

**Annex C- Supply of Material, Construction, Rehabilitation and Solarization Work GPS Malang Dara UC Malak Pur Tehsil Gadezai District Buner**

S.#	Name	DESCRIPTION	Unit	Quantity	Brand Offered	Unit Rate	Total Cost
<b>a. Boundry Wall</b>							
1	Dismantling Dry stone Masonary	Dismantling Dry stone Masonary and proper disopal of debris away from site / School Building	Cft	562.50			
2	Excavation	Excavation in foundation of building, bridges etc complete : in shingle/gravel	Cft	200.00			
3	PCC (1:4:8)	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:4:8)	Cft	50.00			
4	Brickwork CSM 1:4	1st class brick work in ground floor Cement, sand mortar 1:4	Cft	310.41			
5	PCC (1:2:4)	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4)	Cft	16.28			
6	Cement plaster in 1:4 CSM	Wall Internal Surface plaster: Cement plaster 1:4 upto 20' height 1/2" thick	Sft	560.00			
7	Paint Work	Preparing surface & painting with snowcem / weathershield paint : First coat & 2nd Coat	Sft	4,900.00			
8	Barbed wire fencing	Providing and fixing barbed wire (12 Guage) fencing consisting of 1.5"x1.5"x3/16" angle iron post 3.25 ft long, 5 to 6 ft centre to centre	Rft	350.00			
<b>Sub total</b>							
<b>b. Solarization</b>							
9	SOLAR PANEL	Supply and installation of Mono-crystalline A-Grade Solar PV Module (Single face or Bifacial)(N-type latest technology) with a minimum capacity of 585 watts per PV Module, featuring a minimum module efficiency of 22% (Monofacial/Bifacial/PERC Module). The panel must comply with international standards, including IEC 61215:2016, IEC 61730-1:2004, IEC 61730-2:2004, and IEC 61710. The module should deliver outstanding conversion efficiency and be compatible with high-voltage input inverters/charge controllers (1000 Vdc). 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 at time of sample submission. 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.	No's	6			
10	Mounting Structure	Mounting Structure 12SWG (Hot-dip Galvanized (minimum 80 microns) coatingsteel Structure) with the following minimum specifications: Wind speeds resistant up to 180–200 km/h, comply with relevant regional seismic zone requirements, compatible with framed solar PV modules (60/72/144 cell modules), typically fixed tilt, 10°–30° (optimized for site latitude and roof space or as per site requirements), Structural spacing ≤ 1.5 m to minimize deflection. Member Thickness:Main purlins / rafters: ≥ 2.5–3.0 mm (steel) Vertical & diagonal bracings: ≥ 2.0 mm Bracing:Diagonal bracing mandatory for L3 category to resist lateral loads. Cross bracing provided between rows if spacing > 3 m. Bolts & Nuts: SS 304/316 grade, minimum property class 8.8 (zinc plated or hot-dip galvanized). Roof Anchoring: Chemical anchors or through-bolt anchoring tested for pull-out strength. Minimum factor of safety: 1.5 against uplift.Compatibility: Anti-galvanic corrosion measures between aluminum and steel members (use of EPDM washers, isolators). Note: These are the minimum requirements, however, tolerance will be kept as per the site situations and conditions. The fixing of the structure is also included all type of the civil and mechanical works like dismantling, cutting, filling, removing the trash, making of 1ft x 1ft x 1ft concrete 1:2:4 pads, welding, cutting, fixing etc. The anchor bolts should be done through chemeical anchoring i.e ANCHOR BOLT HIGH STRENGTH EPOXY MORTAR dipped and well fixed in epoxy. All the openings in the hallow sections will be properly water tight through additional welding or any suitable water proofing method.	No's	1			

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11	Inverter (3 kW Off-grid)	Type: Off-Grid Solar Inverter Operation Mode: Solar PV Direct Operation without Battery Backup, Configuration: Single Unit or Parallel Compatible, Phase: Single Phase or Three Phase (as required), Technology: Pure Sine Wave Mounting: Wall Mounted, Outdoor Rating: IP65 Minimum. Minimum 3 years repair/replacement warranty and 5 year service warranty Electrical Specifications: Rated Output Power: Minimum 3 kW, Recommended PV Capacity: 5–6 kWp, AC Output Voltage 230V AC (Single Phase) / 400V AC (Three Phase) Frequency: 50/60 Hz, Output Waveform: Pure Sine Wave, Inverter Efficiency: ≥ 96% min, Peak Efficiency ≥ 98%, Total Harmonic Distortion (THD) < 3% MPPT Quantity: Minimum 2 Independent MPPTs, MPPT Voltage Range: 200–850 V DC, Maximum DC Input :Voltage 1000 V DC, Maximum Input Current: ≥ 25 A per MPPT Capacity: Minimum 2x rated load Protection Features	No's	1			
