



**PAKISTAN SECURITY PRINTING CORPORATION (PVT.) LTD.**  
(WHOLLY OWNED SUBSIDIARY OF STATE BANK OF PAKISTAN)

**INVITATION FOR BIDS**

**(SINGLE STAGE – TWO ENVELOPE PROCEDURE)**

SEALED BID ON PRESCRIBED BIDDING DOCUMENTS ARE INVITED FROM REPUTABLE SERVICE PROVIDERS, MUST BE REGISTERED WITH TAX AUTHORITIES AND ARE ACTIVE TAX PAYERS FOR FOLLOWING JOB ON F.O.R. BASIS.

Tender No.	Bid Doc. Submission	Bid Opening Date & Time	Earnest Money	Description of Job / Items	Qty	COST OF TENDER FORM
LP/T-2155/25	20-Feb-2025 11:00 A.M.	20-Feb-2025 11:30 A.M.	2% (Excluding GST & SST)	Supply of Equipment and Auxillaries for 2 MW On-Grid Solar System with Single Axis Sun Tracking and 1MWH Battery Energy Storage System. (As per BOQ/Details attached with Bid Document)	01 No.	Download from PSPC Website (Free of Cost)
				Services are required for Installation, Commissioning & Testing of 2 MW On-Grid Solar System with Single Axis Sun Tracking and 1MWH Battery Energy Storage System.	01 Job.	

**Specification / BOQ / Detail attached with relevant document.**

**TENDER IS AVAILABLE AT PPRA WEBSITE "[www.ppra.org.pk](http://www.ppra.org.pk)" AND AT PSPC WEBSITE "[www.pspc.gov.pk](http://www.pspc.gov.pk)"**

1	TENDER DOCUMENTS CONTAINING THE GENERAL CONDITIONS OF THE CONTRACT, INCLUDING TECHNICAL DETAILS / SPECIFICATIONS, ETC., ARE AVAILABLE ON THE PSPC PVT. LTD. WEBSITE. BIDDER(S) ARE REQUIRED TO DOWNLOAD COMPLETE BID/TENDER DOCUMENT AND DROPPED IN THE TENDER BOX PLACED AT P.S.P.C PVT. LTD. FACTORY MAIN GATE OF PAKISTAN SECURITY PRINTING CORPORATION PVT. LTD. (PSPC) FACTORY, JINNAH AVENUE, MALIR HALT, KARACHI ON OR BEFORE ABOVE-MENTIONED DATE & TIME BIDDER(S).
2	BIDS ARE REQUIRED TO BE SUBMITTED IN TWO PARTS (TECHNICAL & FINANCIAL BIDS) IN TWO SEPARATE SEALED ENVELOPES. EARNEST MONEY 2% (EXCLUDING SST & GST) AS PER LIST ABOVE IN THE SHAPE OF PAY ORDER / DEMAND DRAFT (CHEQUE WILL NOT BE ENTERTAINED) MUST BE ENCLOSED WITH FINANCIAL BID IN SEALED ENVELOPE IN FAVOUR OF "PAKISTAN SECURITY PRINTING CORPORATION PVT. LTD." (PSPC) AND TENDER DOCUMENTS MAY BE ADDRESSED TO TENDER OPENING COMMITTEE. IN CASE OF HOLIDAY, BIDS WILL BE OPENED ON THE NEXT WORKING DAY.
3	BIDDER(S) MUST FILL ALL THE REQUIRED FIELDS BY PROVIDING A SIGNATURE AND STAMP ON EACH PAGE. NON-COMPLIANCE WILL LEAD TO THE REJECTION OF THE BID THEN AND THERE. PSPC RESERVES THE RIGHT TO REJECT ALL BIDS OR PROPOSALS AT ANY TIME PRIOR TO THE ACCEPTANCE OF A BID OR PROPOSAL.
4	ONLY TECHNICAL BIDS WILL BE OPENED ON THE TENDER OPENING DATE. TECHNICALLY COMPLIANT BIDS WILL QUALIFY FOR OPENING OF FINANCIAL BIDS.
5	BID WILL BE EVALUATED TECHNICALLY AS PER OUR SPECIFICATION / BOQ / REQUIREMENT AND TERMS & CONDITIONS OF THE TENDER DOCUMENTS.
6	OUTER COVER OF THE ENVELOPE MUST BE MARKED CLEARLY WITH THE BID NUMBER.
7	BIDS WILL BE OPENED IN PRESENCE OF THE BIDDER(S), WHO DESIRE TO ATTEND. CONDITIONAL / INCOMPLETE BID DOCUMENT WILL NOT BE CONSIDERED. OTHER TERMS & CONDITIONS AS PER TENDER DOCUMENT.
8	DETAIL / SPECIFICATION / BOQ ATTACHED WITH TENDER DOCUMENT. IN CASE OF ANY QUERY, PURCHASE DEPARTMENT MAY BE CONTACTED ON UAN - 111-117-772 (EXT-2214), FAX NO. 021-99248534 DURING WORKING HOURS (MONDAY TO FRIDAY EXCLUDING PUBLIC HOLIDAYS).
9	PRE-BID MEETING WILL BE HELD ON 03.02.2025 IN PSPC AT 10:00 AM. ALL BIDDERS ARE REQUESTED TO PLEASE PROVIDE INFORMATION (NAME, CNIC #, CNIC DATE OF ISSUE AND CONTACT NO) TO PSPC (PURCHASE.LOCAL@PSPC.GOV.PK) (EXT: 2214) BEFORE 31-01-2025.

  
**DEPUTY GENERAL MANAGER**  
**(PURCHASE)**



## BIDDING DOCUMENTS

For

***SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID  
SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH  
BATTERY ENERGY STORAGE SYSTEM  
SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &  
TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN  
TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER  
ATTACHED BOQ / TECHNICAL SPECIFICATIONS  
& TERMS & CONDITIONS)***

(Single Stage Two Envelope Procedure)

**(In case of any contradiction between tender documents and BOQ / Technical specification, the terms & condition mentioned in BOQ / Technical specification will Prevail)**

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***Purchase Department, Pakistan Security Printing Corporation (Pvt.) Ltd***

Jinnah Avenue, Malir Halt, Karachi-Pakistan,

Phone: (92-21)-99248511-15, Facsimile :( 92-21)-99248534

Email: [purchase.local@pspc.gov.pk](mailto:purchase.local@pspc.gov.pk) Website: [www.pspc.gov.pk](http://www.pspc.gov.pk)



## **Preface**

Rule 23 of Public Procurement Rules requires procuring agencies to formulate bidding documents that shall be made available to the bidders immediately after the publication of the invitation to bid.

**Document comprises of the Sections listed below:**

### **PART-A – BIDDING PROCEDURE & REQUIREMENTS**

<b>Section I</b>	<b>Invitation to Bids</b>
<b>Section II</b>	<b>Instructions to Bidders (ITB)</b>
<b>Section III</b>	<b>Bid Data Sheet (BDS)</b>
<b>Section IV</b>	<b>Eligible Countries</b>
<b>Section V</b>	<b>Technical Specifications, Schedule of Requirements</b>
<b>Section VI</b>	<b>Standard Forms</b>

### **PART-B – CONDITIONS OF CONTRACT AND CONTRACT FORMS**

<b>Section VII</b>	<b>General Conditions of Contract (GCC)</b>
<b>Section VIII</b>	<b>Special Conditions of Contract (SCC)</b>
<b>Section IX</b>	<b>Contract Forms</b>
	<b>Integrity Pact</b>



**Bidding Documents for SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2  
MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND  
1MWH BATTERY ENERGY STORAGE SYSTEM  
SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &  
TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN  
TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER  
ATTACHED BOQ / TECHNICAL SPECIFICATIONS &  
TERMS & CONDITIONS)**

**PART-A – BIDDING PROCEDURE & REQUIREMENTS**

**Section I - Invitation to Bids**

**Section II- Instructions to Bidders (ITB)**

This Section provides information to help Bidders prepare their Bids. Information is provided for the submission, opening, and evaluation of Bids and for the award of Contract.

**Section III- Bid Data Sheet (BDS)**

This Section includes provisions specific to procurement and to supplement Section-II, Instructions to Bidders.

**Section IV - Eligible Countries**

This Section contains information regarding eligible countries.

**Section V - Technical Specifications, Schedule of Requirements**

This Section includes the details of specifications for the goods and ancillary services to be procured and schedule of requirements.

**Section VI - Standard Forms**

This Section includes the standard forms for the Bid Submission, Price Schedules, and Bid Security etc. These forms are to be completed and submitted by the Bidder as part of Bid.

**PART-B – CONDITIONS OF CONTRACT AND CONTRACT FORMS**

**Section VII - General Conditions of Contract (GCC)**

This Section includes the general clauses to be applied in all the contracts.

**Section VIII - Special Conditions of Contract (SCC)**

This Section consists of Contract Specific general and special conditions.

**Section IX - Contract Forms**

This Section contains forms which, once completed, will become part of the Contract. The forms for

**Performance Security** will be submitted by the successful bidder to whom Purchase Order is issued, before the award of contract.

**Integrity Pact**

The successful bidder shall be required to furnish Integrity Pact as per the attached format.

## **Checklist for Tender “Single Stage Two Envelop”**

To ensure following condition should be complied before submitting the tender documents in PSPC.

		YES	NO
01.	Complete tender documents have been read thoroughly and understood.		
02.	Complete tender documents duly filled in and each page signed and stamped.		
03.	Separate sealed envelopes of Technical and Financial bid.		
04.	Financial element not mentioned in technical document.		
05.	Bid security exactly calculated as per percentage mentioned in tender advertisement is attached.		
06.	Provision of sample, if mandatory.		
07.	Period of Bid validity is 90 days from bid opening date.		
08.	Delivery schedule and payment terms are agreed.		



**PART-A**

**BIDDING PROCEDURE & REQUIREMENTS**

**SECTION I: INVITATION TO BIDS**



## Pakistan Security Printing Corporation (Pvt.) Ltd

### INVITATION TO BIDS

Invitation No. LP/T-2155/2025

Date:

1. This Invitation to Bids follows the Procurement Advertisement (PA) No. LP/T-2155/2025 for the procurement of **SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)**.
2. The Pakistan Security Printing Corporation (Pvt.) Ltd (PSPC) has reserved the funds for the procurement planned during the financial year 2024-25. It is intended that part of the proceeds of the fund will be used to cover eligible payment under the contract for the procurement.
3. PSPC now invites sealed bids from eligible Manufacturer / Suppliers to acquire **SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)** that meet the following eligibility criteria:
  - This invitation for Bids is open to all reputed manufactures / suppliers / contractors.
  - Bidders should not be under a declaration of ineligibility for corrupt and fraudulent practices issued by any Government (Federal, Provincial), a local body and international or a public sector organization.
  - They must be registered with tax authorities and are active tax payers
  - Contractor(s)/firm(s) applying must have valid registration with Pakistan Engineering Council (PEC) in **Category C-2** or above and at least in Specialization Codes **CE-10, EE-11, EE-04, EE-05 & EE-10**.
  - Valid Sales Tax Certificate from Sindh Revenue Board (SRB).
  - Valid NTN Certificate from Federal Board of Revenue. Bidder should be an active Tax payer.
  - Firms in litigation with the Employer shall not be permitted to participate in this process.
  - An affidavit (on non-judicial stamp paper) to the effect that the bidder has never been black-listed by any previous employer.
  - An affidavit (on non-judicial stamp paper) to the effect that all documents / particulars / information given with this qualification Documents are true.
  - An affidavit (on non-judicial stamp paper) to the effect that the bidder has never indulged in corrupt, fraudulent or collusive practice for procuring contracts.
  - An affidavit (on non-judicial stamp paper) to the effect that the bidder is not presently involved nor has been in the past in litigation with its employers.
  - An undertaking to comply with the code of conduct of the procuring agency.

The bidders do not fulfill any of the above mandatory requirements shall not be considered for detailed evaluation and hence disqualified for further evaluation.



4. The bidding shall be conducted in line with the Single Stage Two Envelope Procedure of the Public Procurement Rules 2004 and any Regulations, Regulatory Guides, Procurement Guidelines or Instructions issued by the Authority (from time to time) and is open to all potential bidders.
5. All bids must be accompanied by a Bid Security in an acceptable form. The amount of Bid Security shall be 2% of the total value of bid.
6. Tender documents containing the General Conditions of Contract, including technical details / specification etc., are available on PSPC website. Bidder (s) are required to download complete bid / tender document.
7. The original bid and tender documents, properly filled in (each page duly signed & stamped), and enclosed in sealed envelope(s), must be dropped in the tender box placed at main gate of Pakistan Security Printing Corporation Pvt, Ltd. (PSPC) Factory, Jinnah Avenue Malir halt Karachi, on or before **February 20, 2025 11:00 AM**. The bids will be opened on the same day at **11:30 AM** in public and in the presence of bidders' representatives who choose to attend the opening at the **Tender Room Admin-1 (Sir Syed Block) Office, Pakistan Security Printing Corporation (Pvt.) Ltd, Jinnah Avenue, Malir Halt, Karachi-Pakistan**.
8. Pre-bid meeting will be held on **03.02.2025** at Rumi Hall PSPC at 10:00 a.m. All bidders are requested to please provide information (Name, CNIC #, CNIC date of issue and contact no) to PSPC ([purchase.local@pspc.gov.pk](mailto:purchase.local@pspc.gov.pk)) (Ext: 2214) before **31-01-2025**.
9. In case of any contradiction in BOQ and Tender document the BOQ/Technical Specifications will be considered as the primary document and it will be prevailed.

**Muhammad Asad Khan**  
Deputy General Manager  
(Purchase)  
*sd* Pakistan Security Printing Corporation (Pvt.) Ltd.  
**Muhammad Asad Khan**  
Deputy General Manager (Purchase)  
Pakistan Security Printing Corporation (PVT) Ltd.  
Jinnah Avenue, Malir Halt, Karachi  
Phone: (92-1)-99248511-15 Direct, (92-21)-99248527  
E-mail: [muhhammad.asad@pspc.gov.pk](mailto:muhhammad.asad@pspc.gov.pk) Website: [www.pspc.gov.pk](http://www.pspc.gov.pk)





## BIDDER DETAILS

1.	BRIEF DESCRIPTION OF GOODS / JOBS & QUANTITY:	
2.	<b>NAME OF BIDDER</b> (Company / Manufacturer / Supplier)	
3.	ADDRESS	
4.	GST NO.	
5.	NTN NO.	
6.	NAME OF AUTHORIZED PERSON	
7.	DESIGNATION	
8.	TELEPHONE	
9.	FAX	
10.	CELL NO.	
11.	EMAIL ADDRESS	
12.	NAME & ADDRESS OF PRINCIPAL, IF ANY	
13.	PHONE NO. OF PRINCIPAL	

**BID SUBMITTED BY**

Company Seal \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Designation \_\_\_\_\_

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# SECTION II: INSTRUCTION TO BIDDERS (ITBs)

## Section II. Instructions to Bidders (ITBs)

A. Introduction	
<b>1. Scope of Application</b>	<p>1.1 The Procuring Agency (PA), as indicated in the <b>Bid Data Sheet (BDS)</b> invites Bids for the equipment and related services as specified in the BDS and Section V - Technical Specifications &amp; Schedule of Requirements. The successful Bidders will be expected to supply and install the equipment within the specified period and timeline(s) as stated in the BDS.</p>
<b>2. Sources of Funds</b>	<p>2.1 Source of funds is referred in Clause-2 of Invitation to Bids.</p>
<b>3. Eligible Bidders</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

	<p>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.</p> <p>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:</p> <ul style="list-style-type: none"><li>a. 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.</li><li>b. have controlling shareholders in common; or</li><li>c. receive or have received any direct or indirect subsidy from any of them; or</li><li>d. have the same legal representative for purposes of this Bid; or</li><li>e. 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</li><li>f. Submit more than one Bid in this Bidding process.</li></ul> <p>3.8 A Bidder may be ineligible if –</p> <ul style="list-style-type: none"><li>a. he is declared bankrupt or, in the case of company or firm, insolvent;</li><li>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;</li><li>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</li></ul>
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	<p>entailing the total or partial loss of the right to administer and dispose of the property;</p> <p>d. the Bidder is convicted, by a final judgment, of any offence involving professional conduct;</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p><b>4. Eligible Goods and Related Services</b></p>	<p>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”.</p> <p>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.</p> <p>4.3 The nationality of the supplier that supplies and install the goods shall not determine the origin of the goods.</p>

	<p>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.</p> <p>4.5 If so required in the <b>BDS</b>, 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.</p>
<p><b>5. One Bid per Bidder</b></p>	<p>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.</p> <p>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.</p> <p>5.3 A person or a firm cannot be a sub-contractor with more than one bidder in the same bidding process.</p>
<p><b>6. Cost of Bidding</b></p>	<p>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.</p>
<p><b>B. Bidding Documents</b></p>	
<p><b>7. Contents of Bidding Documents</b></p>	<p>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:</p> <p style="padding-left: 40px;"> <b>Section I</b> -Invitation to Bids  <b>Section II</b> Instructions to Bidders (ITBs)  <b>Section III</b> Bid Data Sheet (BDS)  <b>Section IV</b> Eligible Countries  <b>Section V</b> Schedule of Requirements and Technical Specifications  <b>Section VI</b> Standard Forms  <b>Section VII</b> General Conditions of Contract (GCC)  <b>Section VIII</b> Special Conditions of Contract (SCC)  <b>Section IX</b> Contract Forms         </p> <p>7.2 The number of copies to be completed and returned with the Bid is specified in the <b>BDS</b>.</p> <p>7.3 The Procuring Agency is not responsible for the completeness of the Bidding Documents and their addenda, if they were not</p>

	<p>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.</p> <p>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.</p>
<p><b>8. Clarification of Bidding Documents</b></p>	<p>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 <b>BDS</b>.</p> <p>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 <b>ITB 23.1</b>. However, this clause shall not apply in case of alternate methods of Procurement.</p> <p>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.</p> <p>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.</p> <p>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 <b>ITB 9</b>.</p> <p>8.5 If indicated in the <b>BDS</b>, 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 <b>BDS</b>. 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.</p> <p>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</p>



	<p>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 <b>ITB 9</b>. Non-attendance at the pre-Bid meeting will not be a cause for disqualification of a Bidder.</p>
<p><b>9. Amendment of Bidding Documents</b></p>	<p>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.</p> <p>9.2 Any addendum issued including the notice of any extension of the deadline shall be part of the Bidding Documents pursuant to <b>ITB 7.1</b> 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.</p> <p>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.</p>
<p><b>C. Preparation of Bids</b></p>	
<p><b>10. Language of Bid</b></p>	<p>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 <b>BDS</b>. 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 <b>BDS</b>, in which case, for purposes of interpretation of the Bidder, the translation shall govern.</p>
<p><b>11. Documents and Sample(s) Constituting the Bid</b></p>	<p>11.1 The Bid prepared by the Bidder shall constitute the following components: -</p> <ul style="list-style-type: none"> <li>a) Form of Bid and Bid Prices completed in accordance with <b>ITB 14 and 15;</b></li> <li>b) Details of the Sample(s) where applicable and requested in the <b>BDS</b>.</li> </ul>

	<ul style="list-style-type: none"> <li>c) Documentary evidence established in accordance with ITB 13 that the Bidder is eligible and/or qualified for the subject bidding process;</li> <li>d) Documentary evidence established in accordance with <b>ITB 13.3(a)</b> 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;</li> <li>e) 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;</li> <li>f) Bid security or Bid Securing Declaration furnished in accordance with <b>ITB 18</b>;</li> <li>g) Duly Notarized Power of Attorney authorizing the signatory of the Bidder to submit the bid; and</li> <li>h) Any other document required in the <b>BDS</b></li> </ul> <p>11.2 Where a sample(s) is required by a procuring agency, the sample shall be:</p> <ul style="list-style-type: none"> <li>(a) submitted as part of the bid, in the quantities, dimensions and other details requested in the <b>BDS</b>;</li> <li>(b) carriage paid;</li> <li>(c) received on, or before, the closing time and date for the submission of bids; and</li> <li>(d) evaluated to determine compliance with all characteristics listed in the <b>BDS</b>.</li> </ul> <p>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)-</p> <ul style="list-style-type: none"> <li>(a) do(es) not conform to all characteristics prescribed in the bidding documents; and</li> <li>(b) is / are not submitted within the specified time clearly mentioned in the Bid Data Sheet.</li> </ul> <p>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.</p> <p>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.</p>
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	<p>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).</p>
<p><b>12. Documents Establishing Eligibility of the Goods and Related Services and Conformity to Bidding Documents</b></p>	<p>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.</p> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>a. a detailed description of the essential technical specifications and performance characteristics of the Goods;</li> <li>b. 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;</li> <li>c. any other procurement specific documentation requirement as stated in the BDS.</li> </ul> <p>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 <b>specified in the BDS</b> following commencement of the use of the goods by the Procuring Agency.</p> <p>12.5 For purposes of the commentary to be furnished pursuant to <b>ITB 12.3(c)</b> 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.</p>

	<p>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.</p>
<p><b>13. Documents Establishing the Eligibility and Qualification of the Bidder</b></p>	<p>13.1 Pursuant to <b>ITB 11</b>, 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.</p> <p>13.2 The documentary evidence of the Bidder’s eligibility to Bid shall establish to the satisfaction of the <b>Procuring Agency</b> 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”.</p> <p>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 <b>Procuring Agency</b> that:</p> <ul style="list-style-type: none"> <li>a) 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;</li> <li>b) The Bidder has the financial, technical, and supply/production capability necessary to perform the Contract, meets the qualification criteria specified in <b>BDS</b>.</li> <li>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.</li> <li>d) That the Bidder meets the qualification criteria listed in the Bid Data Sheet.</li> </ul>
<p><b>14. Form of Bid</b></p>	<p>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.</p>
<p><b>15. Bid Prices</b></p>	<p>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.</p> <p>15.2 All items in the Schedule of requirement must be listed and priced separately in the Price Schedule(s). If a Price Schedule</p>

	<p>shows items listed but not priced, their prices shall be construed to be included in the prices of other items.</p> <p>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):</p> <p>Provided that:</p> <ul style="list-style-type: none"> <li>a) where there is only one (substantially) responsive bidder, or</li> <li>b) where there is provision for alternate proposals and the respective items are not listed in the other bids,</li> </ul> <p>The procuring agency may fix the price of missing items in accordance with market survey, and the same shall be considered as final price.</p> <p>15.4 The Bid price to be quoted in the Form of Bid in accordance with <b>ITB 15.1</b> shall be the total price of the Bid, excluding any discounts offered.</p> <p>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.</p> <p>15.6 Prices indicated on the Price Schedule shall be entered separately in the following manner:</p> <p style="padding-left: 40px;"><b>a) For goods manufactured from within Pakistan (or within the country where procurement is being done in case of foreign missions abroad):</b></p> <ul style="list-style-type: none"> <li>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: <ul style="list-style-type: none"> <li>A. on the components and raw material used in the manufacturing or assembly of goods quoted ex- works or ex-factory; OR</li> <li>B. on the previously imported goods of foreign origin quoted ex-warehouse, ex-showroom, or off-the-shelf.</li> </ul> </li> <li>ii. All applicable taxes which will be payable on the goods if the contract is awarded.</li> <li>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 <b>BDS</b>.</li> </ul>
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	<p>iv. The price of other (incidental or allied) services, if any, listed in the <b>BDS</b>.</p> <p style="text-align: center;"><b>b) For goods offered from abroad:</b></p> <p>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 through carriers registered in any eligible countries. Similarly, the Bidder may obtain insurance services from any eligible source country. Or</p> <p>ii. The price of the goods quoted FOB port of shipment (or FCA, as the case may be), if specified in the <b>BDS</b>. or</p> <p>iii. The price of goods quoted CFR port of destination (or CPT as the case may be), if specified in the <b>BDS</b>.</p> <p>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 <b>BDS</b>.</p> <p>v. The price of (incidental) services, if any, listed in the <b>BDS</b>.</p> <p>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: -</p> <p style="text-align: center;"><b>a) For Goods: -</b></p> <p>i) the price of the Goods, quoted as per applicable INCOTERMS as specified in the <b>BDS</b></p> <p>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</p> <p><b>b) For Related Services</b></p> <p>i) The price of the related services, and</p>
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	<p>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.</p> <p>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 <b>ITB 29</b>.</p> <p>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.</p>
<p><b>16. Bid Currencies</b></p>	<p>16.1 Prices shall be quoted in the following currencies:</p> <p>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 <b>BDS</b>.</p> <p>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.</p> <p>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.</p> <p>16.3 Bidders shall indicate details of their expected foreign currency requirements in the Bid.</p> <p>16.4</p> <p>16.5 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.</p>
<p><b>17. Bid Validity Period</b></p>	<p>17.1 Bids shall remain valid for the period specified in the BDS after the Bid submission deadline prescribed by the Procuring Agency. A Bid valid for a shorter period shall be rejected by</p>



	<p>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.</p> <p>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.</p> <p>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.</p>
<p><b>18. Bid Security or Bid Securing Declaration</b></p>	<p>18.1 Pursuant to <b>ITB 11</b>, unless otherwise specified in the <b>BDS</b>, 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 <b>BDS</b> or Bid Securing Declaration as specified in the <b>BDS</b> in the format provided in <b>Section VI (Standard Forms)</b>.</p> <p>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 <b>ITB 18.9</b>.</p> <p>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 <b>BDS</b> which shall be in any of the following:</p> <p>a) 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</p>

	<p>Validity is extended. In either case, the form must include the complete name of the Bidder;</p> <p>b) a cashier's or certified cheque; or</p> <p>c) another security if indicated in the BDS</p> <p>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.</p> <p>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.</p> <p>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 <b>ITB 29</b>.</p> <p>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:</p> <p style="padding-left: 40px;">(a) the expiry of the Bid Security;</p> <p style="padding-left: 40px;">(b) 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;</p> <p style="padding-left: 40px;">(c) the rejection by the Procuring Agency of all Bids;</p> <p style="padding-left: 40px;">(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.</p> <p>18.8 The successful Bidder's Bid Security will be discharged upon the Bidder signing the contract pursuant to <b>ITB 42</b>, or furnishing the performance guarantee, pursuant to <b>ITB 43</b>.</p> <p>18.9 The Bid Security may be forfeited or the Bid Securing Declaration executed:</p> <p style="padding-left: 40px;">a) if a Bidder:</p> <p style="padding-left: 80px;">i) withdraws its Bid during the period of Bid Validity as</p>
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	<p>specified by the Procuring Agency, and referred by the bidder on the Form of Bid except as provided for in <b>ITB 17.2</b>; or</p> <p>ii) does not accept the correction of errors pursuant to <b>ITB 31.2</b>; or</p> <p>b) in the case of a successful Bidder, if the Bidder fails:</p> <p>i) to sign the contract in accordance with <b>ITB 42</b>; or</p> <p>ii) to furnish performance security (or guarantee) in accordance with <b>ITB 43</b>.</p>
<p><b>19. Alternative Bids by Bidders</b></p>	<p>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, <b>ITB 19.2</b> shall prevail.</p> <p>19.2 When alternative schedule for supply and installation of equipment is explicitly invited, a statement of that effect will be included in the <b>BDS</b> as will the method for evaluating different schedule for delivery of goods.</p> <p>19.3 If so allowed in the <b>BDS</b>, 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.</p>
<p><b>20. Withdrawal, Substitution, and Modification of Bids</b></p>	<p>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.</p> <p>20.2 Bids requested to be withdrawn in accordance with <b>ITB 20.1</b> shall be returned unopened to the Bidders.</p>
<p><b>21. Format and Signing of Bid</b></p>	<p>21.1 The Bidder shall prepare an original and the number of copies of the Bid as indicated in the <b>BDS</b>, clearly marking each “ORIGINAL” and “COPY,” as appropriate. In the event of any discrepancy between them, the original shall prevail:</p> <p>Provided that except in Single Stage One Envelope Procedure,</p>

	<p>the Bid shall include only the copies of technical proposal.</p> <p>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 <b>BDS</b> 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.</p> <p>21.3 Any interlineations, erasures, or overwriting shall be valid only if they are signed by the person or persons signing the Bidder.</p>
<p><b>D. Submission of Bids</b></p>	
<p><b>22. Sealing and Marking of Bids</b></p>	<p>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.</p> <p style="text-align: center;"><b>Note:</b> <i>The envelopes shall be sealed and marked in accordance with the bidding procedure adopted as referred in Rule-36 of PPR-2004.</i></p> <p>22.2 The inner and outer envelopes shall:</p> <ul style="list-style-type: none"> <li>a) be addressed to the Procuring Agency at the address given in the BDS; and</li> <li>b) bear the title of the subject procurement or Project name, as the case may be as indicated in the <b>BDS</b>, the Invitation to Bids (ITB) title and number indicated in the <b>BDS</b>, and a statement: “DO NOT OPEN BEFORE,” to be completed with the time and the date specified in the <b>BDS</b>, pursuant to <b>ITB 23.1</b>.</li> </ul> <p>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:</p> <ul style="list-style-type: none"> <li>a) Bidder shall submit his <b>TECHNICAL PROPOSAL</b> and <b>FINANCIAL PROPOSAL</b> in separate inner envelopes and enclosed in a single outer envelope.</li> <li>b) <b>ORIGINAL</b> and each copy of the Bid shall be separately sealed and put in separate envelopes and marked as such.</li> <li>c) The envelopes containing the <b>ORIGINAL</b> and copies will be put in one sealed envelope and addressed / identified as given in <b>Sub- Clause 21.2</b>.</li> </ul>

	<p>22.4 The inner and outer envelopes shall:</p> <ul style="list-style-type: none"> <li>a) be addressed to the Procuring Agency at the address provided in the Bidding Data;</li> <li>b) 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 <b>ITB 23.1.</b></li> <li>c) 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 <b>Clause IB.24</b></li> </ul> <p>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</p>
<p><b>23. Deadline for Submission of Bids</b></p>	<p>23.1 Bids shall be received by the Procuring Agency no later than the date and time specified in the BDS.</p> <p>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 <b>ITB 9</b>, 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.</p>
<p><b>24. Late Bids</b></p>	<p>24.1 The Procuring Agency shall not consider for evaluation any Bid that arrives after the deadline for submission of Bids, in accordance with <b>ITB 23.</b></p> <p>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.</p>
<p><b>25. Withdrawal, of Bids</b></p>	<p>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.</p> <p>25.2 Revised bid may be submitted after the withdrawal of the original bid in accordance with the provisions referred in <b>ITB 22.</b></p>
<p><b>E. Opening and Evaluation of Bids</b></p>	
<p><b>26. Opening of Bids</b></p>	<p>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</p>

	<p>in the BDS. The Bidders' representatives present shall sign a register as proof of their attendance.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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 <b>BDS</b> 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.</p> <p>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</p>
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	<p>modification or substitution; (c) the presence of a Bid Security, if required; and (d) Any other details as the Procuring Agency may consider appropriate.</p> <p>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.</p> <p>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.</p> <p>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 <b>ITB 24</b>.</p> <p>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.</p> <p>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.</p> <p>26.13 A copy of the minutes of the Bid opening shall be furnished to individual Bidders upon request.</p> <p>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 unopened to the respective bidders subject to redress of the grievances from all tiers of grievances.</p>
<p><b>27. Confidentiality</b></p>	<p>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</p>



	<p>persons not officially concerned with such process until the time of the announcement of the respective evaluation report.</p> <p>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.</p> <p>27.3 Notwithstanding <b>ITB 27.2</b> 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.</p>
<p><b>28. Clarification of Bids</b></p>	<p>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.</p> <p>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 <b>ITB 31</b>.</p> <p>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:</p> <ul style="list-style-type: none"> <li>a. evaluation &amp; qualification criteria;</li> <li>b. required scope of work or specifications;</li> <li>c. all securities requirements;</li> <li>d. tax requirements;</li> <li>e. terms and conditions of bidding documents.</li> <li>f. change in the ranking of the bidder</li> </ul> <p>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.</p>
<p><b>29. Preliminary Examination of Bids</b></p>	<p>29.1 Prior to the detailed evaluation of Bids, the Procuring Agency will determine whether each Bid:</p> <ul style="list-style-type: none"> <li>a. meets the eligibility criteria defined in <b>ITB 3</b> and <b>ITB 4</b>;</li> </ul>

