Tender Fee: Rs. 5,000/-
(Non-Refundable)

TENDER FORM
FINANCIAL DOCUMENT
Tender # CW/11/24-25

Design, Supply, Installation, Testing & Commissioning of
241.0 kWp Roof Mounted Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA City Campus
INSTITUTE OF BUSINESS ADMINISTRATION IBA KARACHI IBA MAIN CAMPUS KARACHI UNIVERSITY ENCLAVE KARACHI
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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 241.0 kWp Roof Mounted Grid Tied Utility Interactive Photo Voltaic Solar Power System	241.02		366,000
	TOTAL AMOUNT OF THE PROJECT WITH OUT TAX		28,712,600	
	TOTAL AMOUNT OF THE PROJECT WITH TAX		32,579,360	
	GRAND TOTAL AMOUNT OF THE PROJECT PER WATT WITH TAX		135.17	

PROJECT TITLE: Design, Supply, Installation, Testing & Commissioning of 241.0 kWp Roof Mounted Grid Tied Utility Interactive Photo Voltaic Solar Power System at IBA City 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	As-built drawings shall be submitted after handing over the work.				
6	All DBs will be lockable type.				
7	Upon completion of the installation, the contractor shall organize an onsite training program involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates.				
8	The price includes all 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.				
9	All the following items include Supply, Installation, Testing, Commissioning and Operate of the complete PV Solar System				
10	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.				
11	The inverter room will have air conditioners as recommended by OEM (sized based on inner room volume and heat dissipation of inverters) and will have lock & key.				
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 required in IBA existing LV Panel for AC cable connections, Contractor must include the price in the financial proposal.				

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BOQ ROOF MOUNTED SOLAR PV SYSTEM ESTIMATED CAPACITY_241kWp							
Sr No	Product	Unit	Qty	Unit Price (PKR)	Amount without Tax (PKR)	Tax Amount (PKR)	Amount with Tax (PKR)
1	MODULE MOUNTING STRUCTURE						
	FAYSAL BANK ROOF MOUNTED						
i)	Designing, Supplying, Fabrication & Installation of Elevated Mounting structure Hot Dip Galvanized Iron (HDGI). 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 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 tilt angle shall be optimum as per site requirement. 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	149,760	45	6,739,200	1,213,056	7,952,256
a	Designing of the structure as per design specification approved by IBA Engineer: • Column/Pole Size: 4" x 4" in 12 gauge. Columns may be circular or square shape. • Base Plate Size: 10" x 10" with 10mm thickness. • Top Plate Dimension: 6" x 6" with 6mm thickness. • Bracing Angles: In 12 gauge. • Sharing Girder: Sharing of Girder not allowed in structure design. • Tilt Angle: Must be optimal for energy generation. • Cleaning Space: Adequate cleaning space must be incorporated. • Material: Hot Dip Galvanized (HDGI). • Civil Pads: Civil concrete pads sizes shall be L x W x H (1' x 1' x 1') • Gauges: All gauges will be assessed before galvanization. • Fasteners: All Allen bolts, Spring Washer, Nuts, Washer & Plate Washer must be SS304. • Cleaning Platform: MS Moveable cleaning ladder in 14gauge with proper cleaning						
	platform of checker plate with epoxy paint. • Galvanization Coating Thickness: 100 to 120 microns for durability. • Mounting Accessories: Includes brackets, clamps, and bolts						
b	Layout at Site approved by IBA Engineer						
c	Placing of Anchor Bolts & Base Plate as per design & length & Details approved by IBA Engineer.						
d	The Contractor shall remove all the debris and clear the site as per direction						
e	The Contractor shall submit the detail technical shop drawing before execution of work.						
f	After completion of the work the contractor shall submit the as built drawing.						
g	Minimum warranty period for structure 10 years						
	AUDITORIUM ROOF						

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i)	Designing, Supplying, Fabrication & Installation of Ballast type PV Mounting structure in Aluminium. The mounting structures and the civil concrete pads 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, for anodized aluminium AL6005/6063. The mounting structure components are bonded together to guaranty potential equalization. The tilt angle shall be not more than 15 deg. 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	91,260	15	1,368,900	246,402	1,615,302
a	Designing of the structure as per design specification approved by IBA Engineer.						
b	Layout at Site approved by IBA Engineer						
c	Civil work as per drawing and specification approved by IBA Engineer.						
d	Placing of 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 as per 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).						
2	**PV MODULES-241.02KWp:**						
i	Supply, Installation, Testing & Commissioning (SITC) N-type 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 585 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.	Watt	241,020	30	7,230,600		7,230,600
3	**GRID-TIED INVERTER (PCU)**						