12	DC Wiring (6 mm <sup>2</sup> )	DC Wiring (6 mm <sup>2</sup> ) : Solar DC Cable 1 Core 6mm BS:6500 Single Core Cables conform to BS-6004 "PVC Insulated cables (armored) for electric power and lighting". PVC Insulated Sheathed Cables and are rated 450/750 Volts. Single Core Cables with additional PVC safety. (99% pure copper).The composite rate covers all wires and conductors, to be placed and run in a flexible PVC pipe (1.5" or 2", or per site requirements).	Rft	200			
13	Cable: 3/0.029"	Supply and Erection single core PVC insulated copper conductor 250/440 V grade cable : 3/0.029" (99% pure copper).The composite rate covers all wires and conductors, to be placed and run in a flexible PVC pipe (1.5" or 2", or per site requirements).	Rft	50			
14	Cable: 7/0.029"	Supply and Erection single core PVC insulated copper conductor 250/440 V grade cable : 7/0.029" (99% pure copper).The composite rate covers all wires and conductors, to be placed and run in a flexible PVC pipe (1.5" or 2", or per site requirements).	Rft	50			
15	Surge Protection Device (SPD)	Surge Protection Device (SPD): A suitable Surge Protection Device (SPD) must be installed on both the DC and AC sides to safeguard the system from lightning surges and transient over-voltages. On the DC side, a Type II, 2-pole or 3-pole SPD rated for 1000 V DC, with a nominal discharge current (In) of at least 20 kA and a maximum discharge current (Imax) up to 40 kA, should be connected between the PV array and inverter input. On the AC side, a Type II SPD rated for 415 V AC, 3-phase + neutral with similar surge handling capacity should be installed at the inverter output or in the main AC distribution board. The SPD must comply with IEC 61643-31 standards, include visual fault indicators or replaceable modules, and be mounted on a DIN rail in a weatherproof enclosure with short, direct connections to the earthing system. Proper coordination with the system earthing (resistance < 2 Ω) is essential to ensure effective protection and long-term reliability of the PV installation	No's	1			
16	Circuit Breaker	AC Circuit Breaker (Inverter Output Side): Type: AC MCB / MCCB, 4 Pole (TPN + Neutral), suitable for inverter output. Voltage Rating: 415 V AC, 50 Hz. Current Rating: To match inverter AC output (for a 20 kW inverter, typically ~32–40 A; breaker rated at 63 A, 4P recommended for safe margin). Breaking Capacity: ≥ 10 kA at 415 V AC. Trip Curve: C or D curve, depending on inverter specs and inrush current. Standard Compliance: IEC 60898-1 / IEC 60947-2. Mounting: DIN-rail or MCCB panel-mounted, in weatherproof IP54/IP65 enclosure if outdoors. Features: Overload and short-circuit protection, thermal-magnetic release, high mechanical endurance. Installation: Placed between inverter AC output and main AC distribution board (MCCB/ACDB), coordinated with AC SPD. Protection: must be dust-proof and weatherproof (IP54–IP65)	No's	4			

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S.#	Name	DESCRIPTION	Unit	Quantity	Brand Offered	Unit Rate	Total Cost
17	Rotary Changeover MI 4 Pole 63A	Rotary Changeover MI 4 Pole 63A: A Rotary Changeover Switch, 4 Pole, 63A shall be a heavy-duty manual type (MI) designed for safe and reliable transfer between two power sources, rated for 63 Amperes at 415V AC, 50Hz, 3-phase + Neutral. The switch shall have OFF – I – II positions with a robust rotary operating handle, padlocking provision in OFF position for maintenance safety, and clear position indication. It shall be suitable for both resistive and inductive loads, complying with IEC/IS 60947-3 standards, with a short-circuit withstand capacity of at least 10 kA. The device shall have silver-plated contacts, high mechanical endurance of minimum 10,000 operations, and electrical endurance of at least 1,000 operations at rated load. The body shall be made of heat-resistant, flame-retardant insulating material with heavy-duty terminals to accommodate copper/aluminum cables up to 25 mm <sup>2</sup> . The changeover switch shall be supplied in a dust- and vermin-proof enclosure (IP54 or higher), fabricated from powder-coated sheet steel or thermoplastic, complete with earthing provision and adequate space for incoming/outgoing cables. Installation shall include proper crimped terminations, enclosure earthing with minimum 16 mm <sup>2</sup> copper conductor, and compliance with all relevant electrical standards. The complete system shall be tested for continuity, insulation resistance, dielectric strength, and smooth switching operation before commissioning and final approval.	No's	1			