	<ul style="list-style-type: none"> <li>b. has been prepared as per the format and contents defined by the Procuring Agency in the Bidding Documents;</li> <li>c. has been properly signed;</li> <li>d. is accompanied by the required securities; and</li> <li>e. is substantially responsive to the requirements of the Bidding Documents.</li> </ul> <p>The Procuring Agency's determination of a Bid's responsiveness will be based on the contents of the Bid itself.</p> <p>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: -</p> <ul style="list-style-type: none"> <li>a. affects in any substantial way the scope, quality, or performance of the Services;</li> <li>b. limits in any substantial way, inconsistent with the Bidding Documents, the Procuring Agency's rights or the Bidders obligations under the Contract; or</li> <li>c. if rectified, would affect unfairly the competitive position of other Bidders presenting substantially responsive Bids.</li> </ul> <p>29.3 The Procuring Agency will confirm that the documents and information specified under <b>ITB 11, 12 and 13</b> 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.</p> <p>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.</p> <p><b><i>Explanation:</i></b> 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 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</p>
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	<p><i>irregularities include failure of a bidder to –</i></p> <ul style="list-style-type: none"> <li>(a) <i>Submit the number of copies of signed bids required by the invitation;</i></li> <li>(b) <i>Furnish required information concerning the number of its employees;</i></li> <li>(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></li> </ul> <p>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.</p> <p>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.</p> <p>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.</p>
<p><b>30. Examination of Terms and Conditions; Technical Evaluation</b></p>	<p>30.1 The Procuring Agency shall examine the Bid to confirm that all terms and conditions specified in the <b>GCC</b> and the <b>SCC</b> have been accepted by the Bidder without any material deviation or reservation.</p> <p>30.2 The Procuring Agency shall evaluate the technical aspects of the Bid submitted in accordance with <b>ITB 22</b>, to confirm that all requirements specified in <b>Section V – Schedule of Requirements, Technical Specifications</b> of the Bidding Documents have been met without material deviation or reservation.</p> <p>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 <b>ITB 29</b>, it shall reject the Bid.</p>

<p><b>31. Correctness of Errors</b></p>	<p>31.1 Bids determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows: -</p> <p>31.2 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;</p> <p>31.3 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</p> <p style="padding-left: 20px;">a. where there is a discrepancy between the amounts in figures and in words, the amount in words will govern.</p> <p style="padding-left: 20px;">b. 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.</p> <p>31.4 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 <b>ITB 18.9</b>.</p>
<p><b>32. Conversion to Single Currency</b></p>	<p>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.</p> <p>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 <b>BDS</b>.</p>
<p><b>33. Evaluation of Bids</b></p>	<p>33.1 The Procuring Agency shall evaluate and compare only the Bids determined to be substantially responsive, pursuant to <b>ITB 29</b>.</p>

	<p>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.</p> <p>33.3 The Procuring Agency’s evaluation of a Bid will take into account:</p> <ul style="list-style-type: none"> <li>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;</li> <li>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</li> </ul> <p>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.</p> <p>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 <b>BDS</b>, and quantified in ITB 32.5:</p> <ul style="list-style-type: none"> <li>a. Cost of inland transportation, insurance, and other costs within the Pakistan incidental to delivery of the goods to their final destination.</li> <li>b. delivery schedule offered in the Bid;</li> <li>c. deviations in payment schedule from that specified in the Special Conditions of Contract;</li> <li>d. the cost of components, mandatory spare parts, and service;</li> <li>e. the availability (in Pakistan) of spare parts and after-sales services for the equipment offered in the Bid;</li> <li>f. the projected operating and maintenance costs during the life of the equipment;</li> <li>g. the performance and productivity of the equipment offered; and/or;</li> <li>h. other specific criteria indicated in the <b>BDS</b>, and/or in the Technical Specifications.</li> </ul>
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	<p>33.5 For factors retained in <b>BDS</b>, pursuant to ITB 33.4 one or more of the following quantification methods will be applied, as detailed in the <b>BDS</b>:</p> <p>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 <b>BDS</b> 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.</p> <p>b. <i>Delivery Schedule</i></p> <p>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 <b>BDS</b>, 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. <b>OR</b></p> <p>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. <b>No credit will be given to earlier deliveries, and Bids offering delivery beyond this range will be treated as non-responsive.</b> Within this acceptable range, an adjustment per week, as specified in the <b>BDS</b>, 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. <b>OR</b></p> <p>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</p>
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	<p>to the Bid price a factor equal to a percentage, specified in the <b>BDS</b>, of EXW or as per applicable INCOTERM price per week of variation from the specified delivery schedule.</p> <p><i>c. Deviation in Payment Schedule</i></p> <p>i) Bidders shall state their Bid price for the payment schedule outlined in the <b>SCC</b>. 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. <b>OR</b></p> <p>ii) The <b>SCC</b> 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 <b>BDS</b>.</p> <p><i>d. Cost of Spare Parts</i></p> <p>i) The list of items and quantities of major assemblies, components, and selected spare parts, likely to be required during the initial period of operation specified in the <b>BDS</b>, is annexed to the Technical Specifications. The total cost of these items, at the unit prices quoted in each Bid, will be added to the Bid price. <b>OR</b></p> <p>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 <b>BDS</b>. 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. <b>OR</b></p> <p>iii) The Procuring Agency will estimate the cost of spare parts usage in the initial period of operation specified in the <b>BDS</b>, 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</p> <p><i>e. Spare parts and after sales service facilities in Pakistan</i></p>
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	<p>The cost to the Procuring Agency of establishing the minimum service facilities and parts inventories, as outlined in the <b>BDS</b> or elsewhere in the Bidding Documents, if quoted separately, shall be added to the Bid price.</p> <p>f. <i>Operating and maintenance costs</i></p> <p>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 <b>BDS</b> or in the Technical Specifications.</p> <p>g. <i>Performance and productivity of the equipment.</i></p> <p>(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 <b>BDS</b> 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 <b>BDS</b> or in the Technical Specifications. <b>OR</b></p> <p>(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 <b>BDS</b> or in the Technical Specifications.</p> <p>h. <i>Specific Additional Criteria</i></p> <p>Other specific additional criteria to be considered in the evaluation and the evaluation method shall be detailed in the <b>BDS</b> and/or the Technical Specifications.</p> <p>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 <b>BDS</b>.</p>
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<p><b>34. Domestic Preferences</b></p>	<p>34.1 If the <b>BDS</b> 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.</p>
<p><b>35. Determination of Most Advantageous Bid</b></p>	<p>35.1 In case where the Procuring Agency adopts the Cost Based Evaluation Technique and, the Bid with the lowest evaluated price—from amongst those which are eligible, compliant and substantially responsive shall be the Most Advantageous Bid.</p> <p>35.2 The Procuring Agency may adopt the Quality &amp; Cost Based Selection Technique due to the following two reasons:</p> <ul style="list-style-type: none"> <li>i. 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</li> <li>ii. Where the Procuring Agency, in addition to the mandatory requirements and mandatory technical specifications, requires parameters <b>specified in Evaluation Criteria</b> to be evaluated while determining the quality of the goods:</li> </ul> <p>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.</p>
<p><b>36. Post qualification of Bidder and/or Abnormally Low Financial Proposal</b></p>	<p>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 <b>BDS</b>.</p> <p>In case of International Tendering, the parameters for incorporation or licensing within Pakistan may be fulfilled as part of post qualification.</p> <p>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:</p> <ul style="list-style-type: none"> <li>(a) 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</li> </ul>

	<p>concerns as to the capability and capacity of the respective Bidder to perform that contract</p> <p>(b) 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;</p> <p>(c) 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;</p> <p>(d) The Procuring Agency shall not incur any liability solely by rejecting abnormally Bid; and</p> <p>(e) 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.</p> <p><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:</p> <ul style="list-style-type: none"> <li>(i) Comparing the bid price with the cost estimate;</li> <li>(ii) Comparing the bid price with the bids offered by other bidders submitting substantially responsive bids; and</li> <li>(iii) Comparing the bid price with prices paid in similar contracts in the recent past either government- or development partner-funded.</li> </ul> <p>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.</p> <p>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.</p> <p>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.</p> <p>Explanation: The Certificate shall be furnished by the bidder.</p>
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	<p>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.</p> <p>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.</p>
<b>F. Award of Contract</b>	
<b>37. Criteria of Award</b>	<p>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:</p> <ul style="list-style-type: none"> <li>a) eligible in accordance with the provisions of ITB 3;</li> <li>b) is determined to be qualified to perform the Contract satisfactorily; and</li> <li>c) Successful negotiations have been concluded, if any.</li> </ul>
<b>38. Negotiations</b>	<p>38.1 Negotiations may be undertaken with the Most Advantageous Bid relating to the following areas:</p> <ul style="list-style-type: none"> <li>(a) a minor alteration to the technical details of the statement of requirements;</li> <li>(b) reduction of quantities for budgetary reasons, where the reduction is in excess of any provided for in the Bidding documents;</li> <li>(c) a minor amendment to the special conditions of Contract;</li> <li>(d) finalizing payment arrangements;</li> <li>(e) delivery arrangements;</li> <li>(f) the methodology for provision of related services; or</li> <li>(g) clarifying details that were not apparent or could not be finalized at the time of Bidding;</li> </ul> <p>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.</p>
<b>39. Procuring Agency's Right to reject All Bids</b>	<p>39.1 Notwithstanding <b>ITB 37</b>, 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.</p> <p>39.2 Notice of the rejection of all Bids shall be given promptly to all Bidders that have submitted Bids.</p>

	<p>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</p>
<p><b>40. Procuring Agency's Right to Vary Quantities at the time of Award</b></p>	<p>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.</p>
<p><b>41. Notification of Award</b></p>	<p>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.</p> <p>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).</p> <p>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 <b>ITB 43</b> and signing of the contract in accordance with <b>ITB 42.2</b>.</p> <p>41.4 Upon the successful Bidder's furnishing of the performance security (or guarantee) pursuant to <b>ITB 43</b>, 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 <b>ITB 18.7</b>.</p>
<p><b>42. Signing of Contract</b></p>	<p>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.</p> <p>42.2 Immediately after the Redressal of grievance by the GRC, and <b>after fulfillment of all conditions precedent</b> of the Contract Form, the successful Bidder and the Procuring Agency shall sign the contract.</p> <p>42.3 Where no formal signing of a contract is required, purchase order issued to the bidder shall be construed to be the contract.</p>
<p><b>43. Performance Security (or Guarantee)</b></p>	<p>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 <b>BDS and SCC</b>, denominated in the type and proportions of currencies in the Letter of Acceptance and in accordance with the Conditions of Contract.</p> <p>43.2 If the Performance Security (or Guarantee) is provided by the successful Bidder and it shall be in the form specified in the <b>BDS</b></p>

	<p>which shall be in any of the following:</p> <ul style="list-style-type: none"> <li>(a) certified cheque, cashier’s or manager’s cheque, or bank draft;</li> <li>(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.</li> <li>(c) bank guarantee confirmed by a reputable local bank or, in the case of a successful foreign Bidder, bonded by a foreign bank; or</li> <li>(d) surety bond callable upon demand issued by any reputable surety or insurance company.</li> </ul> <p>Any Performance Security (or guarantee) submitted shall be enforceable in Pakistan.</p> <p>43.3 Failure of the successful Bidder to comply with the requirement of <b>ITB 43.1</b> 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.</p>
<p><b>44. Advance Payment</b></p>	<p>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.</p> <p>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 <b>BDS</b>. 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 <b>SCC</b>.</p>
<p><b>45. Arbitrator</b></p>	<p>45.1 The Arbitrator shall be appointed by mutual consent of both parties as per the provisions specified in the <b>SCC</b>.</p>
<p><b>46. Corrupt and Fraudulent Practices</b></p>	<p>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.</p>

<b><u>G. Grievance Redressal &amp; Complaint Review Mechanism</u></b>	
<b>47. Constitution of Grievance Redressal Committee</b>	<p>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.</p>
<b>48. GRC Procedure</b>	<p>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.</p> <p>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.</p> <p>48.3 In case, the complaint is filed against the technical evaluation report, the GRC shall suspend the procurement proceedings.</p> <p>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 envelope bidding procedure is adopted.</p> <p>48.5 The GRC, in both the cases shall investigate and decide upon the complaint within ten days of its receipt.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<b><u>H. MECHANISM OF BLACKLISTING</u></b>	



<p><b>49. Mechanism of Blacklisting</b></p>	<p>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:</p> <ul style="list-style-type: none"> <li>i. Involved in corrupt and fraudulent practices as defined in Rule-2 of Public Procurement Rules;</li> <li>ii. Fails to perform his contractual obligations; and</li> <li>iii. Fails to abide by the id securing declaration;</li> </ul> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>49.9 Such blacklisting or barring action shall be communicated</p>
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	<p>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.</p> <p>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</p> <p>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.</p> <p>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.</p>
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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
<b>1. INTRODUCTION</b>		
1.	1.1	<p>Name of Procuring Agency: <b>Pakistan Security Printing Corporation (Pvt.) Ltd.</b></p> <p>The Description (as specified in Invitation to Bids) of the Goods is: <b>SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &amp; TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS &amp; TERMS &amp; CONDITIONS)</b></p> <p><b>Time for Completion:</b> Complete Project must be completed within 06 months from the date of issuance of purchase Order.</p>
2.	2.1	<p>Financial year for the operations of the Procuring Agency: [2024-25]</p> <p>Name of Project: <b>SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &amp; TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS &amp; TERMS &amp; CONDITIONS)</b></p> <p>Name and identification number of the Contract: <b>LP/T-2155/2025</b></p>
3.	3.1 TO 3.7	Not Applicable
4.	4.1	Ineligible country(s) are [ <b>as per Section IV of the Bidding Documents</b> ]
5.	4.5	Demonstration of authorization by manufacturer: <b>Manufacturer's Authorization Form is required (Not Applicable)</b>
<b>2. BIDDING DOCUMENTS</b>		
6.	7.2	The number of documents to be completed and returned is one original. Each page duly signed and stamped.
7.	8.1	<p>The address for clarification of Bidding Documents is</p> <p style="text-align: center;"><b>Deputy General Manager (Purchase)</b>            Purchase Department, Pakistan Security Printing Corporation (Pvt.)            Ltd            Jinnah Avenue, Malir Halt Karachi-75100 Phone: 99248511-5            Phone: (92-21)-99248511-15, Facsimile :( 92-21)-99248534            Email: purchase.local@pspc.gov.pk, Website: www.pspc.gov.pk</p>

	<b>8.5</b>	A pre-bid meeting may be held before 15 days of tender opening date. In case if the Procuring Agency decides to hold the pre-bid meeting, then the information of the date, time and venue of the meeting will be communicated to the Bidders. The Bidders shall send in writing to the Procuring Agency any clarifications, enquiries he considers necessary in respect of the provisions of the Bidding Documents before the date of pre-bid meeting. Any cost to be incurred to attend the pre-bid meeting will be borne by the Bidder(s).
	<b>9.2</b>	In case of any corrigendum/ Addendum, the PSPC shall promptly publish at the PPRA web page/printing media before the bid opening date.
<b>3. PREPARATION OF BIDS</b>		
<b>10.</b>	<b>10.1</b>	The Language of all correspondences and documents related to the Bid is <b>English</b> .
<b>11.</b>	<b>11.1 (b&amp;h)</b>	In addition to the documents stated in <b>ITB 11</b> , the following documents must be included with the Bid a) Affidavit for Bidder's Blacklisting Status b) Sample <b>Not</b> required
<b>12.</b>	<b>12.3 (c)</b>	Other procurement specific documentation requirements are <b>Not Required</b>
<b>13.</b>	<b>12.4</b>	The Bidder shall be required to provide an undertaking that they will ensure to supply material as per BOQ / Technical Specification. In case of up gradation or modification in spare parts, Supplier will notify the Procuring Agency in advance for technological upgrades during warranty period.
<b>14.</b>	<b>13.3 (b&amp;d)</b>	The eligibility and qualification criteria required from Bidders in <b>ITB 13.3(b)</b> is modified as follows: a) <i>This invitation for Bids is open to all reputed manufactures / supplier/ contractor.</i> b) <i>Bidders should not be under a declaration of ineligibility for corrupt and fraudulent practices issued by any Government (Federal, Provincial), a local body and international or a public sector organization.</i> c) <i>They must be registered with tax authorities and are active tax payers.</i> d) <i>Contractor(s)/firm(s) applying must have valid registration with Pakistan Engineering Council (PEC) in <b>Category C-2</b> or above and at least in Specialization Codes <b>CE-10, EE-11, EE-04, EE-05 &amp; EE-10</b>.</i> e) <i>Valid Sales Tax Certificate from Sindh Revenue Board (SRB).</i> f) <i>Valid NTN Certificate from Federal Board of Revenue. Bidder should be an active Tax payer.</i> g) <i>Firms in litigation with the Employer shall not be permitted to participate in this process.</i> h) <i>An affidavit (on non-judicial stamp paper) to the effect that the bidder has never been black-listed by any previous employer.</i> i) <i>An affidavit (on non-judicial stamp paper) to the effect that all documents / particulars / information given with this qualification Documents are true.</i> j) <i>An affidavit (on non-judicial stamp paper) to the effect that the bidder has never indulged in corrupt, fraudulent or collusive practice for procuring contracts.</i> k) <i>An affidavit (on non-judicial stamp paper) to the effect that the bidder is not presently involved nor has been in the past in litigation with its employers.</i> l) <i>An undertaking to comply with the code of conduct of the procuring agency.</i>  The bidders do not fulfill any of the above mandatory requirements

		<p>shall not be considered for detailed evaluation and hence disqualified for further evaluation.</p> <p>The Bidder is required to include with its Bid, documentation from the manufacturer of the goods that it has been duly authorized to deliver, in Pakistan, the goods as indicated in its Bid.</p>
15.	15.7 (a) (i)	<p>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.</p> <p><b>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).</b></p>
16.	15.6 (a)	<p><b>(iii) Price shall be inclusive of all costs as per schedule mentioned in BOQ including transportation to procuring agencies premises.</b></p> <p><b>(iv) No incidental or allied services payment shall be made</b></p>
17.	15.6 (b)	<b>Not Applicable</b>
18.	15.7	<b>Not Applicable</b>
19.	15.8	The price shall be fixed.
20.	16.1 (a)	<p>a) For goods and related services originating or delivering within Pakistan, the currency of the Bid shall be <b>Pakistan Rupee.</b></p> <p>b) For goods and related services that the Bidder will deliver from outside Pakistan: <b>Not Applicable</b></p>
21.	17.1	The Bid Validity period shall be <b>90</b> days.
22.	18.1	<p>The amount of Bid Security shall be <b>2% of total value of bid (excluding GST &amp; SST)</b></p> <p>The currency of the Bid Security shall be: <b>Pakistan Rupee</b></p>
23.	18.3	The Bid Security shall be in favor of Procuring Agency in the form of a Bank Guarantee or Pay Order from any Scheduled Bank of Pakistan, or insurance guarantee ( <i>PACRA Rating "AAA, AA++"</i> )
24.	18.3 (c)	Another Security: <b>Not Applicable.</b>
25.	19.1	Alternative Bids to the requirements of the Bidding Documents will not be permitted.
26.	21.1	The number of copies of the Bid to be completed and returned shall be <b>None.</b>
27.	21.2	Duly notarized Power of Attorney authorizing the signatory of the Bidder to submit the Bid.

28.	21.2	Written confirmation of authorization to be provided by the bidder.
<b>4. SUBMISSION OF BIDS</b>		
29.	22.2 (a)	To be dropped in the tender box placed at PSPC factory gate on or before deadline by clearly mentioning the tender # on the top of the envelope.
30.	22.2 (b)	<p>Title of the subject Procurement or Project name: <b>SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &amp; TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS &amp; TERMS &amp; CONDITIONS)</b></p> <p>ITB title and No: <b>LP/T-2155/2025</b></p> <p>Time and date of Bid submission;</p> <p><b>February 20, 2025 11:00 AM</b></p>
31.	23.1	<p>The deadline for Bid submission is:</p> <p><b>February 20, 2025 11:00 AM</b></p>
<b>5. OPENING AND EVALUATION OF BIDS</b>		
32.	26.1	<p>The Bid opening shall take place at:</p> <p><b>Admin-1 Office</b>, Pakistan Security Printing Corporation (Pvt.) Ltd, Jinnah Avenue, Malir Halt, Karachi- Pakistan.</p> <p><b>February 20, 2025 11:30 AM</b></p> <p>In case of any unforeseen reasons, unrest or force majeure, which may cause delay on the bid opening date, the bids shall be opened on the next working day at the same place and time.</p>
33.	26.6	The opening date of Financial Proposal will be communicated to the eligible bidders by the Procuring Agency.
34.	27	<p>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.</p> <p>The Bidder shall not disclose or attempt to make public any information relating to the bidding documents, bidding process and</p>



		<p>award of the contract to any person or entity without the Procuring Agency's prior written consent.</p> <p>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.</p>
35.	32.2	The currency that shall be used for Bid evaluation and comparison purposes is: <b>Pakistani Rupees.</b>
36.	33.4	The evaluation committee evaluate the bid by considering bid price including the criteria mentioned in ITB 33.4 b, c, d, e & g.
37.	33.4 (h)	Other specific criteria are Not applicable
38.	33.5 (b)	<p>Delivery schedule:</p> <p>The goods covered under this invitation are required to be delivered (shipped) within an acceptable range of weeks specified in the Schedule of Requirement.</p> <p><b>No credit will be given to earlier deliveries, and Bids offering delivery beyond this range will be treated as non-responsive.</b></p> <p><b>Job completion period 06 months.</b></p>
39.	33.5 (c) (ii)	Deviation in payment schedule is <b>Not Applicable.</b>
40.	33.5 (d)	Cost of spare parts. <b>Not applicable</b>
41.	33.5(e)	<p>Spare parts and after sales service facilities in Pakistan.</p> <p>The Bidder shall be required to provide an undertaking that they will ensure to Complete Supply &amp; Services as per BOQ / Technical Specification.</p>
42.	33.5 (f)	Operating and maintenance costs. <b>Not applicable</b>
43.	33.5 (g)	<p>Performance and productivity of Equipment</p> <p>Items offered shall have a minimum productivity specified under the relevant provision to be considered responsive as specified in the Technical Specifications.</p>
44.	33.5 (h)	Specific additional criteria to be used in the evaluation and their evaluation method or reference to the Technical Specifications is <b>Not Applicable.</b>

<p><b>45.</b></p>	<p><b>33.6</b></p>	<p>In case of 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: - Bidder(s) shall submit bid for Complete Requirement, evaluation of bids and award of contract(s) will be made for the Complete Requirement as specified in bid evaluation criteria.</p>																				
<p><b>46.</b></p>	<p><b>34.1</b></p>	<p>Domestic preference <b>Not Applicable.</b></p>																				
<p><b>47.</b></p>	<p><b>35</b></p>	<p><b>Evaluation Techniques</b>  <b>Quality and Cost Based Selection (QCBS)</b>            In such combination, there shall be some specific weightage of both the technical features (such as prescribed in ITB 35.2) and financial aspects of the proposal. The financial marks shall be awarded on the basis of inverse proportion calculations. The highest ranked bid shall be declared, on the basis of combined evaluation.</p> <p><b><u>EVALUATION CRITERIA</u></b>            Detailed Evaluation</p> <ol style="list-style-type: none"> <li>i. Evaluation of the bids and award of contract will be done for the complete requirement.</li> <li>ii. Prospective firm shall conform all technical requirements mentioned in this document for qualification.</li> <li>iii. The Financial Bids of the only technically qualified bids will be opened.</li> <li>iv. The contract will be awarded on Quality plus Cost Based Selection method to the firm gaining highest marks based on criteria given below.</li> </ol> <p><b><u>Technical Evaluation</u></b>            Technical evaluation shall be conducted using the specified criteria according to the scoring system outlined below:</p> <table border="1"> <thead> <tr> <th rowspan="2">Category</th> <th colspan="2">Marks</th> </tr> <tr> <th>Maximum</th> <th>Minimum</th> </tr> </thead> <tbody> <tr> <td>Experience Capability</td> <td>70</td> <td>35</td> </tr> <tr> <td>Personnel Capability</td> <td>20</td> <td>10</td> </tr> <tr> <td>Financial Capability</td> <td>10</td> <td>5</td> </tr> </tbody> </table> <p>To qualify, bidders must receive not less than the specified minimum acceptable 50 percent marks for each category and aggregate of minimum 60 marks.            The bidder is to provide substantial documentary evidence in each case for marking in the Qualification Criteria. Where it is found that substantial evidence is not available, the marking will not be made.</p> <p><b><u>Experience Capability</u></b>            Experience for similar/ comparable projects completed (Form A-4) will be evaluated on the basis of the following marks:</p> <table border="1"> <thead> <tr> <th>Sr.</th> <th>Experience Capability</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2 Marks shall be granted of the bidder has an experience of at least 5 years as Solar Power Plant installation company with minimum installation of 1MW single project Additional 1 Marks for each year of added experience beyond 5 years. Maximum Marks 10</td> <td>10</td> </tr> </tbody> </table>	Category	Marks		Maximum	Minimum	Experience Capability	70	35	Personnel Capability	20	10	Financial Capability	10	5	Sr.	Experience Capability	Marks	1	2 Marks shall be granted of the bidder has an experience of at least 5 years as Solar Power Plant installation company with minimum installation of 1MW single project Additional 1 Marks for each year of added experience beyond 5 years. Maximum Marks 10	10
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2	5 marks shall be granted if the bidder has completed (Design, installation and commissioning) of one Solar Plant of capacity $\geq$ 2MW during last 07 years Additional 5 marks for each additional project of same capacity during last 07 years	15
3	5 marks shall be granted if the bidder has completed (Design, installation and commissioning) of one Solar Plant of capacity $\geq$ 2MW with single Axis Sun tracking during last 07 years Additional 5 marks for each additional project of same capacity during last 07 years	15
4	5 marks shall be granted if the bidder has Supplied and installed Li-ion based one Battery energy storage system (BESS) of capacity $\geq$ 1 MWh during last 07 years Additional 2 marks for each additional project of same capacity during last 07 years	15
5	10 marks shall be granted if the bidder has completed (Design, installation and commissioning) of one Solar Plant of capacity $>$ 2MW with 1 MWh BESS during last 07 years Additional 5 marks for each additional project of same capacity during last 07 years	15
Total Marks Allocated		70

Bidder must acquire minimum 2 marks in Sr. # 1, 5 marks in Sr. # 2,3,4 and 10 marks in sr. # 5 in order to comply and total of 35 marks to comply with this section Information regarding previous projects is to be supported with submission of Job Completion Certificate/ Takeover Certificate and any other relevant document is mandatory. PSPC reserves the right to authenticate these documents

Criteria for Detailed Evaluation

**Financial Capability**

Financial Soundness of a bidder will be considered as follows:

1	Average Annual Turnover in last 3 years (from Audited Financial Statements)	05 marks will be given if the average annual turnover for last three years is equal to Pak Rs 300 million. 01 additional mark will be given for every Pak Rs. 50 million increase in the average annual turnover. Full marks will be given in case of Average Annual Turnover $>$ Pak Rs 550million.
Maximum Marks		10

The Audited Financial Statements of the last three years from Chartered Accountant firm must be submitted and should demonstrate the soundness of the bidder's financial position, showing long term profitability. Where necessary, the Employer may make inquiries with the bidder's bankers.

**Personnel Capability**

Personnel Capability of bidders shall be evaluated on the basis of following Marks:

No	Key Personnel	Education and Experience	Marks (Maximum)	Maximum Marks
1	Project Manager Electrical	Bachelors in Electrical Engineering/Equivalent with at least 10 years of Solar Plants installation Experience	3 Marks for 10 Years of Experience Additional 0.5 Mark for every additional 1 year of solar plants installation experience.	05
2	Automation and control Engineer (Electrical/ Electronics)	Bachelors in Electrical/Electronic Engineering with at least 6 years of	1 Marks for 6 Years' Experience Additional 0.5 Mark for every additional 1 year	03

			automation Experience	of automation experience.													
3	Civil Engineer	Bachelors in Civil Engineering with at least 6 years of Solar Plants installation Experience	1 Marks for 6 Years' Experience Additional 0.5 Mark for every additional 1 year of experience.		03												
4	Mechanical Engineer	Bachelors in Mechanical /structural/material Engineering with at least 6 years of Solar Plants installation Experience	1 Marks for 6 Years' Experience Additional 0.5 Mark for every additional 1 year of experience.		03												
5	Site Supervisor (Electrical)	DAE/Equivalent in Electrical with at least 6 years of Solar Plants installation Experience	1 Marks for 6 Years' Experience Additional 0.5 Mark for every additional 2 years of experience.		02												
6	Site Supervisor (Civil)	DAE/Equivalent in Civil with at least 6 years of Solar Plants installation Experience	1 Marks for 6 Years' Experience Additional 0.5 Mark for every additional 2 years of experience.		02												
7	Health Safety inspector	Bachelors in Engineering with 6 years of experience OR Diploma in safety /Equivalent with at least 6 years of Solar Plants installation Experience	1 Marks for 6Years Experience Additional 0.5 Mark for every additional 2 years of experience.		02												
<b>Total Marks</b>					<b>20</b>												
<p>Bidder must provide personnel from Sr. # 1 to 7. Minimum “3 marks” in Sr. # 1 and “1 mark” from Sr. # 2 to 7 is mandatory for qualification whereas minimum 12 marks is mandatory to qualify in personnel capability section</p> <p><i>(Information regarding education qualification, total work experience and specific work experience is to be supported by documentary evidence such as copy of education qualification certificate/degree and CVs of concerned personnel proposed for the below positions duly signed and any other relevant documents along with PEC/ relevant institution Certificate)</i></p> <p><b>Financial Bid Evaluation Criteria</b></p> <p>Bidders must submit section wise financial bid in a separate envelope clearly mentioning “financial bid” on the top. The Financial bid will be evaluated as per following criteria. The lowest quoted bid say Bid-B will be awarded full 100 Marks. The other bid say Bid-A will be awarded marks in financial bid evaluation as:</p> <p>Marks awarded to Bid-A = (Price quoted in lowest Bid-B/Price quoted in Bid-A) x 100</p> <p>Example: -</p> <table border="1"> <thead> <tr> <th>Bids</th> <th>Price Quoted</th> <th>Marks awarded in Financial Evaluation</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>80 Million</td> <td>(60/80) x100=75</td> </tr> <tr> <td>B</td> <td>60 Million</td> <td>100</td> </tr> <tr> <td>C</td> <td>100 Million</td> <td>(60/100) x100=60</td> </tr> </tbody> </table> <p><b>Overall Evaluation Criteria of Bid(s)</b></p>						Bids	Price Quoted	Marks awarded in Financial Evaluation	A	80 Million	(60/80) x100=75	B	60 Million	100	C	100 Million	(60/100) x100=60
Bids	Price Quoted	Marks awarded in Financial Evaluation															
A	80 Million	(60/80) x100=75															
B	60 Million	100															
C	100 Million	(60/100) x100=60															

		<p>Technical Evaluation (weightage) 70%</p> <p>Financial Evaluation (weightage) 30%</p> <p>Overall Evaluation Criteria = (Marks in Tech Eval. Out of 100) x 70% + (Marks in Financial Evaluation out of 100) x 30%</p> <p>Example: "If any bidder acquires 85 marks in technical evaluation and 60 marks in financial evaluation, its total marks will be <math>(85 \times 70/100) + (60 \times 30/100)</math> equals to 77.5</p> <p>The bid Scoring highest marks in overall Bid Evaluation will be considered successful.</p>
	<b>36.</b>	<b>Post qualification of Bidder and/or Abnormally Low Financial Proposal Not applicable.</b>
<b>6. AWARD OF CONTRACT</b>		
<b>48.</b>	<b>40.1</b>	Percentage for quantity increase or decrease is <b>15%</b> .
<b>49.</b>	<b>41</b>	Letter of acceptance may please be read as Purchase Order. Final evaluation will be uploaded on PPRA website as per PP Rules after which purchase order will be issued to successful bidder.
<b>50.</b>	<b>43.2</b>	<p><b>i)</b> The Performance Guarantee shall be in the form of Payment order / Demand Draft or an unconditional Bank Guarantee enforceable in Pakistan, or insurance guarantee (<i>PACRA Rating "AAA, AA++"</i>) or as per Performance Guarantee form specified in the Bidding Documents. In case of successful bidder, bid security will be treated as performance guarantee.</p> <p><b>ii)</b> the bidder will submit the performance guarantee after 14 days of the issuance of Purchase order.</p>
<b>51.</b>	<b>44.1</b>	The Advance Payment is <b>10 % against bank guarantee</b> or <i>insurance guarantee (PACRA Rating "AAA, AA++")</i>
<b>52.</b>	<b>44.2</b>	The Advance Payment is <b>Applicable</b> against bank guarantee or <i>insurance guarantee (PACRA Rating "AAA, AA++")</i>
<b>53.</b>	<b>45.1</b>	<p>In case of any dispute and difference which may arise in connection with the execution of the contract, the matter shall be referred to Managing Director of Corporation, who shall take decision in the matter.</p> <p>In case the dispute remains unresolved, the matter will be resolved through arbitration as per the Arbitration Act, 1940.</p>
<b>7. REVIEW OF PROCUREMENT DECISIONS</b>		
<b>54.</b>	<b>48.1</b>	<p>The address of the Procuring Agency</p> <p>Chairman (Grievance Redressal Committee) Pakistan Security Printing Corporation (Pvt.) Ltd Jinnah Avenue, Malir Halt, Karachi - Pakistan</p>
	<b>48.6</b>	<p>The Address of PPRA to submit a <b>copy</b> of grievance:</p> <p>Grievance Redressal Appellate Committee, Public Procurement Regulatory Authority</p>



		1 <sup>st</sup> Floor, G-5/2, Islamabad, Pakistan Tel: +92-51-9202254
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## **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**



- The delivery schedule expressed as days stipulates hereafter a delivery date which is the date of delivery required.
- Complete Project must be completed within 06 months from the date of issuance of purchase Order.



