MINIMUM MANDATORY STAFF: The Contractor shall arrange all requisite resources for timely completion of project as per provisions given in the Bidding Documents.

Following is the list of Minimum Mandatory Staff Requirement & Equipment to be deployed at site by the Contractor as and when required by the Engineer till completion of the Project. In case Contractor fails to deploy any of the following personnel, the Engineer will deduct the amount mentioned at column (E) for the respective personnel. However, the deduction of the amount does not relieve the Contractor to deploy the minimum staff at site and shall not prejudice Engineer / Employer from any other remedy defined in the Contract.

<i>Designation</i>	<i>Nos.</i>	<i>Minimum Qualification</i>	<i>Min. Relevant Working Experience</i>	<i>Minimum Amount to be deducted per month per person in case the personnel is not deployed at site (Rs.)</i>
(A)	(B)	(C)	(D)	(E)
Engineer (Electrical)	01	B.E/ BSC (Registered with PEC)	05 years	250,000/-
Site Supervisors (Electrical)	01	DAE Electrical/ B-Tech	08 years	120,000/-

Authorized Signature and official Seal: _____

Name: _____

Date: _____



SECTION VI – STANDARD FORMS



Table of Forms

Sr. No.	Form No.	Description	Proposal Part
1.	Form T1	Bidder Information Form	Technical Proposal
2.	Form T2	Declaration for Ultimate Beneficial Owners Information	Technical Proposal
3.	Form T3	Letter of Bid – Technical Proposal	Technical Proposal
4.	Form T4	Undertaking	Technical Proposal
5.	Form T5.1	Manufacturer's Authorization Form	Technical Proposal
6.	Form T5.2	Distributor's Authorization Form	Technical Proposal
7.	Form T6	Form of Bid Security	Technical Proposal
8.	Form T7	S2 Form	



Form T1 – Bidder Information Form

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

IFB No: ED/PROC-HOK/958705/2025/270

Title: Supply, installation, testing & commissioning of Solar System at residential facility
Queens Road, Lalazar Karachi.

Bidder: _____

1. Bidder's Name <i>[insert Bidder's legal name]</i>
2. Bidder's actual or intended country of registration: <i>[insert actual or intended country of registration]</i>
3. Bidder's year of registration: <i>[insert Bidder's year of registration]</i>
4. Bidder's Address in country of registration: <i>[insert Bidder's legal address in country of registration]</i>
5. Bidder's Authorized Representative Information Name: <i>[insert Authorized Representative's name]</i> Address: <i>[insert Authorized Representative's Address]</i> Telephone/Fax numbers: <i>[insert Authorized Representative's telephone/fax numbers]</i> Email Address: <i>[insert Authorized Representative's email address]</i>
6. Attached are copies of original documents of <i>[check the box(es) of the attached documents]</i> ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above. ☐ Establishing that the Bidder is not under the supervision of the Procuring Agency 7. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.



Form T2 - Declaration for Ultimate Beneficial Owners Information**(Applicable for Procurement of Rs. 50 M or Above)**

IFB No: ED/PROC-HOK/958705/2025/270

Title: Supply, installation, testing & commissioning of Solar System at residential facility
Queens Road, Lalazar Karachi.

Bidder:

Declaration of Ultimate Beneficial Owners Information for Public Procurement Contracts

1. Name:
2. Father's Name/Spouse's Name:
3. CNIC/NICOP/Passport no:
4. Nationality:
5. Residential address:
6. Email address:
7. Date on which shareholding, control or interest acquired in the business:
8. In case of indirect shareholding, control or interest being exercised through intermediary companies, entities or other legal persons or legal arrangements in the chain of ownership or control, following additional particulars to be provided:

1	2	3	4	5	6	7	8	9	10
Name	Legal form (Company/Limited Liability Partnership/Association of Persons/Single Member Company/ Partnership Firm/ Trust/Any other individual, body corporate (to be specified))	Date of incorporation/ registration	Name of registering authority	Business Address	Country	Email address	Percentage of shareholding, control or interest of BO in the legal person or legal arrangement	Percentage of shareholding, control or interest of legal person or legal arrangement in the Company	Identity of Natural Person who ultimately owns or controls the legal person or arrangement



9. Information about the Board of Directors (details shall be provided regarding number of shares in the capital of the company as set opposite respective names).

1	2	3	4	5	6	7	8
Name and surname (InBlock Letters)	CNIC No. (in case of foreigner ,Passport No)	Father's/ Husband's Name in full	Current Nationality	Any other Nationality (ies)	Occupation	Residential address infull or the registered/ principal office address for a subscriber other thannatural person	Number of shares taken by each subscriber (in figures and words)
Total number of shares taken (in figures and words)							

10. Any other information incidental to or relevant to Beneficial Owner(s).



Form T3 – Letter of Bid (Technical Proposal)**Date of this Bid submission:** -----**IFB No.:** ED/PROC-HOK/958705/2025/270**Title of Procurement:** Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi.

To: SBP Banking Service Corporation – Engineering Department

We, the undersigned Bidder, hereby submit our Bid, in two parts, namely:

- (a) The Technical Proposal, and
- (b) The Financial Proposal.

In submitting our Bid we make the following declarations:

- (a) **No reservations:** We have examined and have no reservations to the bidding document, including addenda issued in accordance with Instructions to Bidders (ITB 9);
- (b) **Eligibility:** We meet the eligibility requirements and have no conflict of interest in accordance with ITB 3;
- (c) **Bid/Proposal-Securing Declaration:** We have not been suspended nor declared ineligible by the Procuring Agency based on execution of a Bid Securing Declaration or Proposal Securing Declaration in the Procuring Agency's country in accordance with ITB 4;
- (d) **Conformity:** We offer to supply in conformity with the bidding document and in accordance with the Delivery Schedules specified in the Schedule of Requirements;
- (e) **Bid Validity Period:** Our Bid shall be valid for the period specified in **BDS 17.1** (as amended, if applicable) from the date fixed for the Bid submission deadline specified in **BDS 23.1** (as amended, if applicable), and it shall remain binding upon us, and may be accepted at any time before the expiration of that period;
- (f) **Performance Security:** If our Bid is accepted, we commit to obtain a performance security in accordance with the bidding document;
- (g) **One Bid per Bidder:** We are not submitting any other Bid(s) as an individual Bidder, and we are not participating in any other bid(s) as a Joint Venture member or as a subcontractor, and meet the requirements, other than Alternative Bids submitted in accordance with **ITB 19**;
- (h) **Suspension and Debarment:** We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Procuring Agency. Further, we are not ineligible under Pakistan laws;
- (i) **State-owned enterprise or institution:** *[select the appropriate option and delete the other]* *[We are not a state-owned enterprise or institution]* / *[We are a state-owned enterprise or institution but meet the requirements of]*; _____
- (j) **Binding Contract:** We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;
- (k) **Not Bound to Accept:** We understand that you are not bound to accept the Most Advantageous Bid or any other Bid that you may receive; and
- (l) **Fraud and Corruption:** We hereby certify that we have taken steps to ensure that no person acting for us, or on our behalf, engages in any type of Fraud and Corruption.



Form T4 – Undertaking

IFB No: ED/PROC-HOK/958705/2025/270

Title: Supply, installation, testing & commissioning of Solar System at residential facility
Queens Road, Lalazar Karachi.

