	LIST OF COMMUNITY/ PUBLIC FACILITIES TO BE SOLARISED - KHYBER PAKHTUNKHWA - LOT#5						
Sr. No.	Facility Name	Province	District	Coordinates	Sector		
1	Govt. Institute for the Visually Impaired Peshawar	Khyber Pakhtunkhwa	Peshawar	34.0171117, 71.5846686	Education		
2	Govt. Primary School Dagar Banda	Khyber Pakhtunkhwa	Kohat	33.551474 <i>,</i> 71.478199	Education		
3	Govt. High School Centennial Model High School # 4	Khyber Pakhtunkhwa	Kohat	33.595716, 71.453682	Education		
4	Department of Computer Systems Engineering, University of Engineering & Technology Peshawar	Khyber Pakhtunkhwa	Peshawar	34.003195 <i>,</i> 71.484484	Education		
5	Foreign Students Hostel, UET Peshawar	Khyber Pakhtunkhwa	Peshawar	34.003195 <i>,</i> 71.484484	Education		
6	Govt Primary School Garhi Karimdad	Khyber Pakhtunkhwa	Peshawar	34.1496749, 71.5930647	Education		
7	Govt Primary School Isakhel Hameed	Khyber Pakhtunkhwa	Peshawar	34.14059, 71.602671	Education		
8	Govt Primary School Mamu Khatki	Khyber Pakhtunkhwa	Peshawar	34.161446, 71.583037	Education		
9	Govt Primary School Baadeen Payan	Khyber Pakhtunkhwa	Peshawar	34.1201185, 71.6258232	Education		
10	Govt Primary School Nahaqi no 1	Khyber Pakhtunkhwa	Peshawar	34.103063, 71.61303	Education		
11	Govt Primary School Shakrapura	Khyber Pakhtunkhwa	Peshawar	34.095447, 71.632815	Education		
12	Govt Girls Middle School Shakrapura	Khyber Pakhtunkhwa	Peshawar	34.096769 <i>,</i> 71.630155	Education		
13	Govt Girls Middle School Bhatian	Khyber Pakhtunkhwa	Peshawar	34.13495 <i>,</i> 71.59648	Education		
14	Govt Primary School Naguman	Khyber Pakhtunkhwa	Peshawar	34.126750, 71.605417	Education		
15	Govt Girsl Middle School IsaKhel Hameed	Khyber Pakhtunkhwa	Peshawar	34.142694 <i>,</i> 71.594637	Education		
16	Govt Primary School Bhatian	Khyber Pakhtunkhwa	Peshawar	34.1349121, 71.5952704	Education		
17	Pak Afghan Dosti Hospital Torkham	Khyber Pakhtunkhwa	Khyber	34.121241 <i>,</i> 71.094440	Health		
18	Basic Health Unit Torkham	Khyber Pakhtunkhwa	Khyber	34.117677, 71.102394	Health		

	SOLARIZATION OF Govt. Institute for the Visually Impaired Peshawar BILL OF QUANTITIES (BOQ) - BOYS SECTION SCHOOL		
Sr. No	Description	Unit	Qty
1	PV System Capacity: 24 kW	TO BE P	ROVIDED
2	ON-GRID HYBRID INVERTERS: 20 kVA	BY UNHCR	
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	24,000
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. <b>Note</b> : 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	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	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) compilated 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	Job	1
	<b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.		
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	24
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

	SOLARIZATION Of Govt. Institute for the Visually Impaired Peshawar			
	BILL OF QUANTITIES (BOQ) - BOYS SECTION HOSTEL			
Sr. No	Description	Unit	Qty	
1	PV System Capacity: 24 kW		ROVIDED	
2	ON-GRID HYBRID INVERTERS: 20 kVA	TO BE PROVII BY UNHCF		
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	24,000	
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 45Outgoing 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	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		u	
	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	720	
	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	1,440	
	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 Eartning compressed with excavated hole 6 up 63 feet, GL pipe 2' (50mm)with Lees, Sockets, Endcan of 60 (RET) Conner Plate of 1/2"x 2" x 48" 2x 70mmso S/Core conner bare conductor 125 (Ft) Earth Connection Point o 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	24	
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	

