

**LIST OF COMMUNITY/ PUBLIC FACILITIES TO BE SOLARISED - KHYBER PAKHTUNKHWA - LOT#7**

Sr. No.	Facility Name	Province	District	Coordinates	Sector
1	RAHA Special Education Complex, Phase 5 Hayatabad	Khyber Pakhtunkhwa	Peshawar	33.990810, 71.433909	Education
2	Kyber Teaching Hospital (Accident & Emergency Block)	Khyber Pakhtunkhwa	Peshawar	33.9960686, 71.4864737	Health
3	Hayatabad Medical Complex (Admin and Emergency Blocks)	Khyber Pakhtunkhwa	Peshawar	33.9931146, 71.4510632	Health
4	Lady Reading Hospital (Admin & Filtration OPD Blocks)	Khyber Pakhtunkhwa	Peshawar	34.0108469, 71.5693278	Health
5	Tehsil Headquarter Hospital Parova	Khyber Pakhtunkhwa	D.I. Khan	31.5581043, 70.7645225	Health

**SOLARIZATION Of RAHA Special Education Complex, Phase 5 Hayatabad, Peshawar**

**BILL OF QUANTITIES (BOQ)**

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 180 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>ON-GRID HYBRID INVERTERS: 150 kVA</b>		
3	<b>Lithium Ion Battery: 177 kWh</b>		
4	<b>Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works</b>		
	Supply and Erection of hot dipped (80 microns Average) galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle.	Per Watt	180,000
5	<b>AC DISTRIBUTION BOX</b>		
	Supply, Installation and Commissioning of AC Distribution Boxes made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 5 Incoming Circuit Breakers and at least 100 Outgoing Circuit Breakers of 10 A rating and 100 Outgoing Circuit Breakers of 20 A for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. <b>Note:</b> All outgoing circuits must be properly tagged as per site installations	No.	5
6	<b>DC Flexible Copper Cable from PV Module to DC Combiner and Inverter</b>		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	900
7	<b>DC Flexible Copper Cable from Inverter to Batteries</b>		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90
8	<b>DC Disconnect Switch Box</b>		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	9
9	<b>AC Wiring for Internal Circuits</b>		
	Providing and Fixing of Single-Phase Wiring of Size 2.5 mm sq in PVC Duct Patti (where required) from main power access point to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer	Meter	6,300
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	12,600
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,800
10	<b>HDPE Pipe for DC Cable Laying</b>		
	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. (75 mm diameter) PN-8	Meter	900
11	<b>Power System Earth</b>		
	Providing & fixing of Plate type Earthing compressed with excavated hole of up to 63 feet, GI pipe 2 (50mm) with Tees, Sockets, Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48" 2x 70mmsq S/Coar copper bare conductor 125 (Ft) Earth 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE</b>		
	Supply and Erection copper tape, including copper staple & copper, nails/Screw etc.: Size 1.5"x1/8" copper Tape 1.5"x1/8" Staple & Nails	Meter	100
13	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD</b>		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	20.0
14	<b>Miscellaneous</b>		
	Protection cages for inverters and batteries made of mild steel 16 SWG powder coated paint and should ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery.	No	10
	Additional electrical works	No	1
	Installation and transportation of equipment to site	Per kW	180
15	<b>Application for Net-Metering and Installation of Bi-Directional Energy Meter</b>		
	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including Supply and Installation of Bi-directional, Extension of Load, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION Of Kyber Teaching Hospital, Peshawar (Accident & Emergency Block)			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 180 kW</b>	TO BE PROVIDED BY UNHCR	
2	<b>ON-GRID HYBRID INVERTERS: 150 kVA</b>		
3	<b>Lithium Ion Battery: 125 kWh</b>		
4	<b>Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works</b>		
	Supply and Erection of hot dipped (80 microns Average) galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	Per Watt	180,000
5	<b>AC DISTRIBUTION BOX</b>		
	Supply, Installation and Commissioning of AC Distribution Boxes made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 05 Incoming Circuit Breakers and at least 15 Outgoing Circuit Breakers of 10 A & 20 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. <b>Note:</b> All outgoing circuits must be properly tagged as per site installations	No.	3
6	<b>DC Flexible Copper Cable from PV Module to DC Combiner and Inverter</b>		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	720
7	<b>DC Flexible Copper Cable from Inverter to Batteries</b>		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
8	<b>DC Disconnect Switch Box</b>		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	4
9	<b>AC Wiring for Internal Circuits</b>		
	Providing and Fixing of Single-Phase Wiring of Size 2.5 mm sq in PVC Duct Patti (where required) from main power access point to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer	Meter	630
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,260
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	450
10	<b>HDPE Pipe for DC Cable Laying</b>		
	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. (75 mm diameter) PN-8	Meter	720
11	<b>Power System Earth</b>		
	Providing & fixing of Plate type Earthing compressed with excavated hole 6"up 63 feet, GI pipe 2"(50mm)with Tees , Sockets , Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48", 2x 70mmsq S/Core copper bare conductor 125 (Ft) Earth Connection Point of 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compiled with all respect.  6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE</b>		
	Supply and Erection copper tape, including copper staple & copper, nails/Screw etc.: Size 1.5"x1/8" copper Tape 1.5"x1/8" Staple & Nails	Meter	80
13	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD</b>		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	4
14	<b>Miscellaneous</b>		
	Protection cages for inverters and batteries made of mild steel 16 SWG powder coated paint and should ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery.	No	10
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	180
15	<b>Application for Net-Metering and Installation of Bi-Directional Energy Meter</b>		
	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including Supply and Installation of Bi-directional, Extension of Load, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

