Tender Fee: Rs. 5000/-

(Non-Refundable)

TENDER FORM

FINANCIAL DOCUMENT

Tender # CW/31/24-25

Design, Supply, Installation, Testing & Commissioning of 108 kWp Adamjee Roof Mounted Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA Main Campus

INSTITUTE OF BUSINESS ADMINISTRATION IBA KARACHI
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CONTENTS

SCHEDULE - A TO BID: SCHEDULE OF PRICES

A. Price Schedule of Solar PV Systems:

SUMMARY OF BID PRICES

Item No.	Description	TOTAL INSTALLED CAPACITY kWp	AMOUNT (PKR)	TOTAL UNIT GENERATION YEARLY (Minimum) KWh
(A)	Design, Supply, Installation, Testing & Commissioning of 108kWp Roof Mounted Grid Tied Utility Interactive Photo Voltaic Solar Power System	108.00		
	TOTAL ESTIMATED COST OF THE PROJECT WITH OUT TAX			
	TOTAL ESTIMATED COST OF THE PROJECT WITH TAX			
	TOTAL ESTIMATED COST OF THE PROJECT PER WATT WITH TAX			

PROJECT TITLE: Design, Supply, Installation, Testing & Commissioning of 108.0 kWp Roof Mounted Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA Main Campus

ABSTRACT OF COST

Sr No.	Product	Capacity	Unit	Quantity	Price (PKR)
	Photovoltaic Solar System works				
	General: The system is designed to cover the Essential loads in IBA Main Campus				
1	The system will be grid interactive connected which will allow many power sources options. The system will import from the grid when loads are being more than the generated from PV and supply surplus electricity to the grid when PV generates more than the loads.				
2	Contractor shall submit shop drawings for all civil, electrical and a complete photovoltaic solar system works, including a single line diagram showing all the components of the PV system, DC & AC distribution boards, PV Arrays layout, connections and cables, wire cross section for all the system to be approved by the Engineer before executing the work.				
3	Contractor shall submit the catalogues of each component showing the requested specifications stated at the bill of quantity.				
4	The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, as recommended by manufacturer, maintenance manuals and manufacturer's warranty for each components of the system.				
5	The contractor shall submit the testing documents of earth pits, AC Cable, DC Cable				
6	As-built drawings shall be submitted after handing over the work.				
7	All DBs will be lockable type.				
8	Upon completion of the installation, the contractor shall organize an on site training program involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates.				
9	The price includes all builder's works, making good and reinstatement including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.				
10	All the following items include Supply, Installation, Testing, Commissioning and Operate of the complete PV Solar System				
11	All material not naturally corrosion-resistant shall be treated or finished to protect surface and functional integrity under the ambient conditions prevailing at the site.				
12	To protect metallic accessories from corrosion two anticorrosive coats of paint will be made on material.				
13	Contractor must provide Bank Maintenance Guarantee for Period of One year for all components of the Solar System.				
14	If any necessary upgrades of copper links/circuit breakers/etc required in IBA existing LV Panel for AC cable connections, Contractor must include the price in the financial proposal.				

BOQ SOLAR PV SYSTEM AT ADAMJEE ROOF IBA MAIN CAMPUS ESTIMATED CAPACITY_108.0kWp							
Sr No	**Product**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
1	**MODULE MOUNTING STRUCTURE**						
	ADAMJEE ROOF						
i)	Supply of PV Mounting structure in MS Iron. The mounting structures must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads etc) minimum wind speed pressure 35m/s with 3sec of gust pressure in harsh environment. The design submission must be as per ASTM-A36, ASTM-123 and ASCE 7-10. The mounting structure components are bonded together to guaranty potential equalization. The work is to be carried out strictly as per approved structure drawings, design and specification and the rate quoted is inclusive of the following:	Watt	108000.0				
a	Designing of the structure as per design specification approved by IBA Engineer. • Column/Pole Size: Minimum 4.5" x 4.5".Columns may be circular or square shape in 12 Gauge. • All the Structure material should be minimum 12 Gauge. • Primary Girder: 1.8Kg/ft & above • Secondary Girder: 1.8Kg/ft & above • Base Plate Size: 12" x 12" with 12mm thickness. • Top Plate Dimension: 6" x 6" with 6mm thickness. • Sag Rods: 12mm stud threaded at both side sag rod.						