Bidder: _____

UNDERTAKING

1. I/We hereby confirm and declare that I/We, [insert Bidder name], has/have not been declared in-eligible or debarred, blacklisted/sanctioned by any Federal or Provincial Government Department, National Counter Terrorism Authority (NACTA), Agency, Organization or Autonomous Body anywhere in Pakistan or fraudulent practices, or no failure to perform with SBP.
2. I/We, M/s -----, understand and agree unconditionally that in case I/We, M/s fail to abide by the above undertaking or any of terms of the Contract, the Client/ SBP BSC shall be at liberty to terminate the Contract without prejudice to any other rights / remedy available in the Contract.



Form T5.1 – Manufacturer’s Authorization Form
(NOT Applicable)

*[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The Bidder shall include it in its Bid, if so indicated in the **BDS.**]*

IFB No: ED/PROC-HOK/958705/2025/270

Title: Supply, installation, testing & commissioning of Solar System at residential facility
Queens Road, Lalazar Karachi.

Bidder: _____

To: *[SBP Banking Service Corporation – Engineering Department]*

WHEREAS

We *[insert complete name of Manufacturer]*, who are official manufacturers of *[insert type of goods manufactured]*, having factories at *[insert full address of Manufacturer’s factories]*, do hereby authorize *[insert complete name of Bidder]* to submit a Bid the purpose of which is to provide the following Goods, manufactured by us *[insert name and or brief description of the Goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 18 of the General Conditions of Contract, with respect to the Goods offered by the above firm.



Form T5.2 – Distributor’s Authorization Form
(NOT Applicable)

[The Bidder shall require the Distributor to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Distributor and should be signed by a person with the proper authority to sign documents that are binding on the Distributor.]

IFB No: ED/PROC-HOK/958705/2025/270

Title: Supply, installation, testing & commissioning of Solar System at residential facility
Queens Road, Lalazar Karachi.

Bidder: _____

To: *[SBP Banking Service Corporation – Engineering Department]*

WHEREAS

We *[insert complete name of official Distributor]*, who are official Distributor of *[insert type of goods manufactured]*, having Distributor / office at *[insert full address of Distributor]*, do hereby authorize *[insert complete name of Bidder]* to submit a Bid the purpose of which is to provide the following Goods, manufactured by _____ *[insert name and or brief description of the Goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 18 of the General Conditions of Contract, with respect to the Goods offered by the above firm.



Form T6 – Form of Bid Security

**(Bank Guarantee)
(NOT APPLICABLE)**

[The bank shall fill in this Bank Guarantee Form in accordance with the instructions indicated.]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: SBP Banking Service Corporation – Engineering Department

IFB No.: ED/PROC-HOK/958705/2025/270

Date: *[Insert date of issue]*

BID GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that _____ *[insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof]* (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Bid (hereinafter called "the Bid") for the execution of Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi. under Request for Bids No. ED/PROC-HOK/958705/2025/270 ("the RFB").

Furthermore, we understand that, according to the Beneficiary's conditions, Bids must be supported by a Bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Bid during the period of Bid validity set forth in the Applicant's Letter of Bid ("the Bid Validity Period"), or any extension thereto provided by the Applicant; or
- (b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to sign the contract agreement, or (ii) has failed to furnish the performance security, in accordance with the Instructions to Bidders ("ITB") of the Beneficiary's bidding document.

This guarantee will expire: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the Contract agreement signed by the Applicant and the performance security issued to the Beneficiary in relation to such Contract agreement; or (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Bidding process; or (ii) twenty-eight days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

[Signature(s)]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.



Form T7 – Form of Bid Securing Declaration**(NOT APPLICABLE)***The Bidder shall fill in this Form in accordance with the instructions indicated.]***Date:** [date (as day, month and year)]**IFB No.:** ED/PROC-HOK/958705/2025/270**Title:** Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi.**To:** [SBP Banking Service Corporation – Engineering Department]

We, the undersigned, declare that:

We understand that, according to your conditions, Bids must be supported by a Bid- Securing Declaration.

We accept that we will be blacklisted and henceforth cross debarred for participating in respective category of public procurement proceedings for a period of (not more than) six months, if fail to abide with a bid securing declaration, however without indulging in corrupt and fraudulent practices, if we are in breach of our obligation(s) under the Bid conditions, because we:

- (a) have withdrawn our Bid during the period of Bid validity specified in the Letter of Bid; or
- (b) having been notified of the acceptance of our Bid by the Procuring Agency during the period of Bid validity, (i) fail or refuse to sign the Contract; or (ii) fail or refuse to furnish the Performance Security (or guarantee), if required, in accordance with the ITB.

We understand this Bid Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of our Bid.

Name of the Bidder* _____

Name of the person duly authorized to sign the Bid on behalf of the Bidder** _____

Title of the person signing the Bid _____

Signature of the person named above _____

Date signed _____ day of _____, _____

*: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder

**: Person signing the Bid shall have the power of attorney given by the Bidder attached to the Bid



Form T8 – S2 Form

		STATE BANK OF PAKISTAN BANKING SERVICES CORPORATION Supplier Bank Account (IBAN) Details Form				S-2			
1. For Office use:									
*Office/Deptt Supplier *Supplier Type				*Supplier No. *Liability A/C *Prepayment A/C			WHT Rate		
		New			Update				
2. Supplier Information									
*Supplier Name *Supplier NTN Supplier Address									
				CNIC No.					
Contact No. E-mail Address						Supplier City			
						Mobile			
						Fax No.			
3. Bank Account Information									
*Bank Name *IBAN (24 Characters) *Branch Type *Title of Account									
						*Supplier Stamp & Signature			
		Islamic			Commercial				
(For Office use only)									
Forwarded By		Verified By		Entered By (Supplier Mgt User)					
(Procurement Function)				Date					
Field marked with * are mandatory. Information without complete Bank Account Details (IBAN) & NTN/ CNIC will not be accepted. Any changes in Supplier's particulars should be conveyed immediately to SBP BSC. SBP BSC will not be responsible for credit into wrong account of supplier due to change in bank account details not conveyed to SBP BSC or delay in settlement of supplier's claims.									

FINANCIAL PROPOSAL

Price Schedule

----- REFER TO VOLUME-II OF THE BIDDING DOCUMENTS -----



PART-B

SECTION VII – GENERAL CONDITIONS OF THE CONTRACT



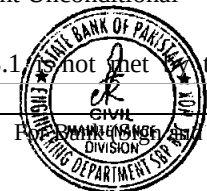
SECTION VII – GENERAL CONDITIONS OF THE CONTRACT**1. Definitions**