18	SOLAR SYSTEM EARTHING	SOLAR SYSTEM EARTHING: Supplying, installation and commissioning of a complete earthing system for the solar PV plant, comprising minimum one copper-bonded earth rods of 3 m length each, driven vertically into borehole of not less than 3.5 m depth with proper backfilling and compaction. The earth rod shall be housed in an accessible inspection chamber/manhole with cast iron cover. The system shall include a copper lightning arrester, earth joints, clamps, and GI pipes for mechanical protection. A 16 mm <sup>2</sup> flexible copper cable shall be provided from the PV structure to the earth rods, while 6–10 mm <sup>2</sup> copper wire shall loop and interconnect all PV module frames and structures to ensure equipotential bonding. The main earth conductor from the electrode pits to the inverter/ACDB shall be 16–25 mm <sup>2</sup> copper, sized for prospective fault current. Both DC and AC side SPDs shall be connected to earth using short, low-impedance 10–16 mm <sup>2</sup> copper conductors, while lightning down conductors shall be 25–35 mm <sup>2</sup> copper (or equivalent approved material) bonded to the same network. All joints shall be made with exothermic welds or approved heavy-duty clamps, protected in GI pipe/conduits against damage, and permanently marked. The complete system shall be tested and commissioned to achieve an earth resistance of less than 2 Ω, and all results shall be recorded and approved by the supervising engineer/consultant. The earthing should conform with the Pakistan Engineering Council (PEC) PETSAC-2014 (Pakistan Electric Technical Standards and Codes, IEC 60364 (Low-Voltage Electrical Installations), IEEE 80 (Guide for Safety in AC Substation Grounding), IEC 62548 (Photovoltaic Systems - Design Qualifications and Installation, IEC 62305 (Protection Against Lightning) etc.	No's	1			
<b>Sub Total</b>							
<b>c. Rehabilitation of GPS Malang Dara School building (2 NO's of classrooms: 16'x24' and (24'x9')</b>							
19	CGI Sheet Removal from Roof	Removal of 25% existing damaged/rusted CGI Sheets from Roof of 2 No's Class rooms (16'x24') and 1 Veranda (24'x9') and fixing it as vertical partition/boundary as per instruction of Engineer.	Sft	360.38			
20	Ceramic Tiles 16" x 16"	Providing and Fixing of Ceramic Tile 16"x16"	Sft	1,024.00			
21	Cement plaster in 1:3 CSM	Cement plaster 1:3 upto 20' height 1/2" thick	Sft	320.00			
22	Paint / Weathershield	Preparing surface & painting with snowcem / weathershield paint : First coat & 2nd Coat	Sft	2,100.00			
23	PVC Tiles 2' x 2'	P/F of PVC tile of size 2' x 2' ' false ceiling with finishing of joints along with Aluminum L and T sections and Hanging wires	Sft	984.00			
24	CGI Sheet	Supply & fix corrugated GI sheet with GI bolts, nuts, limpet etc. complete : 22 BWG	Sft	360.38			
25	Plain GI Sheet Ridging	Plain GI sheet ridging including fixture complete 9" lap & 24" overall, of 24 gauge GI sheet ridging	Rft	70.00			
26	Distemping	Distemping Old surface including surface preparation : Two coats	Sft	2,784.00			

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S.#	Name	DESCRIPTION	Unit	Quantity	Brand Offered	Unit Rate	Total Cost
27	Paint Work	Preparing surface and painting with emulsion paint (Painting old surfaces : Sashes, fanlights, doors or windows): First coat and 2nd Coat	Sft	1,993.50			
28	Electric wire 7/29	Supply and Erection of Electric wire 7/29	Rft	350.00			
29	Electric wire 3/29	Supply and Erection of Electric wire 3/29	Rft	350.00			
30	Two pin socket	Supply and Erection of two pin socket 15Amp-220/250 Volt AC	No's	10.00			
31	Electric switch	Supply and Erection of Electric switches 15Amp-220/250 Volt AC	No's	10.00			