## Technical Specifications

### 1. Scope of Project and Requirements:

The Pakistan Security Printing Corporation (Pvt.) Ltd intends to procure **SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM** **SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)**

#### 1.1. Delivery:

Delivery will be considered accomplished when offered Items will be delivered at Procuring Agency's site i.e. respective department as per schedule of requirement or as per BOQ / Technical specifications (enclosed).

#### 1.2. Installation (if any):

Installation will be considered accomplished when offered Items will be installed at Procuring Agency's site i.e. respective Pakistan Security Printing Corporation (Pvt.) Ltd as per requirement specified in BOQ.

#### 1.3. Integration (if any):

Integration means that all the necessary configuration of the offered Items is according to the Procuring Agency's requirement and ready for the use.

#### 1.4. Operational Acceptance (if any):

Operational Acceptance means that the offered machine has been installed, configured, integrated and operational after testing in accordance with the standard procedure provided by the OEM.

#### 1.5. Training & Documentation (if any):

The bidder will provide formal hands on training and documentation as specified in BOQ.

#### 1.6. Factory Acceptance Test & Site Acceptance Test (if any):

The bidder will provide FAT & SAT as specified in BOQ.

### Technical Requirements

Sr. #	Description	Qty. / Items	Bidder's Technical Offering Specification / details
1	<b>SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM</b> (As per BOQ / Technical Specifications) <b>(Detail of technical requirement on page # 115-130)</b>	<b>01</b> <b>No</b>	
2	<b>SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &amp; TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM</b>	<b>01</b> <b>Job</b>	

**Note: - Bidder shall be filled the offering description / specification in above column or submit separate sheet.**

## **Implementation Schedule**

- Complete Project must be completed within 06 months from the date of issuance of purchase Order.

# **SECTION VI – STANDARD FORMS FOR (Single Stage Two Envelope Procedure)**

## **Table of Forms**

<b>Sr. No.</b>	<b>Form No.</b>	<b>Description</b>	<b>Proposal Part</b>
1	Form T1	Letter of Bid – Technical Proposal	Technical Proposal
2	Form T2	Bidder Information Form	Technical Proposal
3	Form T3	Bidder's Eligibility / Qualification Criteria	Technical Proposal
4	Form T4	Affidavit for Bidder's Blacklisting Status	Technical Proposal
5	Form T5	Declaration for Ultimate Beneficial Owners Information	Technical Proposal
6	Form T6	Manufacturer's Authorization Form	Technical Proposal
7	Form T7	Code of Conduct	Technical Proposal
8	Form F1	Letter of Bid – Financial Proposal	Financial Proposal
9	Form F2	Form of Bid Security	Financial Proposal
10	Form F3	Price Schedule	Financial Proposal
11	Form F4	Non-Disclosure Agreement (NDA)	Financial Proposal



# TECHNICAL PROPOSAL FORMS

## Form T1 – Letter of Bid (Technical Proposal)

*INSTRUCTIONS TO BIDDERS: (delete this box once you have completed the document)*

*Place this Letter of Bid in the first envelope "TECHNICAL PROPOSAL".*

*The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.*

*Note: All italicized text in black font is to help Bidders in preparing this form and Bidders shall delete it from the final document.*

**Date of this Bid submission: February 20, 2025**

**ITB No.:** LP/T-2155/2025

**Title of Procurement:** SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

**To: Pakistan Security Printing Corporation (Pvt.) Ltd**

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 the following Equipment: *SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS);*
- (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 our Purchase Order 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.

**Name of the Bidder:** *[insert complete name of Bidder]*

**Name of the person duly authorized to sign the Bid on behalf of the Bidder:** \*\* *[insert complete name of person duly authorized to sign the Bid]*

**Title of the person signing the Bid:** *[insert complete title of the person signing the Bid]*

**Signature of the person named above:** *[insert signature of person whose name and capacity are shown above]*

**Date signed** *[insert date of signing]* **day of** *[insert month]*, *[insert year]*

\*\*.: Person signing the Bid shall have the power of attorney given by the Bidder. The power of attorney shall be attached with the Bid Schedules.



## Form T2 – 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.]*

ITB No: LP/T-2155/2025

Title: SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

Bidder: [Manager]

1. Bidder's Name *[insert Bidder's legal name]*

2. Bidder's actual or intended country of registration: *[insert actual or intended country of registration]*

3. Bidder's year of registration: *[insert Bidder's year of registration]*

4. Bidder's Address in country of registration: *[insert Bidder's legal address in country of registration]*

### 5. Bidder's Authorized Representative Information

Name: *[insert Authorized Representative's name]*

Address: *[insert Authorized Representative's Address]*

Telephone/Fax numbers: *[insert Authorized Representative's telephone/fax numbers]*

Email Address: *[insert Authorized Representative's email address]*

6. Attached are copies of original documents of *[check the box(es) of the attached original documents]*

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 T3 – Bidder’s Eligibility / Qualification Criteria**

*[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.]*

ITB No: LP/T-2155/2025

Title: SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM  
SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

Bidder: [Manager]

#	Eligibility / Qualification Criteria	Means of Verifications	Reference in Bid**	Bidder's Assessment (Y/N)
a.	This invitation for Bids is open to all reputed manufactures / suppliers / contractors.	Attach copy of valid NTN certificate.		
b.	Bidders should not be under a declaration of ineligibility for corrupt and fraudulent practices issued by any Government (Federal, Provincial), a local and international body or a public sector organization.	Undertaking on N.J stamp paper (Value of stamp paper should be as per required value as per stamp duty act)		
c.	They must be registered with tax authorities and are active tax payers.	Attach copy of valid GST certificate and reference of Active Taxpayer list of FBR.		
d.	Contractor(s)/firm(s) applying must have valid registration with Pakistan Engineering Council (PEC) in <b>Category C-2</b> or above and at least in Specialization Codes <b>CE-10, EE-11, EE-04, EE-05 &amp; EE-10</b> .			
e.	Valid Sales Tax Certificate from Sindh Revenue Board (SRB).			
f.	Firms in litigation with the Employer shall not be permitted to participate in this process.			
g.	An affidavit (on non-judicial stamp paper) to the effect that the bidder has never been black-listed by any previous employer.			
h.	An affidavit (on non-judicial stamp paper) to the effect that all documents / particulars /			



	information given with this qualification Documents are true.			
i.	An affidavit (on non-judicial stamp paper) to the effect that the bidder has never indulged in corrupt, fraudulent or collusive practice for procuring contracts.			
j.	An affidavit (on non-judicial stamp paper) to the effect that the bidder is not presently involved nor has been in the past in litigation with its employers.			
k.	An undertaking (on non-judicial stamp paper) that bidder will comply with the procuring agency's code of conduct.			

Seal & Signature of Bidder: \_\_\_\_\_

Date: \_\_\_\_\_

**Annex-1****Experience of Similar Assignment (Applicable)**

#	Assignment / Product Description	Company / Name of Customer	Contact Person Name / Contact Details
1.			
2.			
3.			
4.			
5.			

Please attach copies of work/Purchase orders, contract or customer reference letter/email or any other reference document that can substantially prove the above.

**Details of Trained/Experienced Resources (Applicable)**

#	Resource Name	Certificate Details	Certificate Issuance Date
1.			
2.			
3.			
4.			

**Office Address**

#	Company Name	Complete Office Address	Office Numbers
1.			
2.			
3.			

**Form T4 – Affidavit for Bidder’s Blacklisting Status**

ITB No: LP/T-2155/2025

Title: SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM  
SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

Bidder: \_\_\_\_\_

**[Required on non-judicial stamp paper; value of Rs. 100 stamp paper should be as per required value as per Stamp Duty Act]**

To:

Deputy General Manager (Purchase)  
Purchase Department  
Pakistan Security Printing Corporation (Pvt.) Ltd  
Jinnah Avenue, Malir Halt,  
Karachi –Pakistan

**Affidavit for Bidder’s Blacklisting Status**

Dear Sir,

I/We hereby confirm and declare that I/We, [Manager], has/have not been Blacklisted/Sanctioned by any Federal or Provincial Government Department, National Counter Terrorism Authority (NACTA), Agency, Organization or Autonomous Body anywhere in Pakistan during last 05 (five) years.

Detection of false declaration / statement at any stage of the entire Bidding Process / Currency of the Contract shall lead to Disqualification and forfeiture of Bid Security and/or Performance Guarantee and termination of contract.

Seal &amp; Signature of Bidder: \_\_\_\_\_

Date: \_\_\_\_\_





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 (In Block 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 in full or the registered/ principal office address for a subscriber other than natural person	Number of shares taken by each subscriber (in figures and words)
<b>Total number of shares taken (in figures and words)</b>							

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

Name & signature  
(Person authorized to issue notice on behalf of the company)

Seal & Signature of Bidder:	
Date:	



## Form T6 – Manufacturer’s Authorization Form

*[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.**]*

Invitation No: LP/T-2155/2025

Title: SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

Bidder: \_\_\_\_\_

To: *[Pakistan Security Printing Corporation (Pvt.) Ltd]*

### WHEREAS

We [ \_\_\_\_\_ ], 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 28 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: [ \_\_\_\_\_ ]

Name: [ \_\_\_\_\_ ]

Title: [ \_\_\_\_\_ ]

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ *[insert date of signing]*

## Form T7 – Code of Conduct & Undertaking

### Objective

This Code of Conduct aims to establish PSPC's business and employment practices on the highest standards of ethical behavior, integrity, accountability, courage and excellence.

It also aims to ensure that all concerned adhere to PSPC's defined core values, act with prudence, protect the interests of PSPC and maintain a positive work environment.

### Scope

This Code of Conduct is applicable on all PSPC Employees, Contract Employees, Trainees, Apprentices, Deputationist, Outsourced Workforce, and other stakeholders.

### General Behavior

The ethical principles of the Corporation prevail over the concerned individual's personal origins, beliefs, values, opinions, preferences, or habits at all times. All concerned, while they are in PSPC's service, shall strictly adhere to the following rules of General Behavior at all times which include, but are not limited to, the following responsibilities:

- 3.1. Comply with all applicable laws, including, but not limited to, those pertaining to general employment, anti-fraud, corruption, bribery, anti-discrimination, anti-harassment, health, safety and environmental protection.
- 3.2. Conduct themselves honestly and carry out their duties diligently and impartially to the best of their abilities, in compliance with the applicable rules, regulations, policies and procedures, as defined by PSPC from time to time.
- 3.3. Maintain highest standards of ethics and professionalism and devote their working activities to the service of PSPC.
- 3.4. Not guarantee or promise employment of any type to anyone for any length of time.
- 3.5. Assist and advise colleagues and show openness and transparency in all dealings with them.
- 3.6. Do not withhold information from concerned colleagues that may affect the conduct of business, particularly in order to gain a personal advantage. Providing false, inaccurate or exaggerated information, refusing to cooperate with colleagues or demonstrating any form of obstructive behavior is strictly not allowed.
- 3.7. Not indulge in any activity during off duty hours that directly or indirectly undermines the provisions of this Code, other PSPC rules, policies and procedures, or brings disrepute to PSPC.
- 3.8. Refrain from indulging in any illegal and unlawful activity including but not restricted to substance abuse and consumption of alcohol, drugs or any kind of intoxicant(s), as well as, any sort of gambling/betting activities, etc.
- 3.9. Officers of PSPC performing supervisory functions/roles on behalf of PSPC shall take

every possible care to act within the delegated authority as provided by any law, rules or regulations under which such officers may purport to act.

## **Fraud, Embezzlement & Misrepresentation**

4.1. All concerned shall not commit, or assist any activity that involves making false statements, fraud, forgery, misappropriation, theft, embezzlement, bribery, misrepresentation, violation of PSPC rules and regulations, policies and procedures or any similar activity that harms, or may harm the interest and reputation of PSPC.

4.2. Be honest in conveying professional conclusions, opinions, research and findings for whatever purpose and shall not manipulate the system for personal gains.

4.3. Refrain from indulging in any illegal and unlawful activity.

4.4. Abstain from any false or intentionally misleading information and declarations, bogus documents, and submit false or misleading claims with wrong information.

## **Discrimination and Harassment**

5.1. All concerned shall treat all internal and external stakeholders with respect, fairness and courtesy and avoid all such forms of behavior that create or may create an atmosphere of harassment, hostility, intimidation and discrimination of any kind, especially involving age, gender, health, ancestry, physical disability, race, religion, length of service, political beliefs, marital status or family structure.

5.2. Shall not propagate in any manner whatsoever sectarianism, ethnic / regional hatred / animosity and take part in sectarian, ethnic, linguistic or parochial activities, as well as partiality or favoritism on these bases, indulge in nepotism, victimization, willful abuse of power, and unwarranted negative criticism and gossip about other employees.

5.3. Avoid creating / sending / forwarding electronic or any other form of communication that contains statements or material, which is discriminatory, offensive, defamatory, illegal or constituting harassment.

5.4. Refrain from engaging in any form of inappropriate relationship with persons with whom they have a professional relationship.

## **Confidentiality**

6.1. All concerned shall maintain strict confidentiality of PSPC and its constituents affairs and shall not communicate directly or indirectly to their colleague(s) or (ex) employee(s) belonging to other department(s) or profession or to the press or public, any document or information which has come into their possession in the course of their official duties, or has been prepared or collected by them in the course of their duties, whether from official sources or otherwise, unless compelled to do so by judicial or other authority or unless instructed to do so by a superior officer in the discharge of his / her duties. This confidentiality must be maintained by the employee even after the cessation of their employment with PSPC.

6.2. All concerned shall not give any evidence, document, or any information before a public committee without the prior approval of the Competent Authority.

6.3. Interaction or communication directly or indirectly on behalf of PSPC with foreign governments, media, and missions in Pakistan without seeking clearance from the

competent authority is not permissible.

## **Use of PSPC Assets and Resources**

7.1. All concerned are required to use PSPC assets such as properties, office equipment, supplies etc. for PSPC's business purposes and not for gain or benefit of persons or entities other than PSPC, including self.

7.2. Material information such as information contained in any file, document, note, report, letter, fax, USB, email, instrument, etc. held by the concerned must be used solely for the purpose of PSPC business and returned to PSPC upon cessation of employment / contract agreement.

7.3. Official information, documents, reports, proposals, research papers, software, etc. developed using PSPC time and resources constitute PSPC's intellectual property. All concerned will neither have the right to claim these as their own, nor shall they use/exploit the same for personal gain or benefit of persons or entities other than PSPC during or beyond cessation of their employment with PSPC.

## **Political Affiliation**

8.1. No employee of PSPC shall take part in or subscribe in aid of or assist in any way, any political activity / movement in Pakistan or relating to the affairs of Pakistan, or take part in, or in any way assist, any movement or activity, which is, or tends directly or indirectly to be, subversive to Government as by law established in Pakistan or detrimental to the ideology or integrity of Pakistan.

8.2. Employees shall not canvass or otherwise interfere with or use their influence in connection with or take part in any election to a legislative body, whether in Pakistan or elsewhere, provided that an employee who is qualified to vote at such election may exercise their right to vote; but if he/she does so, he/she shall give no indication of the manner in which he/she proposes to vote or has voted.

## **Attendance and Punctuality**

9.1. All concerned shall not leave the office or absent himself / herself from duty, without prior permission of the Competent Authority.

9.2. Strictly adhere to defined break timings, as defined by PSPC from time to time.

## **Conflict of Interest**

10.1. All concerned are required to recognize and disclose activities that might give rise to conflicts of interest or the perception of conflicts and to ensure that such conflicts are properly managed or avoided. All disclosure should be made at the time the conflict arises, or when it is recognized that a conflict may be perceived, in writing to the supervisor. If the supervisor also has an interest in the matter, the disclosure shall be made to the next higher level of authority.

10.2. While an officer is serving in PSPC, their spouse, children and siblings will henceforth not be eligible for recruitment in PSPC, SBP and/or any of its other subsidiaries.

## Gifts and Entertainment

11.1. Except as permitted, employees shall neither receive nor give any gift(s) or favor(s), in cash or any kind, from / to any organization, including those stakeholders (individual, entities or person created by law) who are in contact with PSPC.

11.2. The above instructions will not be applicable in case;

- a. A gift received for value of up to Rs 10,000 provided aggregate value of gifts received / given from / to during a fiscal year from same source does not exceed Rs 20,000;
- b. Advertising materials including trade discounts that an individual or entity normally offers to its general customers;

11.3. The intended recipient will politely refuse the offer of gifts valuing above. However, where such refusal may impact the official relationships, the gift so received would be immediately, but not later than 72 hours, surrendered to HR.

## Prohibitions

12.1. Smoking or other use of tobacco products (including, but not limited to, cigarettes, pipes, cigars, electronic Cig, snuff, or chewing tobacco) is not permitted within the office premises. Employees may smoke outside in open air, at the designated areas, without compromising on the working hours.

12.2. Use of any sort of drug including Pan, Gutka, Naswar, etc. within the office premises is not allowed.

## Self-Disclosure of Criminal Conviction

All employees are required to self-disclose any criminal offence for which any investigating agency have taken cognizance and for which a conviction has been decided against such an employee by any court of law while being professionally engaged with PSPC irrespective of the nature of engagement.

## Health & Safety

All employees must take measures to promote safe working practices, and follow the instructions given by the Health, Safety, and Environment Team from time to time.

## Whistleblowing

All concerned are responsible to immediately report any alleged ethical misconduct or fraud. The employees may raise their concerns through a written report or email at [whistleblower@pspc.gov.pk](mailto:whistleblower@pspc.gov.pk). For more information on the applicability of this policy, refer to Whistleblowing Policy.

## Compliance with the rules of conduct

### Role of line managers

16.1.1. Line managers shall take the necessary measures to encourage respect for the rules of conduct within the entities for which they are responsible.

16.1.2. Managers should ensure that employees placed under their authority are aware of this code.

16.1.3. Apart from the vigilance, line managers are expected to behave in an exemplary manner as regards respect for the principles and rules set out in this code.

16.2. Any information pertaining to violation of this Code must immediately be reported to Director Human Resources.

16.3. If Director Human Resources is found to be violating this Code, MD may be reported. In case of violation by MD, Chairman PSPC may be reported.

## **Reporting Confidentially**

17.1. All stakeholders when reporting to Director HR shall be deemed to have made such report in strict confidence.

17.2. Human Resource Department shall not disclose the identity of concerned employee to other parties unless it is in the interest of the Corporation or it is required by law.

## **Consequences of Violating the Code**

18.1. Any employee who violates the Code shall be subject to disciplinary action.

18.2. Failure to report deviations of the Code by all concerned may result in disciplinary action. Similarly, failure to report deviations of the Code by other stakeholders may result in the termination of their relationship with the Corporation.

## **Interpretation**

This policy shall supersede all previous policies on the subject. In case of any ambiguity in understanding this Policy, the interpretation of the Managing Director will be treated as final. Any exception to the policy shall be approved by the Managing Director on the recommendation of Director HR and shall be reported to Board Human Resource Committee for ratification.

**Undertaking for Compliance with Code of Conduct****Bidder Name:** \_\_\_\_\_**Bidder Representative (If any):** \_\_\_\_\_**Date:** \_\_\_\_\_

I, the undersigned, on behalf of [Bidder Company Name], hereby acknowledge that I have received, read, and understood the Code of Conduct established by [Procuring Agency Name].

As a bidder participating in the procurement process, I undertake to:

1. Adhere to the highest standards of integrity and professionalism in all interactions with PSPC
2. Ensure that all communications and representations made during the bidding process are truthful and transparent.
3. Comply with all applicable laws, regulations, and policies outlined in the Code of Conduct.
4. Avoid any conflicts of interest and disclose any potential conflicts promptly.
5. Report any unethical behavior or violations of the Code of Conduct to the appropriate authorities within PSPC.

I understand that any breach of this undertaking or the Code of Conduct may result in disqualification from the bidding process and potential legal consequences.

**Authorized Signature:** \_\_\_\_\_**Date:** \_\_\_\_\_





# FINANCIAL PROPOSAL FORMS

## Form F1 – Letter of Bid (Financial Proposal)

*INSTRUCTIONS TO BIDDERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE DOCUMENT*

*Place this Letter of Bid - Financial Proposal in the second envelope marked "FINANCIAL PROPOSAL".*

*The Bidder must prepare the Letter of Bid - Financial Proposal on stationery with its letterhead clearly showing the Bidder's complete name and business address.*

*Note: All italicized text is to help Bidders in preparing this form.*

**Date of this Bid submission: February 20, 2025**

**Invitation No:** LP/T-2155/2025

**Name of Project:** SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

**To:** [Pakistan Security Printing Corporation (Pvt.) Ltd]

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 (c) below is:

*In case of only one lot, the total price of the Bid is [insert the total price of the bid in words and figures, indicating the various amounts and the respective currencies];*

*In case of multiple lots, the total price of each lot is [insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies];*

*In case of multiple lots, total price of all lots (sum of all lots) [insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies];*

- (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: *[Specify in detail the method that shall be used to apply the discounts];*

- (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 our Purchase Order shall constitute a binding contract between us, until a formal contract is prepared and executed.

**Name of the Bidder:** *\*[insert complete name of the Bidder]*

**Name of the person duly authorized to sign the Bid on behalf of the Bidder:** \*\*  
*[insert complete name of person duly authorized to sign the Bid]*

**Title of the person signing the Bid:** *[insert complete title of the person signing the Bid]*

**Signature of the person named above:** *[insert signature of person whose name and capacity are shown above]*

**Date signed** *[insert date of signing]* **day of** *[insert month]*, *[insert year]*

\*: In the case of the Bid submitted by a 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. The power of attorney shall be attached with the Bid Schedules.



## Form F2 – Form of Bid Security (Bank Guarantee)

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

*[Guarantor letterhead or SWIFT identifier code]*

**Beneficiary:** *Pakistan Security Printing Corporation (Pvt.) Ltd*

**Invitation No:** **LP/T-2155/2025**

**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 \_\_\_\_\_ under Request for Bids No. \_\_\_\_\_ ("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 F3 – Price Schedule****Invitation No:** LP/T-2155/2025

**Title:** SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (AS PER ATTACHED BOQ / TECHNICAL SPECIFICATIONS & TERMS & CONDITIONS)

**Bidder:** [Manager]

Below mentioned services & supplies will be as per technical specification given in Section V- Technical Specification. **All prices must be in Pak Rupee.** All the quotes must be provided as per format specified below.

Sr. #	Description	Qty. / Items	Total Amount	GST / SST	Total Amount with GST
1	SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM (As per BOQ / Technical Specifications)	01 No			
2	SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING & TESTING OF 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM	01 Job			
<b>Total Amount of bid</b>					

**Note:**

- Prices should be inclusive of all applicable taxes and duties in Pakistan.
- Before filling this form kindly read the required Technical Specifications in Section V.
- The prices should include the price of incidental services. No separate payment shall be made for the incidental services
- (Mobilization advance against Bank Guarantee as per attached bank guarantee form in BOQ) & insurance guarantee PACRA rating AAA or AA++ company.
- Please provide a detailed breakdown related to the cost of each item which will be used for the subject Job. Lumsum bid/quotation will not be acceptable and will be disqualified at the time of final evaluation. Refer Page # 115-130.**

Bidder Must Quote Payment of Supplies and Services separately whereas Payment against item/job shall be done as per undermentioned breakup:

Supply		Services	
Advance Payment	10%	Land Clearance and levelling	15%
Arrival of Solar Panels	15%	On installation of mounting structure	15%
Arrival of Inverters	15%	Installation of solar panels	15%
Arrival of BESS	10%	Installation of KIOSK, inverters, MV panels, BESS along with complete cabling	15%
Arrival of Mounting Structure	10%	Commissioning and System ramp up, Synchronization with Gas generator and	25%



		K-Electric and Commissioning of BESS and SCADA software	
Arrival of AC/DC Cables	10%	Handing over of complete equipment to PSPC complete in all respect	15%
Arrival of KIOSK	10%		
Arrival of MV Panel	05%		
After commissioning and handing over of complete equipment to PSPC.	15%		
<b>Total Supplies</b>	<b>100%</b>	<b>Total Services</b>	<b>100%</b>

## Form F4 – Non-Disclosure Agreement

### Rs. 500/- Stamp Paper Print

P.O.#: \_\_\_\_\_

### NON-DISCLOSURE AGREEMENT (NDA)

This agreement is entered into as of ..... day of..... Year

between

**Pakistan Security Printing Corporation (Pvt.) Limited**, Manufacturer of Banknotes and Prize Bonds registered under the laws of Pakistan, having its registered office at Jinnah Avenue Malir Halt, Karachi, through its authorized representative \_\_\_\_\_ (hereinafter referred to as '**PSPC**', which expression, where the context so requires and permits, shall mean and include its successors-in-interest, administrators, executors, legal representatives and permitted assigns );

and

\_\_\_\_\_, having its registered office at ..... through its authorized representative (hereinafter referred to as '**.....**' which expression, where the context so requires and permits, shall mean and include its successors-in-interest, administrators, executors, legal representatives and permitted assigns).

(PSPC and \_\_\_\_\_ are hereinafter collectively referred to as the "Parties" and individually as a "Party").

**'Agreement'** means this Agreement and all written amendments and revisions made thereto from time to time.

**"Effective Date"** means the date of execution of this Agreement.

**'State'** means the territory of the Islamic Republic of Pakistan.

### **WHEREAS**

The Parties to this Agreement wishes to enter into an Agreement concerning the disclosure of certain proprietary and confidential information, whereby it will be necessary for each party (the "**Disclosing Party**") to disclose to the other Party (the "**Receiving Party**"), as the case may, information of a confidential or proprietary nature for the purposes as defined in the Agreement (**Authorized Purpose**) (irrespective of the form of presentation or communication including, but not limited to data, notes,

analyses, compilations, studies, physical objects, samples, financial information, technical information, cost information, techniques, , material, methods, processes, sources and any other information, however, described, which is or could be valuable in the type of business in which Disclosing Party is engaged) provided that any disclosure of information made in writing shall be marked confidential or with words of similar effect and that any disclosure made orally shall subsequently be reduced to writing by the Disclosing Party and marked confidential or with words of similar effect with a copy sent to the Receiving Party within 30 days of disclosure ("Information").

### **IT IS AGREED AS FOLLOWS:**

1. This Agreement will apply to any disclosure of Information on the Effective Date. This Agreement may be terminated by any Party after giving a prior notice of 30 (Thirty) days' in writing; or immediately if the Disclosing Party has reason to believe that the Receiving Party is in breach of any of the obligations contained herein. Such termination shall not affect any obligation imposed by this Agreement with respect to Information received prior to such termination.
2. Receiving Party shall hold and protect the Confidential Information in the same manner as it protects its own confidential information and in any event such protection shall not be less than that which a reasonable person or business would take in protecting its own confidential information; and shall use the Confidential Information for the sole and exclusive benefit of the Disclosing Party. Receiving Party shall carefully restrict access to Confidential Information and only disclose Information on a need-to-know basis to such of its employees, contractors, agents, representatives and consultants as is reasonably required, and are under similar obligations of confidentiality as contained in this Agreement, the use whereof shall be restricted for Authorized Purpose only.

Receiving Party shall not, without the prior written approval of the Disclosing Party, use publish, copy, or otherwise disclose the Confidential Information to others, or permit the use by others for any purpose other than the Authorized Purpose. Receiving Party shall, forthwith upon receipt of a written request from the Disclosing Party or on termination:

- (i) return all information supplied by the Disclosing Party as well as items and materials relating to or derived from the Information;
  - (ii) deliver to the Disclosing Party or at its request destroy immediately all items and materials made by the Receiving Party containing Information, that are not returned pursuant to paragraph (i) above;
  - (iii) not keep copies or duplicates of any items or materials referred to in paragraphs (i) or (ii) above; and
  - (iv) provide a certificate signed by a senior officer of the Receiving Party confirming that the provisions of this clause have been complied with.
3. This Agreement shall not apply to any Information which the Receiving Party: (a) can show is or becomes publicly available through no fault of the Receiving Party; (b) can show was in its possession prior to the date of disclosure; (c) may subsequently receive from any third party legally in possession of the Information and who was not restricted from disclosing it; (d) can show is independently acquired by the Receiving Party as a result of work carried out by an employee, consultant or contractor of the Receiving Party to whom no disclosure of Information has been made; or (e) is required to disclose pursuant to a court order or any



law/rules/regulations provided that the Receiving Party shall have given prior written notice to the Disclosing Party.

4. This Agreement shall not be deemed to confer or imply the grant or agreement to grant by the Disclosing Party to the Receiving Parties of any of its rights under copyright, patents, trademarks, design rights or other similar rights. All Information supplied hereunder is supplied on an "as is" basis and the Disclosing Party gives no representation or warranty as to its accuracy, completeness or fitness for any purpose other than the Authorized Purpose. The Disclosing Party shall not be liable for any loss or damage suffered by the Receiving Parties as a result of any Receiving Party's use of the Information.
5. This Agreement does not create any agency or partnership relationship and each party shall act as an independent entity. This Agreement will not be assignable or transferable by the Parties. All additions or modifications to this Agreement must be made in writing and signed by the Parties.
6. Notices shall be delivered personally, or by prepaid first class mail, or transmitted by facsimile to the Parties at such address or number as the parties shall specify from time to time.
7. The Receiving party may obtain consent of the Disclosing party for any waiver of rights, to share information received under this Agreement to a third party for the Authorized Purpose. Any waiver of any right under this Agreement is only effective if it is in writing and applies to the specific circumstance for which it has been given.
8. In the event of a breach, Disclosing Party shall be entitled, in addition to any other remedies and damages available at law or in equity, to an injunction to restrain the violation thereof by Receiving Party, or its employees, contractors, agents, representatives and consultants,
1. This Agreement shall be governed by and shall be construed in accordance with the laws of Pakistan. In case of any dispute and difference which may arise in connection with the execution of the contract, the matter shall be referred to Director Operations of Corporation, who shall take decision in the matter. In case the dispute remains unresolved, the matter will be resolved through arbitration as per the Arbitration Act, 1940.

In WITNESS WHEREOF, the parties have executed this Agreement and shall be effective as of the date first above written.

