ISLAMIC RELIEF PAKISTAN

Rehabilitation and Installation of Solar System in Janazgah and Madrassa in Tehkal District Peshawar-Annexure-B

S.No	Items & Specification	Brand	Quantity	Unit	Unit Rate	Amount-PKR
1	**SOLAR PANEL : Supply and installation of Mono-crystalline A-Grade Solar PV Module (Single face or Bificial)(N-type latest technology) with a minimum capacity of 580 watts per PV Module, featuring a minimum module efficiency of 22% (Single face Module). The panel must comply with international standards, including IEC 61215:2016, IEC 61730-1:2004, IEC 61730-2:2004, and IEC 61710. Preference will be given to panels with Anti-PID Certification based on IEC TS-62804-1 standards (e.g., TUV PPP-58042). The module should deliver outstanding conversion efficiency and be compatible with high-voltage input inverters/charge controllers (1000 Vdc). It must include a clear anodized aluminum frame with anti-reflection cover glass, and exhibit resistance to ammonia and salt mist corrosion. Each panel should be equipped with a factory-installed weatherproof terminal junction box (minimum IP65 protection), allowing for easy replacement of DC cables, debugging, and blocking diodes. A minimum 25-year performance warranty for minimum 80% output power is required. Panels must include brand name, serial number, import date, and manufacturing date, with certified high wind speed resistance and flash test reports provided for samples. All data should be accessible and verifiable online on the manufacturer's website. Canadian Solar, Jinko Solar, Longi Solar or any other best available and reputed brand with actual import documents and other necessary items to be validated as per the specifications or sample provided.**					
a	SOLAR PANEL		50.00	No's		
2	**Supply and Fixing of Galvanized MS C-Channel for L3 Solar Mounting Frame Supply, fabricate and install structural mild-steel C-channel sections measuring 3" × 1½" × ⅜" (web depth × flange width × return lip), with minimum 0.104" (12 SWG) steel thickness, hot-dip galvanized with a minimum average zinc coating thickness of 80 microns. Include cutting, drilling, connection plates, galvanized or SS 304 fasteners, fabrication, Base plates and anchor bolts, Bracing, connection plates, nuts and bolts, Roof waterproofing at foundation/anchor locations , transportation, installation, labour, tools and all necessary accessories, complete as per approved structural drawings.**					
a	L3 frame		30.00	Sets		
3	**Providing and laying Plain Cement Concrete (PCC) 1:2:4 using approved cement, sand and coarse aggregate, including batching, mixing, placing, compacting, finishing, curing for a minimum period of seven (7) days, and all labor, materials, tools, equipment and incidentals required to complete the work in accordance with the drawings, specifications and instructions of the Engineer-in-Charge.**					
a	In Foundation of L3 frame structure		45.00	Cft		
4	**Supply, Installation, Testing and Commissioning of 10 kW Hybrid Solar Inverter Supply, install, test and commission one 10 kW single-phase hybrid solar inverter, 230 V, 50 Hz, with pure sine-wave output, compatible with a 48/51.2 V $LiFePO_4$ battery bank and grid-connected solar PV system. The inverter shall support a minimum maximum PV input capacity of 12 kW, with at least two independent MPPT trackers and suitable PV voltage and current limits for the approved solar array. It shall provide automatic changeover to battery backup during grid failure, integrated battery charging and discharging management, CAN/RS485 battery BMS communication, and Wi-Fi/app monitoring or equivalent. The inverter shall incorporate overload, short-circuit, overvoltage, overtemperature and other manufacturer-provided electrical protections. It shall have a minimum five-year manufacturer's or authorized supplier's warranty and shall be supplied complete with mounting accessories, communication cables, configuration, testing, commissioning, operating manuals and warranty documentation. The proposed inverter shall be suitable for the connected load and approved PV array, with all specifications verified against the manufacturer's datasheet before procurement.**					
a	10 KW Hybrid Invertor		3.00	No's		
5	**Supply and install 6 mm^2 tinned copper solar DC cable, single-core, double-insulated, UV-resistant, weatherproof and suitable for outdoor photovoltaic installations, rated for 1,500 V DC. Cable insulation and sheath shall be heat-resistant, halogen-free and suitable for exposure to moisture and sunlight. The cable shall be compatible with the approved PV modules, connectors and inverter. The rate shall include supply, transportation, laying, routing, termination, identification, cable clips, ties, labour, tools and all necessary accessories, complete as per approved electrical drawings and manufacturer's recommendations.**					
a	6 mm^2 DC wire		300.00	Rft		
6	**Supply and installation of 4 mm^2 tinned copper solar PV DC cable, stranded and flexible, double XLPE-insulated, UV-resistant, fire-retardant and weather-resistant, rated 1,500 V DC, compliant with IEC 62930 or EN 50618, suitable for PV module-to-inverter connections, including routing, termination and identification.**					
a	4 mm^2 DC wire		600.00	Rft		
7	**Supply and installation of TUV-approved MC4-compatible PV connectors, rated for the system voltage and current, suitable for the specified cable size, complete with locking mechanism and weatherproof seals.**					
a	MC4-compatible PV connectors		40.00	Pairs		
8	**Supply and installation of DC combiner/protection box, weatherproof enclosure, minimum IP65 for outdoor exposure, with DC isolator, appropriately rated string fuses where required, Type II DC SPD, terminals and internal wiring, suitable for the approved PV string configuration.**					
a	MC4-compatible PV connectors		2.00	Cft		