1.1. The following words and expressions shall have the meanings hereby assigned to them:

- a) **“Authority”** means Public Procurement Regulatory Authority.
- b) The **“Arbitrator”** is the person appointed with mutual consent of both the parties, to resolve contractual disputes as provided for in the General Conditions of the Contract **GCC Clause 31** hereunder.
- c) The **“Contract”** means the agreement entered into between the Procuring Agency 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.
- d) The **“Commencement Date”** is the date when the Supplier shall commence execution of the contract as specified in the **SCC**.
- e) **“Completion”** means the fulfillment of the related services by the Supplier in accordance with the terms and conditions set forth in the contract.
- f) **“Country of Origin”** means the countries and territories eligible under the PPRA Rules 2004 and its corresponding Regulations as further elaborated in the **SCC**.
- g) The **“Contract Price”** is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.
- h) **“Defective Goods”** are those goods which are below standards, requirements or specifications stated by the Contract.
- i) **“Delivery”** means the transfer of the goods from the supplier equipment, machinery, and /or other materials which the Supplier is required to supply to the Procuring Agency under Contract.
- j) **“Effective Contract date”** is the date shown in the Certificate of Contract Commencement issued by the Procuring Agency upon fulfillment of the conditions precedent stipulated in **GCC Clause 3**.
- k) **“Procuring Agency”** means the person named as Procuring Agency in the **SCC** and the legal successors in title to this person, procuring the Goods and related service, as named in **SCC**.
- l) **“Related Services”** means those services ancillary to the delivery of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training, initial maintenance and other such obligations of the Supplier covered under the Contract.
- m) **“GCC”** means the General Conditions of Contract contained in this section.
- n) **“Intended Delivery Date”** is the date on which it is intended that the Supplier shall effect delivery as specified in the **SCC**.
- o) **“SCC”** means the Special Conditions of Contract.
- p) **“Supplier”** means the individual private or government entity or a combination of the above whose Bid to perform the contract has been accepted by the Procuring Agency and is named as such in the Contract Agreement, and includes the legal successors or permitted assigns of the supplier and shall be named in the **SCC**.
- q) **“Project Name”** means the name of the project stated in **SCC**.
- r) **“Day”** means calendar day.
- s) **“Eligible Country”** means the countries and territories eligible for participation in accordance with the policies of the Federal Government.
- t) **“End User”** means the organization(s) where the goods will be used, as named in the **SCC**.
- u) **“Origin”** means the place where the Goods were mined, grown, or produced



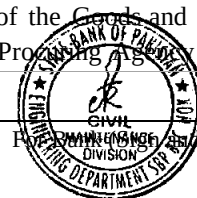
	or from which the Services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized new produce results that is substantially different in basic characteristics or in purpose or utility from its components. v) “Force Majeure” means an unforeseeable event which is beyond reasonable control of either Party and which makes a Party’s performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances. For the purposes of this Contract, “Force Majeure” means an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of a Party, and which makes a Party’s performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances. and includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood, epidemics, or other adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent), confiscation or any other action by Government agencies. w) “Specification” means the Specification of the Goods and performance of incidental services in accordance with the relevant standards included in the Contract and any modification or addition made or approved by the Procuring Agency. x) The Supplier's Bid is the completed Bid document submitted by the Supplier to the Procuring Agency.
2.Application and Interpretation	2.1 These General Conditions shall apply to the extent that they are not superseded by provisions of other parts of the Contract. 2.2 In interpreting these Conditions of Contract headings and marginal notes are used for convenience only and shall not affect their interpretations unless specifically stated; references to singular include the plural and vice versa; and masculine include the feminine. Words have their ordinary meaning under the language of the Contract unless specifically defined. 2.3 The documents forming the Contract shall be interpreted in the following order of priority: (1) Form of Contract, (2) Special Conditions of Contract, (3) General Conditions of Contract, (4) Letter of Acceptance, (5) Certificate of Contract Commencement (6) Specifications (7) Contractor's Bid, and (8) Any other document listed in the Special Conditions of Contract as forming part of the Contract.
3.Conditions Precedent	3.1 Having signed the Contract, it shall come into effect on the date on which the following conditions have been satisfied: - 49.1.1 Submission of performance Security (or guarantee) in the form specified in the SCC; 49.1.2 Furnishing of Advance Payment Unconditional Guarantee. 3.2 If the Condition precedent stipulated on GCC Clause 3.1 is not met the date



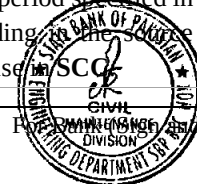
	3.3	specified in the SCC this contract shall not come into effect; If the Procuring Agency is satisfied that each of the conditions precedent in this contract has been satisfied (except to the extent waved by him, but subject to such conditions as he shall impose in respect of such waiver) he shall promptly issue to the supplier a certificate of Contract commencement, which shall confirm the start date.
4. Governing Language	4.1	The Contract as all correspondence and documents relating to the contract exchanged by the Supplier and the Procuring Agency shall be written in the language specified in SCC . Subject to GCC Clause 3.1 , the version of the Contract written in the specified language shall govern its interpretation.
5. Applicable Law	5.1	The contract shall be governed and interpreted in accordance with the laws of Pakistan, unless otherwise specified in SCC.
6. Country of Origin	6.1	The origin of Goods and Services may be distinct from the nationality of the Supplier.
7. Standards	49.2	The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, the American Standards (such as ACI, IEEE, ASME, etc.) or the Pakistani standards such as PSQCA such standards shall be the latest issued by the concerned institution.
8. Use of Contract Documents and Information; Inspection and Audit by Government of Pakistan	8.1	The Supplier shall not, without the Procuring Agency'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 Procuring Agency 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 as far as may be necessary for purposes of such performance.
	8.2	The Supplier shall not, without the Procuring Agency's prior written consent, make use of any document or information enumerated in GCC Clause 7.1 except for purposes of performing the Contract.
	8.3	Any document, other than the Contract itself, enumerated in GCC Clause 7.1 shall remain the property of the Procuring Agency and shall be returned (all copies) to the Procuring Agency on completion of the Supplier's performance under the Contract if so required by the Procuring Agency.
	8.4	The Supplier shall permit the Government of Pakistan or / and donor agencies involved in financing the project 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 Government of Pakistan or / and the appropriate donor agencies, if so required by the Government of Pakistan or / and the appropriate donor agencies.
9. Patents and Copy Rights	9.1	The Supplier shall indemnify the Procuring Agency 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 Pakistan.
	9.2	The patent right in all drawings, documents, and other materials containing data and information furnished to the Procuring Agency by the Supplier herein shall remain vested in the supplier, or, if they are furnished to the Procuring Agency directly, or through the Supplier by any third party, including suppliers of materials, the patent right in such materials shall remain vested in such third party.
10. Performance Security (or Guarantee)	10.1	The Performance Security (or Guarantee) shall be provided to the Procuring Agency no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Procuring Agency, and denominated in the types and proportions of the currencies in which the Contract Price is payable as specified in the SCC .
	10.2	The proceeds of the Performance Security (or Guarantee) shall be payable to the Procuring Agency as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.
	10.3	The Performance Security (or Guarantee) shall be in one of the following forms a) A bank guarantee, an irrevocable letter of credit issued by a reputable bank, or in the form provided in the Bidding Documents or any other form acceptable to the Procuring Agency; or