32	Duct Patti 1"	Supply and Erection of duct patti 1"	Rft	200.00			
33	Bulb Holder	Supply and Erection of Light holder screw type	No's	10.00			
34	LED Bulb 18 watt	Supply and Erection of Energy efficient LED Bulb 18 watt	No's	10.00			
35	PVC box and fiber sheet 4"x4"	Supply and Erection of Wall electric board High quality PVC box and fiber sheet 4"x4"	No's	4.00			
36	PVC box and fiber sheet 8"x10"	Supply and Erection of Wall electric board High quality PVC box and fiber sheet 8"x10"	No's	4.00			
37	Steel nails 1"	Steel nails 1"	Packet	1.00			
38	Steel nails 2"	Steel nails 2"	Packet	1.00			
39	AC ceiling fan	Supply and Erection best quality AC ceiling fan complete with GI rod, canopy, blades & regulator : 56" sweep	No's	4.00			
40	Student Chairs	Supply of chairs (Sheesham Seasoned Wood/Metal Structure) Overall Size:- Depth 450 x width 470 x height 780mm Seat Height:- 450mm Table Size:- 460 x 220mm (shaped) Table height:- 645mm Seat Size:- 430 x 450mm (08-Nos wooden strips) Back Size:- 430 x 170mm(03-Nos wooden pieces) Chair structure made of mild steel square pipe 20/20mm (Mild steel/cold rolled) wall thick 1.2mm. Finished with N.C. Structure Painted with red oxide and two layers of enamel paint of black color having 20 x 20mm rubber shoe good quality fixed in chair legs.	No's	40.00			
<b>Sub total</b>							
<b>d. Rehabilitation of Latrine Block and Water Supply</b>							
41	Dismantling	Dismantling PCC 1:2:4 Flooring of 3 No's latrine	Sft	72.00			
42	PCC (1:2:4)	Plain Cement Concrete for floor of latrine including placing, compacting, finishing & curing (Ratio 1:2:4)	Cft	37.50			
43	Ceramic Tiles 16" x 16"	Providing and Fixing of Ceramic Tile 16"x16"	Sft	334.00			
44	Cement plaster in 1:4 CSM	Cement plaster 1:4 up to 20' height 1/2 " thick	Sft	207.00			
45	Distempering	Distempering New surface : Two coats	Sft	779.25			
46	WC (Indian)	Providing and Fixing glazed earthen ware WC (Indian) squatting type with built-in foot rests : Coloured, as per instruction of Engineer incharge	No's	3.00			
47	P-Trap	P- Trap	No's	3.00			
48	Main Hole with cover 12" x 12"	construction of main hole along with cover 12"x12"	No's	3.00			
49	PVC Pipe 2"	S/F of Approved quality PVC pipe 2" dia vent pipe with cap, as directed/approved by the Engineer	Rft	21.00			
50	Soap Dish	Supply & Installation Mirror with soap Dish good quality complete in all aspect	No's	1.00			
51	PVC Pipe 3"	Providing and fixing 3" dia PVC pipe class B	Rft	37.00			
52	PVC Pipe 4"	Providing and fixing 4" dia PVC pipe class B	Rft	13.00			
53	PVC Elbow 3" or 4"	PVC Elbow 3" or 4"	No's	6.00			
54	PVC Tee (3"x2") or (4"x2")	PVC Tee (3"x 2") or (4"x 2")	No's	3.00			
55	Wash Basin	Wash basin white medium size 16" X22" with all accesseries complete	No's	1.00			
56	Bib Cock	Providing and fixing chromium plate bib cock	No's	6.00			
57	Floor trap	Providing and fixing floor trap of cost iron (4"x 4")	No's	3.00			
58	PPRC 1" i/d	Providing, laying cutting, jointing, testing PPRC pipeline including specials complete in all respect as per specifications: except excavation 1" i/d	Rft	150.00			
<b>Sub total</b>							

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S.#	Name	DESCRIPTION	Unit	Quantity	Brand Offered	Unit Rate	Total Cost
<b>e. New Class Room/Shed</b>							
59	Excavation	Excavation in foundation of building, bridges etc complete : in shingle/gravel	Cft	64.00			
60	PCC (1:2:4)	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4)	Cft	128.00			
61	GI Pipe 3"	Providing and Fixing of GI Pipe 3" dia extra light Quality including cutting, welding, jointing with nuts and bolts complete in all aspect as per instructions of Engineer incharge. Pole Size (length 10', dia 3")	No's	8.00			
62	M/S Plate 6"x6" 14 gauge	Providing and Fixing of M/S plate 6" x 6" SWG 14 over GI poles including welding complete in all aspect	No's	8.00			
63	MS Pipes 1.5"x3" 18 gauge as in Truss	Providing and Fixing of MS Rectangular pipes in shed trusses. Size 3" x 1.5" 18 gauge including cutting, welding, jointing nuts and bolts complete with all aspect. Truss size (length 16', Back height 1-6" front 9"	Rft	128.00			
64	MS Pipes 1.5"x3" 18 gauge as in vertical Members	Providing and Fixing of MS Rectangular pipes in shed trusses vertical members Size 1.5"x3" 18 gauge, including welding, nuts and bolts complete with all aspect.	Rft	24.00			