For and on behalf of  
Pakistan Security Printing Corporation

\_\_\_\_\_

For and on behalf of

This Agreement has been executed in the presence of the following witnesses:

1. Full Name: \_\_\_\_\_
- Address: \_\_\_\_\_
- Signature: \_\_\_\_\_
- CNIC No: \_\_\_\_\_



2. Full Name: \_\_\_\_\_
- Address: \_\_\_\_\_
- Signature: \_\_\_\_\_
- CNIC No: \_\_\_\_\_





# **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 affect 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.

	<p>s) <b>“Eligible Country”</b> means the countries and territories eligible for participation in accordance with the policies of the Federal Government.</p> <p>t) <b>“End User”</b> means the organization(s) where the goods will be used, as named in the <b>SCC</b>.</p> <p>u) <b>“Origin”</b> 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.</p> <p>v) <b>“Force Majeure”</b> 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, <b>“Force Majeure”</b> 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.</p> <p>w) <b>“Specification”</b> 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.</p> <p>x) The Supplier's Bid is the completed Bid document submitted by the Supplier to the Procuring Agency.</p>
<p><b>2.Application and Interpretation</b></p>	<p>2.1 These General Conditions shall apply to the extent that they are not superseded by provisions of other parts of the Contract.</p> <p>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.</p> <p>2.3 The documents forming the Contract shall be interpreted in the following order of priority:</p> <ol style="list-style-type: none"> <li>(1) Form of Contract,</li> <li>(2) Special Conditions of Contract,</li> <li>(3) General Conditions of Contract,</li> <li>(4) Letter of Acceptance,</li> <li>(5) Certificate of Contract Commencement</li> <li>(6) Specifications</li> <li>(7) Contractor's Bid, and</li> </ol>

	(8) Any other document listed in the Special Conditions of Contract as forming part of the Contract.
<b>3. Conditions Precedent</b>	<p>3.1 Having signed the Contract, it shall come into effect on the date on which the following conditions have been satisfied: -</p> <ul style="list-style-type: none"> <li>i. Submission of performance Security (or guarantee) in the form specified in the <b>SCC</b>;</li> <li>ii. Furnishing of Advance Payment Unconditional Guarantee.</li> </ul> <p>3.2 If the Condition precedent stipulated on GCC Clause 3.1 is not met by the date specified in the SCC this contract shall not come into effect;</p> <p>3.3 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.</p>
<b>4. Governing Language</b>	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 <b>SCC</b> . Subject to <b>GCC Clause 3.1</b> , the version of the Contract written in the specified language shall govern its interpretation.
<b>5. Applicable Law</b>	5.1 The contract shall be governed and interpreted in accordance with the laws of Pakistan, unless otherwise specified in SCC.
<b>6. Country of Origin</b>	6.1 The origin of Goods and Services may be distinct from the nationality of the Supplier.
<b>7. Standards</b>	7.1 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.
<b>8. Use of Contract Documents and Information; Inspection and Audit by Government of Pakistan</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>

<p><b>9. Patents and Copy Rights</b></p>	<p>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.</p> <p>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.</p>
<p><b>10. Performance Security (or Guarantee)</b></p>	<p>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 <b>SCC</b>.</p> <p>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.</p> <p>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 another form acceptable to the Procuring Agency; or  b) A cashier's or certified check.</p> <p>10.4 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 <b>SCC</b>.</p>
<p><b>11. Inspection and Testing</b></p>	<p>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. <b>SCC</b> 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.</p> <p>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.</p> <p>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.</p> <p>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</p>

	<p>inspected, tested, and passed by the Procuring Agency or its representative prior to the Goods' shipment from the country of origin.</p> <p>11.5 Nothing in <b>GCC Clause 10</b> shall in any way release the supplier from any warranty or other obligations under this Contract.</p>
<b>12. Packing</b>	<p>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.</p> <p>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 <b>SCC</b>, and in any subsequent instructions ordered by the Procuring Agency.</p>
<b>13. Delivery and Documents</b>	<p>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 <b>SCC</b>.</p> <p>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.</p> <p>13.3 Documents to be submitted by the Supplier are specified in <b>SCC</b>.</p>
<b>14. Insurance</b>	<p>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 <b>SCC</b>.</p>
<b>15. Transportation</b>	<p>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.</p> <p>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</p> <p>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.</p>
<b>16. Related Services</b>	<p>16.1 The Supplier may be required to provide any or all of the following services, including additional services, if any, specified in <b>SCC</b>:</p>

	<ul style="list-style-type: none"> <li>a) Performance or supervision of on-site assembly, Installation Commissioning and/or start-up of the supplied Goods;</li> <li>b) Furnishing of tools required for assembly and/or maintenance of the supplied Goods;</li> <li>c) Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;</li> <li>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</li> <li>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.</li> </ul> <p>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.</p>
<p><b>17. Spare Parts</b></p>	<p>17.1 As specified in <b>SCC</b>, 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:</p> <ul style="list-style-type: none"> <li>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</li> <li>b) In the event of termination of production of the spare parts: <ul style="list-style-type: none"> <li>i) advance notification to the Procuring Agency of the pending termination, in sufficient time to permit the Procuring Agency to procure needed requirements; and</li> <li>ii) following such termination, furnishing at no cost to the Procuring Agency, the blueprints, drawings, and specifications of the spare parts, if requested.</li> </ul> </li> </ul>
<p><b>18. Warranty / Defect Liability Period</b></p>	<p>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.</p> <p>18.2 This warranty shall remain valid for a period specified in the <b>SCC</b> 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 <b>SCC</b> after the date of shipment from the port or place of loading in the source country, +whichever period concludes earlier, unless specified otherwise in <b>SCC</b>.</p> <p>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.</p> <p>18.4 Upon receipt of such notice, the Supplier shall, within the period specified in</p>



	<p><b>SCC</b> 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.</p> <p>18.5 If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in <b>SCC</b>, 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.</p>
<p><b>19. Payment</b></p>	<p>19.1 The method and conditions of payment to be made to the Supplier under this Contract shall be specified in <b>SCC</b>.</p> <p>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 <b>GCC Clause 13</b>, and upon fulfillment of other obligations stipulated in the Contract.</p> <p>19.3 Payments shall be made promptly by the Procuring Agency, within thirty (30) 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 <b>SCC</b>.</p> <p>19.4 The currency or currencies in which payment is made to the Supplier under this Contract shall be specified in <b>SCC</b> 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.</p> <p>19.5 All payments shall be made in the currency or currencies specified in the <b>SCC</b> pursuant to <b>GCC Clause 19.4</b></p>
<p><b>20. Prices</b></p>	<p>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.</p> <p>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 <b>SCC</b> or in the Procuring Agency's request for Bid Validity extension, as the case may be.</p>
<p><b>21. Change Orders</b></p>	<p>21.1 The Procuring Agency may at any time, by a written order given to the Supplier pursuant to <b>GCC Clause 22</b>, make changes within the general scope of the Contract in any one or more of the following:</p> <ul style="list-style-type: none"> <li>a) Drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Procuring Agency;</li> <li>b) The method of shipment or packing;</li> <li>c) The place of delivery; and/or</li> <li>d) The Services to be provided by the Supplier.</li> </ul> <p>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,</p>



	<p>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.</p> <p>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</p>
<b>22. Contract Amendments</b>	22.1 Subject to <b>GCC Clause 20</b> , no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.
<b>23. Assignment</b>	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.
<b>24. Sub-Contracts</b>	<p>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.</p> <p>24.2 Subcontracts must comply with the provision of GCC Clause 5.</p>
<b>25. Delays in the Supplier's Performance</b>	<p>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.</p> <p>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.</p> <p>25.3 Except as provided under <b>GCC Clause 28</b>, 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 <b>GCC Clause 26</b>, unless an extension of time is agreed upon pursuant to <b>GCC Clause 25.2</b> without the application of liquidated damages.</p>
<b>26. Liquidated Damages</b>	26.1 Subject to <b>GCC Clause 28</b> , 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 <b>SCC</b> 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 <b>SCC</b> . Once the said maximum is reached, the Procuring Agency may consider termination of the Contract pursuant to <b>GCC Clause 26</b> .
<b>27. Termination for Default</b>	<p>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.</p> <p>27.2 Fundamental breaches of Contract shall include, but shall not be limited to the</p>



	<p>following:</p> <ul style="list-style-type: none"> <li>a) 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 <b>GCC Clause 24</b>; or</li> <li>b) the Supplier fails to perform any other obligation(s) under the Contract;</li> <li>c) Supplier’s failure to submit performance security (or guarantee) within the time stipulated in the <b>SCC</b>;</li> <li>d) the supplier has abandoned or repudiated the contract.</li> <li>e) the Procuring Agency or the Supplier is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;</li> <li>f) a payment is not paid by the Procuring Agency to the Supplier after 84 days from the due date for payment;</li> <li>g) 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; and</li> <li>h) 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.</li> </ul> <p>27.3 For the purpose of this clause:  <b>“Corrupt and Fraudulent Practice”</b> means the practices as described in Rule-2 (1) (f) of Public Procurement Rules-2004.</p> <p>27.4 In the event the Procuring Agency terminates the Contract in whole or in part, pursuant to <b>GCC Clause 26.1</b>, 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.</p>
<p><b>28. Termination for Force Majeure</b></p>	<p>28.1 Notwithstanding the provisions of <b>GCC Clauses 25, 26, and 27</b>, 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.</p> <p>For purpose of this clause, <b>“Force Majeure”</b> 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</p> <p>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</p>

	<p>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.</p>
<b>29. Termination for Insolvency</b>	<p>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.</p>
<b>30. Termination for Convenience</b>	<p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>a) To have any portion completed and delivered at the Contract terms and prices; and / or</li> <li>b) To cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Services and for materials and parts previously procured by the Supplier.</li> </ul>
<b>31. Disputes Resolutions</b>	<p>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, within twenty-eight (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.</p> <p>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.</p>
<b>32. Procedure for Disputes Resolutions</b>	<p>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 <b>SCC</b>.</p> <p>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.</p> <p>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 <b>SCC</b>.</p>
<b>33. Replacement of Arbitrator</b>	<p>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.</p>

<p><b>34. Limitation of Liability</b></p>	<p>34.1 Except in cases of criminal negligence or willful conduct, and in the case of infringement pursuant to <b>GCC Clause 8</b>,</p> <p>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</p> <p>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.</p>
<p><b>35. Notices</b></p>	<p>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 <b>SCC</b>.</p> <p>35.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.</p>
<p><b>36. Taxes and Duties</b></p>	<p>36.1 A foreign Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside Pakistan.</p> <p>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.</p> <p>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.</p>



## **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
<b>Definitions (GCC 1)</b>		
1.	1.1	The Procuring Agency is: [Subject]
2.	1.1(p)	The Supplier is: [Name and address]
3.	1.1(q)	The title of the subject procurement or The Project is: <b>SUPPLY OF EQUIPMENT AND AUXILIARIES FOR 2 MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWH BATTERY ENERGY STORAGE SYSTEM SERVICES ARE REQUIRED FOR INSTALLATION COMMISSIONING &amp;</b>
<b>Governing Language (GCC 4)</b>		
4.	4.1	The Governing Language shall be: <b>English</b>
<b>Applicable Law (GCC 5)</b>		
5.	5.1	The Applicable Law shall be: <b>Laws of Pakistan</b>
<b>Country of Origin (GCC 6)</b>		
6.	6.1	Country of Origin is the country where offered items is/are manufactured.
<b>Performance Security (or guarantee) (GCC 10)</b>		
7.	10.1	The amount of performance guarantee, as a percentage of the Contract Price, shall be: [05% (five percent)] for a period of 2 years
8.	10.4	Successful bidder, shall submit 5% performance guarantee and the same will be released after 2 years of satisfactory supply of goods / services.
<b>Inspections and Tests (GCC 11)</b>		
9.	11.1	Inspection and tests prior to shipment of Goods and at final acceptance are as follows;

		<p><b>On Site Training</b>  Contractor must provide detailed on-site training to PSPC staff of 10 persons on operation and maintenance of all components of Solar Plant. PSPC may reasonably request additional training and Contractor will conduct such training at Contractor expense. Training may take place over multiple sessions to accommodate PSPC's staff availability. Onsite training shall include but not limited to following:</p> <ul style="list-style-type: none"> <li>• General Operation and Maintenance of all system</li> <li>• General safety orientation regarding operation and maintenance of plant</li> <li>• Sequence of operation of Plant</li> <li>• Synchronizing of PV with gas generators or K-Electric</li> <li>• Monitoring of all plant parameters, checking components status, warnings, alarms, configurations, control of breakers through SCADA software</li> <li>• Detailed warning and alarms list and their probable root causes</li> <li>• Fault diagnosis of inverters, BESS, MV/LV panels, DC boxes physically at the equipment and through SCADA software.</li> <li>• System configuration and settings including BESS output control, ramp rate control, PV plant active &amp; reactive power, Voltage and frequency control, Power Plant contingency management, peak Power shifting, Power smoothing/ramping etc.</li> <li>• Data exchange and storage</li> <li>• All passwords of inverters, BESS control, SCADA software, Sun tracking controllers and all other controllers must be handed over to PSPC officer in charge.</li> </ul>
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<b>Packing (GCC Clause 12)</b>		
10.	12.2	Not Applicable
<b>Delivery and Documents (GCC Clause 13)</b>		

11.	13.1	<b>For Goods supplied from abroad:</b> Not Applicable
12.	13.3	<b>For Goods from within Pakistan:</b> Upon delivery of the Goods to the transporter, the Supplier shall notify the Procuring Agency and mail the following documents to the Procuring Agency:  (ii.) delivery note  (ii.) Manufacturer's or Supplier's warranty certificate as specified  in BOQ / Technical specification;





<b>Insurance (GCC Clause 14)</b>		
13.	14.1	Not applicable.
<b>Related Services (GCC Clause 16)</b>		
14.	16.1	<p>Related services to be provided are:</p> <p>Supplier shall provide all the related services as per GCC-16 without any additional cost to the Procuring Agency (If required in BOQ / Technical specification).</p>
<b>Spare Parts (GCC Clause 17)</b>		
15.	17.1	<p>Additional spare parts requirements are:</p> <p>Compliance certificate on vender's letter head on spare part availability for</p>
<b>Warranty (GCC Clause 18)</b>		

16.	18.2	<p>GCC Clause 18.2—In partial modification of the provisions, the Supplier shall, in addition, comply with the performance and/or consumption guarantees specified under the Contract. If, for reasons attributable to the Supplier, these guarantees are not attained in whole or in part, the Supplier shall, at its discretion, either:</p> <ul style="list-style-type: none"><li>a. make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense and to carry out further performance tests in accordance with SCC 4.</li><li>b. pay liquidated damages to the Procuring Agency with respect to the failure to meet the contractual guarantees. The rate of these liquidated damages shall be <b>2%</b> per month or part of month for the value of the stores which the SUPPLIER has failed to deliver within the stipulated period, provided that damages shall not <b>exceed 10%</b> of the total price payable under the Purchase Contract, otherwise BUYER will make deduction from SUPPLIER'S bill.</li></ul>
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All proposed L.T Switchboards (complete set including all equipment, devices, components, parts etc.) will include a warranty of at least 2 years from his proposed Original Equipment Manufacturer (OEM). The warranty period shall commence upon issuance of the Taking Over Certificate (TOC). Effectiveness of duration of warranty from Original Equipment Manufacturer (OEM) shall commence from the effective date of Taking Over Certificate issued by the Engineer. All warranties are to be endorsed in the name of the Employer and an undertaking shall be submitted from Original Equipment Manufacturer (OEM) and local representatives for ensuring compliance of services to the Employer during Warranty Period. The cost incurred for such warranty shall deem to have been included in the item rate of relevant BOQ item. No additional payment, whatsoever, shall be admissible in this regard and for extended warranty, if any.

All proposed H.T Switchboards (complete sets including all equipment, devices, components, parts etc.) will include a warranty of at least 2 years from his proposed Original Equipment Manufacturer (OEM). The warranty period shall commence upon issuance of the Taking Over Certificate (TOC). Effectiveness of duration of warranty from Original Equipment Manufacturer (OEM) shall commence from the effective date of Taking Over Certificate issued by the Engineer. All warranties are to be endorsed in the name of the Employer and an undertaking shall be submitted from Original Equipment Manufacturer (OEM) and local representatives for ensuring compliance of services to the Employer during Warranty Period. The cost incurred for such warranty shall deem to have been included in the item rate of relevant BOQ item. No additional payment, whatsoever, shall be admissible in this regard and for extended warranty, if any.

**Warranty (From the date of handing over certificate):**

- 5 Years Inverters warranty
- 12-year Product warranty of PV panels
- 5-year Product warranty of BESS and 20 years' service life
- 2 years repair warranty of KIOSK Structure
- 2 years repair warranty of Transformers
- 2 years replacement warranty of MET station
- 2 years Sun tracking motors replacement warranty
- 5 Years repair warranty against any defect of PV array structure
- 1 Year replacement warranty of all breakers
- 2 year replacement warranty of all remaining equipment and components
- 2 year workmanship warranty against any defect in local works
- FOC After sales maintenance service for 2 year

**DETAILED WARRANTY OF PANELS & OTHER EQUIPMENTS**

Refer Page # 115-130

17.	18.4 & 18.5	<p>The period for correction of defects in the warranty period is: As specified in BOQ/Technical Specification.</p> <p>If, as a result of the Contractor's failure to comply with the provision of the Contract, such use proves to be unsatisfactory, the Employer will have the right to continue such use until such portion of the work can, without injury to the Employer, be taken out of service / operation for correction of defects, errors, omissions, or replacement of unsatisfactory materials or equipment, as necessary for such work to comply with the Contract; provided that the period of such operation or use pending completion of appropriate remedial action shall not exceed twelve months unless otherwise mutually agreed upon in writing between the parties.</p>																																												
<b>Payment (GCC Clause 19)</b>																																														
18.	19.1	<p>The method and conditions of payment to be made to the Supplier under this Contract shall be as follows:</p> <p><b>Payment for Goods supplied from abroad:</b> <b><i>NOT APPLICABLE</i></b></p>																																												
		<p><b>Payment for Goods and Services supplied from within Pakistan:</b> Bidder Must Quote Payment of Supplies and Services separately whereas Payment against item/job shall be done as per undermentioned breakup:</p> <table border="1"> <thead> <tr> <th colspan="2"><b>SUPPLY</b></th> <th colspan="2"><b>SERVICES</b></th> </tr> </thead> <tbody> <tr> <td>Advance Payment</td> <td>10%</td> <td>Land Clearance and levelling</td> <td>15%</td> </tr> <tr> <td>Arrival of Solar Panels</td> <td>15%</td> <td>On installation of mounting structure</td> <td>15%</td> </tr> <tr> <td>Arrival of Inverters</td> <td>15%</td> <td>Installation of solar panels</td> <td>15%</td> </tr> <tr> <td>Arrival of BESS</td> <td>10%</td> <td>Installation of KIOSK, inverters, MV panels, BESS along with complete cabling</td> <td>15%</td> </tr> <tr> <td>Arrival of Mounting Structure</td> <td>10%</td> <td>Commissioning and System ramp up, Synchronization with Gas generator and K-Electric and Commissioning of BESS and SCADA software</td> <td>25%</td> </tr> <tr> <td>Arrival of AC/DC Cables</td> <td>10%</td> <td>Handing over of complete equipment to PSPC complete in all respect</td> <td>15%</td> </tr> <tr> <td>Arrival of KIOSK</td> <td>10%</td> <td></td> <td></td> </tr> <tr> <td>Arrival of MV Panel</td> <td>05%</td> <td></td> <td></td> </tr> <tr> <td>After commissioning and hand over of complete equipment to PSPC</td> <td>15%</td> <td></td> <td></td> </tr> <tr> <td><b>Total Supplies</b></td> <td><b>100%</b></td> <td><b>Total Services</b></td> <td><b>100%</b></td> </tr> </tbody> </table>	<b>SUPPLY</b>		<b>SERVICES</b>		Advance Payment	10%	Land Clearance and levelling	15%	Arrival of Solar Panels	15%	On installation of mounting structure	15%	Arrival of Inverters	15%	Installation of solar panels	15%	Arrival of BESS	10%	Installation of KIOSK, inverters, MV panels, BESS along with complete cabling	15%	Arrival of Mounting Structure	10%	Commissioning and System ramp up, Synchronization with Gas generator and K-Electric and Commissioning of BESS and SCADA software	25%	Arrival of AC/DC Cables	10%	Handing over of complete equipment to PSPC complete in all respect	15%	Arrival of KIOSK	10%			Arrival of MV Panel	05%			After commissioning and hand over of complete equipment to PSPC	15%			<b>Total Supplies</b>	<b>100%</b>	<b>Total Services</b>	<b>100%</b>
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19.	19.3	<p>Rate to be used for paying the Supplier's interest on the late payment made by Procuring Agency shall be <b>(Not Applicable)</b></p>																																												
<b>Prices (GCC Clause 20)</b>																																														
20.	20.1	<p>Quoted Prices shall not be adjusted.</p>																																												
<b>Liquidated Damages (GCC Clause 26)</b>																																														

21.	25.1	The SUPPLIER shall pay to the BUYER at the rate of 2% per month or part of month for the value of the stores which the SUPPLIER has failed to deliver within the stipulated period, provided that damages shall not exceed 10% of the total price payable under the Purchase Contract, otherwise BUYER will make deduction from SUPPLIER'S bill.
<b>Procedure for Dispute Resolution (GCC Clause 32)</b>		
23.	32.3	<p><b>Dispute Resolution</b></p> <p>In case of any dispute and difference which may arise in connection with the execution of the contract, the matter shall be referred to Managing Director of Corporation, who shall take decision in the matter.</p> <p>In case the dispute remains unresolved, the matter will be resolved through arbitration as per the Arbitration Act, 1940.</p>
<b>Notices (GCC Clause 35)</b>		
26.	35.1	<p>— Procuring Agency's address for notice purposes: <i>(to be inserted at the time of contract signing)</i></p> <p>— Supplier's address for notice purposes: <i>(to be inserted at the time of contract signing)</i></p>
<b>Tax &amp; Duties (GCC Clause 36)</b>		



27	36	<p>Prices payable to the Supplier as stated in the Contract are not subject to any adjustment during performance of the contract. However, any subsequent legislation enacted, changes in the rate of any tax, levy of additional tax or duty during the currency of contract that impacts the contract price would be duly accounted for by both the parties of the contract i.e. in case of increase or decrease in the rates of the said taxes and duties or levy of any new tax or duty, the contract price would be adjusted accordingly.</p>
<b>Confidentiality</b>		
28		<p>28.1 Information relating to evaluation of bids and recommendations concerning to award of the Contract shall not be disclosed by the Procuring Agency to the Supplier or to any other person who is not officially concerned with the process, until the announcement of the result of evaluation.</p> <p>28.2 The Supplier 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.</p> <p>28.3 In case of any disclosure related to the bidding process and contractual obligations at any stage by the Supplier, the Procuring Agency may terminate the Contract.</p>

# SECTION IX: CONTRACT FORMS

(TO BE EXECUTED ON N.J. STAMP PAPER VALUING 0.35% OF PURCHASE ORDER)

PURCHASE CONTRACT (SUPPLY)

PURCHASE ORDER # \_\_\_\_\_

This agreement made on the \_\_\_\_ day of \_\_\_\_\_ effective from \_\_\_\_ between Messrs, \_\_\_\_\_, hereinafter referred to as SUPPLIER & Pakistan Security Printing Corporation (Pvt) Limited, Karachi, Pakistan, hereinafter referred to as BUYER on the following terms as conditions: -

- |                      |   |   |
|----------------------|---|---|
| 1. COMMODITY         | : | _____   |
| 2. SPECIFICATIONS    | : | _____   |
| 3. COUNTRY OF ORIGIN | : | _____   |
| 4. QUANTITY          | : | _____   |
| 5. UNIT PRICE        | : | _____   |
| 6. TOTAL VALUE       | : | _____   |
| 7. PACKING           | : | _____   |
| 8. TERMS OF PURCHASE | : | Free delivery at BUYER Factory situated at Jinnah Avenue, Malir Halt, Karachi |

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 Purchase Order
- h. Integrity Pact
- i. Performance Security (Guarantee) Form
- j. Undertaking of Code of Conduct

## 9. DELIVERY:

The SUPPLIER shall deliver the goods within as per Purchase order from the date of Purchase Order, to the authorized representative of the Corporation and obtain his signature with name and designation, otherwise the BUYER will not be responsible for the goods delivered. No supply shall be made on holidays & after 4 pm from Monday to Thursday & 1 pm on Friday & Saturday.

## 10. LIQUIDATED DAMAGES:

The SUPPLIER shall pay to the BUYER at the rate of 2% per month or part of month for the value of the stores which the SUPPLIER has failed to deliver within the stipulated period, provided that damages shall not exceed 10% of the total price payable under the Purchase Contract, otherwise BUYER will make deduction from SUPPLIER'S bill.

**11. FORCE MAJEURE**

The SUPPLIER shall not be held responsible for late or non-delivery of the goods due to strikes and generally recognized force majeure causes. However, in such cases, the SUPPLIER shall deliver to the BUYER a certificate of the accident issued by the competent Government Authority and/or the Chamber of Commerce at the place where the accident occurred as evidence thereof, reasonable extension shall be granted at the option of the Corporation.

**12. INSPECTION**

The BUYER or his authorized representative shall have the right to inspect any goods after or before the dispatch from the SUPPLIER'S Factory or premises. However, such inspection shall not absolve the SUPPLIER from the responsibility or liability for the delivery of goods according to the contracted specification nor shall be interpreted so as in any way to imply acceptance of such goods.

**13. WARRANTY**

The SUPPLIER hereby gives a warranty that the supplies to be made by him will be highest grade in quality consistent with the established and generally accepted standards. The SUPPLIER Shall protect and indemnify the BUYER against loss, damages and expenses whatever that the BUYER may suffer as a result of failure of the material to render useful service and that this warranty to remain effective after inspection and payment, as to the patent or latent defect detected after installation or use for a period of \_\_\_\_\_.

**14. CLAIM.**

If the SUPPLIER fails to deliver the goods within the period stipulated in the contract, or if the goods are short in weight, or if the packing of the goods is not in conformity with the contracted specification or reference samples, or if the goods otherwise not in accordance with the contracted specifications, the BUYER shall have the right in addition to and notwithstanding their right to claim compensation for breach of contract, to terminate the un-executed part of the contract and make purchases from other sources at the risk and cost of the SUPPLIER. The supplier shall settle all claims referred by the BUYER within fifteen days of the receipt of the same and in the event of their failure to do so, shall be liable to pay interest @ 14% per annum of the amount claimed

**15. PERFORMANCE GUARANTEE.**

**05%** Performance Guarantee is required of the total contract amount for the entire contract period and would be kept with PSPC for a period of 2 years after project completion. The Performance Guarantee shall be in the form of Payment order / Demand Draft or an unconditional Bank Guarantee or insurance guarantee (*PACRA Rating AAA & AA+ only*) enforceable in Pakistan as per Performance Guarantee form specified in the Bidding Documents.

In case of successful bidder, bid security will be treated as performance guarantee.

**16. OTHER CONDITIONS:**

- A) The SUPPLIER shall arrange delivery of goods with advance Note or Delivery Challan on which the Purchase Order No. quantity and suppliers name must be mentioned. Otherwise it shall be liable to non-acceptance and held by the BUYER at the SUPPLIER risk and if not cleared by them within a week time, go down expenses shall be charged at actual.



- B) The SUPPLIER shall not transfer or assign directly to any person or person any portion of this contract without prior written consent of the Buyer.

### 17. PAYMENT.

Part supply / Services Part Payment may be allowed as per BOQ. Payment shall be made by the BUYER through cheque within 30 days of receipt of two copies of the invoice/ bill by the G.M (F&A) P.S.P.C and one copy by the Purchase Order Manager P.S.P.C. along with copy of relevant advice note or challan and acceptance

certificate from the BUYER authorized Officer/ Stock Controller.

### 18. TAXES & CHARGES.

Supplier shall pay all taxes & charges with respect to transaction of business under this contract agreement liable under any law enforce for the time being which may subsequently enforce during the execution of this agreement.

### 19. ARBITRATION

In case of any dispute and difference which may arise in connection with the execution of the contract, the matter shall be referred to Managing Director of Corporation, who shall take decision in the matter.

In case the dispute remains unresolved, the matter will be resolved through arbitration as per the Arbitration Act, 1940.

### 20. TERMINATION

The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:

A- If the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof.

B- If the supplier fails to perform any other obligations(s) under the contract.

C- If the supplier, in the judgment of purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract. In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner as it deems appropriate, goods & services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods or services. However, the supplier shall continue performance of the contract to the extent not terminated.

For and on behalf of CORPORATION

For and on behalf of the CONTRACTOR

Signature.: _____	Signature. _____
Name. _____	Name. _____
PAKISTAN SECURITY PRINTING CORPORATION	_____
(Pvt.) LTD.	_____
Jinnah Avenue, Malir Halt, Karachi.	_____

WITNESSES: -			
Signature	: _____	Signature	: _____
Name	: _____	Name	: _____
Address	: _____ _____	Address	: _____ _____
N.I.C. NO.	: _____	N.I.C. NO.	: _____

### 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 Government of Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) through any corrupt business practice.

Without limiting the generality of the foregoing [Name of Supplier] represents and warrants that it has fully declared the brokerage, commission, 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 GoP, except that which has been expressly declared pursuant hereto.

[Name of Supplier] certifies that it has made and will make full disclosure of all agreements

and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, 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 GoP under any law, contract or other instrument, be voidable at the option of GoP.

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

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[Buyer]

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[Seller/Supplier]

## Performance Security (or guarantee) Form

To: [Subject]

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]*

## BILL OF QUANTITIES

### 2MW ON-GRID SOLAR SYSTEM WITH SINGLE AXIS SUN TRACKING AND 1MWh BATTERY ENERGY STORAGE SYSTEM

Pakistan security printing corporation (PSPC) intends to extend their existing Solar PV system to reduce its basket energy cost. A 2MW Ground based Solar System with Single Axis Sun tracking and 1MWh Battery Energy Storage System (BESS) is required to enhance Power generation. The solar system must be able to operate in synchronization primarily with Gas Generators (3 X 1.4MW) by sharing the load and also with K-Electric Supply. The objective is to maximize the consumption of clean solar energy over all other sources and reduce energy costs.

#### Abbreviations and Acronyms

A-E	Architectural and engineering	ANSI	American National Standards Institute
AC	alternating current	BMS	Battery management system
AHJ	Authority Having Jurisdiction	IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers	kW	kilowatt
E	kilowatt-hour	NEC	National Electrical Code
NEMA	National Electrical Manufacturers	SOW	Statement of Work
UL	Underwriters Laboratories	ASCE	American Society of Civil Engineers
BES	Battery Energy Storage System	ECP	Earth Connecting Point

Sr. No.	Description	Make/Origin	Model	Quantity	Price	Total Amount
1.	<p><b>Solar PV Panel (N Type-Double Glass-Bi-facial)</b> Annual Production linear degradation warranty must be less than or equal to 0.4% for over 30 years (except 1st year) and 12 years of Product warranty.</p> <p>Ratings at STC (Standard Test Conditions) All the panels must be <math>\geq 710W</math> Output efficiency greater or equal to 22.5% Power Tolerance 0~3% Temperature Coefficients of Pmax: <math>\leq -0.29\%/^{\circ}C</math> Temperature Coefficients of Voc: <math>\leq -0.26\%/^{\circ}C</math> Temperature Coefficients of Isc: <math>\leq 0.05\%/^{\circ}C</math> Modules must be tested at ESTI (European Solar test installation) or certified according to international standard IEC- 61215 &amp; IEC 61941 and their results should be provided. Cells should be made of monocrystalline silicon. Module must be framed with marine grade aluminum with appropriate seals to prevent water and corrosion damage to the active component panels. The modules must have a separate connection box on their back side that meets protection class IP68. Connections must be direct wire connection type, panel wiring using crimped or soldered connection lugs must not be used for wire connections. The connections screws must include lock washers, Vibration proofing or other means to prevent loosening due to thermal cycling of panels. Details of the material used in construction, including the frame, the connection boxes, the backing material, encapsulation material and payback time of the solar system cost should be clearly mentioned in bid. Voc, Isc, Impp, Vmpp, Wp, Physical size and weight, manufacturer's name, module model identification, Module serial No., rated Power at standard conditions, date of manufacture must be mentioned on PV module and also on bid. Warranty terms and procedures must be clearly mentioned in the bid on OEM's official letter head for making warranty claims.</p>	EU/USA/JAPAN /CHINA	Trina Solar/Jinko solar/JA Solar/Longi Solar	2860 No.		

2.	<p><b>Inverter 3 phase</b>  On-Grid inverter Maximum Input Power Approx. 330 KW, 800V @50Hz  Operating efficiency at least 98.5%,  MPPT Voltage 500~1500V  Total Harmonic distortion <math>\leq</math> 01%  Operation range -25<sup>o</sup>C ~60<sup>o</sup>C  IP66 Rated  Must have inbuild type II DC and AC surge arrester Protection  Power factor adjustment range -0.8 to +0.8  Output of this inverter is required to be synchronized with 11KVSystem K-electric &amp; Genset supply and export or Import power to or from K-electric (both at 11kV)  Genset supply taking voltage variation up to 5% and frequency variation up to 4%. Inverter should be able to supply rated voltage in case of partial shading on PV panels. Inverter must be equipped with protections including loss of mains, anti-islanding relays as per NEC rules. Inverter must be able to remain in synchronization with Gas generator or K Electric supply during voltage disturbance of 150ms and 30%Un in Gas generator or K-Electric supply. Inverter should provide facility to induct or not induct excess power into connected grid.  Display and Logging  System export KWh Solar KWh  Running hours  inverter voltage, Current, KW, KVA, Frequency, the system must have provision to interface with the remote display for public viewing. (USB, RS485port, Ethernet)  Complied to IEC 62109-1/-2, IEC 62920, IEC 60947-2, EN 50549-2, IEC 61683 or equivalent standards  Warranty terms and procedures must be clearly mentioned in the bid for making warranty claims.</p>	USA/EU/Japan/China	Huawei/A BB/SMA/fronius/Equivalent	06No.		
3.	<p><b>KIOSK Substation</b>  Both Main Transformer(2200KVA) and BESS transformer (1250KVA) along with all LV Panels must be installed in a KIOSK substation build as per IEC 62271-202 standard.  Kiosk must have ventilation system designed for ambient temperature 45degree C to keep the temperature within acceptable range for LV panels and transformers  Integrated fire protection system with alarm  Must have glass wool sheet to absorb external heat and to maintain temperature inside each</p>	Tariq Electric/Equivalent	<p><b><u>Transformers</u></b>  Transpower/PEL</p> <p><b><u>Termination Kits</u></b>  RAYCHEM/3M</p> <p><b><u>LV Panels</u></b>  Schneider/</p>	01No.		

