

LIST OF COMMUNITY/ PUBLIC FACILITIES TO BE SOLARISED - KHYBER PAKHTUNKHWA - LOT#6

Sr. No.	Facility Name	Province	District	Coordinates	Sector
1	Govt. Primary School Padhana	Khyber Pakhtunkhwa	Haripur	34.0414502, 72.9139341	Education
2	Govt. Primary School Ismaila Serai	Khyber Pakhtunkhwa	Swabi	34.223417, 72.245471	Education
3	Govt. Primary School Bagheecha Dheri No. 1	Khyber Pakhtunkhwa	Mardan	34.218757, 72.207713	Education
4	Govt. Primary School Bagheecha Dheri No. 2	Khyber Pakhtunkhwa	Mardan	34.225724, 72.203198	Education
5	Govt. Primary School No. 1 Jalala	Khyber Pakhtunkhwa	Mardan	34.335888, 71.901258	Education
6	Govt. Primary School No. 2 Jalala	Khyber Pakhtunkhwa	Mardan	34.3330613, 71.9086159	Education
7	Govt. Girls Primary School Qadam Khela	Khyber Pakhtunkhwa	Malakand	34.5092907, 71.928834	Education
8	Govt. Boys Primary School Qadam Khela	Khyber Pakhtunkhwa	Malakand	34.5125425, 71.9305818	Education
9	Govt. Primary School Bhera Kalu Pind	Khyber Pakhtunkhwa	Haripur	33.9990145, 72.8484251	Education
10	Govt. Primary School Dheri Sikandar Pura	Khyber Pakhtunkhwa	Haripur	34.013898, 72.949270	Education
11	Govt. Primary School Charaghdin	Khyber Pakhtunkhwa	Mardan	34.3156095, 71.8875318	Education
12	Govt. Primary School But Seri	Khyber Pakhtunkhwa	Mardan	34.226320, 72.182430	Education
13	Govt. Primary School Misikin Abad	Khyber Pakhtunkhwa	Mardan	34.336000, 71.91308	Education
14	Govt. Primary School Khan Qila	Khyber Pakhtunkhwa	Mardan	34.344501, 71.868010	Education
15	Govt. Primary School Gulmakam	Khyber Pakhtunkhwa	Malakand	34.4870676, 71.918981	Education
16	Govt. Primary School Zafar Medan	Khyber Pakhtunkhwa	Mansehra	34.327236, 73.203916	Education
17	Govt. Girls High School Dhinda	Khyber Pakhtunkhwa	Haripur	33.998262, 72.886404	Education
18	Govt. High School Kangra Colony	Khyber Pakhtunkhwa	Mansehra		Education
19	Basic Health Unit Jalala	Khyber Pakhtunkhwa	Mardan	34.337016, 71.898660	Health
20	Tehsil Headquarter Hospital Chota Lahore	Khyber Pakhtunkhwa	Swabi	34.044329, 72.355649	Health

SOLARIZATION Of Govt Primary School Padhana, Haripur

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 8 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	12

SOLARIZATION Of Govt Primary School Ismaila Serai, Swabi

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 15 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	12

SOLARIZATION Of Govt Primary School Bagheecha Dheri No. 1, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 16 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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 25 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	6
	Additional electrical works	No	1
	Installation and transportation of equipment to site	Per kW	18

SOLARIZATION Of Govt Primary School Bagheecha Dheri No. 2, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 14 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 25 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A and one (01) 63 A Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	1
9	AC Wiring for Internal Circuits		
	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	Meter	360
	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	Meter	720
	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	Meter	90
10	HDPE Pipe for DC Cable Laying		
	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	100
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	12

SOLARIZATION Of Govt Primary School No. 1 Jalala, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 13 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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 25 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPPE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	360
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPPE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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.	No	1
9	AC Wiring for Internal Circuits		
	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	450
	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	900
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supplying and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	4
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	18

SOLARIZATION Of Govt Primary School No. 2 Jalala, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 22 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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 35 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	270
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	540
	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	1,080
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	4
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	18

SOLARIZATION Of Govt Girls Primary School Qadam Khela, Malakand

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 11 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	3
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	12

SOLARIZATION Of Govt Boys Primary School Qadam Khela, Malakand

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 10 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	3
	Net metering cost	No	
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	12

SOLARIZATION Of Govt Primary School Bhera Kalu Pind, Haripur

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 13 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	12

SOLARIZATION Of Govt Primary School Dheri Sikandar Pura, Haripur

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 13 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	80
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A and one (01) 63 A Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs, shrouds, thimbles etc..	No	1
9	AC Wiring for Internal Circuits		
	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	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	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	50
10	HDPE Pipe for DC Cable Laying		
	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	80
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	Protection cages for inverters and batteries placed in the gallery 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	12

SOLARIZATION Of Govt Primary School Charaghdin, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 20 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	18

SOLARIZATION Of Govt Primary School But Seri, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 20 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	HDPE Pipe for DC Cable Laying		
	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	90
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	18

SOLARIZATION Of Govt Primary School Miskin Abad, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 15 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	HDPE Pipe for DC Cable Laying		
	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	90
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	18

SOLARIZATION Of Govt Primary School Khan Qila Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 9 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	12,000
5	AC DISTRIBUTION BOX		
	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 25 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	450
	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	900
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	12

SOLARIZATION Of Govt Primary School Gulmakam, Malakand

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 20 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	18