65	MS Pipes 1.5"x3" 18 gauge in purlin	Providing and Fixing of MS Rectangular pipes in shed purlins Size 1.5"x3" as in purlin 18 gauge	Rft	96.00			
66	CGI Sheet 24 Gauge	Providing and Fixing of CGI Sheets 24 gauge, including welding, nuts and bolts complete with all aspect.	Sft	256.00			
67	Paint Work	All steel fabrications will be treated with 1 coat of redoxide paint and subsequently with 1 coat enamel paint complete in all respect.	Job	1.00			
68	Moveable Wheeled Dustbin 240L	Supply of Moveable Wheeled Dustbin 240L made of good quality Polythene as per instruction of Engineer incharge.	No's	2.00			
69	Visibility Plate	Supply and fixing of steel Inauguration Plate, size 24" x 24" using 18 guage steel plate with standard text and Logo's as per approved design and minimum 5x numbers of wall chalking/weather shield paint of given data with IR logo complete 5' X 8' size on the near by walls or as directed by Engineer.	Job	1.00			
70	Plantation	Supplying and plantation of different types of locally grown and habitated plants in the School (with colored flower pot or planter) as per site requirements and directions of Engineer in Charge. Plants: Arabian Jasmine, Moringa, Oleander, Aloe vera, Bottle Bursh, Guava, lemon, ivy or creeping vine (commonly used to cover walls), Paper flower etc.	No's	30.00			
<b>Sub total</b>							
<b>f. New Bore</b>							
71	Resistivity Survey	Conducting Elec: Resistivity survey of the area and furnishing its reports along with water quality result	No's	1.00			
72	Equipment Mobilization	Mobilization of equipment for drilling of bore upto 6" dia	Job	1.00			
73	Drilling of Bore Hole	Tubewell boring in all type of soils including shingle/rock with rotary machine From 0' to 200' below ground : 6" i/d	Rft	150.00			
74	PVC Strainer	Providing and installing PVC Strainer BSS Class "C" of approved make \ quality in tubewell bore hole, including socket, special sockets, studs etc. complete as per specification:- 4" Nominal Pipe Size (NPS) (100mm)	Rft	26.00			
75	PVC blind pipe	Providing and installing PVC blind pipe BSS Class "C" in Tube Well Bore Hole including Sockets and Solvents and jointing with strainer etc. complete : 4" Nominal Pipe Size (NPS) (100 mm)	Rft	124.00			
76	Submersible pump with motor	Providing and Fixing of Submersible pump with motor for pressure pump 1 HP including water proof heavy duty electric switch board with appropriate female plugs and ON/OFF buttons complete in all aspects.	No's	1.00			

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S.#	Name	DESCRIPTION	Unit	Quantity	Brand Offered	Unit Rate	Total Cost
77	Shrouding	Shrouding with graded pack gravel 3/8" (10 mm) to 1/8" (3 mm) around tubewell in bore hole complete as per specification	Job	1.00			
78	GI Steel Rope	Providing and fixing GI Steel (Hamp core) Ropes 1/2" dia	Rft	80.00			
79	Submersible Flat Cable	Supply and installation of Submersible Flat Cable made of 99.9% copper, coated with double PVC as per BSS Standards, 3x6 mm2	Rft	100.00			
80	HDPE Pipe 25mm	Providing, laying, cutting, jointing, testing and disinfecting High Density Polyethylene Pipe (HDPE) Din-8074/Din-8075/ISO-4427 in trenches, complete in all respects except excavation. (25 mm dia) PN-12.5	Rft	150.00			
81	Bore development	Bore development/cleaning of Bore with 1 to 1.5 HP submersible Pump using electricity or generator until clear water starts flowing free from any suspended solids	Hr	4.00			
82	Polyethylene Water Tank	Supplying and Fixing Polyethylene Water Tank made from food grade FDA Certified raw material, 3 layers UV stablized, inert with water, anti-fungus and anti-bacterial and have a service life of more than 10 years : 300 gallons (Vertical)	No's	1.00			
83	1'x1' size steel door	supply and installation of 1'x1' size steel door (Painted) Guage 18 using 1"x1" angle iron fixed in foundation (PCC 1:2:4 with dimension 2x2x2 ft) of sumercibile pump with proper support to hang and fasten the accessories inside the borehole.	Job	1.00			
<b>Sub total</b>							
<b>Grand Total : (a,b,c,d,e,f) (Inclusive of All Govt. Applicable Taxes, labour, material supply, loading/unloading, Transportation and Installation, if any)</b>							