<p>compartment RAL7035 Epoxy polyester powder coating paint certified for outdoor marine and coastal areas. Must be properly earthed with 2 X ECP at each compartment. 12-14 Gauge Material IP 66 or above rated 2200KVA LV panels must be connected through a BTB Kiosk Substation essentially contain following three compartments: <b>1) LV Panels Compartment:</b> LV Panels (7 incoming 1 outgoing) Non-Type Tested, Form 3b, Main Busbar 2000A Floor Standing, Indoor/IP42, 50kA, Rated Voltage Approx. 800V in accordance with IEC 60947 (Refer Annexure I for detailed Specifications)</p> <p><u>Inverter Incomer Panel</u> Panel must contain 7 incomer breakers (6 inverters+ 1 Spare): 7 X TP MCCBs, Adj. 320A 800V, I<sub>sc</sub>20 kA in accordance with IEC 60947-2 Make: ABB/Siemens/Schneider/Terasaki 3 X Phase indication Lamps at each breaker Make Schneider/Camsco/Emas</p> <p><u>Dispatch Panel</u> 1 X Outgoing 4P Air Circuit Breaker, Rated Operational Voltage 800V, adjustable 2000A, 65 kA @ 40°C with manual operating mechanism and Spring charging Electronic trip unit LSIG, motorized operating mechanism, 2NO &amp; 2NC auxiliary contact, Shunt Coil, Closing Coil, Undervoltage trip in accordance with IEC 60947-2 Make Siemens/ABB/Schneider/Terasaki 4 X CTs 2000/5A Make FICO/Metelx 1 X MODBUS TCP enabled Energy Analyzer Siemens PAC4200/ABB/Schneider 3 X Phase indication Lamps Make Schneider/Camsco/Emas ON/OFF/TRIP indication Lamps Schneider/Camsco/Emas ON/OFF Push Button Set Schneider/Camsco/Emas Exhaust Fans with Louvers Must have type II AC Surge protection device (SPD) Local/Remote Operation Functionality</p> <p><u>BESS Outgoing Panel</u> 1 X Incoming Cum Outgoing 4P Air Circuit Breaker, Rated Operational Voltage 800V, adjustable 1250A, 65 kA @ 40°C with manual operating mechanism</p>	<p>ABB/ Siemens or authorized manufacturer of above</p> <p><b><u>Breakers</u></b> Schneider/ ABB/ Siemens/ Terasaki</p> <p><b><u>Digital Energy Analyzer</u></b> Schneider/ ABB/Siemens</p> <p><b><u>CTs</u></b> Fico/ Metelx</p> <p><b><u>Indication lights</u></b> Schneider/ /maruyasu/ Lovata</p> <p><b><u>BTB</u></b> Schneider/ ABB/ Siemens/ Tariq Electric</p>			
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<p>and Spring charging Electronic trip unit LSIG, motorized operating mechanism, 2NO &amp; 2NC auxiliary contact, Shunt Coil, Closing Coil, Undervoltage trip in accordance with IEC 60947-2  Make Siemens/ABB/Schneider  4 X CTs 1250/5A Make FICO/Metelx  1 X RS485 enabled Energy Analyzer Siemens PAC4200  3 X Phase indication Lamps Make Schneider/Camsco/Emas  ON/OFF/TRIP indication Lamps Schneider/Camsco/Emas  ON/OFF Push Button Set Schneider/Camsco/Emas  Exhaust Fans with Louvers  Local/Remote Operation Functionality</p> <p><b>2) Main Transformer Cabinet</b>  Oil Type Step-up Transformer: 2200 kVA, 50Hz, ONAN, with Roller Wheels, Indoor Type  Ambient Temperature: 50 Deg C  Max winding temperature rise 90 Deg C  0.8/11kV Vector Group Dyn11  Winding Type: LV(Cu)/MV(Cu) IEC 60076  Efficiency at unity power factor and 100% rated current: 98.5%  Rated Basic Impulse Level (BIL):75KV  Must be supplied with first filling of oil, Transformer oil shall be in accordance with IEC 60296  Silica Gel Breather  Accessories: Pressure Release Device (with contacts), Double Float Buchholz Relay (with contacts), Oil Temperature Relay (with contacts), oil level indicator (with contacts), off load tap changer 5 positions  Must have oil drain valve. Base rollers for installation and removal of transformer.  Transformer neutral and body must be properly grounded.  10KG Silica Gel Grains (Sealed Pack) must also be supplied with transformer  2 Years Warranty</p> <p><b>3) BESS Transformer Cabinet</b>  Oil Type Step-up Transformer: 1250 kVA, 50Hz, ONAN, with Roller Wheels,  Indoor Type, 130/180 (55 Deg C Ambient)  LV side 690V/As per BESS output voltage.  MV side: 11kV Vector Group Dyn11  Winding Type: LV(Cu)/MV(Cu) IEC 60076  Efficiency at unity power factor and 100% rated current: 98.5%  Rated Basic Impulse Level (BIL):75KV  Must be supplied with first filling of oil,</p>					
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	<p>Transformer oil shall be in accordance with IEC 60296 Silica Gel Breather Accessories: Pressure Release Device (with contacts), Double Float Buchholz Relay (with contacts), Oil Temperature Relay (with contacts), oil level indicator (with contacts), off load tap changer 5 positions Must have oil drain valve. Base rollers for installation and removal of transformer. Transformer neutral and body must be properly grounded. 10KG Silica Gel Grains (Sealed Pack) must also be supplied with transformer 2 Years Warranty</p> <p><b>Bus Tie Duct (LV panels to Transformer)</b> Dispatch Panel in LV compartment must be connected to Main transformer(2200KVA) through 2000A BTd and BESS incomer panel are to be connected with BESS transformer (1250KVA) through BTd of relevant size and rating as per OEM and global standards. LV bus tie duct routine tested in accordance with IEC 61439 standards The LT Bus Tie Duct shall be 3-phase, 4-bar with earth as body with full capacity neutral and shall have conductors of rectangular 99.9% pure high conductivity electrolytic tinned copper of cross sections of 2000A rating. The housing of LT Bus Tie Ducts shall be made of at least 14 SWG sheet steel. The sheet steel shall be derusted, degreased and painted with heat resistant paint over base coat of anti-rust paint to ensure adequate protection against environmental effects of highly corrosive environment. IP-54 rated LT Bus Tie Duct / Bus Bar Trunking shall be of 100% rating at 35 deg. C. 2 Years Warranty</p>					
4	<p><b>Battery Energy Storage System (BESS):</b> BESS must be complete with all related auxiliaries including Master Controller, Power Conversion system Min. Energy storage system capacity with controller:1000 kWh Power Conversion System (At least):1000KW Max Rated discharge power (At least):1000KWh Rated Output Voltage: 690V/As per Design 50Hz, PF: 1 Charge and discharge response time:300ms Ambient working Temperature 40-degree C Container Protection Level IP66</p>	EU/USA/Japan/China	Reflex/Equivalent	01No.		

	<p>External communication MODBUS TCP/IP  Minimum Charge discharge cycle:9000C  Service Life: 20 years Storage power must not drop below 80% after 10 years  AC to AC round trip efficiency: minimum 90%  <b>BESS Master Controller:</b>  Master Controller with Metering modules, Digital IO cards and other related hardware equipment, capable of synchronization with Generator &amp; Grid</p>					
5	<p><b>Medium Voltage Switchgear (MV Panel)</b>  01No. Incomer MV panel for Solar Power Output  01No. Incomer MV panel for BESS power Output  01NO. Outgoing/dispatch MV panel for connection with Power House busbar  The proposed HT Switchboard must be type-tested in accordance with the latest edition of IEC 62271. Contractor shall submit duly verified global type test certificates for the offered complete HT Switchboard in accordance with the latest edition of IEC 62271-200 including Internal Arc Test (for Switchgear &amp; control gear classification IAC)  VCB 630A fully Type tested at global type tests standards, 50Hz, IP-42, Type-Tested, 25kA-1s, CT Ratio: 150/5/5A, 0.5M5, 5P20 Rated Voltage: 11 kV Protection Relay with: Over-current, Earth Fault, Under/Over voltage, with Modbus TCP Based energy Analyzer Siemens PAC 4200, Energy Meter with CT &amp; PT. One incomer and one outgoing panel must be installed for smooth synchronization with Gas Generator/K-Electric Supply. Exact length of cables must be estimated prior to the submission of bid through as site survey and must be quoted in bid accordingly. Both panels are to be installed at PSPC existing MV room at Power house hence panels must be similar in Nature/size/brand/color in order to be fully compatible with existing panels. Any type of dummy panel/bus riser panel/Coupling required to connect MV panels with Existing MV panels is included in scope of work.  A DC supply system must be installed as a backup control supply for 7 no. MV panels (04 existing and 03 new). Detailed specifications are attached in annexure VII.  (Refer Annexure II and VII for detailed Specifications)</p>		ABB/ Siemens/ Schneider	03 No.		

6.	<p><b>Rack, Array support, Panel Structure</b>  Concrete Piling structure, Single axis Tracker <math>\pm 45</math>, P-01/2 Portrait, Column, Lintels: HDG as per ASTM A-123, Purlins/ Tube: MAZCS <math>\geq 275\text{gm/m}^3</math>, Hardware: HDG, Solar Panel bolts SS-304, Concrete Pile: Approx. 300x800mm  Must be Time based Single Axis sun tracking of Solar system. In this system, coordinates of sun (According to each month of the year) shall be fed in the Sun tracking controller where Solar PV panels must track the sun based on feed-in coordinates of sun irrespective of the irradiance of sunlight it receives.  With stand wind loading (for a speed 10% above the 50-year maximum recorded at location by the meteorological department)  The solar arrays must be mounted on a dedicated rack/support structure. Bidder must provide detailed proposals for system orientation and mounting scheme, drawings and technical specifications, Length width height and the type of installation of rack/support structures for approval in technical bid. Arrays must be efficiently designed in order to achieve solar tracking with minimum number of motors and tracking infrastructure.  All types of structures must be of Hot dip galvanized coated structure MS support with stainless steel (minimum SS304) nuts &amp; bolts. Analysis of foundation weight bearing capacity for supporting structure and panels must also be provided.  Bidders must attach cost and benefit of solar tracking system and clearly mention minimum increase in generation via solar tracking that will be verified upon commissioning.  Land levelling / piling or any other requirement for installation of support structure for solar panels is included in vendor's scope of work. Soil testing report and topographical survey of land designated for solar installation are attached herewith the BOQ for ready reference as <b>Annexure VIII and Annexure IX</b> respectively.</p>	EU/USA/Japan/China		2000KW Installed Power		
7.	<p><b>Earthing Network</b>  Complete solar system including PV panels, Panel structure, inverters, Cable trays, Kiosk, Transformers, BESS, LV Panels and all related conducting structure or equipment must be properly grounded to earthing Pits through 1C/Cu/PVC, 0.45/1kV Green/yellow-Green striped cables of suitable sizes as per IEC 62548:2020/NEC (NFPA 70)/ EN 50583-1 &amp; EN 50583-2 and Original Equipment Manufacturer recommended</p>	EU/USA/Japan/China	<b>Cables</b> Pakistan Cables/ pioneer cables/Fast Cable/ Newage Cables	01 Job		

<p>standards for earthing and grounding of Solar Systems.</p> <p>All inverters, LV panels, BESS and Kiosk Structure must be grounded through 70sqmm/1C/Cu/PVC, 0.45/1kV Green/yellow-Green striped cables with &lt;5 Ohms Earthing pits</p> <p>All PV panels and PV Panels structure must be grounded through 2.5sqmm/1C/Cu/PVC, 0.45/1kV Green/yellow-Green striped cables (PV panel to Panel) and with 6sqmm/1C/Cu/PVC, 0.45/1kV Green/yellow-Green striped cables (Structure) with &lt;5 Ohms Earthing pits</p> <p>Complete Solar Setup must be properly protected against lightning damages through 2 Nos of Lightning Rod ESE-5m GI pole with base plate and 25sqmm/1C/Cu bare conductor connected to &lt;5 Ohms Earthing pits.</p> <p>System must also be protected against lightening surges through AC surge protection devices (AC - SPDs) to be installed at incomer breaker at LV panel and DC surge protection devices (DC - SPDs) at all incoming PV string circuits at all inverters Make: ABB/Siemens/Schneider</p> <p>There must be separate earthing pits for body and neutral grounding of Main transformer (2200KVA) and BESS transformer. Contractor shall be responsible to ensure specified resistance of all earthing pits in dry condition and submit test results.</p> <p><b>Transformers Body Earthing and BESS transformer Neutral Earthing</b>          &lt;10hm Earthing Pit with a 600 mmx 600 mm x 3 mm tin plated copper Plate type earth electrode including 2x70 sq.mm bare tinned copper conductor cable as earthing lead, inspection chamber with medium duty C.I cover, 50 mm dia. medium duty pipe. (3 Earthing Pits)          Earthing leads must be connected to separate Earth connecting point (ECP) (50 x 6 mm rectangular shaped tinned copper bar having two terminals) for installation inside plate / rod type earth electrodes, along with all accessories. (3 Earthing Pits)          These ECPs at Earthing pits must be connected to an external Earth connecting points (300 x 50 x 6 mm rectangular shaped tinned copper bar having</p>		<p><u><b>Pipes</b></u>          Galco/          Jeddah/          Protek/          Steelex/III</p> <p><u><b>Cable</b></u></p> <p><u><b>Trays</b></u>          EZZI          ENGINEERING ASHRAF          FABRICATI          ON &amp;          ENGINEERING          INDUSTRIES</p> <p><u><b>Earthing System</b></u>          Schneider/          ABB/          Siemens          FURSE/          nVENT (by          ERICO/          DEHN/          WALLIS</p>			
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	<p>six terminals) installed near to transformers along with all accessories including protective enclosure with cover through 2X70sqmm/1C/Cu/PVC, 0.45/1kV Green/yellow-Green striped cables (In underground UPVC Pipes) (3 No.)</p> <p>Both Transformers must be body grounded through 1X70sqmm/1C/Cu/PVC, 0.45/1kV Green/yellow-Green striped cables from Earthing connecting point at two points on each transformer body. And neutral earthing of BESS transformer through 2X70sqmm/1C/Cu/PVC, 0.45/1kV (Please refer details in Annexure V)</p> <p><b>2200KVA Transformer Neutral Earthing</b></p> <p>&lt;10hm Earthing Pit with a 600 mm x 600 mm x 3 mm tin plated copper Plate type earth electrode including 2X150 sq.mm bare tinned copper conductor cable as earthing lead, inspection chamber with medium duty C.I cover, 75 mm dia. medium duty pipe. (1 Earthing Pit)</p> <p>Earthing lead must be connected to separate Earth connecting point (ECP) (50 x 6 mm rectangular shaped tinned copper bar having two terminals) for installation inside plate / rod type earth electrodes, along with all accessories. (1 Earthing Pit)</p> <p>These ECP at Earthing pits must be connected to an external Earth connecting points (300 x 50 x 6 mm rectangular shaped tinned copper bar having six terminals) installed near to transformers along with all accessories including protective enclosure with cover. (1 No.)</p> <p>2200KVA Transformer must be neutral grounded through 2X150sqmm/1C/Cu/PVC, 0.45/1kV cable Green/yellow-Green striped cables from ECP to transformer neutral. (Please refer details in Annexure V)</p> <p>Incomer and outgoing MV panels must be connected to existing earthing network of PSPC Power House MV room.</p>					
8.	<p><b>AC Cables (Inverter to LV Panels)</b></p> <p>Rated Voltage= 1.9/3.3 KV, 99.99% pure Copper conductor, 3-1/2Core, Un-armored, XLPE, all cables must be sized according to system design IEC 60364-5-52 standard. CU/PVC/XLPE. Exact length of cables must be estimated prior to the submission of bid through as site survey and must be quoted in bid accordingly (Refer Annexure IV for detailed Specifications) (All cables on walls must be run through cable</p>	EU/USA/Japan	Pakistan/ pioneer cables/fast Cables /Newage Cables	Approx. 90m		

	trays/ladders. Please refer detailed specifications of cable trays/ladders in Annexure VI)					
9.	<b>MV Cable (Transformer to MV Room)</b> (3-1/2C ) 8.7/15kV rated 150sqmm/CU/PVC/XLPE/ 95°C SWA (Armored) (Refer Annexure III for detailed Specifications)		Pakistan Cables/ pioneer cables/ Fast Cables /Newage Cables			
10.	<b>DC Cables</b> 4/6sqmm Cables (As per Design) must be of 99.9% copper, water resistant, UV resistant and must be enclosed in UPVC pipes from PV panels to DC combiner boxes and DC combiner box to inverter. Maximum voltage difference between solar arrays and PV system main panel must be less than 2%. Double- Insulated XLPO/XLPO rated at 1500VDC. All cables must be sized according to system design with 30% power/ampere cushion in cables. Exact length of cables must be estimated prior to the submission of bid through an on site survey and must be quoted in bid accordingly (All cables on walls must be run through cable trays/ladders. Please refer detailed specifications in Annexure V and VI)	EU/USA/Japan	Pakistan Cables/ pioneer cables/Fast Cable/ Newage Cables	9000m Aprox.		
11.	<b>DC Box &amp; Sun Tracking Controller panel</b> All DC cables from PV panels must be routed to inverters via Weatherproof DC combiner boxes/panels as per global Standards Each string must have 2 Pole DC breaker and Surge protection device (SPD) of suitable rating as per OEM recommendation All terminal connections must be through lugs. Cable dressing with cable ties and flexible sleeves. Cable Entry from bottom. Sun Tracking panel including all modules, drives, breakers, PLCs, modules along with relevant cabling as per OEM and global standards	EU/USA/Japan/ China	Schneider/ ABB/ Siemens/ Terasaki/ Equivalent	01 No.		
12.	<b>Genset/K-Electric Supply Controller</b> Controller for synchronization, monitoring and control of solar with gas generator and K-Electric. Must be able to support minimum 30inverters, 5 Gas generators of 1.4MW each and K-Electric grid of 4300KW. Must be able to control active and reactive power control of PV plant	USA/EU/Japan/ China	Encombi/ ECPV-L Huawei /Equivalent			



13	<b>Meteorological Station</b> Pyranometer Make Apogee SP-522-SS/Equivalent Module Temperature Sensor Make Rika RK220-01/Equivalent Air Temperature Sensor Make Rika RK-330-01 and RK95-01/Equivalent Data Logger Make: Sfera Stratopi/Equivalent Power Supply UNOPS/1AC/24DC/120W Make: Pheonix Contact/Equivalent Enclosure and Mast as per manufacturer & global standards	EU/USA/Japan/China		01No.		
14	<b>Solar System Monitoring and Control</b> Complete Solar Plant is required to be monitored and controlled through a centralized operator room which shall be the LV room at PSPC. Bidders shall be responsible for following jobs: <ul style="list-style-type: none"> <li>• SCADA suite for Solar+ BESS real time monitoring, root cause analysis/fault diagnosis and asset management including preventive alerts, system health analysis with generation reports.</li> <li>• Synchronization and load sharing of Solar System with BESS &amp; Gas Generators</li> <li>• Synchronization and load sharing of Solar System with BESS &amp; K-Electric</li> <li>• Monitoring of parameters, KW, V, I, KWh, PF, Alarms, warnings, status and System configurations of all project components including Solar MV Panels (MV incomer, BESS MV incomer and dispatch MV panel), LV panels (Dispatch panel and BESS incomer panel), All inverters BESS, transformers and MET station, protection relays</li> <li>• Monitoring of Instantaneous generation, daily, weekly and yearly generation curve with BESS contribution</li> <li>• Remote tripping and energizing of Solar MV panels and LV Panel breakers</li> <li>• User defined settings to energize load on Gas generators, K-Electric, Solar, BESS on fixed or percentage basis.</li> <li>• Genset controllers, Inverter Controller, BESS controller, data loggers, MET. station controllers, Sun tracking controller boxes including all relevant network and equipment is included in contractor's scope of work</li> <li>• System must have:             <ul style="list-style-type: none"> <li><u>Active Power Management:</u> Ramp rate control, reconnection soft start, safety shutdown, Over/under frequency control etc.</li> <li><u>Reactive Power Management:</u> Reactive power</li> </ul> </li> </ul>	EU/USA/Japan/China		01 Job		



	<p>control, PF control, Voltage Control etc.  <u>Energy Storage Management:</u> Over/under frequency support, Power Plant contingency management, peak Power shifting, Power smoothing/ramping etc.  <u>Data exchange capability:</u> Cloud connectivity, Communication with 3<sup>rd</sup> party systems, Jenbacher Gas gensets DIANE XT4</p> <ul style="list-style-type: none"> <li>• Complete Communication Network along with fiber, CAT6, power and control cabling and relevant equipment from Solar System to Power House and LV room is included in contractor's scope of work</li> <li>• PSPC has two control stations for its generation and distribution network at power house and LV room. Monitoring and control of complete system must be replicated on both system with different rights (modifiable) at different stations.</li> <li>• All kinds of user level and maintenance level passwords of SCADA software, inverters, BESS PCS, Energy analyzers and all other controllers must be provided to PSPC upon handing over of Project. Provision of all passwords is mandatory of issuance of Project completion report.</li> <li>• Visual and audible alarm if potential safety hazard exists.</li> </ul>					
15	<p><b>Civil Works and Water Network</b>  <u>Inverter Skid:</u>  All inverters must be installed on Ground mounted inverter Skid with Brick wall Inverter Mounting Structure 6 inverters with DC boxes one sided, MS A-36 Painted structure with GI corrugated sheet on top, RCC foundation of skid.</p> <p><u>Water Distribution Network</u>  A water distribution network must be Supplied and installed at solar setup with at least 2 water taps at each row of PV arrays. Line pressure must be maintained to 3 to 4 bar via a Pressure Pump of suitable size. A water storage tank must be installed (if required as per design) to maintain water pressure. All water pipes must be PPRC of suitable size and capacity.  Bidder must propose water recycling system for solar panel cleaning water in 1<sup>st</sup> stage of technical proposal. PSPC reserve the right to opt or reject the proposed system</p> <p><u>Land Preparation:</u></p> <ul style="list-style-type: none"> <li>• Preparation of land for the installation of solar</li> </ul>					

<p>PV panels including:</p> <ul style="list-style-type: none"> <li>• Removal of vegetation, shrubs, and debris from the site to ensure a clean and level ground.</li> <li>• Removal of roots and stumps to prevent regrowth.</li> <li>• Grading and laser leveling of the site to ensure uniform ground levels for efficient installation and drainage.</li> <li>• Filling low-lying areas with suitable soil.</li> <li>• Compacting the ground using suitable machinery.</li> <li>• Designing and constructing a drainage system to prevent waterlogging (</li> <li>• Excavation for open water drains/channels</li> <li>• Brick lining of drain canals</li> <li>• Backfilling and compacting around drains.</li> <li>• Building access roads for material transportation and maintenance.</li> <li>• Any other work not mentioned above required for the completion of job</li> </ul> <p><b><u>Cable Trenches</u></b></p> <ul style="list-style-type: none"> <li>• All kinds of DC and AC cables must be installed in RCC trenches with covers from PV arrays to inverters</li> <li>• MV cables must be properly buried in ground 3ft deep with 1<sup>st</sup> fine sand layer in base, cable on top of 1<sup>st</sup> layer, 2<sup>nd</sup> layer of fine sand on top of 2<sup>nd</sup> layer, Bricks layer on top of 2<sup>nd</sup> soil layer, 6" Caution tape on top of bricks layer and final layer of soil on top.</li> <li>• Installation of metal marker (6"x6"x0.25") properly installed &amp; grouted at every 20-meter distance and at each turning point along the path of cable route</li> </ul> <p><b><u>Foundations</u></b></p> <p>All foundations required for Solar Power plant including but not limited to following is in contractor's scope of work:</p> <ul style="list-style-type: none"> <li>• Concrete piles and foundations for the installation of solar rack and array structure</li> <li>• Concrete foundation for KIOSK substation</li> <li>• Concrete foundation for BESS container</li> </ul>					
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16	<p><b>Warranty (From the date of handing over certificate):</b>  5 Years Inverters warranty  12-year Product warranty of PV panels  5-year Product warranty of BESS and 20 years service life  2 years repair warranty of KIOSK Structure  2 years repair warranty of Transformers  2 years replacement warranty of MET station  2 years Sun tracking motors replacement warranty  5 Years repair warranty against any defect of PV array structure  1 Year replacement warranty of all breakers  2 year replacement warranty of all remaining equipment and components  2 year workmanship warranty against any defect in local works  FOC After sales maintenance service for 2 year</p>					
17	<p><b>On Site Training</b>  Contractor must provide detailed operation and maintenance on site training of PSPC staff of all components of Solar Plant. PSPC may reasonably request additional training and Contractor will conduct such training at Contractor expense. Training may take place over multiple sessions to accommodate PSPC's staff availability. Onsite training shall include but not limited to following:</p> <ul style="list-style-type: none"> <li>• General safety orientation regarding operation and maintenance of plant</li> <li>• Sequence of operation of Plant</li> <li>• Synchronizing of PV with gas generators or K-Electric</li> <li>• Monitoring of all plant parameters, checking components status, warnings, alarms, configurations, control of breakers through SCADA software</li> <li>• Detailed warning and alarms list and their probable root causes</li> <li>• Fault diagnosis of inverters, BESS, MV/LV panels, DC boxes physically at the equipment and through SCADA software.</li> <li>• System configuration and settings including BESS output control, ramp rate control, PV plant active &amp; reactive power, Voltage and frequency control, Power Plant contingency management, peak Power shifting, Power smoothing/ramping etc.</li> <li>• Data exchange and storage</li> <li>• All passwords of inverters, BESS control, SCADA software, Sun tracking controllers and all other controllers must be handed over to</li> </ul>					

	PSPC officer in charge.					
18	<p><b>Tools and Documentations</b></p> <ul style="list-style-type: none"> <li>• 2No. X Automatic Solar Panels Cleaning and rinsing devices <ul style="list-style-type: none"> <li>✓ Nylon cleaning rollers Minimum length: 2.4m</li> <li>✓ Water connection through hose pipe</li> <li>✓ Electric or diesel driven</li> <li>✓ Wheels on top and bottom of machine for forward and backward movement</li> <li>✓ Low water usage</li> <li>✓ With Water and without water cleaning options</li> <li>✓ Good quality Water Hose compatible with cleaning machine Approx length 160m</li> <li>✓ Make EU/USA/JAPAN CHINA KSOLARA FK3/Equivalent</li> </ul> </li> <li>• 4 No. Solar panel cleaning wipers with rollers</li> <li>• 2 No. X Pressure washers 36-40bar pressure Approx. 850W-1000W flow 330L/h approx. induction motor type. Complete in all respect Make Ingco/Prescott/Equivalent</li> <li>• Operation and maintenance manuals of inverters, BESS, Sun tracking system (2 Hard copy and Pdf)</li> <li>• Single Line diagram of complete system, Schematic diagrams of MV panels and LV panels and BESS, sun tracking system (2 Hard copy and Pdf)</li> <li>• Solar Panels arrays layout diagrams (2 Hard copy and Pdf)</li> <li>• AC and DC Cabling diagrams along with Routes (2 Hard copy and Pdf)</li> <li>• Complete shop drawings of all systems with necessary execution / fixing/ installation details such as no. of wires, size of conduit, cable routes, cable schedules(2 Hard copy and Pdf)</li> <li>• Earthing network diagram (2 Hard copy and Pdf)</li> <li>• Spare Parts list of all balance of system (2 Hard copy and Pdf)</li> <li>• Training manuals (2 Hard copy and Pdf)</li> <li>• Any other diagram, manual not mentioned above</li> </ul>					

19	<b>System Studies</b> Contractor shall be responsible for following system studies of entire system including MV room of power house: <ul style="list-style-type: none"><li>• Load Flow Study</li><li>• Short Circuit Study</li><li>• Arc Flash study</li><li>• Transient Stability analysis</li></ul>					
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## 19. Operational Philosophy

Pakistan Security Printing is operating a captive generation and Grid to fulfil their load demand. Following are the details of the energy mix:

- 3 x 1450 kW (Gas Gensets) (Primary Source)
- 1 x 1000kW & 1 x 500KW (Standby Diesel Gensets)
- 1 x 4300kW Grid (Secondary Source)

Pakistan Security Printing is planning to operate an average load of ~4 MW in a full operational scenario after future upgradations. Gas gensets are running based on the plant loading and requirements, at 80~85% loading factor. Pakistan Security Printing wants to add 2MW solar energy to their energy mix while ensuring the reliability and stability of the power generation.

It is planned that a Solar PV system size of 2 MW will be integrated with the existing generation along with 1MWh Battery Energy Storage System (BESS).

BESS is required to work as a flexibility resource in the electrical network of the facility. The system must be able to absorb the power fluctuations of the PV plant caused by adverse weather conditions to ensure the smooth and reliable operation of generators.

The primary purpose of the BESS must be as follows:

**Solar Firming:** The BESS controller will closely monitor the electrical parameters of all generation sources including PV with the status of circuit breakers and common fault alarm of the gas generators. The controller, based on the PV ramp-up and ramp-down rates must calculate the required discharge and charge power of the BESS to ensure straighten power curve while smoothing out the power curve of PV plant.

**Genset Contingency:** In the case of tripping of one gas generator(1.4MW rated, 1.2MW Max operated), BESS control system must detect the fault, calculate the power deficit in the generation and will discharge BESS to cater the power short fall up to 1MW while maintaining the system frequency accordingly. Shortfall beyond 1MW i.e. 200KW shall be catered through spinning reserve of remaining 2 gas generators in operation. Coordination of BESS with the load shedding scheme is mandatory for control scheme and PV-BESS system must have the capability to cater and generate load shed signal.

**Solar Curtailment:** To cater for scenarios where solar is being curtailed due to lower available load, BESS must be able to act as a load by charging batteries. This requires coordination with the existing PV-Genset controller.

**Genset Support:** During events of increased loading on gas generators beyond their maximum limit, BESS must be able to support Generators while bearing excess load. The system will keep supporting until the load is normalized OR another genset is started to support increased load.

**Black Start:** BESS will support black start operation by forming a grid, using Virtual Synchronous Generator functionality. However, black start sequence needs to be discussed in detail, to assess the inrush currents against BESS capability

**Power Stability:** BESS must be able to absorb the fluctuations of the PV plant caused by adverse weather conditions to ensure the smooth and reliable operation of generators. Moreover, it must be capable to work in synchronization with K-Electric/Gas genset in case of fluctuations in supply. Moreover, BESS must enhance voltage and power factor stability by supplying or absorbing reactive power, which helps maintain optimal grid conditions.

It is planned that initially during the day time, PSPC will operate only 2 gas generators (1.4MW X 2) or equivalent KE and the load of the third generator will be catered by PV + BESS. PV + BESS is required to be synchronized with the genset/K-Electric supply.

The Contractor must ensure that the system is capable of achieving the above-mentioned operational requirement and commissioning of this entire system is the Contractor's responsibility.

## 20. Terms & Conditions

- Electricity from the PV-BESS must be provided at 50 Hertz and at the appropriate voltage (11

kV) for electrical interconnection with the Gas Generators/ K.E on the electrical distribution system.

- The BESS, and associated equipment, shall be provided in self-contained containers rated for the site conditions. BESS enclosures will be installed on a concrete pad constructed by Contractor at mutually agreed location. Contractor provided thermal conditioning systems shall maintain ambient temperature within warranty requirements.
- BESS components and associated ancillary equipment shall have working space clearances required by local code, and electrical circuitry shall be within weatherproof enclosures marked with the environmental rating suitable for the type of environment in compliance with NFPA 70.
- The Contractor shall commission the PV-BESS and provide a commissioning report documenting PV-BESS performance during normal grid-tied operations, Gas Generator Sync operation and Response to gas generator failure operation.
- Contractor shall provide and install fire suppression system and observe guidelines from the National Electrical Code (NEC) 2017.
- Contractor must follow latest edition of the local and nationally recognized safety and environment codes through design installation and commissioning.

The Contractor is responsible to ensure suitability of land for installation of solar system. Soil testing and topographical survey reports is attached for reference.

### **Interconnection to Electrical Distribution Systems**

- Synchronization of Solar system with our gas generators and K-Electric is the sole responsibility of the Contractor.
- Any tool, material, equipment or manpower required for the purpose shall be arranged by contractor.
- Contractor shall be responsible to fulfill all requirements of gas generator OEM or K-Electric regarding interconnection.
- Any local codes/requirement required by K.E's interconnection laws and regulations shall be followed by the Contractor. Any kind of approval required from authorities shall also be the responsibility of contractor.
- The Contractor is responsible for complying with all electric KE interconnection requirements. The Contractor is responsible for gaining approval from K.E for interconnection. Any Modifications or upgrades required in K-Electric system to interconnect the PV-BESS are the responsibility of the Contractor
- Anything not mentioned in BOQ but required for the completion of job is included in contractor's scope of work and shall be quoted separately.
- Any Modifications or upgrades required in PSPC-owned electrical system to interconnect the PV-BESS are the responsibility of the Contractor (e.g., service panel, generator coordination).
- **Site survey must be conducted prior to the submission of bid** for better understanding and estimation.
- The Contractor shall notify the PSPC of any Contractor-planned electricity service interruption not later than 7 working days prior to beginning the scheduled work that requires the power service interruption. The PSPC shall coordinate all power outages and secure a final date when the outage may proceed. Every reasonable attempt shall be made to secure the Contractor's requested date. Under no conditions shall the power service be interrupted by Contractor without prior written approval by the PSPC.

### **Expected Service Life**

- Unless noted otherwise, all materials furnished for the project shall have an expected service life of at least 10 years while keeping 90% performance efficiency.
- Materials shall be designed to withstand the year-round temperatures and conditions to which they are exposed (sunlight, heat, humidity, rain, wind, sand/dust, seismic activity, salt air, fog, marine corrosiveness, etc.)
- The PSPC shall not accept used, reconditioned, after-market products or equipment.
- Electrical equipment and components used in PV-BESS shall have markings that identify the

manufacturer, size, type, ratings, hazard warnings, and other specifications.