	10.4	b) A cashier's or certified check. The performance security (or guarantee) will be discharged by the Procuring Agency 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 otherwise specified in SCC .
11. Inspection and Testing	11.1	The Procuring Agency 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 Procuring Agency. SCC and the Technical Specifications shall specify what inspections and tests the Procuring Agency shall notify the Supplier in writing or in electronic forms that provide record of the content of communication, in a timely manner, of the identity of any representatives retained for these purposes.
	11.2	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 Procuring Agency.
	11.3	Should any inspected or tested Goods fail to conform to the Specifications, the Procuring Agency may reject the Goods, and the Supplier shall replace the rejected Goods to meet specification requirements free of cost to the Procuring Agency.
	11.4	The Procuring Agency's right to inspect, test and, where necessary, reject Goods after the Goods' arrival in the Procuring Agency's country shall in no way be limited or eared by reason of the Goods having previously been inspected, tested, and passed by the Procuring Agency or its representative prior to the Goods' shipment from the country of origin.
	11.5	Nothing in GCC Clause 10 shall in any way release the supplier from any warranty or other obligations under this Contract.
12. Packing	12.1	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.
	12.2	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 Procuring Agency.
13. Delivery and Documents	13.1	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 as specified in SCC .
	13.2	For purposes of the Contract, "EXW", "FOB", "FCA", "CIF", "CIP," and other trade terms 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.
	13.3	Documents to be submitted by the Supplier are specified in SCC .
14. Insurance	14.1	The Goods supplied under the Contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery in the manner specified in the SCC .
15. Transportation	15.1	Where the Supplier is required under Contract to deliver the Goods FOB, transport of the Goods, up to and including the point of putting the Goods on board the vessel at the specified port of loading, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. Where the Supplier is required under the Contract to deliver the Goods FCA, transport of the Goods and delivery into the custody of the carrier at the place named by the Procuring Agency or other



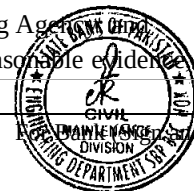
	agreed point shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price. 15.2 Where the Supplier is required under Contract to deliver the Goods CIF or CIP, transport of the Goods to the port of destination or such other named place of destination in Pakistan, as shall be specified in the Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price 15.3 Where the Supplier is required under the Contract to transport the Goods to a specified place of destination within Pakistan, defined as the Project Site, transport to such place of destination in Pakistan, 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.
16. Related Services	16.1 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, Installation Commissioning 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 Procuring Agency's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods. 16.2 Prices charged by the Supplier for related 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 to other parties by the Supplier for similar services.
17. Spare Parts	17.1 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 Procuring Agency 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 Procuring Agency of the pending termination, in sufficient time to permit the Procuring Agency to procure needed requirements; and ii) following such termination, furnishing at no cost to the Procuring Agency, the blueprints, drawings, and specifications of the spare parts, if requested.
18. Warranty / Defect Liability Period	18.1 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 Procuring Agency, 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 Pakistan. 18.2 This warranty shall remain valid for a period specified in the SCC 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 a period specified in the SCC after the date of shipment from the port or place of loading in the country, whichever period concludes earlier, unless specified otherwise



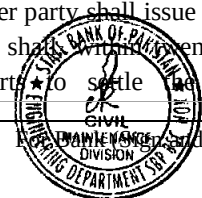
	18.3 The Procuring Agency shall promptly notify the Supplier in writing or in electronic forms that provide record of the content of communication of any claims arising under this warranty. 18.4 Upon receipt of such notice, the Supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective Goods or parts thereof, without costs to the Procuring Agency other than, where applicable, the cost of inland delivery of the repaired or replaced Goods or parts from EXW or the port or place of entry to entry to the final destination. 18.5 If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the Procuring Agency 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 Procuring Agency may have against the Supplier under the Contract.
19. Payment	19.1 The method and conditions of payment to be made to the Supplier under this Contract shall be specified in SCC. 19.2 The Supplier's request(s) for payment shall be made to the Procuring Agency in writing or in electronic forms that provide record of the content of communication, accompanied by an invoice describing, as appropriate, the Goods delivered and Services performed, and by documents submitted pursuant to GCC Clause 13, and upon fulfillment of other obligations stipulated in the Contract. 19.3 Payments shall be made promptly by the Procuring Agency, within sixty (60) days after submission of an invoice or claim by the Supplier. If the Procuring Agency makes a late payment, the Supplier shall be paid interest on the late payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the rate as specified in the SCC. 19.4 The currency or currencies in which payment is made to the Supplier under this Contract shall be specified in SCC subject to the following general principle: payment will be made in the currency or currencies in which the payment has been requested in the Supplier's Bid. 19.5 All payments shall be made in the currency or currencies specified in the SCC pursuant to GCC Clause 19.4
20. Prices	20.1 The contract price shall be as specified in the Contract Agreement Subject to any additions and adjustments thereto or deductions there from, as may be made pursuant to the Contract. 20.2 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 Procuring Agency's request for Bid Validity extension, as the case may be.
21. Change Orders	21.1 The Procuring Agency may at any time, by a written order given to the Supplier pursuant to GCC Clause 22, make changes within the general scope of the Contract in any one or more of the following: - Drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Procuring Agency; - The method of shipment or packing; - The place of delivery; and/or - The Services to be provided by the Supplier. 21.2 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 Procuring Agency change order. 21.3 Prices to be charged by the supplier for any related services that might be needed but which were not included in the Contract shall be agreed upon in advance by the Parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services



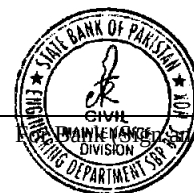
22. Contract Amendments	22.1	Subject to GCC Clause 20 , no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.
23. Assignment	23.1	Neither the Procuring Agency nor the Supplier shall assign, in whole or in part, obligations under this Contract, except with the prior written consent of the other party.
24. Sub-Contracts	24.1	The Supplier shall consult the Procuring Agency in the event of subcontracting under this contract if not already specified in the Bid. Subcontracting shall not alter the Supplier's obligations.
	24.2	Subcontracts must comply with the provision of GCC Clause 5.
25. Delays in the Supplier's Performance	25.1	Delivery of the Goods and performance of Services shall be made by the Supplier in accordance with the time schedule prescribed by the Procuring Agency in the Schedule of Requirements.
	25.2	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 Procuring Agency in writing or in electronic forms that provide record of the content of communication 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 Procuring Agency 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.
	25.3	Except as provided under GCC Clause 28 , 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 26 , unless an extension of time is agreed upon pursuant to GCC Clause 25.2 without the application of liquidated damages.
26. Liquidated Damages	26.1	Subject to GCC Clause 28 , 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 Procuring Agency 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 performance security (or guarantee) specified in SCC . Once the said maximum is reached, the Procuring Agency may consider termination of the Contract pursuant to GCC Clause 27 .
27. Termination for Default	27.1	The Procuring Agency or the Supplier, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the concerned party may terminate the Contract if the other party causes a fundamental breach of the Contract.
	27.2	Fundamental breaches of Contract shall include, but shall not be limited to the following: - 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 Procuring Agency pursuant to GCC Clause 24; or - the Supplier fails to perform any other obligation(s) under the Contract; - Supplier's failure to submit performance security (or guarantee) within the time stipulated in the SCC; - the supplier has abandoned or repudiated the contract. - the Procuring Agency or the Supplier is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation; - a payment is not paid by the Procuring Agency to the Supplier after 84 days from the due date for payment; - the Procuring Agency gives Notice that goods delivered with a defect is a fundamental breach of Contract and the Supplier fails to correct it within a reasonable period of time determined by the Procuring Agency; - if the Procuring Agency determines, based on the reasonable evidence, that the