SOLARIZATION Of Govt Primary School Zafar Medan, Mansehra

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 6 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 5 kVA		
3	Lithium Ion Battery: 8 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	6,000
5	AC DISTRIBUTION BOX		
	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 15 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	180
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	20
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	2
	Additional electrical works	No	1
	Installation and transportation of equipment to site	Per kW	6

SOLARIZATION Of Govt Girls High School Dhinda, Haripur

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 18 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	AC DISTRIBUTION BOX		
	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 20 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	360
	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	720
	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	HDPE Pipe for DC Cable Laying		
	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	90
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	4
	Additional electrical works	No	1
	Installation and transportation of equipment to site	Per kW	18

SOLARIZATION Of Govt. High School KANGRA COLONY HARIPUR			
BILL OF QUANTITIES (BOQ)			
ITEM No.	DESCRIPTION	UNIT	QTY
(a)	(c)	(d)	(e)
1	PV System Capacity: 20 kW		
2	OFF-GRID HYBRID INVERTERS: 20 KVA		
3	Lithium Ion Battery: 20 kWh		
TO BE PROVIDED BY UNHCR			
A			
<u>LT CABLES</u>			
<u>CONDUITS & PIPES</u>			
1	Supply and Erection PVC pipe for wiring purpose complete On surface including clamps etc: 3/4" i/d	1 Rft	100
2	PVC conduit for surface wiring (duraduct) 2" including all charges for nail screws etc	1 Rft.	200
3	Supply and Erection PVC pipe for wiring purpose complete On surface including clamps etc: 1" i/d	1 Rft	300
B			
<u>SOLAR SYSTEM (PHOTOVOLTAIC)</u>			
1	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	1 Watt	20,000
2	Supply and Erection of BOX / STAND for Batteries SHS Inverter & Charge Controller	1 Watt	20,000
3	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PCV sheathed) flexible copper cable	1 Rft.	1,000
4	Supply and Erection 1x25sq.mm Copper cable (Flexible)	1 Rft.	60
5	Supply and Erection of 1x1 ft 4mm Copper Earthing Plate	1 Watt	20,000
6	Supply and Erection of Stainless Steel Nuts and Bolts	1 Watt	20,000
7	Supply and Erection MC4 connector (TUV Approved)	1 Pair	12
8	Supply and Erection MC4 Branch connector	1 Pair	28
9	Supply & erection of Earth Rod	1 Each	6
10	Supply & erection of Earthing wire GSL 6 mm	1 kg	10
11	Plain Cement Concrete including placing, compacting, finishing & curing (Ratio 1:2:4) (1'x1'x1') Foundation for Solar Panels Structure)	100 Cft	36
12	Providing and fixing Lightning Arrestor 1" Copper rod 6ft long with 4" Bowl five spikes complete in all respect (above top structure level)	1 No.	2
13	Providing and fixing Earth Connecting Point 8"x1.5"x 6-8mm insulators with complete Accessories.	1 No	2
14	<u>SOLAR CONTROL PANEL</u> Control Panel includes 1 No Change Over Switch 3 No indication Light 01 No Volts Digital Voltmeter 03 Nos. R- Indication lamps 01 Nos. Earth Bus Bar 01 Nos. Neutral Bus Bar 1 No 80/100A DC MCB CHINTor ABB (for Batteries) 1 no 63A MCB DP for PV 1 CHINTor ABB 3 no 60A MCB DP for Load CHINTor ABB 2 Nos. 60A Amps DP MCB For AC Supply CHINTor ABB 1 no o/u voltage and OL Protection 1 No SPD Includes other Necessary Equioment as per Instruction	1 Job	2

SOLARIZATION Of Basic Health Unit Jalala, Mardan

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 6 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 5 kVA		
3	Lithium Ion Battery: 3 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	6,000
5	AC DISTRIBUTION BOX		
	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. Note: All outgoing circuits must be properly tagged as per site installations	No.	1
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	10
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	225
	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	450
	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	HDPE Pipe for DC Cable Laying		
	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	90
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	0.4
14	Miscellaneous		
	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	2
	Net metering cost	No	
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	6

SOLARIZATION Of Tehsil Headquarter Hospital Chota Lahore, Swabi

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 120 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 100 kVA		
3	Lithium Ion Battery: 96 kWh		
4	Elevated PV MOUNTING STRUCTURE with Foundation, Pedestals and Allied Civil Works		
	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	120,000
5	AC DISTRIBUTION BOX		
	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 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. Note: All outgoing circuits must be properly tagged as per site installations	No.	5
6	DC Flexible Copper Cable from PV Module to DC Combiner and Inverter		
	Supply and Erection 1x6 sq.mm single core (XLPE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	1,800
7	DC Flexible Copper Cable from Inverter to Batteries		
	Supply and Erection 1x25 sq.mm single core (XLPE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90
8	DC Disconnect Switch Box		
	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	AC Wiring for Internal Circuits		
	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	4,500
	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	9,000
	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	HDPE Pipe for DC Cable Laying		
	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	1,800
11	Power System Earth		
	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 Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	Job	1
12	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE		
	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	SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD		
	Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc.	Meter	10.0
14	Miscellaneous		
	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	18
	Additional electrical works	No	1
	Installation and transportation of equipment to site	Per kW	120
15	Application for Net-Metering and Installation of Bi-Directional Energy Meter		
	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