S.No	Items & Specification	Brand	Quantity	Unit	Unit Rate	Amount-PKR
9	**Supply and install complete solar PV cable management accessories, including UV-resistant cable clips, saddles, cable ties, weatherproof DC junction boxes, cable glands, and UV-resistant PVC/GI conduits or cable ducts, complete with bends, couplers, clamps, supports, seals, terminals, and all necessary fittings. All materials shall be suitable for outdoor installation, resistant to UV radiation, moisture and corrosion, and compatible with the PV cables, mounting structure and electrical equipment. The installation shall ensure secure cable routing, protection against abrasion and mechanical damage, and neat, safe cable management in accordance with the approved electrical layout and manufacturer's recommendations. The rate shall include supply, transportation, installation, labour, tools and all necessary accessories, complete in all respects.**					
a	solar PV cable management accessories, including UV-resistant cable clips, saddles, cable ties, weatherproof DC junction boxes, cable glands, and UV-resistant PVC/GI conduits or cable ducts,		2.00	Job		
10	**Item: Supply, Installation, Testing and Commissioning of Complete AC Distribution, Protection and Earthing System Supply, install, test and commission a complete AC distribution and electrical protection system for the rooftop solar PV installation, comprising an appropriately rated AC distribution board with enclosure, busbars, terminals and internal wiring; main AC isolator; suitably rated circuit breakers for the inverter, fan, lighting and exhaust-fan circuits; Type II AC surge protection device (SPD); residual-current protection (RCD/RCBO) compatible with the selected inverter; copper AC power cables of suitable cross-sectional area; changeover/interlocking arrangement where required; earthing conductors, earth electrodes, clamps and bonding accessories; cable lugs, ferrules, glands, connectors, identification labels and all necessary accessories. All components shall be compatible with the 230 V, 50 Hz single-phase supply and the approved inverter output. Cable sizes, protective-device ratings and earthing arrangements shall comply with applicable electrical standards, the manufacturer's instructions and the approved electrical drawings. The rate shall include supply, transportation, installation, termination, testing, commissioning, labour, tools and all necessary accessories, complete in all respects.**					
	Breakers,SPD and other accessories		2.00	Job		
11	**Supply and Installation of AC Power Cable Supply and install copper conductor AC power cable, minimum 10 mm² cross-sectional area, 0.6/1 kV rated, 3-core (live, neutral and protective earth), XLPE/PVC insulated and PVC sheathed, suitable for 230 V, 50 Hz single-phase solar inverter connections. The cable shall be of an approved make, suitable for the installation environment and current-carrying requirements, and installed in suitable conduit or cable trunking where required. The item shall include cable laying, routing, termination, copper lugs, glands, ferrules, identification, fixing accessories, labour, tools and testing, complete as per approved electrical drawings and manufacturer's recommendations.**					
	AC Power Cable 3-core cable		180.00	Rft		
12	**Supply and install 3/29 stranded copper electrical wire, PVC-insulated, 450/750 V rated, suitable for light-duty electrical wiring and control circuits. The wire shall be of an approved make, with uniform copper strands and insulation free from defects. Include laying, routing, termination, connectors, labour, tools and all necessary accessories, complete as per approved electrical drawings.**					
a	AC wire 3/29		180.00	Rft		
b	AC wire 7/29		180.00	Rft		
c	AC wire 7/36		180.00	Rft		
13	**Supply and install 56-inch (1400 mm) ceiling fans, 220–240 V, 50 Hz, single-phase, rated power approximately 70–80 W, with 99% or better copper winding, three blades, durable body, suitable downrod, canopy, mounting bracket, regulator and all necessary electrical connections. Fans shall provide adequate air delivery, operate with minimum vibration and noise, and be from an approved make such as Pak Fan, Royal, GFC or equivalent, subject to sample approval. Include supply, transportation, installation, testing and commissioning.**					
a	Ceiling Fans		14.00	No's		
14	**Supply and install 12-inch (300 mm) exhaust fans, 220–240 V, 50 Hz, single-phase, with a durable metal or heavy-duty engineering-plastic body, corrosion-resistant blades, protective front and rear guards, suitable mounting frame and adequate airflow for the intended room. The fan shall include its motor, mounting accessories, wiring and electrical connections. Provide a suitable wall/window installation and test the fan for vibration, noise and airflow after installation. Approved make: Pak Fan, Royal, GFC or equivalent, subject to sample approval.**					
a	Exhaust Fan		4.00	No's		
15	**Supply and install 18 W LED ceiling lights, 220–240 V AC, 50 Hz, with minimum luminous efficacy of 90 lumens/W, suitable for indoor installation, a colour temperature of 4000–6500 K or as approved, power factor of at least 0.90, and a rated service life of at least 25,000 hours. Fittings shall include an integrated LED driver, diffuser, mounting accessories and all necessary electrical connections. Approved make: Philips, Osaka, EcoStar or equivalent, subject to sample approval.**					
a	LED lights		30.00	No's		
Grand Total Inclusive of Govt Applicable Taxes, Transportations and Installation						