	Supplier has engaged in corrupt, coercive, collusive, obstructive or fraudulent practices, in competing for or in executing the Contract. 27.3 For the purpose of this clause: “Corrupt and Fraudulent Practice” means the practices as described in Rule-2 (1) (f) of Public Procurement Rules-2004. 27.4 In the event the Procuring Agency terminates the Contract in whole or in part, pursuant to GCC Clause 26.1, the Procuring Agency 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 Procuring Agency for any excess costs for such similar Goods or Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.
28. Termination for Force Majeure	28.1 Notwithstanding the provisions of GCC Clauses 25, 26, and 27, neither Party shall have any liability or be deemed to be in breach of the Contract for any delay nor is other failure in performance of its obligations under the Contract, if such delay or failure is a result of an event of Force Majeure. For purpose of this clause, “Force Majeure” means an event which is beyond the reasonable control of a Party, is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of a Party, and which makes a Party’s performance of its obligations hereunder impossible or so impractical as reasonably to be considered impossible in the circumstances, and includes, but is not limited to, war, riots, civil disorder, earthquake, fire, explosion, storm, flood, epidemics, or other adverse weather conditions, strikes, lockouts or other industrial action (except where such strikes, lockouts or other industrial action are within the power of the Party invoking Force Majeure to prevent 28.2 If a Party (hereinafter referred to as “the Affected Party”) is or will be prevented from performing its substantial obligation under the contract by Force Majeure, it shall give a Notice to the other Party giving full particulars of the event and circumstance of Force Majeure in writing or in electronic forms that provide record of the content of communication of such condition and the cause thereof. Unless otherwise directed by the Procuring Agency in writing or in electronic forms that provide record of the content of communication, 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.
29. Termination for Insolvency	29.1 The Procuring Agency 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 Procuring Agency.
30. Termination for Convenience	30.1 The Procuring Agency, 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 Procuring Agency’s convenience, the Contract is terminated, and the date upon which such termination becomes effective. 30.2 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 Procuring Agency at the Contract terms and price. For the remaining Goods, the Procuring Agency may elect: - To have any portion completed and delivered at the Contract terms and prices; and / or - 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.
31. Disputes Resolutions	31.1 In the event of any dispute arising out of this contract, either party shall issue a notice of dispute to settle the dispute amicably. The parties hereto shall settle the dispute (28) days from the notice date, use their best efforts to settle the dispute



		amicably through mutual consultations and negotiation. Any unsolved dispute may be referred by either party to an arbitrator that shall be appointed by mutual consent of the both parties.
	31.2	After the dispute has been referred to the arbitrator, within 30 days, or within such other period as may be proposed by the Parties, the Arbitrator shall give its decision. The rendered decision shall be binding to the Parties.
32. Procedure for Disputes Resolutions	32.1	The arbitration shall be conducted in accordance with the arbitration procedure published by the Institution named and in the place shown in the SCC .
	32.2	The rate of the Arbitrator's fee and administrative costs of arbitration shall be borne equally by the Parties. The rates and costs shall be in accordance with the rules of the Appointing Authority. In conducting arbitration to its finality each party shall bear its incurred costs and expenses.
	32.3	The arbitration shall be conducted in accordance with the arbitration procedure published by the institution named and in the place shown in the SCC .
33. Replacement of Arbitrator	33.1	Should the Arbitrator resign or die, or should the Procuring Agency and the Supplier agree that the Arbitrator is not functioning in accordance with the provisions of the contract, a new Arbitrator shall be appointed by mutual consent of the both parties.
34. Limitation of Liability	34.1	Except in cases of criminal negligence or willful conduct, and in the case of infringement pursuant to GCC Clause 8 ,
		a) The supplier shall not be liable to the Procuring Agency, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Procuring Agency; and b) The aggregate liability of the Supplier to the Procuring Agency, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment or to any obligation of the Supplier to indemnify the Procuring Agency with respect to patent infringement.
35. Notices	35.1	Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or in electronic forms that provide record of the content of communication and confirmed in writing or in electronic forms that provide record of the content of communication to the other party's address specified in SCC .
	35.2	A notice shall be effective when delivered or on the notice's effective date, whichever is later.
36. Taxes and Duties	36.1	A foreign Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside Pakistan.
	36.2	If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in Pakistan the Procuring Agency shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.
	36.3	A local Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Procuring Agency.



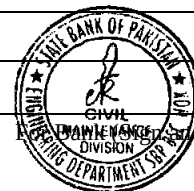
SECTION VIII: SPECIAL CONDITIONS OF THE CONTRACT (SCC)



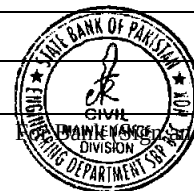
Special Conditions of Contract (SCC)

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

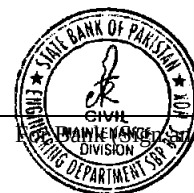
SCC Clause Number	GCC Clause Number	Amendments of, and Supplements to, Clauses in the GCC
		Definitions (GCC 1)
1.	1.1 (k)	The Procuring Agency is: SBP Banking Service Corporation – Engineering Department
2.	1.1(p)	The Supplier is named as such in the Contract Agreement.
3.	1.1(q)	The title of the subject procurement or The Project is: Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi.
4.	1.1(y)	Engineer In-charge or the Engineer means person / firm / company to be nominated by Procuring Agency.
		Application and Interpretations
4.	2.3	The documents forming the Contract shall be interpreted in the following order of priority: (1) Form of Contract, (2) Special Conditions of Contract, (3) General Conditions of Contract, (4) Letter of Acceptance, (5) Certificate of Contract Commencement (6) Bill of Quantities (7) Drawings (8) Specifications (9) Instruction to Bidders and Bid Data Sheet (10) Addendum (11) Contractor's Bid.
		Governing Language (GCC 4)
5.	4.1	The Governing Language shall be: English / Urdu
		Applicable Law (GCC 5)
6.	5.1	The Applicable Law shall be: Laws of Pakistan
		Performance Security (or guarantee) (GCC 10)
7.	10.1	a. The amount of Performance Security (or guarantee), as a percentage of the Contract Price, shall be 10% of the Contract Price state in the Letter of Acceptance / Award in favour of SBP-Banking Services Corporation. OR In case, the cost of the Works is less than four million, the Bid Security of the successful bidder shall be retained as Performance Security. b. Notwithstanding anything contained in the Contract and / or applicable law the Performance Security shall be forfeited if the Supplier fails to perform its obligations under the Contract.
8.	10.4	a. The Performance Security (Guarantee) shall be in in the form of Pay Order / Demand Draft / unconditional Bank Guarantee enforceable in Pakistan as per Performance Security (Guarantee) form specified in the Bidding Documents. b. The Performance Security shall be valid till successful completion of Defect Liability Period / Warranty Period and will be released after successful expiry of Defect Liability Period / Warranty Period.
		Delivery and Documents (GCC Clause 13)
9.	13.1	For Goods supplied from abroad: Not Applicable
10.	13.3	For Goods supplied from abroad: Not Applicable