- Equipment markings should never be removed and should be able to withstand the environmental conditions

#### **Technical bid submittals**

The Contractor shall include but not limited to following PV-BESS submittals in their technical bid:

- A site plan showing the PV-BESS footprint
- Single line diagram and electrical schematic diagrams of complete network including MV, LV panels, inverters, PV arrays, BESS, transformers and KIOSK
- System guaranteed monthly and annual generation with performance ratio and annual degradation factor

#### **Specifications with brochures of all components of system**

- Detailed design with specification, sizes, capacity and piping route of PV and BESS
- Detailed design with specification, sizes, capacity and piping route of Sun tracking system
- Detailed design with specification, sizes, capacity and piping route of Water distribution network
- Detailed design with specification, sizes, capacity and route of cables and trenches
- Detailed design with specification, sizes, capacity and route of water drainage network
- Detailed design with specification, sizes, foundation diagrams and all related civil diagrams of PV structure, BESS, KIOSK, inverter shed



**Annexure (I)****LOW TENSION SWITCHBOARDS****1. SCOPE OF WORK**

The work under this section consists of supplying, installing, testing, connecting, commissioning of all material and services of the complete LT Switchboards as specified herein and/or shown on the Bidding Drawings and given in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at site with other services for exact route, location and position of the LT Switchboards.

**2. GENERAL**

The main Non-type tested LT switchboard shall be manufactured and conform to Form-3b and shall meet the below criteria as stated in the latest edition of IEC 61439:

- Separation of busbars from all functional units
- Separation of all functional units from one another
- Separation of terminals for external conductors and external conductors from the functional units, but not from the terminals of other functional units
- Terminals and external conductors separated from Busbars.
- Separation may be achieved by means of partitions or barriers (metallic or suitable non-metallic material)

The proposed main LT Switchboard shall be designed to be fully compatible with the proposed Remote Terminal Unit (RTU) based Central Control System. The interfacing shall be done ensuring total matching of all power quality parameters including but not limited to Line Voltage /current, Phase voltage/current, Phase angles of Voltage/Current, frequency, Power factor, Purity of Voltage/Current Sine waves etc. unless otherwise recommended by the OEM. These power quality parameters of the available power supply at the main LT Switchboard shall be matched with the power quality parameters of the other incoming power supply from HT Switchboard(s) before hooking-up to avoid any sort of integration issue that may lead to system failure, propagation of faults, and incident of fire etc. The Contractor is fully responsible to take due care in this regard in accordance with the OEM's recommendations and in conformance to the requirements of applicable standard & Code and utility / applicable authority regulations. Moreover, any cost incurrence which may occur for ensuring such monitoring, control, and interfacing/integration works shall be deemed to have been included in the relevant BOQ item of the LT switchboard and no additional payment, whatsoever, shall be admissible in this regard.

The LT Switchboards shall be of sheet steel fabricated, floor/wall mounting, cubicle type, totally enclosed, dust tight and vermin proof. It shall be complete in all respect with material and accessories, factory assembled, tested and finished all according to the specifications and to the normal requirements. All wiring and equipment for control, protection, indication, etc. required for the safe and intended operation of the systems as specified herein or shown on the drawings shall be furnished by the Contractor.

The LT Switch board shall have protection class (IP rating) of IP-42 unless specified

otherwise by the Engineer.

The LT Switchboards with all components and accessories shall be suitable for front operation only and shall:

- be suitable for addition of units, on either side.
- be suitable for extension of Busbar / interfacing with other L.T. Switchboard
- have a rated service short circuit breaking capacity, (Ics) at 800 V AC conforming to IEC 60947-2 and / or as shown on the drawings.
- be provided with adequate clearance from live parts so that flashovers cannot be caused by switching, vermin, pests, etc.
- have all components rated for insulation class of 800-volt minimum.
- be designed for flush mounting of all instruments on the front side.
- have incoming and outgoing cable termination arrangement, terminal blocks, line-up terminals, etc.
- have all incoming and outgoing connections from the bottom or with appropriate provision for top entry as per site requirements.
- have the components mounted so as to facilitate ease of maintenance from the front.
- have wiring diagram in the pocket on the inside of each door of the panel.
- be suitable for 800 volts AC, 3 phase 4 wire, 50 Hz system.
- be labeled with stainless steel nameplate on the front side of door for each incoming and outgoing circuit.
- have doors grounded by flexible copper cable/strip.
- have arrangements for extension of panel in future.
- have common lamp test facility for all lamps.

### 3. **APPLICABLE STANDARDS/CODES**

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope of this Section:

- |             |   |  |
|-------------|---|--|
| IEC 61439   | - | Low Voltage Switchgear and Control gear Assemblies (All Parts)   |
| IEC 60947-3 | - | Low Voltage Switchgear and Control Gear-Switches, Disconnecter, Switch-disconnector and Fuse Combination Units.                    |
| IEC 60947-2 | - | Low Voltage Switchgear and Control Gear-Circuit Breakers for Moulded Case Circuit Breakers (MCCBs) and Air Circuit Breakers (ACBs) |
| IEC 60831   | - | Shunt Power Capacitors of self- heating type AC systems having a rated voltage upto and including 1000V                            |
| IEC 60073   | - | Basic safety principles for man-machine interface, marking and   |

		identification. Coding principles for indicators and actuators
IEC 61869-2	-	Instrument Transformers – Additional requirements for Current Transformers
IEC 61869-3-		Instrument Transformers – Additional requirements for Inductive Voltage Transformers
IEC 60051-1, 2, 3, 5 & 8	-	Direct acting indicating analogue electrical measuring instruments and their accessories
IEC 60898-1	-	Electrical Accessories- Circuit breakers for over current protection for household and similar installations – Circuit breakers for AC operation
IEC 60051-2	-	Direct acting indicating analogue electrical measuring instruments and their accessories. Special requirements for ammeters and voltmeters
IEC 60871-1	-	Shunt Power Capacitors for AC power systems having a rated voltage above 1000V - General
IEC 60947-4-1	-	Low Voltage switchgear and control gear – Contactors and motor starters – Electromechanical contactors and motor starters.
BS EN 60529	-	Degrees of protection provided by enclosures (IP Code)
BS EN 13601	-	Copper and copper alloys: Copper rod, Busbar and wire for general electrical purposes.
IEC 60269	-	Low Voltage fuses
BS 88-2	-	Low Voltage Fuses. Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application). Examples of standardized systems of fuses A to K.
ISO-12944-2	-	Corrosion Protection of Steel Structures by Protective Paint Systems

#### 4. MATERIAL

##### 4.1. Sheet Metal Work

The Switchboards shall be fabricated with 14 SWG MS sheet. It shall be suitably divided into panels and compartments for accommodating the required number of circuit components, instruments and accessories in accordance with the specified form of internal separation.

The switchboard shall be supplied complete with foundation bolts and other installation materials as recommended by the manufacturer. Proper size cable clamping channels with galvanized steel clamps and brass cable glands respectively for unarmoured and armoured cables shall be provided. All holes, cutout shall be tool or jib manufactured and free from burrs and rough edges. An earth bar of appropriate cross section shall be provided and connected to the bodies of all

sections of the switchboard. Two external earth terminals shall be provided for main earth connection to the body of switchboard. The doors shall be earthed by means of flexible copper strip. Means shall be provided to limit the opening angle of doors to about 100°.

The cabling inside the switchboard shall be suitably numbered and harnessed by means of straps or cords. Colour sleeves shall be provided on each cable lugs, connected to the bus bars, circuit breakers or terminals etc. for phase identification. Wiring to door mounted components shall be in flexible PVC conduit. All indicating, selecting and control equipment shall be suitably arranged and clearly labelled by means of flame proof material using indelible ink/markings indicating the rating of fuse, switches, etc. The nameplates provided on the front of panel shall be of flame-retardant material preferably stainless steel. Use of plastic or any inflammable material shall not be permitted for nameplates.

All metalwork of the switchboards shall be cleaned down to bare shining metal phosphated and the surfaces chemically prepared for powder coating or protective color paint system to ensure perfect protection against tropical, highly humid and corrosive atmosphere being compliant with the project's ambient conditions as specified in Clause 3.0 of specification section 8001. Then these shall be coated with powder or paint coating of either RAL 7032 or RAL 7035 colour shade, whichever is applicable and approved by the Engineer. The thickness of powder / paint coating shall not be less than 120 microns.

#### 4.2. Components

The switchboards shall be provided with all components as specified or shown on the Drawings and as necessary for the satisfactory operation of the switchboard and of the electrical system. Typical specifications are given here under.

##### 4.2.1 Bus Bars

The bus bars shall be made of 99.99% pure high conductivity electrolytic tinned copper and shall be completely insulated by heat shrink colored sleeves of specified voltage grade. And mechanically braced for the specified fault level according to relevant IEC standard. The phase identification of bus bars shall be by providing colours sleeves on bus bars ends and these shall be red, yellow and blue for phase and black for neutral. The earth bus bar shall be green. The thickness of tinning on bus bars shall be adequate enough to ensure perfect protection against corrosion beside ensuring specified rated ampacity.

The bus bars shall be triple pole, neutral & earth and shall be of appropriate size to meet the electrical and mechanical requirements of the system. The temperature rise of bus-bars, at rated current, shall be as per approved test certificates submitted by OEM.

Neutral bus bar shall be of the same cross section as phase bus bars. Size of Earth bus bar shall be of half cross-section area as phase bus bars.

Contractor shall submit manufacturer verified bus bar sizing calculations along with supporting documents considering all applicable de-rating

factors for Engineer's review and approval.

#### 4.2.2 Circuit Breakers

The circuit breaker shall be triple/four pole, current limiting type, manually operated or motor operated, spring charged type as mentioned in BOQ. ON-TRIP-OFF indication shall be provided on circuit breakers. The Circuit breakers shall have the following protections and setting range unless otherwise shown on the drawings:

- Adjustable three pole, manual reset thermal overload release of setting range 70 to 100% of rated current.
- Magnetic triple pole short circuit release having range according to manufacturer's standard range.

The incoming circuit breakers of main LT panel (normal and emergency) shall be Air circuit breakers (ACB) type, whereas outgoing circuit breakers of main LT panel shall be either air circuit breaker (ACB) or moulded case (MCCB) type, whichever is stated on the BOQ. Air circuit breakers (ACB), shall be either 4-Pole or 3-Pole (whichever is indicated on the BOQ), motorized, withdrawable type, having LSIG protection.

The incoming circuit breaker shall have two numbers normally open and two numbers normally closed auxiliary contacts rated for 2 Amp, 230 VAC. The incoming circuit breaker shall also have ON-TRIP-OFF indicating lamps. Where mentioned on the BOQ indication lamps shall also be provided for outgoing circuit breakers. Generally, the circuit breaker shall have specified rupturing capacity without the use of back-up fuses. However, if required and / or as mentioned on the drawings, appropriately rated HRC fuses shall be provided as backup protection to ensure a faster tripping in case of abnormally higher fault currents. Auxiliary release and trip coils shall be provided for desired operation and/or interlockings as stated on the drawings and/or as needed per system operational requirement.

The motor operated, spring charged type circuit breakers shall be provided with anti-pumping circuit to prevent repeating cycle of TRIP reset and ON even if the close command is given while the circuit breaker has tripped due to fault.

Wherever withdrawable type circuit breakers are specified on the drawings/BOQ, the LT Switchboard shall also comply with the following requirements:

- All circuit breakers and / or switch fuse units shall be as shown on the drawing. Where two or more feeders are contained in the same cubicle, they are to be separated by barriers of steel or fire-resistant insulating material. If required, the metal surface of the cubicle shall be protected by fire resistant insulating material. Each panel shall combine in tier form all respective components with their incoming and outgoing power feeders.

- The draw out switching units shall be mounted on trucks or slide-in chassis having adequate guidance by greased sliding rails and/ or rollers. They shall be connected to the bus bars by means of a self-aligning plug and socket arrangement and complete isolation of each circuit shall be attained by drawing out the switching unit.
  
- The main contacts shall have safety shutters, which will automatically cover the line contacts as the circuit breaker is withdrawn. The withdrawal of circuit breaker shall be accomplished by means of a crank, with as little effort as possible.
  
- The contact surfaces of the plugs and sockets shall be silver-plated. The contacts shall be of ample size and sufficiently strong to withstand maximum prevailing short circuits and carry continuously their normal rated currents without damage or overheating of any kind. Also, the control circuits shall be provided with plugs and sockets.
  
- The withdrawable units shall have clearly marked service, test and isolated (ready for complete withdrawal) positions. A mechanical interlock is to be provided to prevent withdrawal of the unit unless the power circuit has been interrupted. The unit shall, furthermore, positively be locked in the test position before it is manually released for complete withdrawal.
- All components required to make a fixed type circuit breaker withdrawable, such as, chassis, plugin plates, side plates etc, shall be duly supplied by the Contractor with all necessary details.

#### 4.2.3 Switch - Fuse Units

The switch-fuse unit shall comprise a triple pole on load isolating switch with HRC fuses. The fuse shall be supplied complete with the fuse base and shall conform to BS-88 Class Q1 with a fusing factor of 1.5.

#### 4.2.4 Digital Energy Analyzer

The proposed digital energy analyzer shall be flush mounting, with front dimensions of 96 x 96 mm and shall have accuracy class of 0.5% for Voltage and current. It shall be suitable for single and balances and unbalanced three phase LV Systems.

It shall be communication port Serial RS485 Interface compatible and also equipped with either Modbus RTU or TCP-IP Protocol, and shall be suitable for remote monitoring and interfacing with the main RTU based Central Control System.

The proposed digital energy analyzer shall have clear backlit LCD Display with built-in alarm / notification function, and shall ensure measurement of at least following parameters:

- Voltage (L1-N; L2-N; L3-N; L1-L2, L2-L3; average L-N, average L-L)
- Currents (L1; L2; L3; total)
- Active power (L1; L2; L3; total, kWh)
- Reactive power (L1; L2; L3; total, kVARH)
- Apparent power (L1; L2; L3; total)
- Min, Avg, and Max. values of above parameters
- Maximum demand (MDI) of Power and Current values
- Power factor (L1; L2; L3; total)
- Voltage / Current harmonics
- Total Harmonic Distortion (THD): Voltage and Current
- Voltage / Current Asymmetry
- Active energy counter
- Inductive energy counter
- Capacitive energy counter
- Apparent energy counter
- Frequency (Hz)

All optional accessories (such as expansion modules, software, etc.) which are required to ensure remote monitoring and interfacing with the main RTU based Central Control System shall be proposed by the Contractor and cost for the same shall be deemed to be included in the cost of relevant BOQ item for main LT Switchboard. No extra payment, whatsoever shall be admissible in this regard.

#### 4.2.5 Three Phase Digital Multimeter

The proposed three phase digital multimeter shall be flush mounting, with front dimensions of 96 x 96 mm and shall have accuracy class 1.0 according to relevant IEC standard and shall be suitable for connection to 5 Amps secondary of current transformers or directly through shunt as shown on drawings.

It shall be suitable for single and balanced and unbalanced three phase LV System, have Built-in Selector switch, with clear backlit LCD Display and shall ensure measurement of following parameters:

- Voltage (L1-N; L2-N; L3-N; L1-L2, L2-L3; average L-N, average L-L)
- Currents (L1; L2; L3; total)
- Frequency (Hz)

#### 4.2.6 Current Transformers

Air-cooled, ring type current transformers shall be provided having transformation ratio as indicated on the drawings. The current transformers shall be of suitable burden having accuracy class 1.0 according to IEC 61869-2 or relevant standard. The current transformers shall have 5

amps secondary.

#### 4.2.7 Selector Switches

Ammeter and voltmeter selector switches shall be complete with front plate and grip handle. R-Y-B and OFF position for ammeters and RY-YB-BR-RN-YN-BN and OFF position for voltmeters shall be marked on the respective selector switches.

The selector switches for controls shall be rotary cam type, having required number of positions. It shall be provided complete with knob and front plate showing all positions as required.

#### 4.2.8 Push Buttons

The push buttons shall be illuminated, momentary make/break contact type or latch type (push-on/push-off) as required and approved by the Engineer and suitable for flush mounting. The push button for ON and OFF switching shall be red and green respectively.

#### 4.2.9 Indicating Lamps

Indicating lamps shall be LED type suitable for flush mounting, complete with base. They shall be suitable for operation on 230V AC or 60V DC / 110V DC and it shall have rosettes of suitable colours as approved by the Engineer.

#### 4.2.10 Line up Terminals

Line up terminals wherever provided for control or power circuits shall be suitable for voltage and size of conductors as indicated on drawing.

The line-up terminals for controls shall be suitable for channel mounting. All necessary accessories such as end plates, fixing clips, transparent label holder caps and label sheets with marking shall be provided.

#### 4.2.11 Auxiliary Relays

The auxiliary relays used for control purposes shall generally be provided with operating coil voltage rating 230 volts AC, 50 Hz. The auxiliary relays shall have appropriate number of pins/contacts as required for normal operation of the system. Use of different types and makes shall be avoided as much as possible.

#### 4.2.12 Programme Selector Switches

Programme selector switches shall be rotary or cam type, 2-position, 2-pole and 3-position, 3-pole as required, complete with knob and front plate with position indication.

#### 4.2.13 Surge Protection

Surge Arresters shall be provided in L.T. switchboard, wherever required,



as shown on drawing. The Contractor shall submit proper calculations for the Surge protection device (SPD) rating and the SPDs shall be adequately sized for 400 Volts and shall have the following characteristics:

- Voltage Class (highest system voltage): 800 V rms
- Service (rated voltage): 800V / 1.732 kV rms

This equipment will be tested in accordance with the relevant IEC Standard.

#### 4.3. Warranty

All proposed L.T Switchboards (complete set including all equipment, devices, components, parts etc.) will include a warranty of at least 2 years from his proposed Original Equipment Manufacturer (OEM). The warranty period shall commence upon issuance of the Taking Over Certificate (TOC). Effectiveness of duration of warranty from Original Equipment Manufacturer (OEM) shall commence from the effective date of Taking Over Certificate issued by the Engineer. All warranties are to be endorsed in the name of the Employer and an undertaking shall be submitted from Original Equipment Manufacturer (OEM) and local representatives for ensuring compliance of services to the Employer during Warranty Period. The cost incurred for such warranty shall deem to have been included in the item rate of relevant BOQ item. No additional payment, whatsoever, shall be admissible in this regard and for extended warranty, if any.

### 5. **INSTALLATION**

The LT Switchboards shall be installed at location advised by the Engineer inside KIOSK. The Contractor shall be responsible to ensure co-ordination with the civil works for providing any civil works, openings, holes, etc., to avoid any breakage to completed works. In case the provisions in civil works for installation of electrical equipment are not made or made incorrect the same shall be rectified by the Contractor at his own cost and to the satisfaction of Engineer.

All installation materials for physically erecting the switchboard such as bolts, nuts, washers, supporting steel, etc., shall be provided and installed by the Contractor.

The LT Switchboard shall be completely erected as per manufacturer's instructions and as approved by the Engineer. Loose parts dispatched by the manufacturer shall be installed and connected as per assembly drawing provided by the manufacturer. The incoming and outgoing cables shall be connected as recommended by cable manufacturer and providing color sleeve on the lugs at both ends of cables the cable armour shall be connected effectively to ground.

The control system components, devices, and wiring etc. shall be installed as per manufacturer's instructions and recommendations. After installation, the equipment shall be sequentially tested to confirm that the required switching is effective. The tests shall be carried out in the presence of the Engineer and to his entire satisfaction.

The switchboard body shall be connected to earth as per instructions given in section "Earthing" of these Specifications. The switchboard shall be tested and commissioned in the presence of the Engineer.

The LT Switchboards shall be tested before energizing as per instructions contained in article "Testing" of General Specifications for Electrical Works, Section-8001 of these Specifications.

No separate payment for supplying, installing the control cables for the complete system and testing and commissioning of the entire system is admissible and is deemed to have been included in the BOQ rates for LT Switchboards.

## **Annexure (II)**

### **HIGH TENSION SWITCHBOARD**

#### **1. SCOPE OF WORK**

The work under this section consists of supplying, installing, testing, connecting, and commissioning of all material and services of the complete HT Switchboard as specified herein or stated on the Bidding Drawings and 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 and equipment.

#### **2. TYPE TEST COMPLIANCE**

The proposed HT Switchboard shall be fully type-tested in accordance with the latest edition of IEC 62271. Contractor shall submit duly verified type test certificates for the offered complete HT Switchboard from independent laboratories for following tests in accordance with the latest edition of IEC 62271-200:

- Di-electric Tests on Main Circuits / Low Voltage Circuits
- Temperature-rise tests
- Rated Peak and rated short-time withstand current tests on Main Circuit / Earthing Circuit
- Verification of making and breaking capacities
- Verification of the protection
- Verification of the IP Coding
- Verification of the IK Coding
- Internal Arc Test (for Switchgear & control gear classification IAC)
- Mechanical Operation Tests
- Switching devices and removable parts
- Mechanical and electromechanical interlocks
- Test to verify the insulation level of the equipment
- Electromagnetic compatibility tests (EMC)
- Salt Spray Test for Paint / Coating (1000 hours)

The submission of type test reports from manufacturer's own laboratories or laboratories of any subsidiary company shall not be acceptable. Moreover, submission of type test reports for individual components or device shall not be considered to establish that the offered HT Switchboard is type-tested. Instead, comprehensive type test report of the complete HT Switchboard must be submitted to authenticate that the offered HT Switchboard is a type tested HT Switchboard.

#### **3. APPLICABLE STANDARDS/CODES**

The latest editions of the following standards and codes shall be applicable for the materials within the scope of this section:

IEC 62271-1	-	Common specifications for high voltage Switch gear and control gear
IEC 62271-100	-	High voltage AC circuit breakers
IEC 62271-101	-	High voltage AC circuit breakers-Synthetic testing
IEC 62271-102	-	High voltage AC disconnecter and earthing switches
IEC 62271-103	-	High voltage switches for rated voltage above 1 kV and upto and including 52 kV
IEC 62271-105	-	Alternating current switch –fuse combinations.
IEC 62271-200	-	Metal enclosed switchgear and control gear for rated voltage above 1kV and up to and including 52 kV
IEC 62271-213	-	Voltage detecting and indicating system
IEC 61869-1	-	Instrument transformer-general requirements
IEC 61869-2	-	Instrument transformers – additional requirements of Current Transformers
IEC 61869-3	-	Instrument transformers – additional requirements of Inductive voltage transformers
IEC 60051-1	-	Direct acting indicating analogue electrical measuring instruments and their accessories-Definitions and general requirements common to all parts.
IEC 60051-2	-	Direct acting indicating analogue electrical measuring instruments and their accessories-Special requirements for ammeters and voltmeters
IEC 60051-3	-	Direct acting indicating analogue electrical measuring instruments and their accessories-Special requirements for Watt meters and VAR meters
IEC 60051-4	-	Direct acting indicating analogue electrical measuring instruments and their accessories-Special requirements for frequency meters
IEC 60051-8	-	Direct acting indicating analogue electrical measuring instruments and their accessories-Special requirements for accessories
IEC 60051-9	-	Direct acting indicating electrical measuring instruments and their accessories Recommended test method
IEC 60255	-	Measuring relays and protection equipment
IEC 60099-4	-	Surge arresters: Metal oxide surge arresters Without gaps for AC system

BS EN 13601	-	Copper and copper alloys: Copper rod, bar and wire for general electrical purposes
ISO 12944	-	Paints and varnishes – Corrosion protection of steel Structures by protective paint systems

#### 4. HT SWITCHBOARD

##### 4.1. General Requirement

The HT switchboard shall be sheet steel fabricated, cubicle type, totally enclosed, dust tight vermin proof and with suitable protective provisions for operating in tropical, highly humid and corrosive atmosphere being compliant with the project's ambient conditions as specified in Clause 3.0 of specification section 8001. It shall be complete in all respect with material and accessories, manufactured and type-tested in accordance with the latest edition of IEC 62271 and shall fulfill and conform to the following requirements as minimum:

- Loss of service continuity category: LSC 2B (metallic partition, i.e. separate partitions for busbar, switching device and connection compartments)
- Opened accessible compartments and high-voltage live parts inside HT Switchboard shall be surrounded / separated by means of "Metal partitions and/or shutters" that are intended to be earthed. Therefore, switchgear should satisfy the partition class of "PM"
- Should be Internal Arc Classified Switchgear fully satisfying test Criterion 1 to 5 as per Clause 6.106.5 of IEC 62271-200.

The switchboard shall be suitable for front operation only and shall:

- be completely type tested along with all proposed components
- be suitable for addition of units, on either side, in future.
- be provided with adequate clearance from live parts so that flashovers cannot be caused by switching surges, vermin, pests, etc.
- be designed for flush mounting of all instruments on the front side.
- have all incoming and outgoing connections from the bottom.
- have rear accessibility with rear access cable compartment
- have the components mounted so as to facilitate ease of maintenance from the front.
- have lamp test, alarm test, alarm accept and reset facilities.
- be mounted on cable trench having their own supporting structure of angular or U steel profiles.
- have busbar chamber and instrument chamber protected according to International/Ingress Protection Classification IP-4X.
- be provided with anti-condensate heater in each individual enclosure controlled automatically through adjustable humidistats for maintaining required safe operating condition inside the panel and also to avoid condensation. The heater shall also be manually operable and provided with protective miniature circuit breaker and ON indication lamp.
- have stainless steel name plate.
- have pocket for wiring diagram in suitable location/door of instrument chamber.

All pertinent details and drawings shall be provided to the Engineer for approval prior to manufacturing by the Contractor.

The proposed main HT Switchboard shall be designed to be fully compatible with the proposed Remote Terminal Unit (RTU) based Central Control System. The interfacing shall be done ensuring total matching of all power quality parameters including but not limited to Line Voltage /current, Phase voltage/current, Phase angles of Voltage/Current, frequency, Power factor, Purity of Voltage/Current Sine waves etc. unless otherwise recommended by the OEM. These power quality parameters of the available power supply at the main HT Switchboard shall be matched with the power quality parameters of the other incoming power supply from LT Switchboard(s) / LT Synchronizing Panel before hooking-up to avoid any sort of integration issue that may lead to system failure, propagation of faults, and incident of fire etc. The Contractor is fully responsible to take due care in this regard in accordance with the OEM's recommendations and in conformance to the requirements of applicable standard & Code and utility / applicable authority regulations. Moreover, any cost incurrence which may occur for ensuring such monitoring, control, and interfacing/integration works shall deem to have been included in the relevant BOQ item of the H.T Switchboard and no additional payment, whatsoever, shall be admissible in this regard.

#### 4.2. Capacity and Technical Data

The switchboard shall be designed to conform to the following minimum requirements unless required otherwise for satisfactory and safe operation:

Rated Current	:	As shown on drawings.
Rated Frequency	:	50 Hz
Operating / Service Voltage	:	11 kV
Rated Voltage	:	12 kV
Rated Power Frequency Withstand Voltage.	:	28kV for 1 minute
Rated Short Circuit Capacity	:	<b>350 MVA</b> at 11 kV for one second.
Rated Short Time Withstand Current	:	25 kA
Rated Duration of Short Circuit	:	1 second
Rated Peak Withstand Current	:	63 kA
Rated Short Circuit Breaking Current	:	25 kA
Rated Short Circuit Making Current	:	63 kA
Ambient Air Temperature	:	45°C
Operating Duty	:	B - 0.3" - MB - 3' - B

Rated Impulse withstands Voltage	:	75 kV
Degree of Protection	:	IP- 4X
Loss of Service Continuity Category	:	LSC2B
Partition Class	:	PM
Internal Arc Classification	:	IAC
Type of Accessibility	:	A FLR (Front / Lateral / Rear)
Internal Arc Fault Current	:	25 kA
Arc Fault Duration	:	1 second
<u>Control Voltage:</u>		
a) Indication/Metering	:	110V DC from DC Supply System
b) Tripping	:	110V DC from DC Supply system and 110V AC from Capacitor trip units as a backup provision.
Heaters and audible alarm	:	220 V AC from substation's LT Switchboard.
Auxiliary Contacts	:	Provision for remote indication and/or as required.

#### 4.3. Interlocking

Any interlocking if required inside the HT switchboard and between HT switchboard and other equipment shall be provided as per system operational requirement.

However, following interlocking conditions according to IEC 62271-200 must be fulfilled:

- a) All operations possible with closed door e.g it must be possible to mechanically ON/OFF the VCB with closed door in case of auxiliary supply/relay failure.
- b) Door can only be opened if the withdrawable part is locked in disconnected position
- c) The withdrawable part can only be racked from disconnected to service position if:
  - the high-voltage door is closed
  - Low-voltage connector plugged on
  - Circuit breaker in OPEN position
  - Feeder earthing switch in OPEN position
- d) The withdrawable part can only be racked from disconnected to service position if Circuit-breaker is in OPEN position.
- e) It should be possible to operate the feeder earthing switch only if Withdrawable part is in test position
- f) Opening the high-voltage door must not be possible unless Withdrawable part in test

position

- g) High voltage door can only be closed if low-voltage connector is plugged on
- h) Additionally lockable (optional)
- i) In the event of control voltage failure the Circuit breaker can be switched off mechanically and moved in to test position with closed high voltage door.

#### 4.4. Material

##### 4.4.1 Sheet Metal Work

The HT Switchboard shall be fabricated with angle-iron framework, welded, grinded, finished and clad with 14 SWG sheet steel or SWG thickness as recommended by the manufacturer in accordance with their type-tested protocol design. It shall be suitably divided into panels and compartments for accommodating the required number of circuit components, instruments and accessories.

All metal work of the switchboard shall be cleaned down to bare shining metal phosphated and the surfaces chemically prepared for powder coating being compliant with the project's ambient conditions as specified in Clause 3.0 of specification section 8001. The color shade of the switchboard shall not be other than RAL 7032 or RAL 7035. The thickness of color paint shall not be less than 100 microns.

The Contractor shall submit following documents pertaining to protective paint system for approval of the Engineer.

- Paint manufacturer's confirmation that proposed paint system is compatible with the intended surface to be coated.
- Paint manufacturer's confirmation that proposed paint products are compatible with the project's climatic conditions.
- Paint products catalogues.
- OEM's recommended surface preparation methodology.
- No. of coats.
- DFT per coat.

Each cubicle shall be divided into four (04) compartments:

- Breaker Compartment
- Busbar Compartment
- H.T cable connection compartment
- Low voltage compartment to accommodate instruments

All instruments, relays, control and selector switches, indicating lamp, push buttons and trip levers shall be flush mounted and located at convenient heights on the front doors of switchgear in logical and clear manner. Means shall be provided to limit the opening angle of doors to about 100°.

The switchboard shall be supplied complete with foundation bolts and other installation materials as recommended by the manufacturer. Proper size cable clamping channels shall be provided for fixing required type, size and number of 15 kV XLPE/SWA cable. Adequate number of eye bolts shall be provided to facilitate



handling.

An earth bar of appropriate cross section to safely carry the fault current shall be provided on full length of H.T. switchboard and connected to the body of all sections of the switchboard. The doors shall be grounded by flexible strap of copper braids.

The control cabling inside the switchboard shall be suitably numbered and harnessed by means of straps or cords. All indicating, selecting and control equipment shall be suitably arranged and clearly labeled with indelible labels, indicating the rating and designation of fuses, switches etc. The nameplates shall be provided on the front of panel for each circuit and component which is accessible from outside. The nameplates shall be of stainless steel with engraved equipment designation having minimum width of 5mm. Other labeling on the switchboard such as danger signs, voltage, and switchboard/panel etc., identification shall be of sufficient size to be legible.

On the front of each switch board cubicle a mimic diagram with the required circuit symbols shall be provided. The mimic diagram shall contain at least the following:

- 11 kV busbar
- 11 kV circuit breakers position indicators
- 11kV earthing switch with position indication
- Transformer Symbols
- Bus coupler symbol, if any.

The mimic bus should be of adhesive type, in accordance with the manufacturer's recommendations.

#### 4.4.2 Bus Bars / Insulators

The bus bars shall be made of 99.99% pure high conductivity electrolytic tinned copper conductors suitably protected against corrosion, and shall be completely insulated by heat shrink coloured sleeves of specified voltage and mechanically braced to safely withstand the stresses due to short-time momentary current under the fault conditions. The phase identification of bus bars shall be red, yellow and blue. The clearances shall not be reduced on account of the bus bar insulation or the phase barriers.

The thickness of tinning on bus bar shall be adequate enough to ensure perfect protection against corrosion.

Contractor shall submit manufacturer verified busbar sizing calculations considering all applicable de rating factors for Engineer's review and approval.

The temperature rise of bus bars and their joints shall not exceed 40°C during testing for short circuit.

Accessibility of busbar must be made possible after removing of partitions. In this way, access to the busbar compartment should be "tool-based" according to IEC 62271-200.

Support of bus bars shall be as per manufacturer's type tested design.

The bus bars and support insulators shall safely withstand the forces produced by rated short circuit current as mentioned in Clause 4.2.