	•Bracing Angles: 2"x2" by 1/4" thickness • Structure should have cross bracing angle iron with gusset plate, cross bracing should be installed at both end of the structure to avoid sway under heavy winds. • Structure should have bracing angle. • Sharing Girder: Sharing of Girder not allowed in structure design. • Tilt Angle: Must be optimal for energy generation. • Material: MS Iron A306. • Civil Pads: RCC concrete pads, pads sizes shall be minimum L x W x H (1' x 1' x 1') with finish plaster. • Fasteners: All Allen bolts, Spring Washer, Nuts, Washer & Plate Washer must be SS304. • Structure should have proper cleaning platform minimum width of 1.5' in GI checkered plate with side supports. • Paint: Before applying two coats of epoxy paint in smoke Gray colour, the contractor must first apply two coats of red oxide coating. • Mounting Accessories: Includes brackets, Solid Midclamps & End clamps, and bolts.	
b	Layout at Site approved by IBA Engineer	
c	Civil work as per drawing and specification approved by IBA Engineer.	
d	Placing of GI Rawal Bolts, Nuts bolts as per design & length & Details approved by IBA Engineer.	
e	Tilt angle is to be maintained as per recommended.	
f	The Contractor shall remove all the debris and clear the site before & after the completion of work as per IBA direction	
g	The Contractor shall submit the detail technical shop drawing before execution of work.	
h	After completion of the work the contractor shall submit the as built drawing.	
i	All Allen bolts, nuts, bolts, washers, spring washers and screws for the project should be Stainless steel (SS 304).	
j	The contractor must submit the ANSYS/SAP report prior to the project's execution.	
k	Waterproofing and any other roof damage must be repaired with the approval of the IBA Engineer.	

2	**PV MODULES-108.0KWp:**	**Unit**	**Qty**	**Unit Price(PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
i)	Supply of N-Type or any latest tech. Bifacial Photovoltaic Solar Modules Tier 1 Type anti-reflective high transparency low iron tempered glass, with earthing provision. The modules STC parameters must be as under (a) Min Power Pmax 600 or above Wp rated power (b) Junction Box Protection Degree, IP 68 (c) Connection box, 4.0mm2 conductor cross section, (d) Cable with, MC4 male and female connectors, (e) Anodized Aluminium Frame and Support Bars (f) PVC duct, Clamps & Accessories, support and labels to be installed under PV Array. The Contractor shall provide manufacturer warranty for solar panel for a period not less than 25 years. Contractor must submit all the required certificates for each PV solar panel from manufacturer as per specification. All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval. Make: Jinko/Longi/Canadian	Watt	108000.0				

3	**GRID-TIED INVERTER (PCU)**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
i)	Supply of DC/AC grid tie 3-phase inverter with data communication unit with Ethernet connection. The inverter with must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also. (Leading Market brand, having annual production greater than 1GW). The DC max power input rating should be at least 1.2 times of AC power at standard test condition (STC). The inverter unit shall be suitable for indoor and outdoor installations with IP65. The inverter must include the safety concepts such as (triple protection with Opti protect, electronic strings fuses, self-learning string failure detection, DC surge arrestor type (2) to ensure max availability. The inverter includes online monitoring with Wi-Fi Dongle. All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval. Make: Sungrow/Huawei/SMA Power Rating: 110KW to 125KW.	Each	1				
	Brief specification is as under:						
a	Max Input DC Voltage: 1100V						
b	MPPT Operating Voltage Range: 200V~1000V,						
c	Min 10 Independent MPPT Trackers						
d	Minimum Efficiency 98.0%,						
e	Warranty: 10 Years (Extendable to 15 Years)						
f	Minimum IP rating should be IP65						

4	**COMBINER BOXES**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
a	**DC COMBINER BOX**						
i)	Supply of DC box/Array Junction Box 16gauge wall mounted with all accessories for outdoor usage, proper cable glands as per cable size, slotted cable ducts should be installed for internal DC cabling. DC Combiner Box shall be provided One DC Breaker 4Pole per string. DC Breaker 4Pole 25A/32A,1000VDC, Qty=12 DC Breaker Make: ABB/Zjbeny/Dehn/Chint	Each	1				
b	**AC COMBINER BOX (LV PANEL)**						
i)	Supply AC Combiner Box (LV Panel) with pad floor standing/Wall Mounted Locally fabricated in 16-gauge, Colour Code: RAL7035, MS Powder Coated, Copper Glands, Lugs, Phase indication lights, Tin Coated Copper Busbar for 3 Phases with colour coded heat shrinkable sleeves, Neutral & Earth with Polycarbonate cover sheet. Brass glands at bottom In & Out, CT's, Energy meter with all related accessories for outdoor usage dust proof enclosure. AC Breaker 250A,4P,MCCB,400V/415V, Qty:01 AC SPD 4Pole, 65kA with HRC Fuses Energy Meter: Janitza or Equivalent CT's: Ficco/Saci or Equivalent MCCB Make: ABB/Schneider or Equivalent SPD Make: ABB/Schneider or Equivalent HRC Fuses Make: Schnieder/ABB/Voltron or Equivalent	Each	1				