**SOLARIZATION Of Hayatabad Medical Complex  
(Admin and Emergency Blocks)**

**BILL OF QUANTITIES (BOQ)**

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 126 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>ON-GRID HYBRID INVERTERS: 105 kVA</b>		
3	<b>Lithium Ion Battery: 50 kWh</b>		
4	<b>Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works</b>		
	Supply and Erection of hot dipped (80 microns Average) galvanized steel of a minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	Per Watt	126,000
5	<b>AC DISTRIBUTION BOX</b>		
	Supply, Installation and Commissioning of AC Distribution Boxes made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 05 Incoming Circuit Breakers and at least 50 Outgoing Circuit Breakers of 10 A & 20 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. <b>Note:</b> All outgoing circuits must be properly tagged as per site installations	No.	3
6	<b>DC Flexible Copper Cable from PV Module to DC Combiner and Inverter</b>		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	360
7	<b>DC Flexible Copper Cable from Inverter to Batteries</b>		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	60
8	<b>DC Disconnect Switch Box</b>		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	4
9	<b>AC Wiring for Internal Circuits</b>		
	Providing and Fixing of Single-Phase Wiring of Size 2.5 mm sq in PVC Duct Patti (where required) from main power access point to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer	Meter	810
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,620
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	720
10	<b>HDPE Pipe for DC Cable Laying</b>		
	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. (75 mm diameter) PN-8	Meter	360
11	<b>Power System Earth</b>		
	Providing & fixing of Plate type Earthing compressed with excavated hole 6"up 63 feet, GI pipe 2"(50mm)with Tees , Sockets , Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48", 2x 70mmsq S/Core copper bare conductor 125 (Ft) Earth Connection Point of 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compiled with all respect.  6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	2
12	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE</b>		
	Supply and Erection copper tape, including copper staple & copper, nails/Screw etc.: Size 1.5"x1/8" copper Tape 1.5"x1/8" Staple & Nails	Meter	20
13	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD</b>		
	Supply and Erection 1" diameter & 1m long lightning conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	<b>Miscellaneous</b>		
	Protection cages for inverters and batteries made of mild steel 16 SWG powder coated paint and should ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery.	No	10
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	126
15	<b>Application for Net-Metering and Installation of Bi-Directional Energy Meter</b>		
	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including Supply and Installation of Bi-directional, Extension of Load, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

SOLARIZATION Of Lady Reading Hospital, Peshawar (Admin Block)			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 60 kW</b>	TO BE PROVIDED BY UNHCR	
2	<b>ON-GRID HYBRID INVERTERS: 50 kVA</b>		
3	<b>Lithium Ion Battery: 30 kWh</b>		
4	<b>Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works</b>		
	Supply and Erection of hot dipped (80 microns Average) galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	Per Watt	60,000
5	<b>AC DISTRIBUTION BOX</b>		
	Supply, Installation and Commissioning of AC Distribution Boxes made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 5 Incoming Circuit Breakers and at least 50 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. <b>Note:</b> All outgoing circuits must be properly tagged as per site installations	No.	1
6	<b>DC Flexible Copper Cable from PV Module to DC Combiner and Inverter</b>		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	<b>DC Flexible Copper Cable from Inverter to Batteries</b>		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	20
8	<b>DC Disconnect Switch Box</b>		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	1
9	<b>AC Wiring for Internal Circuits</b>		
	Providing and Fixing of Single-Phase Wiring of Size 2.5 mm sq in PVC Duct Patti (where required) from main power access point to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer	Meter	270
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	540
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	180
10	<b>HDPE Pipe for DC Cable Laying</b>		
	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. (75 mm diameter) PN-8	Meter	180
11	<b>Power System Earth</b>		
	Providing & fixing of Plate type Earthing compressed with excavated hole 6"up 63 feet, GI pipe 2"(50mm)with Tees , Sockets , Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48", 2x 70mmsq S/Core copper bare conductor 125 (Ft) Earth Connection Point of 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compiled with all respect.  6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE</b>		
	Supply and Erection copper tape, including copper staple & copper, nails/Screw etc.: Size 1.5"x1/8" copper Tape 1.5"x1/8" Staple & Nails	Meter	40
13	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD</b>		
	Supply and Erection 1" diameter & 1m long lightning conductor copper rod with 5 spikes ball & base etc.	Meter	4
14	<b>Miscellaneous</b>		
	Protection cages for inverters and batteries made of mild steel 16 SWG powder coated paint and should ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery.	No	6
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	60
15	<b>Application for Net-Metering and Installation of Bi-Directional Energy Meter</b>		
	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including Supply and Installation of Bi-directional, Extension of Load, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