11.	14.1	The Works Amount of Cover: The sum stated in Letter of Acceptance plus fifteen percent 15%. Contractor 's equipment Amount of Cover: Full replacement Cost Injury to Person and Damaged to Property including Third Party Insurance Amount of Cover: I) As per workmen compensation act II) Contractor's all Risk including Third party III) damages to the Structure, stores if supplied by the Bank
		Warranty / Defect Liability Period (GCC Clause 18)
12.	18.2	Defect Liability Period shall be 365 days. Warranty period of parts is 365 days.
13.	18.4 & 18.5	The period for correction of defects in the Warranty Period is <u>03 days.</u>
		Payment (GCC Clause 19)
14.	19.1	The payment shall be made in following stages: a) Advance Payment Up to 15% to total Contract Price (excluding SLA if applicable) against bank guarantee from Scheduled Bank in Pakistan This Advance shall be recovered @ 50% of the amount of work done from Interim Payment Certificates (IPC) / Invoice and shall be fully recovered at least one month before scheduled completion time. The validity of Mobilization Advance Guarantee shall be valid for 60 days beyond the work completion period. Such Guarantee may be progressively reduced to the balance amount of Mobilization Advance indicated in Interim Payment Certificates of the Engineer issued in accordance with this Clause after receipt and verification of the revised guarantee not less than the due amount of mobilization advance. b. Payment for Supply of Material/Equipment: Up to seventy-five percent (75%) of the supply part of the BOQ items will be paid against delivery of material/equipment on site, and upon production of Factory Test Reports / Warranties / Shipping documents/ Inspection Reports at Manufacturer's Facility (where applicable) and indemnity bond as per approved format. c. Payment upon Installation, Testing and Commissioning: Up to ninety percent (90%) of the supply and installation parts of BOQ items will be paid upon successful Testing & Commissioning. d. Payment upon completion: Ten percent (10%) amount of whole BOQ item i.e. Supply and Installation will be paid upon completion of the whole works, including punch list noted at commissioning time. The Supplier / Contractor shall submit testing and fitness certificate in compliance with safety standards. e. Retention Money 10% of the net payable amount from each bill (except Mobilization Advance) of the Contractor will be deducted as retention money. The retention money would be released as follows: 5% on Completion of the whole works, - Balance 5% after successful completion of the Defects Liability Period / Warranty Period.
15.	19.3	Rate to be used for paying the Supplier's interest on the late payment made by Procuring Agency shall be <u>(Not Applicable)</u>
		Prices (GCC Clause 20)



16.	20.1	Prices shall be adjusted in accordance with provisions in the Attachment to SCC. <u>Not Applicable</u>
		Liquidated Damages (GCC Clause 26)
17.	26.1	@ 0.1% of total completed works / day to a maximum of 10% of the total completed works.
		Procedure for Dispute Resolution (GCC Clause 32)
18.	32.3	Dispute Resolution In case of a dispute arising between the Parties regarding the terms of or rights and obligations of the Parties under this Contract, if not resolved amicably, shall be settled by an arbitration in accordance with the Arbitration Act, 1940. The Place of Arbitration shall be Karachi and proceedings will be conducted in English / Urdu. Notwithstanding any reference to the arbitration herein, the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree that the Procuring Agency shall pay the Supplier any monies due to the Supplier.
		Notices (GCC Clause 35)
19.	35.1	Director Engineering (A) SBP Banking Service Corporation – Engineering Department 1st Floor, Engg. Department, SBP-BSC Bolton Market Building, M.A. Jinnah Road Karachi Phone: 92-21-3245 4122/05/71, Facsimile: 92-21-99221176 Website: www.sbp.org.pk



SECTION IX: CONTRACT FORMS



Appendix 1 – Form of Contract

THIS AGREEMENT made the _____ day of _____ 202_ between *[name and address of Procuring Agency]* of Pakistan (hereinafter called “the Procuring Agency”) of the one part and *[name of Supplier]* of *[city and country of Supplier]* (hereinafter called “the Supplier”) of the other part:

WHEREAS the Procuring Agency invited Bids for certain goods and related services, viz., *[brief description of goods and services]* and has accepted a Bid by the Supplier for the supply of those goods and related services in the sum of *[contract price in words and figures]* (hereinafter called “the Contract Price”).

NOW THIS CONTRACT WITNESSETH AS FOLLOWS:

1. In this Contract 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 Contract, In the event of any ambiguity or conflict between the Contract Documents listed below, the order of precedence shall be the order in which the Contract Documents are listed below:-
 - a. This form of Contract;
 - b. the Form of Bid and the Price Schedule submitted by the Bidder;
 - c. the Schedule of Requirements;
 - d. the Technical Specifications;
 - e. the Special Conditions of Contract;
 - f. the General Conditions of the Contract;
 - g. the Procuring Agency’s Letter of Acceptance (Notification of Award); and
 - h. the Supplier’s Letter of Acceptance
 - i. Integrity Pact
 - j. Performance Security (Guarantee) Form
 - k. Certificates to Contract
 - l. Addendum/Corrigendum, if any
 - m. Instruction to Bidders and Bidding Data Sheet
3. In consideration of the payments to be made by the Procuring Agency to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Procuring Agency to provide the goods and related services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Procuring Agency hereby covenants to pay the Supplier in consideration of the provision of the goods and related 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.

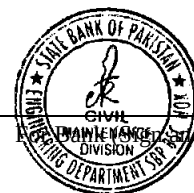
IN WITNESS whereof the parties hereto have caused this Contract to be executed in accordance with their respective laws the day and year first above written.

Signed, sealed, delivered by _____ the _____ (for the Procuring Agency)

Witness to the signatures of the Procuring Agency:.....

Signed, sealed, delivered by _____ the _____ (for the Procuring Agency)

Witness to the signatures of the Supplier:



Appendix 2 – Integrity Pact

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

Contract Number: _____

Contract Value: _____

Contract Title _____

Date: _____

[Name of Supplier] hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from State Bank of Pakistan (SBP-BSC) or any administrative subdivision or agency thereof or any other entity owned or controlled by it (SBP-BSC) through any corrupt business practice.

Without limiting the generality of the foregoing [Name of Supplier] represents and warrants that it has fully declared the brokerage, commission, fee etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultations fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from SBP-BSC, except that which has been expressly declared pursuant hereto.

[Name of Supplier] certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with SBP-BSC and has not taken any action or will not take any action to circumvent the above declaration, representative or warranty.

[Name of Supplier] accepts full responsibility and strict liability for making and false declaration, not making full disclosure, misrepresenting fact or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other right and remedies available to SBP-BSC under any law, contract or other instrument, be voidable at the option of SBP-BSC.

Notwithstanding any rights and remedies exercised by SBP-BSC in this regard, [Name of Supplier] agrees to indemnify SBP-BSC for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to SBP-BSC in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by [Name of Supplier] as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from SBP-BSC.

[Buyer]

[Seller/Supplier]



Appendix 3 – Performance Security (or guarantee) Form

To: SBP Banking Service Corporation – Engineering
Department

WHEREAS *[name of Supplier]* (hereinafter called “the Supplier”) has undertaken, in pursuance of Contract No. *[reference number of the contract]* dated *[insert date]* to delivery *[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.

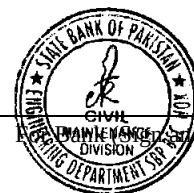
This guarantee is valid until the: *[insert date]*

Signature and seal of the Guarantors

[name of bank or financial institution]

[address]

[date]





BIDDING DOCUMENTS

For

**SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF SOLAR
SYSTEM AT RESIDENTIAL FACILITY QUEENS ROAD, LALAZAR
KARACHI.**

Financial Proposal

Volume-II

Jul-25



FINANCIAL PROPOSAL

Form F1 – Letter of Bid (Financial Proposal)

Date of this Bid submission: -----

IFB No.: ED/PROC-HOK/958705/2025/270

Name of Project: Supply, installation, testing & commissioning of Solar System at residential facility Queens Road, Lalazar Karachi.