5	**CABLES**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
a	**DC CABLES**						
	Supply of 1 Core 6mm2 Cu/XLPO/XLPO cable complete in all respect with accessories to connect the PV solar cells together and to the inverter directly to have a complete operational circuit, clamps, trays and cable end terminations which shall be DC plug and socket connectors. The allowable voltage drop for DC cables between PV Arrays and inverter should be less than 2%. Minimum voltage capacity 1500VDC, Highest permissible voltage conductor/conductor should be 1.5kV DC, Standard Double insulated: Cross link polyolefin, Tinned copper conductor: Cable should be Certified from TUV Approved. Standard:EN50618 Make: Pakistan Cable/Fast Cable/Kuka/ Jiukai as Engineer Approved.	Meter	1600				
b	**AC Cables**						
	Supply of the power cables with all required works in different sizes of ducts/pipes, Cable lugs, Clamps and all needed fittings to connect cables terminals from source to destination with LV termination kit (Raychm). According to drawings, specifications, instructions, and demand of the supervising engineer as follow: Brand: Pakistan Cable/Fast Cable or Equivalent as IBA Engineer Approved.						
i)	4C x 120mm2,0.6/1kV Cu/PVC/PVC STD Pure Copper	Meter	20				
c	**Earthing Cables**						
	Supply of Earthing Cable, Including uPVC Pipe with related accessories. Brand : Pakistan Cable/Fast Cable or Equivalent as Engineer Approved.						
i)	1 core 2.5 sqmm, CU/PVC/FLEX (Green)	Meter	450				
ii)	1 core 4 sqmm, CU/PVC/FLEX (Green)	Meter	180				
iii)	1 core, 50 sqmm, CU/PVC/STD (Green)	Meter	40				

6	**EARTHING SYSTEM**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
i)	Supply of Earth Electrodes (Rod Type) for Earthing System with 25mm Dia 3 meters (10feet) long driven Pure copper Solid rod, complete with clamps lugs, washer/bolts, connected with 1x70mmsq bare copper 50mm diaG.I pipe/UPVC pipe class 'D/E' up to Earth chamber, job includes cad-welding of copper conductor to earth electrode rod at one end and provision/fixing of cable lugs at other end, including all accessories and RCC inspection chamber, heavy duty G.I. Cover having earth symbol, etc as per the specifications and Drawings and to the entire satisfaction and approval of the Engineer. Minimum depth of the earth pit should be 80ft, Earthing result should be less than 1 Ohm for AC/DC/LA	Each	3				
7	**DATA LOGGER REMOTE MONITORING SYSTEM**						
i)	Supply of data Manager with Remote Monitoring System consists of the following parameter: a) Total energy generation of PV Plant b) Instantaneous Power been generated by solar PV plant c) Current load of client d) Load profile v/s energy generation. e) Daily Solar Plant generation report in PDF from Data should be store on server for not more than 10 min time interval. Data must be access through internet via user friendly GUI.	Each	1				
8	**CABLE TRAY**						
i)	Supply of following sizes 16SWG heavy Duti HDGI Perforated/Non-Perforated as per site requirement. Cable Tray 150mm x 100mm with 16 SWG HDGI. Complete with all installation material such as angle iron support of size, MS round bar, elbows, Tee, Nuts, Bolts, Washer, Hilti drop-in anchour, etc. Complete in all respect, as per the specification and drawings.	Meter	40				