<b>SOLARIZATION Of Lady Reading Hospital, Peshawar (Filtration OPD)</b>			
<b>BILL OF QUANTITIES (BOQ)</b>			
Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 54 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>ON-GRID HYBRID INVERTERS: 45 kVA</b>		
3	<b>Lithium Ion Battery: 40 kWh</b>		
4	<b>Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works</b>		
	Supply and Erection of hot dipped (80 microns Average) galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	Per Watt	54,000
5	<b>AC DISTRIBUTION BOX</b>		
	Supply, Installation and Commissioning of AC Distribution Boxes made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 5 Incoming Circuit Breakers and at least 50 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. <b>Note:</b> All outgoing circuits must be properly tagged as per site installations	No.	2
6	<b>DC Flexible Copper Cable from PV Module to DC Combiner and Inverter</b>		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	<b>DC Flexible Copper Cable from Inverter to Batteries</b>		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	30
8	<b>DC Disconnect Switch Box</b>		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	1
9	<b>AC Wiring for Internal Circuits</b>		
	Providing and Fixing of Single-Phase Wiring of Size 2.5 mm sq in PVC Duct Patti (where required) from main power access point to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer	Meter	270
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	540
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	90
10	<b>HDPE Pipe for DC Cable Laying</b>		
	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. (75 mm diameter) PN-8	Meter	180
11	<b>Power System Earth</b>		
	Providing & fixing of Plate type Earthing compressed with excavated hole 6"up 63 feet, GI pipe 2"(50mm)with Tees , Sockets , Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48", 2x 70mmsq S/Core copper bare conductor 125 (Ft) Earth Connection Point of 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compiled with all respect.  6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE</b>		
	Supply and Erection copper tape, including copper staple & copper, nails/Screw etc.: Size 1.5"x1/8" copper Tape 1.5"x1/8" Staple & Nails	Meter	40
13	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD</b>		
	Supply and Erection 1" diameter & 1m long lightning conductor copper rod with 5 spikes ball & base etc.	Meter	4
14	<b>Miscellaneous</b>		
	Protection cages for inverters and batteries made of mild steel 16 SWG powder coated paint and should ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery.	No	5
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	54
15	<b>Application for Net-Metering and Installation of Bi-Directional Energy Meter</b>		
	Preparation & Submission of Complete Net-Metering Case as per the guidelines of DISCO, AEDB, NEPRA including Supply and Installation of Bi-directional, Extension of Load, Approved Energy Meter with all requisite utility fee on behalf of the Employer and fulfillment of all prescribed formalities, complete in all respect.	Job	1

## SOLARIZATION Of Tehsil Headquarter Hospital Parova DI Khan

### BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 54 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>ON-GRID HYBRID INVERTERS: 45 kVA</b>		
3	<b>Lithium Ion Battery: 47 kWh</b>		
4	<b>Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works</b>		
	Supply and Erection of hot dipped (80 microns Average) galvanized steel of minimum thickness of 12 SWG / 2.64 mm Channel / Pipe or 8 SWG / 4.06 mm Angle	Per Watt	54,000
5	<b>AC DISTRIBUTION BOX</b>		
	Supply, Installation and Commissioning of AC Distribution Box made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 5 Incoming Circuit Breakers and at least 70 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. <b>Note:</b> All outgoing circuits must be properly tagged as per site installations	No.	1
	<b>DC Flexible Copper Cable from PV Module to DC Combiner and Inverter</b>		
6	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	360
	<b>DC Flexible Copper Cable from Inverter to Batteries</b>		
7	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	50
	<b>DC Disconnect Switch Box</b>		
8	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	1
	<b>AC Wiring for Internal Circuits</b>		
9	Providing and Fixing of Single-Phase Wiring of Size 2.5 mm sq in PVC Duct Patti (where required) from main power access point to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer	Meter	1,170
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	2,340
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	90
	<b>HDPE Pipe for DC Cable Laying</b>		
10	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. (75 mm diameter) PN-8	Meter	360
	<b>Power System Earth</b>		
11	Providing & fixing of Plate type Earthing compressed with excavated hole 6"up 63 feet, GI pipe 2"(50mm)with Tees , Sockets , Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48", 2x 70mmsq S/Core copper bare conductor 125 (Ft) Earth Connection Point of 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compiled with all respect.	Job	1
	6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.		
	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE</b>		
12	Supply and Erection copper tape, including copper staple & copper, nails/Screw etc. : Size 1.5"x1/8" copper Tape 1.5"x1/8" Staple & Nails	Meter	20
	<b>SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD</b>		
13	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
	<b>Miscellaneous</b>		
14	Protection cages for inverters and batteries made of mild steel 16 SWG powder coated paint and should ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery.	No	4
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	54