#### 4.4.3 Circuit Breaker

The circuit breakers shall be type tested triple pole, with-draw-able type, with arc interruption in vacuum. The operating characteristics and technical data shall be as given under Clause 2.1 of this section. The bidder/Contractor shall submit with his offer the type and details of equipment proposed.

The circuit breaker shall have trip free, direct acting and with both manually and motor operated drive mechanisms. For manual operation a handle shall be provided.

The motor spring operating mechanism shall be so designed to carry out the desired closing sequence using the stored energy in the closing spring supplied by the motor. The operating mechanism should incorporate springs capable of storing the energy required for desired switching sequence when the breaker has been closed. The closing spring is recharged automatic after closing.

The unit shall have rollout trucks and channels for horizontal withdrawal. Interlocking device shall be provided such that the breaker can be closed only when it is in fully plugged-in or fully withdrawn position, and withdrawal of circuit breaker is only possible in the open or isolated position. Safety shutters shall be provided which will automatically cover the live contact as the circuit breaker is withdrawn. Other interlocks as essentially required for safe and proper operation of circuit breaker shall be provided. The circuit breaker phases shall be separated by barriers of approved heat resisting, non-tracking insulating material.

Each circuit breaker shall have a device to register the number of closing operation.

The circuit breaker shall have automatic, mechanically operated 'ON' and 'OFF' position indications. The circuit breakers shall be provided with ON-OFF push buttons.

Luminous indications shall be provided on all incoming and outgoing panels, which shall include but not limited to following:

-	Circuit Breaker	TEST POSITION	
-	Circuit Breaker	ON	
-	Circuit Breaker	OFF	
-	Circuit Breaker	TRIPPED	
-	Heater	ON	
-	Buchholz	Alarm	
-	Buchholz	Trip	
-	Temperature	Alarm	
-	Temperature	Trip	
-	Earthing Switch		ON
-	Earthing Switch	OFF	

Additional indication lamps as shown on the drawings and/or as required by the Engineer shall also be provided.

Indicating lamps shall be LED type suitable for flush mounting, complete with base. They shall be suitable for operation on 110V DC/AC and it shall have rosettes of suitable colours as approved by the Engineer.

Each Circuit Breaker shall be provided with at least three normally closed (NC) and three normally open (NO) potential free auxiliary contacts rated for 10 Amps, 230V AC as spares. Adequate provision shall be made for remote indication of the circuit

breakers position/status.

A test position shall also be provided to facilitate testing operation of circuit breaker manually and by protective relays. Test socket with plug shall be provided for testing the relays.

The circuit breaker shall be complete with necessary secondary wiring with ferrules to indicate the circuit. Protection shall also be provided for all control circuits.

#### 4.4.4 Earthing Switches

A triple pole "Make-Proof" (Spring loaded) type earthing / grounding switch shall be provided for each incoming and outgoing cable earthing, complete with mechanism for interlocking it with the circuit breaker and the roll-out truck, and mechanical indication to show the position of grounding switch.

The earthing / grounding switch shall be type tested in accordance with the latest edition of IEC 62271-102. Contractor shall submit duly verified type test certificates for offered earthing switches from independent laboratories for following tests in accordance with the latest edition of IEC 62271-102 / 200:

- Verification of making & breaking Tests for Earthing Switch
- Short-time withstand current and peak withstand current tests
- Short-circuit making current test
- Operating and Mechanical Endurance Test

The earthing / grounding switch shall be suitable for earthing of equipment and shall be rated to safely carry the fault current due to inadvertent closing of supply circuit breaker and also for making duty on the fault.

Interlocking by means of "Blocking magnet" shall also be provided in the switchboard so that the supply circuit breakers at the Upstream Substation cannot be closed if the respective earthing switches in Substation are ON and to ensure interlocking of Earthing Switches in case of energization of main 11 kV cable. These switches shall be manually operated and be interlocked with the associated circuit breaker.

#### 4.4.5 Instrument Transformers

The proposed 11kV Current Transformer & "11kV Potential Transformer" shall be type-tested. Contractor shall submit independent laboratories certificates in accordance with the latest edition of "IEC 61869-2" (for Current Transformer) & shall submit independent laboratories certificates in accordance with the latest edition of "IEC 61869-3" (for Potential Transformer).

All instrument transformers shall have separate secondaries for instruments/ metering and protection.

The current transformers shall have accuracy class 5P20 / 5P10 for protection and 0.5M5 for metering. The burden of instrument transformers shall be suitable for the load of protection and instrumentation circuits. The voltage transformers shall have accuracy class 1.0 for metering and 3P for protection.

The Contractor shall also submit burdens calculation of Instrument transformers for the loads of protection and instrumentation circuits as specified above to the Engineer for review and approval.

##### 4.4.5.1 Current Transformers



factor

- Rating & insulation : As shown on drawings and as per requirements given specification in Clause 4.2.

#### 4.4.6 Protective relays

The protective relays shall be type tested. The over current and earth fault relay shall be in the form of single unit containing at least two over current elements for phases and for earth fault protection. The front of the relay shall be covered with suitable transparent plastic material fastened to the enclosure with easily removable screws.

The relay shall be numerical static type. The relay shall have inverse definite minimum time characteristics with multiple choice of characteristic curves as per IEC 60255. Each element of relay must contain an instantaneous unit for short-circuit protection.

The circuit breakers shall be provided with inverse definite minimum time directional or non-directional over-current relays for phase and earth fault protection as shown on drawings and / or as needed per system operational requirement.

The relay shall be compatible with the utility's 11kV network.

Operation indicators shall be provided for the phase and earth fault relays for the following:

- Relay Pickup
- Time delayed trip
- Instantaneous trip

The relays shall have the following common characteristics, unless otherwise specifically mentioned:

- Phase fault over current setting range
- Inverse : 50-200% of CT secondary rating
- Instantaneous : 200-800% of CT secondary rating.

The instantaneous elements shall also have infinity setting to block their operation, if necessary.

- Ground-fault : 20-80% of CT secondary rating with instantaneous element as for phase fault unit.
- Time setting range : 0-1 second
- Connection : 5 Amp secondary of CT
- Auxiliary Supply tripping : 110V DC from capacitor trip Unit (Refer Clause 4.4.7) in each breaker panel or CT powered Series Tripping (AC)
- Indications/Controls : 110V AC from secondary of P.T or 110V DC from DC Supply system

- Heaters : 230V AC  
& audible alarm
- Auxiliary Contacts : Provision for remote indication  
and/or as required.

The relay shall be self-powered with non-volatile memory feature i.e. it must have its own built-in battery and therefore do not require external auxiliary supply, shall preferably be triple pole type and have continuous self-supervision. It shall be operated from the fault current supplied through secondary of current transformers and its contacts shall be capable of making and breaking max. rated trip coil currents. Auxiliary contacts shall be provided for A.C. series trip mechanism for indicating breaker trip.

In case the protection relay is not available with self-powered feature in addition to unavailability of external auxiliary supply, then the Contractor shall be responsible for providing an adequately sized Power Supply Unit / UPS with redundant battery chargers to cater for the auxiliary power requirement of the proposed protection relays.

No separate payment shall be admissible for any alternate proposal to cater for the auxiliary power requirement of the proposed protection relays and the payment for the same deemed to have been included in the relevant BOQ item.

#### 4.4.7 Capacitor Shunt Trip Unit

Each circuit breaker in the H.T. switchboard shall be provided with 110 volts DC trip coils, which will be supplied power through the capacitor trip units incase CT powered or Series Tripping (AC) is not available. The trip coils shall be fed through the relay contacts and the 'OFF' push buttons.

The capacitor trip unit will be fed from 110 volts secondary of potential transformer. The capacitor trip unit shall be suitable for performing two successive tripping operations carried out within five minutes. Every circuit breaker shall be provided with a separate capacitor trip unit.

The capacitor trip unit is intended only for successive tripping operations and in no case permitted to be used as an auxiliary power supply.

#### 4.4.8 Meters & Selector Switches

The meters to be provided on HT switchboard are shown on drawings and shall be as specified below:

##### 4.4.8.1 Operating Hours and Switching Frequency Meters.

All incoming and outgoing 11 kV feeders shall be equipped with an operating hour counter and switching frequency meter. These shall operate through the auxiliary contacts of 11kV circuit breaker.

##### 4.4.8.2 Ammeter and Voltmeter

The ammeter and voltmeter shall be moving iron spring controlled or digital having front dimensions of 96 x 96 mm. Voltmeters shall have measuring range of 0-15 kV and ammeters measuring range shall be as shown on the drawings. Ammeters and voltmeters shall conform to BSS accuracy class 1.5 and suitable for connection to the secondary of PTs and CTs installed on the switchboard.

#### 4.4.8.3 Selector Switches

Ammeter selector switch shall be R-Y-B-OFF and voltmeter selector switch RY-YB-BR-OFF. The selector switches shall be complete with front plat and operating lever.

#### 4.4.8.4 kWh and kVARh Meters

Kilowatt-hour (kWh) and Reactive Kilovolt ampere-hour (kVARh) meters shall be suitable for 3 phase, 3-wire, 50 cycles balanced and unbalanced loads. The kWh meter shall also be provided with maximum demand indicator and built in switch for operation at an interval of 30 minutes. Such shall be approved from the local utility (K-Electric).

#### 4.4.8.5 Alarm Indication

On occurrence of any fault in the system and subsequent tripping of Circuit Breaker / load break switch, audio alarm shall be provided on the HT Switchboard. Push buttons shall be provided on HT Panel for independent resetting of the audio alarm and fault indicating lamp. At least two potential free contacts rated 10 Amp AC or DC shall be available for remote connection.

#### 4.4.9 Digital Energy Analyzer

Digital Energy Analyzer shall be provided in H.T. switchboard, wherever required, as shown on drawing. The proposed digital energy analyzer shall be suitable for Power monitoring and WAGES metering application, flush mounting, with front dimensions of 96 x 96 mm and shall be compatible for single and balanced and unbalanced three phase HV Systems.

The proposed digital energy analyzer shall have clear backlit LCD Display with built-in alarm / notification function, and shall comprise of at least following characteristics:

##### 4.4.9.1 Power Quality Analysis:

- EN 50160 2010 compliance report
- IEEE 519 2014 compliance report
- IEC 61000-4-30 class S power quality measurement
- up to the 31st harmonic
- harmonic distortion
- waveform capture
- voltage sag and swell detection
- programmability (logic and math functions)
- Power quality monitoring

##### 4.4.9.2 Supply Voltage

- 90...415 V AC 45...65 Hz +/- 10 %
- 110...415 V DC +/- 10 %

##### 4.4.9.3 Type of Measurement:

- Voltage (L1-N; L2-N; L3-N; L1-L2, L2-L3; Avg. L-N, Avg. L-L)
- Currents (L1; L2; L3; total)
- Active power (L1; L2; L3; total, kWh)
- Reactive power (L1; L2; L3; total, kVARH)
- Apparent power (L1; L2; L3; total)
- Active & Reactive power per phase, rms
- Power Factor per phase, rms
- Voltage Interruption, Voltage Dips and Swells
- Min, Avg, and Max. values of above parameters
- Maximum demand (MDI) of Power and Current values
- Power factor (L1; L2; L3; total)
- Voltage (VL-L, VL-N) harmonics (up to 15-th order)
- Current harmonics (up to 15-th of L1, L2, L3)
- Total Harmonic Distortion (THD): Voltage and Current
- Voltage / Current Asymmetry
- Active energy counter
- Inductive energy counter
- Capacitive energy counter
- Apparent energy counter
- Frequency (Hz)

#### 4.4.9.4 Measurement Accuracy

- Current +/- 0.1 %
- Voltage +/- 0.1 %
- Active energy +/- 0.2 %

#### 4.4.9.5 Accuracy Class

- Class 0.2S (Active Energy)
- Class 0.2 (Active Power)
- Class 0.5S (Reactive Energy)
- Class 0.5 (Power Factor)
- Class 0.2 (Voltage)
- Class 0.2 (Current)

#### 4.4.9.6 Communication Port Protocol

- Modbus RTU 115 kbauds - 2-wire
- ION 115 kbauds - 2-wire
- DNP3
- IEC 61850
- Modbus TCP/IP
- Ethernet Modbus TCP/IP daisy chain 10/100 Mbit/s
- RSTP 801.1d 2004

#### 4.4.9.7 Communication Port Support



- ETHERNET
- Screw Terminal Block RS-485

#### 4.4.9.8 Communication Network Type

- IPv6 (internet protocol)

#### 4.4.9.9 Data Recording:

- Min/max of instantaneous values
- Waveform logs
- Sequence of event recording
- Time stamping
- Alarm logs
- Trending/forecasting
- Sag and swell logs
- Harmonics logs
- GPS synchronisation
- Data logs
- Event logs

#### 4.4.9.10 Cyber Security:

- Enable/disable communication ports
- Password protection
- Syslog protocol support
- Robust security logs
- Port hardening

All optional accessories (such as expansion modules, software, etc.) which are required to ensure remote monitoring and interfacing with the main RTU based Central Control System shall be proposed by the Contractor and cost for the same shall be deemed to be included in the cost of relevant BOQ item for main HT Switchboard. No extra payment, whatsoever shall be admissible in this regard.

#### 4.4.10 Surge Protection

Surge Arresters shall be provided in H.T. switchboard, wherever required, as shown on drawing. The 11 kV surge arrester shall have the following characteristics:

- Voltage Class (highest system voltage) : 12 kV rms
- Service (rated voltage) : 11 / sqrt 3 kV rms

This equipment will be tested in accordance with the relevant IEC Standard.

#### 4.4.11 Insulation Mat

Insulation mat shall be placed in front of the HT switchboard. It shall be one meter wide and 6 mm thick and suitable for providing insulation for 15 kV working. Contractor must ensure that the length of the proposed rubber installation mat shall be such that it must extend a minimum of 0.5 meters beyond both ends of the entire

HT switchboard length for adequate coverage and protection.

#### 4.4.12 Danger Boards with Signs & Designation and Shock / First Aid Charts

As per requirements of Pakistan Electricity Rules/Electric Inspector, Danger Boards having signs and designation of the room shall be installed on the external door of each room of the Substation.

Shock/First Aid Charts shall be installed in H.T, Transformer and L.T, Rooms of substation.

#### 4.5. Routine Tests

The following routine tests shall be performed on H.T. switchboard in accordance with the latest edition of IEC 62271-1 & 62271-200 as minimum unless required otherwise per relevant standard:

- a) Di-electric test on main circuit
- b) Tests on auxiliary and control circuits
- c) Measurement of the resistance of the main circuit
- d) Partial discharge measurement
- e) Mechanical Operation Test
- f) Tests of Auxiliary electrical devices
- g) Tests after erection on site
- h) Relay testing through primary injection test

### 5. **WARRANTY**

All proposed H.T Switchboards (complete sets including all equipment, devices, components, parts etc.) will include a warranty of at least 2 years from his proposed Original Equipment Manufacturer (OEM). The warranty period shall commence upon issuance of the Taking Over Certificate (TOC). Effectiveness of duration of warranty from Original Equipment Manufacturer (OEM) shall commence from the effective date of Taking Over Certificate issued by the Engineer. All warranties are to be endorsed in the name of the Employer and an undertaking shall be submitted from Original Equipment Manufacturer (OEM) and local representatives for ensuring compliance of services to the Employer during Warranty Period. The cost incurred for such warranty shall deem to have been included in the item rate of relevant BOQ item. No additional payment, whatsoever, shall be admissible in this regard and for extended warranty, if any.

### 6. **INSTALLATION (H.T SWITCHBOARD)**

Installation, Testing & Commissioning of complete MV switchgears shall be done under supervision of an OEM's certified Engineer for the offered design. The HT switchboard shall be installed at location shown on the drawing. The cable trenches shall be constructed as part of civil works. The Contractor shall co-ordinate with the manufacturer for civil works including foundation detail as per Ambient conditions referred in Clause 3.0 of technical specification, Section 8001 for providing any openings, holes, etc., in time to avoid any breakage/damage to completed works. In case such provisions in civil works for installation of electrical equipment are not made or made incorrect, the same shall be rectified by the electrical Contractor at his own cost and to the satisfaction and approval of Engineer. In this regard Contractor should submit shop drawing as per Manufacturer's recommendation regarding civil works for the Engineer review and approval.

The Contractor shall provide foundation bolts and grout them in cement concrete floor using non-shrinkable material approved by the Engineer. All installation materials for physically erecting the switchboard, such as bolts, nuts, washers, supporting steel, etc. shall be provided and installed by the Contractor. The switchboard shall be installed upright and in level and shall be firmly and rigidly

bolted on the floor and concrete supports. All wiring external from HT Switchboard to alarm indication control unit protection interlock circuits and for auxiliary power supply for heaters, etc., will be furnished and installed by the Contractor in consultation with the Engineer.

The HT Switchboard shall be erected as per manufacturer's instructions and as approved by the Engineer. Loose parts dispatched by the manufacturer shall be installed and connected as per assembly drawing provided by the manufacturer. Any safety locking of meters relays, etc., provided by the manufacturer for safe transport shall be released only after the switchboard is erected in position.

Necessary provision shall be made in the HT Switchboard for incoming/outgoing cables, and installation of cable termination kits, keeping in view both cable and switchboard manufacturer's recommendations. The cable armor shall be connected to the earth system.

The body of HT Switchboard shall be connected to earth as per instructions given in section "Earthing" of these Specifications. The switchboard shall be tested and commissioned in the presence of the Engineer. The tests to be carried out shall be as recommended by the international standard to which the switchboard is manufactured and/or as recommended by manufacturer; but as a minimum the tests given in Clause 13.0 "Factory Acceptance Test (FAT)" and Clause 14.0 "Site Acceptance Test (SAT)" of General Specifications for Electrical Works, section 8001 of these Specifications shall be carried out.

### **Annexure (III) HIGH TENSION CABLE**

#### **1. SCOPE OF WORK**

The work under this section consists of supplying, installing, testing and commissioning of all material and services of High Tension (HT) cable and accessories as specified herein or as stated on the Bidding Drawings and 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 H.T. cables.

#### **2. GENERAL**

The 15kV cable shall be three core, copper conductor, cross-linked polyethylene (XLPE) insulated, shielded, armoured or unarmoured as per requirements and overall sheathed. It shall be suitable for indoor and outdoor use in the transmission and distribution of electrical energy.

The cables shall be capable of operating continuously at a conductor temperature of not less than 90°C and shall be suitable for 8.7/15 kV, 50 Hz in three phase grounded system in accordance with relevant IEC standard.

The cable shall be treated for vermin proofing and be protected against rodents during storage, laying and all protective pipes/ sleeves shall be plugged to attain the same after installation.

#### **3. APPLICABLE STANDARD/CODES**

The following standards and codes shall be applicable for the materials within the scope of this Section:

IEC 60502 -	Power cables with extruded insulation and their accessories for rated voltages from 1 kV upto 30 kV
IEC 60885- 2, 3	- Electrical test methods for electric cables
IEC 60228	- Conductors of insulated cables
IEC 60332-1-2 -	Tests on electric and cables optical fiber under fire conditions - Tests on a single vertical insulated wire or cable
IEC 60332-3 -	Tests on electric cables under fire conditions - Tests on bunched wire or cable
IEC 60227	- For core identification by colours
IEC 60446	- Basic and safety principles for man-made machine interface, making and identification – Identification of conductors by colours or numerals

#### **4. MATERIAL**

##### **4.1 15 kV Cable**

##### **4.1.1 Material Parameters**

The cable shall meet the following specifications:

Nominal/System Voltage	-	11 kV
Frequency	-	50 Hz
System	-	3 phase with solidly grounded, star point of transformers.
Conductor Size	-	Sq.mm. As given in BOQ,
Number of Cores	-	3
Rated Voltage	-	15/8.76 kV phase to phase/ phase to ground
Continuous operating temperature of conductor	-	90°C
Conductor material	-	Stranded Copper
Insulation	-	Cross-linked polyethylene (XLPE)
Shielding	-	Copper tape
Jacket	-	PVC
Armouring	-	Galvanized steel wire
Over sheathing	-	Triple Extruded PVC
Phase identification	-	Red, Yellow, Blue

#### 4.1.2 Conductor

The conductors shall be of high conductivity electrolytic copper, stranded in accordance with specified standard.

#### 4.1.3 Insulation

The insulation shall be cross-linked polyethylene extruded over the conductor. The insulation shall be laid ensuring the avoidance of any gap/air pockets between the conductor and insulation. The insulation shall be colour coded red, yellow and blue for phase identification. The nominal thickness of crosslinked polyethene (XLPE) insulation shall be at least 4.5mm in accordance with the IEC 60502.

The insulation shall be easy to strip from individual conductors and to separate for jointing/termination purposes.

#### 4.1.4 Screening

All cables shall have a metallic layer surrounding the cores individually and or collectively.

Screening of individual cores in single or three core cables shall consist of a conductor screen and an insulation screen.

##### 4.1.4.1 Conductor Screen

The conductor screen shall be non-metallic and shall consist of an extruded

semi-conducting compound, which may be applied on top of a semi conducting tape. The extruded semiconducting compound shall be firmly bounded to the insulation.

#### 4.1.4.2 Insulation Screen

The insulation screen shall consist of a non-metallic semi conducting layer in combination with metallic layer.

The metallic layer shall be extruded directly upon the insulation of each core and consist of either bounded or strippable semi-conducting compound.

A layer of semi-conducting tape or compound may than be applied over the core assembly. The metallic layer shall be applied over either the individual core or the core assembly collectively.

#### 4.1.5 Shielding

Each core shall be shielded by a layer of semi-conducting material applied directly over the insulation. The semi-conducting insulation shall be covered by a bare copper tape applied with suitable overlapping.

Phase identification tape of red, yellow and blue colours shall be wrapped over the copper shield.

#### 4.1.6 Assembly

The three insulated conductors shall be assembled with PVC or any non-hydroscopic filler and bounded with tape. The tape binder shall then be covered with extruded PVC jacket. The PVC jacket shall be padded with a suitable material before application of armour.

#### 4.1.7 Armour

Armouring shall be provided with single layer of galvanized steel wire to provide cable protection and also act as a low resistance earth return path. The armouring shall be covered with binder tape. The armour shall be of appropriate size to carry the system fault current.

#### 4.1.8 Oversheath

The entire cable assembly shall be covered with a PVC jacket of thickness not less than 2.5 mm. The colour of the jacket shall be black.

Embossed marking on the oversheath at 3 meters intervals shall give the following information:

- Name of Manufacturer
- Year of Manufacture
- Size of cable in sq.mm.
- Voltage grade
- Type of cable i.e. Cu./XLPE/SWA/PVC

#### 4.2 Termination Kits

Termination kits shall be indoor/outdoor type as recommended by cable manufacturer and approved by Engineer. The termination kits shall be complete with all materials and meet all the requirements of IEC publication 60060, 60230 & 60270.

Termination kits shall be hot or cold shrink type suitable for the approved 15 kV HT cable and the ambient conditions described in Section – 8001. The termination kits shall provide reliable water proofing, mechanical and electrical protection after installation. The material and components of termination kits shall perform satisfactorily without distress under normal conditions, cyclic loading and fault conditions.

#### 4.3 Cable Accessories

All cable accessories shall be provided for the complete cabling system without any additional cost unless specifically mentioned in BOQ. These shall include but not limited to the items such as saddles, clamps, fixing channels, connectors, clips, lugs, tapes, solder, identification tags, bushes, glands etc.

#### 4.4 Cable Reels

The cable shall be supplied in non-returnable, mechanically strong, sea/rail/road worthy, wooden or metallic cable drums, protected against weather. The cable drum should bear the markings for cable type, cable size, voltage grade, year of manufacture, name of manufacturer, direction of unreeling, and any other additional marking normally provided by the manufacturer. Cable ends on cable reels shall be protected by means of suitable seal.

#### 4.5 Cable Markers

Above ground cable markers made of Grade-25 reinforced concrete shall be erected at a maximum interval of 20 meters along the straight trench, at each bend for indicating the presence of underground cables. Where the trench changes its direction two number of markers shall be installed one in each direction to indicate the two directions of the trench.

The cable markers shall be finished in grey paint. The letters and symbols for indication shall be engraved in concrete on both sides. Letters shall be MV or LV for medium voltage or low voltage cable. The colour of the engraved letters and symbol shall be red. The dimensions of the markers shall be as shown on the drawing and shall be installed in the ground as shown.

### 5. **INSTALLATION**

#### 5.1 General

All installation material, labour, tools and accessories for cable installation shall be furnished by the Contractor. The cable and accessories shall be installed as described in these Specifications, drawings and in accordance with manufacturer's instructions.

#### 5.2 Underground Cables

The cables to be installed directly underground shall be laid in trenches in single tiers. Unless shown specifically on the drawing the depth of cable below finished

ground level shall be 900 mm minimum measured from the top of the largest cable to the general ground level. The burial depth may be increased as required due to site conditions or when crossing other service pipes and roads. Burial depth less than 900mm and more than 1500mm shall require Engineer's approval.

When cables cross road, paved area, other services or other cables, they shall be laid in protective pipes of required size. If existing services / culverts / drain etc. are present, cables shall be laid using thrust boring or the support as approved by the Engineer. No payment shall be made for carrying out thrust boring and its cost is deemed to be included in the respective BOQ item. Cables entering the buildings shall also be laid in protective pipes. All the protective pipe ends, after installation of cables, shall be plugged water tight by means of sealant as approved by the Engineer. A minimum clearance of 250mm vertically and 500mm horizontally shall be maintained between cables and other services.

The cable trench shall be excavated as per route and location shown on the drawings. Before laying of cables in the trench, the bed of the trench shall be leveled and filled with a 100mm thick layer of fine sand (1.3mm diameter maximum particles size). The sand layer shall be leveled and the cables placed thereon. The cables shall be covered with a layer of fine sand 100mm thick measured above the top of the cable. Cable protective bricks shall be placed over the sand cover which shall be of class-C cement concrete, minimum 50mm thick and 300mm (W) X 300mm (L) dimensions. Good quality bricks of proper strength and shape, well-formed can also be used for the purpose of protection. The tiles or bricks shall be placed over the sand layer and end-to-end to cover the entire length and breadth of the cable trench. After the concrete bricks are placed, the remainder of the trench shall be backfilled with earth in layer of loose thickness of 200mm.

A PVC warning tape shall be provided at 300 mm below normal ground level covering the entire length and breadth of the trench. The warning tape shall be yellow in colour with markings of danger and voltage of the cables printed in black.

Cable identification tags of water-resistant material with indelible marking shall be fixed to cables with ties at a maximum of 20 meters interval along the cable length for identification of cable and circuit. The earth continuity conductor / counterpoise conductor shall be laid in the trench with the cable. The Contractor shall submit to the Engineer for approval, schedule of cable markers showing location of marker and instructions on each.

Sufficient slack shall be left in cables for which purpose the cut lengths of cables shall allow about 3% more in the measured lengths between terminations. At underground joint box, ample slack shall be left to prevent straining of cable joints due to settlement of the cable trench.

## **Annexure IV**

### **LOW TENSION CABLES**

#### **1. SCOPE OF WORK**

The work under this section consists of supplying, installing, testing and commissioning of all material and services of low tension (LT) cables and the accessories as specified herein or as shown on the Bidding Drawings and in the Bill of Quantities.

The Contractor shall discuss the electrical layout with the Engineer and coordinate at site with other services for exact route, location and position of the L.T. cables.

#### **2. GENERAL**



- All multi-core and single core PVC insulated and sheathed cables for light circuits, socket outlets and circuits operating upto 250 volts shall be 300/500 volts grade.
- All single core PVC insulated, non-sheathed cables shall be of 450/750-volt grade.
- Power cables for main feeders, main to sub main feeders, power equipment, etc., armoured or unarmoured shall be of 600/1000 volt grade.
- Armouring of multi-core/ single core cables shall be done with appropriate size galvanized steel / aluminium wire as per relevant codes.

The conductors shall be stranded high conductivity, soft annealed copper. Conductors of single core cables shall be circular, whereas of multi-core cables may be circular or shaped according to standard practices and codes. The PVC insulation, bedding and overall sheath shall be of extruded PVC compound having good flexibility, resistance to ageing and ability to withstand deformation at high temperatures. Non-hygroscopic filler shall be provided in multicore cable to fill empty gaps between the cores to make the cable a smooth round finish. In all shaped cables a non-hygroscopic high strength binding tape shall be provided on the core assembly. All cables shall be treated for vermin proofing and be protected against rodents during storage, laying and all protective pipe/sleeves shall be plugged to attain the same after installation.

Embossed marking on the oversheath at 3 meters intervals shall give the following information:

- Name of Manufacturer
- Year of Manufacture
- No. of cores and size of cable in sq.mm.
- Voltage grade
- Type of cable i.e., Cu./PVC/SWA/PVC

### 3. APPLICABLE STANDARDS/CODES

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope of this section:

- |           |   |  |
|-----------|---|--|
| BS 6004   | - | Electric cables PVC insulated, non armoured cables for voltages upto and including 450/750 volts for electric power, lighting and internal wiring            |
| BS 6346   | - | Electric cables PVC insulated, armoured cables for voltages of 600/1000 V and 1900/3300 V  |
| BS 7846   | - | Electric cables 600/1000V armoured fire resistant cables having thermosetting insulation and low emission of smoke and corrosive gases when affected by fire |
| BS 7889   | - | Electric cables. Thermosetting insulated, unarmoured cables for a voltage of 600/1000 V, for fixed installations   |
| IEC 60227 | - | Polyvinyl chloride insulated cables of rated voltages upto and including 450/750V  |
| IEC 60332 | - | Tests on electric and optical fibre cables under fire conditions   |

BS 6746	-	PVC insulation and sheath for electric cables
BS EN 60228	-	Conductors of insulated cables
BS EN 50525	-	Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V
BS EN 61386	-	Conduit systems for cable management

#### 4. MATERIAL

##### 4.1 General

The power, lighting and control cables shall be furnished and installed in accordance with most appropriate routes, well-coordinated with other services, for interconnection of electrical and medical equipment, fixtures etc., shown on the drawings.

All cables shall have phase identification colours on insulation of each core. The colour code for three phase circuits shall be red, yellow and blue for phase conductors and black for neutral conductor. Where insulated earth conductor is installed, it shall have green or green-yellow colour insulation.

Single-phase circuits shall have insulation of red colour for phase/line, black colour for neutral and green or green-yellow colour for earth conductor.

All DC circuits shall have insulation of white/Red colour for positive, black colour for negative and green or green-yellow colour for earth conductor.

The ends of each length of multi-core armoured or unarmoured cables shall be properly marked for clock-wise and anti clock-wise sequence of core colours.

##### 4.2 Cables for Conduit or Channel Wiring

All cables/wiring in concealed PVC or surface mounted GI conduits or in covered channel shall be single core PVC insulated of specified grade and size, unless specifically shown on the drawings or given in BOQ.

##### 4.3 Cables on surface / concrete trenches / trays or ladders

Cables for distribution system to be installed on surface, in cable ducts, in concrete trenches or on cable trays / ladders shall be single or multi-core PVC insulated and PVC sheathed of specified voltage grade and size, unless specifically shown on the drawings or given in BOQ.

##### 4.4 Underground Cables

Cables for laying directly underground shall be PVC insulated, PVC sheathed and armoured with galvanized steel/ aluminum wire. Cables fully installed in underground ducts/pipes and mechanically protected from end to end shall be PVC insulated and PVC sheathed unless specifically shown on the drawings or given in BOQ.

##### 4.5 Cable Markers

Above ground cable markers made of Grade-25 reinforced concrete shall be erected at a maximum interval of 200 meters along the straight trench for indicating the presence of underground cables.

Where the trench changes its direction two number of markers shall be installed one in each direction to indicate the two directions of the trench. The cable markers shall be finished in grey paint. The letters and symbols for indication shall be engraved in concrete on both sides. Letters shall be LV for low voltage cable. The colour of the engraved letters and symbol shall be red. The dimensions of the markers shall be as shown on the drawing and shall be installed in the ground as shown.

#### 4.6 Cable Accessories

All cable accessories shall be provided for the complete cabling and wiring system without any additional cost unless specifically mentioned in BOQ. These shall include but not limited to the items such as saddles, clamps, fixing channels, connectors, cable joints (where necessary and as approved by the Engineer), clips, lugs, colour sleeves, identification tags, bushes, glands, etc. All cable accessories should be standard products of reputable manufacturers.

### 5. INSTALLATION

#### 5.1 General

All installation material, labour, tools, cable rollers and accessories for cable installation shall be furnished by the Contractor. The cable and accessories shall be installed as described in accordance with these Specifications, drawings and manufacturer's instructions.

The Contractor shall confirm the exact cut lengths for cable by actual measurements at site prior to the ordering. The cable lengths where shown on the drawings or in BOQ are tentative. The Contractor shall be solely responsible for furnishing correct lengths of cable to avoid joints in cable length except where necessary, after obtaining approval of the Engineer.

Necessary precautions for safety of cables shall be taken during the laying of cables to avoid scratches/ cuts to the cable surface. Pulling force on cable at all times shall remain well within the manufacturer's recommended limits.