9	**MISCELLANEOUS ITEMS**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
i)	Supply of 3-inch UPVC conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects.	Meter	75				
ii)	Supply of 2-inch UPVC conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects.	Meter	60				
iii)	Supply of 1-inch UPVC conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects.	Meter	40				
vi)	Supply of Fix Spiral Staircase Structure: M.S. Steel, 3-Coat Black Colour Enamel Paint Dia: 6', Height: 15' Center Pole Dia: 4" Tread Surface: 5 mm thick Checkered plates Tread Frame: 1¼" x 1¼" Angle Iron 6" Riser & Closure Handrail: 1½" round pipe, 12 SWG ¾"x ¾" square pipe, 2.5'~3' height at the nose of each tread Baluster height?? Top Platform: 2' x 5' Foundation: 3'-6" Starting Masonry Steps & Base Platform with Terracotta Stone Complete in all respect & related accessories as per Engineer instructions and approval. Dismantling of existing staircase	Job	1				
v)	Supply of Air Conditioner Type: Split (Wall mounted) BTU Capacity: 2.0 Ton (24000 BTU) DC Inverter Type with complete accessories Warranty: 1 Year Parts & 3 Years compressor Brand: Gree/Kenwood	Each	1				
vi)	Supply of Double Telescopic Aluminium Ladder compact to extended height to 20ft. The folding ladder is high quality construction ensures that each section expands and retracts safely. Intelligent locking pins hold the sections in place and prevent sliding, and the ladder will retract smoothly and slowly. Anti-Slip Steps and rubber feet fitted to protect internal flooring with the grip handle	Each	1				

10	**SERVICES**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
	Designing, Fabrication, Installation, Testing & Commissioning of following items complete in all respects:	Watt	108000				
a)	Installation, Testing & Commissioning PV Mounting structure						
b)	Photovoltaic Solar Modules						
c)	Installation, Testing & Commissioning of Grid tie 3-phase inverter with data communication unit with Ethernet connection						
d)	DC box/Array Junction Box 16gauge wall mounted with all accessories for outdoor usage						
e)	AC Combiner Box (LV Panel) with pad floor standing/Wall Mounted Locally fabricated in 16 gauge						
f)	DC Cable, 1 Core 6mm2 Cu/XLPO/XLPO cable complete in all respect with accessories						
g)	Installation, Testing & Termination of the AC power cables with all required works						
h)	Installation, Testing & Termination of Earthing Cable						
i)	Installation, Testing and Commissioning of data Manager with Remote Monitoring System						
j)	Installation of following sizes 16SWG heavy Duti HDGI Perforated/Non-Perforated as per site requirement. Cable Tray 150mm x 100mm with 16 SWG HDGI. Complete with all installation material						
k)	Installation of UPVC conduit sockets, Bends, Elbows, T-Joints, G.I Clamps, complete in all respects.						
l)	Installation, Testing & Commissioning of Air Conditioner						
m)	Re-fixing pavers/Tiles as in position including providing sand etc.	Each	1				
n)	Fabricate, Installation of Fix Spiral Staircase Structure: M.S. Steel	Job	1				
o)	Construct of concrete manholes/cable chambers (900mm x 900mm x 900mm deep) with heavy duty RCC covers with anti-rust paint, including all required sleeves for pulling underground power cables laid in pipes.	Each	1				

12	**OPERATION & MAINTENANCE**	**Unit**	**Qty**	**Unit Price (PKR)**	**Amount with out Tax (PKR)**	**Tax Amount (PKR)**	**Amount with Tax (PKR)**
i)	Two years of operations and maintenance is an integral activity of this EPC project, which will determine the success of this project. It is to be noted that 2 years O&M will be initiated after project closet is intended that the project performs as per design "Performance Commitment Table" while also maintaining the project to ensure reliability and longevity for 25 years. Industry best practices to be used to operate and maintain the solar PV Project. All necessary preventive and corrective actions to be shared and implemented before the start of the O&M contract. The following key performance metrics to be monitored and reported which are as follows: • Cleaning of solar panels to remove dirt, dust, and debris twice in a month. • Inspection of cables, connectors, junction boxes, and grounding systems. • Tightening of bolts, screws, and clamps in mounting structures. • Identifying and resolving faults in modules, inverters, or other components. • Rapid response to critical failures to minimize downtime. • Tracking key performance indicators (KPIs) such as energy output, PR (performance ratio), and system availability. • Implementing software updates for inverters and monitoring systems. • Managing claims for defective components under warranty. • Implementing and maintaining safety measures for O&M personnel. Performance Ratio (burn test) to be carried out for 15 days once project is completely installed and ready for testing. Monthly reports to be shared covering all aspects of solar PV performance including an event log. Any system under performance or failure of an equipment will automatically trigger the requirement of a detailed root cause analysis RCA (based on site-based tests) and a report will have to be submitted at the earliest completion of an RCA.	Watt	108000				

	Note: Contractor should only submit the 108kWp Performance commitment table.						
	Total Cost in PKR with out Tax						
	Tax Amount						
	Grand Total Cost in PKR with Tax						

Grand Total Amount of in Words:

Rupees: _____

_____