	Dependenting	Hett	Oter
Sr. No	Description PV System Capacity: 24 kW	Unit	Qty
1	ON-GRID HYBRID INVERTERS: 20 kVA	TO BE F	ROVIDE
2		BYL	INHCR
3 4	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	24,000
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 35Outgoing 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	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	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	540
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power	Meter	1,080
	access points on each floor as per the directions/instructions of The Employer/Engineer Providing and Fixing of Single-Phase wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points	Meter	90
10	to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer HDPE Pipe for DC Cable Laying	motor	
	Providing, laying, cutting, jointing, testing and disinfecting High, Density Polyethylene Pipe (HDPE) Din-8074/Din- 8075/ISO-4427	Matan	070
	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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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	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	5
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	18
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

## SOLARIZATION Of Govt. Primary School Dagar Banda Kohat **BILL OF QUANTITIES (BOQ)** Sr. No Description Unit Qtv PV System Capacity: 18 kW 1 TO BE PROVIDED **OFF-GRID HYBRID INVERTERS: 15 kVA** 2 BY UNHCR 3 Lithium Ion Battery: 17 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 Per Watt 18,000 Pipe or 8 SWG / 4.06 mm Angle AC DISTRIBUTION BOX 5 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 No. 1 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 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 DC Disconnect Switch Box 8 Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs No 1 shrouds, thimbles etc 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 poir Meter 270 to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer Providing and Fixing of Single-Phase Wiring of Size 4 mm sg in PVC Duct Patti (where required) from inverter to main power Meter 540 access points on each floor as per the directions/instructions of The Employer/Engineer Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points Meter 90 to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer 10 HDPE Pipe for DC Cable Laying Providing, laying, cutting, jointing, testing and disinfecting High, Density Polyethylene Pipe (HDPE) Din-8074/Din- 8075/ISO-442 Meter 90 n trenches, complete in all respects except excavation. (75 mm diameter) PN-8 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 70mmsg S/Core copper bare conductor 125 (Ft) Earth Connection Point o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect. Job 1 b mm sq (Bare Copper Conductor) 99% Pure Copper for eartning of PV Modules including grounding nuts (imported) made of oure conner (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. SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE 12 Supply and Erection copper tape, including copper staple & copper, nails/Screw etc.: Size 1.5"x1/8" copper Tape 1.5"x1/8" Meter 20 Staple & Nails 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 4 No mechanism for ventilation and proper locking arrangement suitable for housing backup Battery Additional Electrical Works No 1 Installation and transportation of equipment to site Per kW 18