i)	Supply, Installation, Testing & Commissioning (SITC) 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 wife Dongle. All works and materials must be according to the drawings, specifications and supervisor Engineer instructions and approval. Make: Sungrow/Huawei/SMA or equivalent Power Rating: 110KW to 125KW.	Each	2	1,550,000	3,100,000	558,000	3,658,000
	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						
f	Minimum IP rating should be IP65						
4	**COMBINER BOXES**						
a	**DC COMBINER BOX**						
i)	Supply, Installation, Testing & Commissioning (SITC) of DC box/Array Junction Box with all accessories for outdoor usage, proper cable glands as per cable size. DC Combiner Box shall be provided One DC Breaker 4Pole per string. DC Breaker 4Pole 25A/32A,1000VDC, Qty=14 DC Breaker Make: ABB/Zjbeny/Dehn/Chint or Equivalent	Each	2	35,000	70,000	12,600	82,600
b	**AC COMBINER BOX (LV PANEL)**						
i)	Supply, Installation, Testing & Commissioning (SITC) of AC Combiner Box (LV Panel) with pad floor standing/Wall mounted, Locally fabricated in 16 gauge, Colour Code: RAL7035, MS Powder Coated, Copper Glands, and Lugs, Phase indication lights, Tin Coated Copper Bulbar 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 minimum IP Rating 54 With dust proof enclosure. AC Breaker 250A,4P,MCCB,400V/415V, Qty:01 AC Breaker 250A,4P,MCCB,400V/415V, Qty:01 AC Breaker 630A adj,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	465,000	465,000	83,700	548,700
6	**CABLES**						
a	**DC CABLES**						
	Supply, Installation & Testing of DC Cable, 1 Core 4mm2 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 or Equivalent as Engineer Approved.	Meter	5,040	220	1,108,800	199,584	1,308,384
b	**AC Cables**						

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	Supply, Installation & Testing of the AC 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. According to drawings, specifications, instructions, and demand of the supervising engineer as follow: Brand: Pakistan Cable/Fast Cable or Equivalent as Engineer Approved.						
i)	4C x 120mm2,0.6/1kV Cu/PVC/PVC Pure Copper	Meter	40	16,000	640,000	115,200	755,200
ii)	2x4C x 185mm2,0.6/1kV Cu/XLPE/PVC Pure Copper	Meter	110	26,000	2,860,000	514,800	3,374,800
c	Earthing Cables						
	Supply, Installation & Testing of Earthing Cable, Including PVC 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	630	120	75,600	13,608	89,208
ii)	1 core 4 sqmm, CU/PVC/FLEX (Green)	Meter	360	200	72,000	12,960	84,960
iii)	1 core, 70 sqmm, CU/PVC/STD (Green)	Meter	40	2,500	100,000	18,000	118,000
iv)	1 core, 120 sqmm, CU/PVC/STD (Green)	Meter	65	6,000	390,000	70,200	460,200
7	**EARTHING SYSTEM**						
i)	Supply, Installation, testing and commissioning 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 1x35mmsq 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. Earthing result should be less than 1 Ohm for AC/DC/LA	Each	4	145,000	580,000	104,400	684,400
8	**DATA LOGGER REMOTE MONITORING SYSTEM**						
i)	Supply, installation, testing and commission 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) Performance ratio of PV plant d) Current load of client e) Load profile v/s energy generation. f) Daily Solar Plant 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	250,000	250,000	45,000	295,000
9	**CABLE TRAY**						
i)	Supply and installation of following sizes 16SWG heavy duty HDGI Perforated Cable Tray 100mm x 75mm 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	100	4,500	450,000	81,000	531,000
ii)	Supply and installation of following sizes 16SWG heavy duty HDGI Perforated 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	100	5,800	580,000	104,400	684,400
iii)	Supply and installation of following sizes 16SWG heavy duty G.I Cable Tray 300mm 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	75	7,600	570,000	102,600	672,600
10	**CIVIL & MISCELLANEOUS WORK**						
i)	Supply and installation of 3 inch UPVC conduit sockets, Bends, Elbows, T-Joints, Clamps, complete in all respects.	Meter	140	500	70,000	12,600	82,600

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ii)	Supply and installation of 2 inch UPVC conduit sockets, Bends, Elbows, T-Joints, Clamps, complete in all respects.	Meter	75	500	37,500	6,750	44,250
iii)	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	2	95,000	190,000	34,200	224,200
iv)	Re-fixing pavers/Tiles as in position including providing sand etc. Removal/Cutting of trees at designated places for avoiding shadow at Solar structure etc.	Job	1	155,000	155,000	27,900	182,900
v)	Supply and Installation of Air Conditioner Type: Split (Wall mounted) BTU Capacity: 1.5 Ton (18000 BTU) DC Inverter Type with complete accessories Warranty: 1 Year Parts & 3 Years compressor Brand: Gree/Kenwood/Dawlance or equivalent	Each	2	240,000	480,000	86,400	566,400
11	**INVERTER ROOM**						
i)	Design, Provide & Construct RCC Frame structure Inverter Room Size 10'-0" x 12'-0", Height 10'-0" for installation of Grid Tied Invertors, DC Combiner Boxes & AC Combiner Boxes. The rate includes all type of masonry work with Aluminium Door & windows. The rate include all type of labour & material required. Max HT of the room 10'-0" from FFL. Non-skid tiled floor and Plastic Emulsion on walls internal & Weather Shield on external walls as per direction of Engineer Incharge & approved design & drawing	Sq.Ft	120	6,500	780,000	140,400	920,400
12	**NET METERING**						
i)	Service of Net metering application process & handling as per K.E approved criteria complete in all respects or directed by Engineer. This also include the services charges & fee for assessment of Grid load flow study if it required & service charges for Load Inspector etc. Only the cost of K.Electric/Nepra Challan shall be paid by IBA	Job	1	350,000	350,000	63,000	413,000
	Total Amount in PKR without Tax						28,712,600
	Tax Amount						3,866,760
	Grand Total Amount in PKR with Tax						32,579,360
Grand Total Amount of in Words:							
Rupees: Thirty two million, Five Hundred Seventy Nine thousands, Three Hundred and Sixty ruppess only.							

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