To: [SBP Banking Services Corporation]

We, the undersigned Bidder, hereby submit the second part of our Bid, the Financial Proposal

In submitting our Financial Proposal, we make the following additional declarations:

- (a) **Bid Validity Period:** Our Bid shall be valid for the period specified in BDS 17.1 (as amended, if applicable) from the date fixed for the bid submission deadline specified in BDS 23.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (b) **Total Price:** The total price of our Bid, excluding any discounts offered in item below is:
In case of only one lot, the total price of the Bid is *[insert the total price of the bid _____]*;
In case of multiple lots, the total price of each lot is *[insert the total price of each lot _____]*;
In case of multiple lots, total price of all lots (sum of all lots) *[insert the total price of all lots _____]*;
- (c) **Discounts:** The discounts offered and the methodology for their application are: **NOT APPLICABLE**
(i) The discounts offered are: *[Specify in detail each discount offered]*
(ii) The exact method of calculations to determine the net price after application of discounts is shown below: *[_____]*;
- (d) **Commissions, gratuities and fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity]*.

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate “none.”)

- (e) **Binding Contract:** We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed.



Preamble

1. The Bill of Quantities shall be read in conjunction with the Conditions of Contract, Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work executed and measured by the Contractor and verified by the Engineer and valued at the rates and prices entered in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix as per the Contract.
3. The rates and prices entered in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract include all costs of Contractor's labour, supervision, materials, execution, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the Contract. Furthermore, all duties, taxes, GST, SST/PST and other levies payable by the Contractor under the Contract, or for any other cause, as on the date 28 days prior to deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor will have failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the Contract shall be included in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of the Works.
6. General directions and description of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Bidding Documents shall be made before entering prices against each item in the priced Bill of Quantities.
7. Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will govern, and the line total will be corrected accordingly.
8. Each cutting should be signed by the authorized person.
9. The brand names have been provided in order to establish a standard of performance and reliability. However, it does not indicate a preference for a particular brand. The bidder may propose other brands which can be accepted subject to necessary tests to establish equivalency.
10. Where packaging size of a sachet/packet/can/pack etc. is included in the description of item of BOQ, this packaging size is only for reference and does not indicate preference for any specific brand. The bidder may offer another packaging size with a margin or tolerance of no more than 15% of the specified size. However, the total quantity to be supplied must be equal to the cumulative quantity required in the BOQ item.



Bill of Quantities (BOQ)

Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
1.	SECTION - A CABLE CONTAINMENT							
1.1.	Supply & Laying of following sizes of PVC/UPVC Conduits including all accessories such as bends, sockets, j-boxes, flexible conduits, metal saddles etc. for Main / Sub Main Power, & Data Cables, concealed / surface on wall as per design drawings. Provide Pull boxes wherever required. Note: The below mentioned conduits will be used for items where description of the item clearly states that the conduit is not inclusive or already installed. This section will also cover empty conduit runs, sleeves, conduit risers etc.							
1.2.	25mm dia PVC Conduit	120	Rm.					
1.3.	50mm dia UPVC Conduit (Class-D)	30	Rm.					
1.4.	25mm dia Flexible G.I Conduit with PVC Coating	10	Rm.					
2.	Supply & Installation of following sizes of 1.5mm thick Perforated Cable Tray made with prime quality Japanese standard JIS 3302 36-38 microns Galvanized iron steel in line with NEMA standards with min. 36 microns Zinc overlap coating with 1.2mm thick Solid Cover (4 feet covers) including all installation accessories such as rawal bolts, supporting hangers, brackets, elbows, tee & mounting accessories etc. Note: -Color Printed Tags to be provided at every 3 Meter Length. -Threaded Rods & C-Channel base is required for hanging from Ceiling. -All the accessories such as thread M12 rods shall be cadmium plated/stainless steel made such as nuts, screws, bolts, wire etc -Wall Hanger Supports to be provided wherever required. - U-shaped Fischer plates to be used for joints. - 6 Sqmm braided copper terminals with lugs for bonding to be done with every joint							
2.1.	75mm x 75mm	150	Rm.					
2.2.	100mm x 100mm	20	Rm.					



Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
	Note: Contractor is instructed to confirm the sizes, running lengths and termination as per site conditions before commencement of work. All the conduits / cable tray crossings through partition walls shall be properly sealed by fire retardant material after installation.							
	Total Amount (Rs.) Sec - A (Carried Forward To Summary)							
3.	SECTION - B MAIN / SUBMAIN CABLES							
3.1.	Supply, Laying, Termination, Testing & Commissioning of the following ratings of LV Cables along with complete installation and termination accessories to be laid in Cable trench / Cable ladder / Cable tray / Duct Bank including all accessories. Complete in all respects. <i>-Imported Lugs and Connectors shall be used in LV Cables.</i> <i>-Manual crimping of lugs is not allowed. Proper lug presser for smaller lugs and hydraulic lug presser for large size lugs should be used.</i>							
3.2.	From Inverter to DB-AC Combiner Box 4C-50 Sq.mm Cu/PVC/PVC + ECC 1C-25 Sq.mm Cu/PVC	60	Rm.					
	Total Amount (Rs.) Sec - B (Carried Forward To Summary)							
4.	SECTION - C DISTRIBUTION BOARDS							
4.1.	Supply, Placement, Installation, Testing & Commissioning of following Distribution Boards as shown on drawing made with 14/16 SWG sheet steel housing, flush in wall / surface type, with approved color and having specified circuit breakers and components as shown in drawings / specified in list of approved manufacturers. Shop drawings shall be submitted by the contractor before fabrication. Notes: 1) All the DB should be front accessible and maintainable.2) The transportation and placement of DBs upto dedicated location is also included in the work scope, complete in all respects including leveling, grouting etc.3) Laser engraved tags required as mention in SLDs4) Space for circuit tagging required with permanent installation on protective sheet via rivets5) Tin plated Imported Cu bus bar with heat shrink color coded sleeves to be used.6) Hinged protective metallic door required with knob/handle.7) Braided Door earth required.8) Lockable handle required for main door. 9) As-built drawing pocket.11) Cable hanging arrangement. Minimum One Year Warranty Required from date of successful commissioning on site.							
4.2.	DB-DC Combiner Box	2	No.					
4.3.	DB-AC Combiner Box	2	No.					



Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
	Total Amount (Rs.) Sec - C (Carried Forward To Summary)							
5.	SECTION - D WIRING FOR LOW CURRENT SYSTEMS							
	INVERTER COMMUNICATION SYSTEM							
5.1.	Supply, Installation, testing and commissioning CAT-6 UTP Cables for Communication from inverter to inverter or inverter to router in 25mm dia PVC conduit or cable tray as per site requirement including termination and tagging at both ends. Complete in all respects. (Selected Cable Must be UL/EU Listed LSZH Type 23AWG)	1	Coils					
	Note: Contractor is advised to confirm the cable running lengths and termination as per site conditions before commencement of work.							
	Total Amount (Rs.) Sec - D (Carried Forward To Summary)							
6.	SECTION - E SOLAR POWER SYSTEMS							
	<u>Photovoltaic Solar System works</u>							
	Note: A site visit is mandatory prior to the submission of bids. The quantities in the BOQ may vary based on the actual system requirements.							
	<u>General:</u>							
	1. The system will be grid interactive connected which will allow many power sources options. The system will import from the grid when loads are being more than the generated from PV and supply surplus electricity to the grid when PV generates more than the loads.							
	2. Contractor shall submit shop drawings for all civil, electrical and a complete photovoltaic solar system works, including a single line diagram showing all the components of the PV system, DC and AC distribution boards, PV Arrays lay out, connections and cables, wires cross section for all the system to be approved by the bank before executing the work.							
	3. Contractor shall submit the catalogs of each component showing the requested specifications stated at the bill of quantity.							
	4. The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, spare parts regular (as recommended by manufacturer , maintenance manuals and manufacturer's warranty for each components of the system.							
	5. As-built drawings shall be submitted after handing over the work.							
	6. All junction boxes and DBs will be lockable type.							



Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
	7. Upon completion of the installation, the contractor shall organize an onsite training program involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates. 8. The price includes all builders’ works, making good and reinstatement Including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the client representative to complete the job successfully. 9. All the following items include supply, installation, commissioning and operation of the complete PV solar system.							
6.1.	Supply, installation, testing, and commissioning of high-efficiency, mono-crystalline A-grade solar PV modules (solar panels) rated at 610 W or higher, complete with corrosion-resistant aluminum frames. Note: (Tier-1 listed panel).	180	No.					
6.2.	Supply, installation, testing, and commissioning of a three-phase (400 V) grid-tie inverter and monitoring device with a remote application (mobile/web) in accordance with the approved specifications. Note: (Tier-1 listed inverter). minimum 50kW Grid Tie Inverter	2	No.					
6.3.	Supply, laying and connecting all DC cables appropriately sized (4 or 6 sqmm. Stranded tinned Copper, Double insulated, 1000 / 1800 V DC, -40C to +125C, UV resistant) in accordance with the installation requirements and to connect the inverter with PV system designed with all conduits, clamps, trays and cable terminations end which shall be DC plug and socket connectors complete in all respect. The allowable voltage drop for DC cables between inverter and PV system less than 3%.	2	Job.					
6.4.	Supply, laying & connecting of 1C-4 Sqmm Cu/PVC Conductor cable for Panel to Panel Earthing and Main Earth Connecting Point. Complete in all respect.	2	Job.					
6.5.	Supply, installation, testing and commissioning of mounting structure for Solar Panels and Miscellaneous	2	Job.					



Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
	items of very good quality to complete the above job including MC4 Connectors, HDG Angles, HDG Channels, SS Nut & Bolts, Screws, Cable Ties, Cable Glands, Ferrules, Lugs, connectors etc. complete in all respect.							
	Note: Contractor is advised to confirm the cable running lengths and termination as per site conditions before commencement of work.							
	Total Amount (Rs.) Sec - E (Carried Forward To Summary)							
7.	SECTION - F EARTHING / GROUNDING SYSTEM							
	Supply, installation, testing and commissioning of following imported items for Earthing / Grounding System including all material, boring, labor, tools, transportation, all accessories etc. Complete in all respects as per drawing and specification with detailed test reports.							
7.1.	Chemical Enhanced Earth using 38 mm dia copper pipe filled with soil conditioning material including 6" dia, 11' deep boring and back filled chemical to enhance conductivity. Complete with termination clamps, 12" dia heavy duty tin plated round cover as per details given in drawings. (2 No. GCEM made Imported Chemical to be Used in 1 Pit)	4	No.					
7.2.	Earth Connecting Point (ECP) or Equipotential bar made with 375 mm wide, 75 mm high and 5 mm thick tin plated Copper, as shown in drawings. Bar shall be provided with holes suitable for installation of 4No. 25 Sqmm bare copper conductor. ECP shall be enclosed in appropriate size of powder coated metal enclosure with front accessible cover.	2	No.					
7.3.	Earth Testing Point (ETP) or Equipotential bar made with 375 mm wide, 75 mm high and 5 mm thick tin plated Copper, as shown in drawings. Bar shall be provided with holes suitable for installation of 4No. 25 Sqmm bare copper conductor. ECP shall be enclosed in appropriate	2	No.					



Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
	size of powder coated metal enclosure with front accessible cover.							
7.4.	Stranded bare copper conductors of following sizes laid in floor from Earth Pit to ECP in appropriate size of UPVC conduit. Complete in all respects including termination at ECP. 25 Sqmm Bare Copper Conductor	20	Rm.					
7.5.	Supply, installation, testing & commissioning of following size of single core PVC cables in appropriate size of exposed / concealed PVC conduit from ECP to DC/AC Combiner Box and Inverter as per details given below, including all material, labor, tools, transportation, accessories etc. Complete in all respects. 1C-25 Sqmm Cu/PVC	50	Rm.					
	Note: - Contractor is advised to confirm the cable running lengths and termination as per site conditions before commencement of work. - The Contractor shall submit complete technical literature of the quoted system for approval before procurement.							
	Total Amount (Rs.) Sec - F (Carried Forward To Summary)							
8.	SECTION - G NET-METERING & GENERATION-LICENSE ACQUISITION							
8.1.	On completion of work the contractor shall supply one soft copy & one hard copies of as built drawings which clearly indicate all amendments, Solar panels and inverter locations, Structure details, cable tray route, Pull box, earthing and lighting arrestor etc.	1	Job.					
8.2.	The Contractor shall perform, but not be limited to, the following tasks to secure all required permissions and licenses from K Electric, NEPRA, & AEDB/PPIB for net-metering and power generation:•Obtaining Net-Metering and Generation License as per NEPRA & AEDB/PPIB. The contractor to carry out following job but not limited to following to ensure obtaining the necessary	2	Job.					



Sr. No.	Description	Qty.	Unit	Supply (incl. all taxes)		Installation (incl. all taxes)		Total (Rs.) (incl. all taxes)
				Rate (Rs.)	Amount (Rs.)	Rate (Rs.)	Amount (Rs.)	
	permission/licenses as required by relevant authority for net metering : •Site survey & load assessment• Electrical design (one-line SLD & CAD drawings)• Preparation of application dossier (utility bill copies, vendor certificates, equipment datasheets)• Submission and follow-up with K-Electric , NEPRA and AEDB/PPIB• Processing NEPRA generation-license application• Coordination of bi-directional meter installation and commissioning• As-built documentation and client training• Covers all govt./utility fees. Note: The cost of Bidirectional Meters will be borne by the Employer							
	Note : The Contractor is advised to consider it as a Turnkey NOC for Net-Metering (i.e. consultancy, applications, licensing, coordination, meter energization, documentation & client training)							
	Total Amount (Rs.) Sec - G (Carried Forward To Summary)							

SUMMARY

S.#	Description	Supply Amount (Rs.)	Installation Amount (Rs.)	Total Amount (Rs.)
1	SECTION - A CABLE CONTAINMENT			
2	SECTION - B MAIN / SUBMAIN CABLES			



S.#	Description	Supply Amount (Rs.)	Installation Amount (Rs.)	Total Amount (Rs.)
3	SECTION - C DISTRIBUTION BOARDS			
4	SECTION - D WIRING FOR LOW CURRENT SYSTEMS			
5	SECTION - E SOLAR POWER SYSTEMS			
6	SECTION - F EARTHING / GROUNDING SYSTEM			
7	SECTION - G NET METERING AND LICENSE ACQUISITION			
TOTAL AMOUNT INCLUSIVE OF ALL TAXES AND DUTIES (RS.)				

In words (Rs.): _____

_____ Only