#### 5.2 Cables on Surface / Trenches / Trays / Ladders

All cables for installation on surface of wall, column, ceiling, trenches, trays, ladders, etc., shall be fixed to the surface by means of galvanized steel clips secured to a steel channel using suitable stud plate, nuts and washers. The distance between each cable clip shall be such so as to support the entire weight of the cable and that distance between the cable & surface and also the vertical clearance between two adjacent cables at any point is 50mm minimum. Common mounting channels are to be furnished for cable along the same route. The Contractor can offer alternate cable fixing arrangement, which shall be approved by the Engineer before commencement of installation.

Cables shall be laid on cable trays/Cable ladders wherever required as per design, as shown in the drawing or as stated in the BOQ. All cables shall be properly fixed with cable tray/ladders by means of suitable saddles or other approved means. A minimum distance between cables equal to the diameter of the cable shall be maintained between cables.

#### 5.3 Underground cables

The cables to be installed directly underground shall be laid in trenches in single tiers. Unless shown specifically on the drawing the depth of cable below finished ground level shall be 600 mm minimum measured from the top of the largest cable to the general ground level. The burial depth may be increased as required due to site conditions or when crossing other service pipes and roads.

When cables cross road, paved area, other services or other cables, they shall be laid in protective pipes of required size. Cables entering the buildings shall also be laid in protective pipes. The protective pipe ends, after installation of cables, shall be plugged watertight by means of bituminised hesian or equivalent method as approved by the Engineer. A minimum clearance of 250mm vertically and 500mm horizontally shall be maintained between cables and other services.

The cable trench shall be excavated as per route and location shown on the drawings. Before laying of cables in the trench, the bed of the trench shall be leveled and filled with a 100mm thick layer of fine sand (as per specification section 1100). The sand layer shall be leveled and the cables placed thereon. The cables shall be covered with a layer of fine sand 100mm thick measured above the top of the cable. Cable protective bricks shall be placed over the sand cover which shall be of class-C cement concrete, minimum 50mm thick and 300mm (W) X 300mm (L) dimensions. Good quality bricks of proper strength and shape, well-formed can also be used for the purpose of protection. The bricks shall be placed over the sand layer and end-to-end to cover the entire length and breadth of the cable trench. After the concrete bricks are placed, the remainder of the trench shall be backfilled with earth in layer of loose thickness of 200mm. Each layer shall be thoroughly tamped and compacted. Backfill/ earth fill shall be compacted to 95% for traffic / paved area and 90% for non-traffic area of the maximum density of soil / sand when checked as per ASTM D 1557.

A PVC warning tape shall be provided 300 mm below normal ground level covering the entire length and breadth of the trench. The warning tape shall be yellow in colour with marking of danger and voltage of the cable printed in black and as approved by the Engineer.

Cable identification tags of corrosion resistant material shall be tied to cables with PVC cable tie at a maximum of 20-meter interval along the cable length for identification of cable and circuit. The earth continuity conductor shall be laid in the trench with the cables.

Sufficient slack shall be left in cables for this purpose the cut lengths of cables shall allow about 3% more in the measured lengths between terminations. At underground joint box, ample slack shall be left to prevent straining of cable joints due to settlement of earth. Payment shall be done as per actual lengths measured at site after installation.

The cut lengths of cables wherever stated are only as a guide. The Contractor shall measure lengths between terminations of each circuit and if the discrepancy between measured lengths at site and the one given on the drawing differ, the Contractor shall report to Engineer and act as directed. Cables, whether installed underground or in concrete trenches, shall not be bent to a radius less than 12 times the diameter of the cable or as recommended by the cable manufacturer, whichever is higher.

If existing services / culverts / drain etc. are present, LV Cables shall be laid using thrust boring or the support as approved by the Engineer. No separate payment shall be made for carrying out thrust boring and its cost is deemed to be included in the item else wherein BOQ.

## 5.5 Cable Marker

Above ground, cable markers shall be erected at a 20-meter interval along the straight trench, and at each bend for indication of presence of underground cable. The cable marker shall bear the necessary instructions indicated in approved colors.

## **Annexure V**

### **EARTHING / GROUNDING SYSTEM**

#### **1. SCOPE OF WORK**

The work under this section consists of supplying, installing, testing and commissioning of all material and services of the complete Earthing system as specified herein 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 route, location and position of the earth electrode, counterpoise conductor and ECC etc.

#### **2. GENERAL**

The earthing/ Grounding system consists of earth electrodes, earthing leads, earth connecting points, earth continuity conductors and all accessories necessary for the satisfactory operation of the associated electrical system.

All mechanical and electrical systems shall be solidly earthed.

The contractor has to supervise the installation in order to guarantee the proper execution of the works ensuring overall earthing resistance within permissible limits of applicable standards.

#### **3. APPLICABLE STANDARDS/CODES**

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

BS EN 62561-1	-	Lightning protection system components (LPSC) - Requirements for connection components
BS EN 62561-2	-	Lightning protection system components (LPSC) - Requirements for conductors and earth electrode
BS EN 62561-4	-	Lightning protection system components (LPSC) - Requirements for conductor fasteners
BS 951	-	Electrical earthing - Clamps for earthing and bonding Specifications
BS 7430	-	Code of practice for protective earthing of electrical installations
BS EN 12163	-	Copper and Copper Alloys – Rods for general purposes
BS EN 12164	-	Copper and Copper Alloys – Rod for free machining purposes
BS EN 12167	-	Copper and Copper Alloys – Profiles and bars for general Purposes
BS 6346	-	PVC insulated cables

BS EN 13601	-	Copper and Copper Alloys - Copper rod, bar and wire for general electrical purposes
BS EN 13602	-	Copper and Copper Alloys - Drawn round, copper wire for the manufacture of electrical conductors
BS EN 60228	-	Conductors of insulated cables
BS 6004	-	Electric cables, PVC insulated, non-armoured cables for voltages upto & including 450/750Volts for electric power, lighting & internal wiring
BS EN 50522	-	Earthing of power installations exceeding 1 kV a.c
BS 7884	-	Specification for copper and copper-cadmium stranded conductors for overhead electric traction and power transmission systems
IEEE Std.80	-	IEEE Guide for Safety in AC Substation Grounding

#### 4. MATERIAL

##### 4.1 Earth Electrodes

###### 4.1.1 Plate Type (<1 Ohm)

The plate type earth electrode shall comprise a 600 x 600 x 3mm 99.9% pure high conductivity electrolytic copper plate. The surface of the plate shall be tinned for protection. The plate shall have four terminals for connecting the earthing leads. Nuts bolts and washers shall be either of brass or tinned copper. A 50 mm dia. G.I. pipe shall be provided from inspection chamber to earth plate for watering purpose. This pipe shall have 10 mm dia. holes at 500 mm centre to centre all along the length.

At the ground level a medium / heavy weight concrete inspection chamber with water tight cast iron cover shall be constructed having dimensions as shown on the drawings. The inspection chamber shall have a cover supported on angle iron frame. The cover shall be hinged type, as approved by the Engineer and shall finish flush with the ground level.

###### 4.1.2 Copper Clad Steel Rod Type

This type of earth electrode shall comprise a 3 meter long, 19 mm dia. copper clad steel rod having flat head at drive end and pointed conical tip at the driven end. The tip shall be hardened to facilitate driving. At the top of the rod, a brass clamp for bolted connections shall be provided suitable for connection to the down conductor or earthing lead as required.

The inspection chamber with heavy/ medium duty water tight C.I. cover shall be provided as instructed by the Engineer.

##### 4.2 Earthing Leads

The earthing leads shall connect the earth electrode to earth connecting point (ECP) inside the inspection chamber unless required otherwise. It shall be of stranded electrolytic copper. It can be bare tinned copper or PVC insulated (green or green/yellow) of sizes shown on the drawings. The cost of earthing leads deemed to have been included in the price of earth electrode and no separate payment shall be made for it.

#### 4.3 Earth Continuity Conductors

Earth continuity conductors (ECC) shall be stranded bare tinned copper conductor or single core PVC insulated, copper conductor cable of sizes indicated on the drawings. All thimbles, lugs, sockets, nuts, washers & other accessories necessary for the complete installation of ECC shall be provided by the Contractor without any extra cost.

The specifications for single core PVC insulated cables used as ECC shall be same as those given in section "LT Cables" of the technical specifications. PVC insulated cables when used as ECC shall be green or green/yellow.

#### 4.4 Earth Connecting Points (ECPs)

Earth connecting points shall comprise tinned copper bar, rectangular in shape, having dimensions of at least 50 x 6 mm and 300 mm long. At least six terminals for connection shall be arranged on the bar, which can be increased or decreased as required by the Engineer. The length of earth connecting points shall be suitably increased, if more than six earth wires are required to be terminated on the same ECP.

The terminals shall have brass or tinned copper bolts, nuts and washers for protection against corrosion. Two holes shall be provided off centre of the copper bar for fixing to the wall by means of 10 mm dia. nut and bolt and shall be insulated by means of rubber gaskets/washers, porcelain insulators, etc.

Earth connecting points to be installed inside the inspection chamber of plate / rod type earth electrode shall comprise tinned copper bar, rectangular in shape, having dimensions of at least 50 x 6 mm with two terminals for connection.

### 5. **INSTALLATION**

#### 5.1 General

Complete earthing/ grounding systems as shown on the drawing shall be installed by the Contractor. The earthing system shall give earth resistance, including the resistance of soil, earth leads and ECC equal to or less than one ohm.

At all connections of earth continuity conductors to HT Switchboards, Transformers, Generators, LT Switchboards, LT Distribution Boards, Motor Control Centers or any other metallic body, proper size copper or brass sockets, thimbles or lugs shall be used to which the copper wire shall be connected by copper brazing. The soldering of copper wire at joints or terminations shall not be allowed. All tee-off connections shall be by copper brazing using suitable socket and clamps. After brazing, the jointed surface shall be protected by oxide inhibiting compound of low electrical resistance. For connections to metallic body, the surface shall be thoroughly cleaned before bolting the lug or socket.

Lead sheaths or steel tape armours are not permitted as grounding conductors. At any joint or terminations, the ECC shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

The earthing system shall be designed and installed to ensure that when any part of the earthing system is disconnected for the purpose of carrying out periodic testing an alternative path to earth is available.

The earth continuity conductor shall in general run-in cable trench or in conduits/pipes as



shown on the drawings. For under floor runs, these shall be installed in pipe/conduit of appropriate sizes. Where laid along underground cables, these shall be laid directly underground in unpaved areas and in pipes under paved areas.

The earthing system shall be tested after complete installation of earth electrodes.

## 5.2 Earth Electrodes

### 5.2.1 Plate Type

The electrode plate shall be installed at a minimum depth of 16.5 feet (5 meters) from finished ground level or 4 inches (100mm) below permanent water level whichever is less. The minimum horizontal distance between earth electrodes shall be 10 feet (3 metres). Proper mixture of lime and charcoal shall be made and buried alongwith the copper plate in the ground to increase the soil conductivity. The electrode shall be installed as per details shown on the drawings. The inspection chambers shall be constructed at locations approved by the Engineer. Suitable treatment on covers to protect against harsh atmospheric conditions shall be made as per instruction of Engineer.

### 5.2.2 Copper Clad Steel Rod Type

In case the soil conditions at site is permitted and approved by the Engineer, this type of earth electrode may be installed by hammering the electrode in soil, until the top of the rod is about 12 inches (300 mm) below the proposed finished ground level. If hammering down of rod is not possible due to site conditions, a pit shall be first excavated in bare ground upto the required depth and electrode shall be installed upright in the pit. The excavated pit shall be backfilled in layers of 20 inches (500 mm), each layer tamped and compacted. The inspection chambers shall be constructed at locations approved by the Engineer. Suitable treatment on covers to protect against harsh atmospheric conditions shall be made as per instruction of Engineer.

## 5.3 Earth Continuity Conductors (ECCs)

The earth continuity conductors of sizes shown on the drawings shall be installed all along the cable runs and connected to the earthing bar/terminals provided in equipment. The bodies of equipment and all switchboards shall also be connected to earth by specified size of ECC. All other metal work shall also be connected to earth by specified size of ECC. Appropriate size and numbers clamp/saddles shall be utilized to ensure smooth and safe installation of all type of ECCs.

At any joint or terminations, the ECC shall be connected using proper accessories. No connection shall be made by twisting of earth conductors.

## 5.4 Earth Connecting Points

The earth connecting points shall be installed at locations shown on the drawings. These shall be fixed on wall surface by means of brass screws with nuts, washers, porcelain insulators and other insulating material as instructed by the Engineer.



**Annexure VI**  
**Cable Trays / Trunking / Ladders**

**1. SCOPE OF WORK**

The work under this section consists of supplying, installing, testing and commissioning of all material and accessories for Miscellaneous Items 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 coordinate at site with all other services for exact locations, installation height and positions of the Miscellaneous Items.

**2. GENERAL**

The Miscellaneous Items as described in this section shall comply with other sections of these specifications as applicable. The Contractor shall ensure that all the miscellaneous items be supplied/fabricated from the reputable manufacturers, who have already supplied/fabricated similar items.

**3. 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 60947-3	-	Low Voltage Switch Gear and Control Gear - Switches, disconnectors, switch-disconnectors and fuse-combination units
BS EN ISO 1461	-	Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods.
BS EN 50085	-	Cable trunking and cable ducting systems for electrical installations.
BS EN 61537	-	Cable management. Cable tray systems and cable ladder systems
BS EN 60335-2-80	-	Household and similar electrical appliances. Safety. Particular requirements for fans.
ISO-12944-2	-	Corrosion Protection of Steel Structures by Protective Paint Systems
BS EN 60529	-	Degrees of protection provided by enclosures (IP Code)

**4. MATERIAL**

**4.4. Hot Dipped Galvanized M.S. Cable Trays / Trunking / Ladders**

The hot dipped galvanized M.S. cable tray / trunking (with cover) must be 14 SWG M.S. sheets. Suitable trunking design shall be provided for bends, crossings, etc., keeping in view allowable bending radius of cables.

After cutting/perforation and fabrication of each tray / trunking and cover section, the metalwork shall be hot dipped galvanized and coated in accordance with the latest edition of BS EN ISO 1461.

Arrangement shall be provided to secure the cables in position on the trunking. Cables laid on tray / trunking shall be properly fixed or clamped, with smooth finished split pieces with bore diameter to suit the cable. Supports shall be arranged as far as practicable for easy

removal of any cable without disturbing other cables.

Copper braid connections shall be provided at every joint, fixing accessories of cable tray to ensure continuity.

Cable trays / ladders shall be earthed with flexible copper braid/ strip.

All cables of wall and inside KIOSK must be run on cable trays/trunking/ladders supported to the wall and/or ceiling. The tray / ladder shall be of appropriate dimensions to ensure minimum clearance of one dia spacing between the cables. Tray / ladder shall be provided with complete accessories such as straight through joint, flexible expansion coupler, tee, cross, internal and external bend, cover etc. complete with proper support and fixing accessories, GI nuts, bolts washer etc.

The cable tray / ladder shall be fabricated in sections not exceeding 3 meters length.

The arrangements shall be provided for manufactured bends, crossing, connection piece etc. keeping in view the allowable bending radii of the cables. The design of such trays shall include a factor of safety to guard against permanent distortion when supporting the load of the erection staff during cable installation. Arrangement shall be provided to secure the cable in position on the trays. At every building expansion joint flexible expansion couplers shall be provided, All auxiliary material not particularly specified but necessary for proper execution shall be coated as the cable tray/ trunking/ ladder and shall be included in the offer.

## 5. **INSTALLATION**

### 5.1. Hot dipped galvanized Cable Trays / Trunking / Ladders

The cable trays / ladders shall be installed on supports fixed to the wall and/or ceilings/trusses. The supports shall be fixed to civil works by means of Rawl bolts. The additional hangers and other metalwork required for the installation of the trays / trunking / ladders shall be galvanized and finished by method as specified for the cable tray / trunking.

The distance between alternate supports (span) in straight runs shall be finalized as per loading and in no case shall exceed 2 metres. In addition to these, supports shall be provided near each bend or change in direction, end of trunking/ tray.

The straight jointing, bends and other accessories shall be fixed with cable tray/ ladders in such a manner that they are in one line with no sharp edges/ protruded surfaces. Rivet head nuts shall be installed on inner side of tray/ ladder.

On straight lengths over 65'-8" (20 meter) and at every building expansion joint suitable flexible expansion couplers shall be provided.

At each joint, bend earth continuity shall be ensured by using copper earth braid and copper lugs in electro-tinned finish.

**Annexure VII**  
**DIRECT CURRENT SUPPLY SYSTEM**

**1. SCOPE OF WORK**

The work under this section consists of Design, supplying, installing, testing, and commissioning of all material and services of the complete Direct Current Supply System as specified herein, 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 location and position of the equipment.

**2. GENERAL**

The DC supply system shall include the following components unless required otherwise:

- Automatic Battery Charger
- Batteries.
- Cable Network.

The DC distribution system shall at least supply the indications, tripping coils, charging motors and relays in the HT and LT switchboards.

The design of DC supply system shall be carried out such, that when mains supply is available the charger and battery are connected in parallel with the load, and the rectifier shall supply the load current. The battery shall contribute to the load current only if the voltage across the load falls below the battery quiescent voltage. On failure of mains supply, the battery shall immediately take over supplying power to the loads. When mains supply is restored, the charger shall automatically resume power supply to the DC loads, simultaneously recharging the battery. All equipment shall be designed and rated to operate in tropical climate at an ambient temperature of 50° C.

The DC distribution equipment shall be included in the battery charger cubicle. Contractor is to submit the design calculations for the selection of various components of DC supply system like:

- Proposed type, rating and no. of batteries.
- Proposed size and type of cable.

**3. APPLICABLE STANDARDS/CODES**

The latest editions of the following standards and codes shall be applicable for the materials specified within the scope of this section.

VDE 0510 - Specifications for electric storage batteries and battery plants.

IEC 60146 - Specifications for semi conductor converters.

#### 4. MATERIAL

##### a) Automatic Battery Chargers

The battery chargers shall be able to supply total DC load and the power for initial, boost or float charging of the batteries.

They shall be installed in a floor standing cubicle with all control and protection devices. It shall include incoming switch, transformer, fused thyristor rectifiers, control equipment, voltage regulator, fused outgoing feeders to the batteries and to the DC loads and auto-change over switch.

The battery charger shall be equipped with an automatic and manually operated changeover switch for continuous and quick charging. It shall be adjustable for different loads.

Adjustable voltage and current limiting devices shall be provided.

Charging shall be governed by constant current / constant voltage (IU) characteristics.

The feeding transformers shall be of the dry type for a nominal primary voltage of 415 V with tappings at the primary windings. The rectifiers shall be of the silicon semi-conductor type. Smoothing chokes shall be provided to decrease the voltage ripple factor.

As a minimum, each rectifier cubicle shall comprise the following:

- One (1) AC ammeter and voltmeter with selector switch
- One (1) DC ammeter each for rectifier and battery current
- One (1) DC voltmeter
- One (1) DC fuse switch
- One (1) manual/automatic selector switch
- Indication lamps for alarm signal
- One (1) DC high and low voltage-monitoring device
- One (1) DC earth-fault protection device
- One (1) rectifier output voltage monitoring device
- One (1) battery low electrolyte level indication
- Fused outgoing to DC loads.
- The panel shall have common lamp test facility.

The individual alarms as mentioned above shall be indicated locally with the provision for remote alarm.

Forced air draft fans shall be provided in the panel to remove heat.

**b) Key Features**

- Battery Charger will be floor mounted with 1+1 configuration.
- Metal casing / cubicle will be 3mm load bearing members & 2mm for other sides finished with attractive weather-proof powder coated paint.

**c) Protections**

The proposed battery charger shall have following protections as minimum:

- Load under voltage
- Battery under voltage
- DC earth Fault
- Charger failure
- AC mains Failure
- Output fuse
- Output Short circuit protection
- Capacitor Fuse Failure

**d) Indications**

The proposed battery charger shall have following Indications as minimum:

- Power ON
- Auto
- Manual
- Float
- Boost
- Load under voltage
- Battery under voltage
- DC earth Fault
- Charger failure
- AC mains Failure
- Output fuse
- Output Short circuit protection
- Capacitor Fuse Failure

**e) BMS Compatibility**

The Battery Charger will be fully BMS/ SCADA compatible. It will have sufficient nos. of potential free contacts & transducers (4-20mA output) for digital and analogue signals respectively. It will also be possible to control various functionality of Battery Charger from BMS/SCADA system through hard wire connection.

**f) Main Specifications & Features**

- Output volts 110 Volts D.C.
- Voltage Control Float 110-132V  
Boost 121-143V
- Output Amps. 50A D.C.
- Ripple Less than 3% (r.m.s)
- Input V / Freq. 1 phase 230V AC 50Hz.  
(Taps 200-220-230-240-250V )
- Temperature rise 50°C for Transformer and choke,  
65°C for Semiconductor  
at 50°C ambient temperature
- Duty Cycle 100%

**g) HMI Display Details**

Display 1:

- AC Voltage
- DC Voltage
- Load Current
- Battery Current

The Auto/Manual Buttons are given on HMI to select the mod of charger. In auto mod charger will automatically select float or boost mod and in manual mod. User will select float or boost mod.CC/VC mod also given on HMI for selection.

Display 2:

It shows the digital inputs:

PARAMETERS	DIGITAL INPUTS
AC mains fail	√
Load Bus Over Voltage	√
Load Bus Under Voltage	√
Float Charger fail	√
Earth Leakage	√
Float Charger On	√
Float Charger Off	√
Float Charger on Auto mode	√
Float Charger on Manual mode	√
Boost Charger On	√

Boost Charger Off	√
Boost Charger On CV mode	√
Boost Charger On CC mode	√
Charger on local mode	√
Charger on Remote mode	√

Display 3 / 4:

Display 3 and 4 for the setting of voltage and current of float/boost in Auto and manual mod

#### h) **Battery Bank**

The batteries shall be either lithium ion, maintenance-free, housed in a separate matching enclosure. The battery size shall be adequate to supply auxiliary DC supply power to the required for specified time (atleast 1 hour backup) in the event of an outage on the normal mains supply. Battery ratings shall be based on an operating temperature range upto 40 deg.C. A circuit breaker shall be provided in the battery circuit. All connection cables shall be provided for battery panel.

The Contractor shall also submit design calculations for battery sizing for Engineer's review and approval.

#### i) **Cable Network**

The Cable network shall comprise of furnishing and installing all cables required to complete the D.C. supply system in the MV room. This shall include but not limited to the following:

- D.C. Cables from Chargers to Batteries
- D.C. Cables from Chargers to D.C. Distribution Board
- D.C. Cables from D.C. Distribution Board to terminals of the H.T.

Switchboards requiring D.C. Supply Voltage for indications, tripping coils, relays and charging motors etc.

#### j) **Required Equipment:**

The Contractor shall furnish all necessary tools, thermometers, cell testers, and hydrometers etc, required for maintenance of the batteries. List of all such equipment shall be provided with the offer.

#### k) **Warranty:**

The entire Direct Current Supply System (complete D.C System including all equipment, devices, components, parts etc.) will include a warranty of at least 2 years from his proposed Original Equipment Manufacturer (OEM). The warranty period shall commence upon issuance of the Taking Over Certificate (TOC). Effectiveness of duration of warranty from Original Equipment Manufacturer

(OEM) shall commence from the effective date of Taking Over Certificate issued by the PSPC Engineer. All warranties are to be endorsed in the name of the Employer and an undertaking shall be submitted from Original Equipment Manufacturer (OEM) and local representatives for ensuring compliance of services to the Employer during Warranty Period. The cost incurred for such warranty shall deem to have been included in the item rate of relevant BOQ item. No additional payment, whatsoever, shall be admissible in this regard and for extended warranty, if any.

#### **l) Installation**

A dedicated DC Supply room is provided for the placement / installation of complete DC supply system components.

The location of DC equipment is tentatively shown on the drawings. The actual placement of each component of DC supply system shall be done in accordance with the recommendations of the manufacturer keeping in view the available room space, site conditions and in coordination with other equipment.

The batteries shall be installed on treated wooden / steel racks.

All loose parts dispatched separately with the DC equipment shall be installed as per manufacturer's instructions and all adjustment or setting shall be made as required.

The DC supply system installation shall include connecting all incoming, outgoing and interconnecting cables.

The battery charger / DC distribution equipment body shall be effectively connected to earth. The DC supply system shall be tested and commissioned in presence of the Engineer. The DC equipment shall be tested before energizing and duly signed by PSPC Engineer.



## Evaluation Criteria

### Mandatory Requirements

- Contractor(s)/firm(s) applying must have valid registration with Pakistan Engineering Council (PEC) in Category C-2 or above and at least in Specialization Codes CE-10, EE-11, EE-04, EE-05 & EE-10.
- Valid Sales Tax Certificate from Sindh Revenue Board (SRB).
- Valid NTN Certificate from Federal Board of Revenue. Bidder should be an active Tax payer.
- Firms in litigation with the Employer shall not be permitted to participate in this process.
- An affidavit (on non-judicial stamp paper) to the effect that the bidder has never been black-listed by any previous employer.
- An affidavit (on non-judicial stamp paper) to the effect that all documents / particulars / information given with this qualification Documents are true.
- An affidavit (on non-judicial stamp paper) to the effect that the bidder has never indulged in corrupt, fraudulent or collusive practice for procuring contracts.
- An affidavit (on non-judicial stamp paper) to the effect that the bidder is not presently involved nor has been in the past in litigation with its employers.
- An undertaking (on non-judicial stamp paper) that the bidder will comply with the Code of Conduct of the procuring agency.

## EVALUATION CRITERIA

### Detailed Evaluation

- v. Evaluation of the bids and award of contract will be done for the complete requirement.
- vi. Prospective firm shall conform all technical requirements mentioned in this document for qualification.
- vii. The Financial Bids of the only technically qualified bids will be opened.
- viii. The contract will be awarded on Quality plus Cost Based Selection method to the firm gaining highest marks based on criteria given below.

### Technical Evaluation

Technical evaluation shall be conducted using the specified criteria according to the scoring system outlined below:

Capability	Maximum	Minimum
Experience Capability	70	35
Personnel Capability	20	10
Financial Capability	10	5

To qualify, bidders must receive not less than the specified minimum acceptable 50 percent marks for each category and aggregate of minimum 60 marks.

The bidder is to provide substantial documentary evidence in each case for marking in the Qualification Criteria. Where it is found that substantial evidence is not available, the marking will not be made.

### Experience Capability

Experience for similar/ comparable projects completed (Form A-4) will be evaluated on the basis of the following marks:

Sr. No.	Experience Capability	Marks
1	2 Marks shall be granted of the bidder has an experience of at least 5 years as Solar Power Plant installation company with minimum installation of 1MW single project Additional 1 Marks for each year of added experience beyond 07 years. Maximum Marks 10	10
2	5 marks shall be granted if the bidder has completed (Design, installation and commissioning) of one Solar Plant of capacity $\geq$ 2MW during last 07 years Additional 5 marks for each additional project of same capacity during last 07 years	15
3	5 marks shall be granted if the bidder has completed (Design, installation and commissioning) of one Solar Plant of capacity $\geq$ 2MW with single Axis Sun tracking during last 07 years Additional 5 marks for each additional project of same capacity during last 07 years	15
4	5 marks shall be granted if the bidder has Supplied and installed Li-ion based one Battery energy storage system (BESS) of capacity $\geq$ 1 MWh during last 07 years Additional 2 marks for each additional project of same capacity during last 07 years	15
5	10 marks shall be granted if the bidder has completed (Design, installation and commissioning) of one Solar Plant of capacity > 2MW and 1 MWh BESS during last 07 years Additional 5 marks for each additional project of same capacity during last 07 years	15
Total Marks Allocated		70

Bidder must acquire minimum 2 marks in Sr. # 1, 5 marks in Sr. # 2,3,4 and 10 marks in sr. # 5 in order to comply and total of 35 marks to comply with this section

Information regarding previous projects is to be supported with submission of Job Completion Certificate/ Takeover Certificate and any other relevant document is mandatory. PSPC reserves the right to authenticate these documents

Criteria for Detailed Evaluation

### Financial Capability

Financial Soundness of a bidder will be considered as follows:

1	Average Annual Turnover in last 3 years (from Audited Financial Statements)	05 marks will be given if the average annual turnover for last three years is equal to Pak Rs 300 million. 01 additional mark will be given for every Pak Rs. 50 million increase in the average annual turnover. Full marks will be given in case of Average Annual Turnover > Pak Rs 550million.
Maximum Marks		10

The Audited Financial Statements of the last three years from Chartered Accountant firm must be submitted and should demonstrate the soundness of the bidder's financial position, showing long term profitability. Where necessary, the Employer may make inquiries with the bidder's bankers.

### Personnel Capability

Personnel Capability of bidders shall be evaluated on the basis of following Marks:

Sr. No.	Key Personnel	Education and Experience	Marks (Maximum)	Maximum Marks
1	Project Manager Electrical	Bachelors in Electrical Engineering/Equivalent with at least 10 years of Solar Plants installation Experience	3 Marks for 10Years of Experience Additional 0.5 Mark for additional solar 1 years of experience.	05
2	Automation and control Engineer (Electrical/ Electronics)	Bachelors in Electrical/Electronic Engineering with at least 6 years of automation Experience	1 Marks for 6Years Experience Additional 0.5 Mark for additional automation 1 years of experience.	03
3	Civil Engineer	Bachelors in Civil Engineering with at least 6 years of Solar Plants installation Experience	1 Marks for 6Years Experience Additional 0.5 Mark for additional 1 years of experience.	03
4	Mechanical Engineer	Bachelors in Mechanical /structural/material Engineering with at least 6 years of Solar Plants installation Experience	1 Marks for 6 Years' Experience Additional 0.5 Mark for additional 1 years of experience.	03
5	Site Supervisor (Electrical)	DAE/Equivalent in Electrical with at least 6 years of Solar Plants installation Experience	1 Marks for 6Years Experience Additional 0.5 Mark for additional 2 years of experience.	02
6	Site Supervisor (Civil)	DAE/Equivalent in Civil with at least 6 years of Solar Plants installation Experience	1 Marks for 6Years Experience Additional 0.5 Mark for additional 2 years of experience.	02
7	Health Safety inspector	Bachelors in Engineering with 6 years of experience OR Diploma in safety /Equivalent with at least 6 years of Solar Plants installation Experience	1 Marks for 6Years Experience Additional 0.5 Mark for additional 2 years of experience.	02
Total Marks				20

Bidder must provide personnel from Sr. # 1 to 7. Minimum "3 marks" in Sr. # 1 and "1 mark" from Sr. # 2 to 7 is mandatory for qualification whereas minimum 12 marks is mandatory to qualify in personnel capability section

*(Information regarding education qualification, total work experience and specific work experience is to be supported by documentary evidence such as copy of education qualification certificate/degree and CVs of concerned personnel proposed for the below positions duly signed and any other relevant documents along with PEC/ relevant institution Certificate)*

### Financial Bid Evaluation Criteria

Bidders must submit section wise financial bid in a separate envelope clearly mentioning “financial bid” on the top. The Financial bid will be evaluated as per following criteria. The lowest quoted bid say Bid-B will be awarded full 100 Marks. The other bid say Bid-A will be awarded marks in financial bid evaluation as:

Marks awarded to Bid-A = (Price quoted in lowest Bid-B/Price quoted in Bid-A) x 100

Example: -

Bids	Price Quoted	Marks awarded in Financial Evaluation
A	80 Million	$(60/80) \times 100 = 75$
B	60 Million	100
C	100 Million	$(60/100) \times 100 = 60$

### Overall Evaluation Criteria of Bid(s)

Technical Evaluation (weightage) 70%

Financial Evaluation (weightage) 30%

Overall Evaluation Criteria = (Marks in Tech Eval. Out of 100) x 70% + (Marks in Financial Evaluation out of 100) x 30%

Example: “If any bidder acquires 85 marks in technical evaluation and 60 marks in financial evaluation, its total marks will be  $(85 \times 70/100) + (60 \times 30/100)$  equals to 77.5

The bid scoring highest marks in overall Bid Evaluation will be considered successful.

### Payment Breakup

Complete Project must be completed within 6 months of issuance of purchase Order.

Bidder Must Quote Payment of Supplies and Services separately whereas Payment against item/job shall be done as per undermentioned breakup:

Supply		Service	
Advance Payment	10%	Land Clearance and levelling	15%
Arrival of Solar Panels	15%	On installation of mounting structure	15%
Arrival of Inverters	15%	Installation of solar panels	15%
Arrival of BESS	10%	Installation of KIOSK, inverters, MV panels, BESS along with complete cabling	15%
Arrival of Mounting Structure	10%	Commissioning and System ramp up, Synchronization with Gas generator and K-Electric and Commissioning of BESS and SCADA software	25%
Arrival of AC/DC Cables	10%	Handing over of complete equipment to PSPC complete in all respect	15%
Arrival of KIOSK	10%		
Arrival of MV Panel	05%		
After commissioning and handing over of complete equipment to PSPC	15%		
<b>Total Supplies</b>	<b>100%</b>	<b>Total Services</b>	<b>100%</b>