

**LIST OF COMMUNITY/ PUBLIC FACILITIES TO BE SOLARISED - BALOCHISTAN - LOT#4**

Sr. No.	Facility Name	Province	District	Coordinates	Sector
1	Sandeman Provincial Hospital	Balochistan	Quetta	30.193326, 67.0082421	Health
2	Sheikh Mohamed Bin Zayed Al-Nayan Institute of Cardiology	Balochistan	Quetta	30.2547452, 67.0595351	Health
3	Sheikh Khalifah Bin Zayyad Hospital (Nursery Ward)	Balochistan	Quetta	30°04'58.1"N 66°57'42.6"E	Health
4	DHQ Chaman	Balochistan	Quetta		Health
5	Benazir Bhutto Hospital	Balochistan	Quetta	30.1886° N, 67.0310° E	Health
6	Baluchistan Institute of Psychiatry and Behavioral Sciences - BIPBS	Balochistan	Quetta		Health

## SOLARIZATION Of Sandeman Provincial Hospital Quetta

### BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 324 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>ON-GRID HYBRID INVERTERS: 270 kVA</b>		
3	<b>Lithium Ion Battery: 288 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	324,000
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.	4
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	50
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	5
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	900
	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	1,800
	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	360
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 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) complied 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	4
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	2
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	12
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	324
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 Sheikh Mohamed Bin Zayed Al-Nayan Institute of Cardiology Quetta

### BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 468 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>ON-GRID HYBRID INVERTERS: 390 kVA</b>		
3	<b>Lithium Ion Battery: 433 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	468,000
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 200 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	1,050
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	270
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	2,970
	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	5,940
	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	1,050
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) complied 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	20
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	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	14
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	468
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 Sheikh Khalifah Bin Zayyad Hospital (Nursery Ward) Quetta**

**BILL OF QUANTITIES (BOQ)**

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 18 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>OFF-GRID HYBRID INVERTERS: 15 kVA</b>		
3	<b>Lithium Ion Battery: 6 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	18,000
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 10 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	10
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	180
	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	360
	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	270
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	20
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	0.4
14	<b>Miscellaneous</b>		
	Protection cages for inverters and batteries placed under staircases 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	3
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	18

## SOLARIZATION Of District Headquarters Hospital Chaman

### 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: 108 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	126,000
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 100 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	270
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	14,760
	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	29,520
	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	270
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) complied 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	20
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	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	8
	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 Benazir Bhutto Hospital Quetta

### BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 90 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>OFF-GRID HYBRID INVERTERS: 75 kVA</b>		
3	<b>Lithium Ion Battery: 91 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	90,000
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 40 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.	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	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	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	3
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	1260
	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	2520
	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	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) complied 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	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	15
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	90
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 Baluchistan Institute of Psychiatry and Behavioral Sciences - BIPBS Quetta

### BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	<b>PV System Capacity: 108 kW</b>	<b>TO BE PROVIDED BY UNHCR</b>	
2	<b>OFF-GRID HYBRID INVERTERS: 90 kVA</b>		
3	<b>Lithium Ion Battery: 118 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	108,000
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 100 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	540
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	10
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	1,530
	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	3,060
	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	540
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) complied 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	20
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	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	4
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	108
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