## SOLARIZATION Of Govt. Centennial Model High school # 4 Kohat **BILL OF QUANTITIES (BOQ)** Sr. No Description Unit Qty PV System Capacity: 18 kW 1 TO BE PROVIDED **OFF-GRID HYBRID INVERTERS: 15 kVA** 2 BY UNHCR 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 Per Watt 18,000 Pipe or 8 SWG / 4.06 mm Angle AC DISTRIBUTION BOX 5 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 No. 1 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 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 DC Disconnect Switch Box 8 Supply, Installation and Commissioning of Hot Dipped Galvanized IP-65 DC Combiner Box including at least three (03) 32 A, one (01) 63 A, & one (01) 125 A DC Circuit Breakers, DC Surge Protective Devices, Neutral Busbar and Grounding Busbar with lugs No 1 shrouds, thimbles etc 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 poir Meter 360 to Critical and Normal Loads on Each Floor as per the directions/instructions of The Employer/Engineer Providing and Fixing of Single-Phase Wiring of Size 4 mm sg in PVC Duct Patti (where required) from inverter to main power Meter 720 access points on each floor as per the directions/instructions of The Employer/Engineer Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points 90 Meter to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer HDPE Pipe for DC Cable Laying 10 Providing, laying, cutting, jointing, testing and disinfecting High, Density Polyethylene Pipe (HDPE) Din-8074/Din- 8075/ISO-442 Meter 180 n trenches, complete in all respects except excavation. (75 mm diameter) PN-8 Power System Earth 11 Providing & fixing of Plate type Earthing compressed with excavated hole 6"up 63 feet, GI pipe 2"(50mm)with Tees , Sockets , Endcap of 60 (RFT) Copper Plate of 1/2"x 2" x 48", 2x 70mmsq S/Core copper bare conductor 125 (Ft) Earth Connection Point o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect. Job 1 ο mm sq (bare copper conductor) 99% Pure copper for eartning of PV ividuales including grounding nuts (imported) made of nure conner (tin coated) complete in all respects Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Emplover/Engineer SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - COPPER TAPE 12 Supply and Erection copper tape, including copper staple & copper, nails/Screw etc. : Size 1.5"x1/8" copper Tape 1.5"x1/8" Meter 20 Staple & Nails SUPPLY, INSTALLATION OF LIGHTNING PROTECTION SYSTEM - LIGHTENING ROD 13 Meter 0.4 Supply and Erection 1" diameter & 1m long lightening conductor copper rod with 5 spikes ball & base etc. 14 Miscellaneous Protection cages for inverters and batteries placed under staircases made of mild steel 16 SWG powder coated paint and should 4 No ensure proper mechanism for ventilation and proper locking arrangement suitable for housing backup Battery. Additional Electrical Works 1 No nstallation and transportation of equipment to site Per kW 18

	BILL OF QUANTITIES (BOQ)		
Sr. No	Description	Unit	Qty
1	PV System Capacity: 84 kW	TO BE P	ROVIDE
2	ON-GRID HYBRID INVERTERS: 70 kVA		NHCR
3	Lithium Ion Battery: 79 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	84,000
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 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.	2
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	450
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	50
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	
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	630
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,260
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to energy meter on each floor as per the directions/instructions of The Employer/Engineer	Meter	540
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	450
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) compilated with all respect. 6 min sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of nure conner (the 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	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	8
	Additional electrical works	No	
	Installation and transportation of equipment to site	Per kW	84
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

SOLARIZATION Of Foreign Students Hostel, University of Engineering & Technology Peshawar				
	BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty	
1	PV System Capacity: 48 kW	TO BE P	ROVIDED	
2	ON-GRID HYBRID INVERTERS: 40 kVA		NHCR	
3	Lithium Ion Battery: 70 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	48,000	
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 65 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	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	50	
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	990	
	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	1,980	
	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	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) compilated 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	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	5	
	Additional electrical works	No	1	
	Installation and transportation of equipment to site	Per kW	48	
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	

	SOLARIZATION Of Govt Primary School Garhi Karimdad, Peshawar				
BILL OF QUANTITIES (BOQ)					
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 18 kW	TO BE P	ROVIDED		
2 3	OFF-GRID HYBRID INVERTERS: 15 kVA Lithium Ion Battery: 20 kWh	BY UNHCR			
	-				
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				
	(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	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 poin 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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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	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"				
	Supply and Election copper tape, including copper staple & copper, hairs/Sciew etc Size 1.5 x1/6 copper rape 1.5 x1/6 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 Isakhel Hameed, Peshawar				
	BILL OF QUANTITIES (BOQ)				
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 6 kW	TO BE P	ROVIDED		
2	OFF-GRID HYBRID INVERTERS: 5 kVA	-	NHCR		
3	Lithium Ion Battery: 6 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				
6	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 DC Flexible Copper Cable from PV Module to DC Combiner and Inverter	No.	1		
Ŭ	Supply and Erection 1x6 sq.mm single core (XPLE/XPLO insulated/PVC sheathed) flexible copper cable	Meter	90		
	Cappy and Erosion The squinin single core (ALEE/ALEO insulated/F vo siteatiled) liexible copper cable	WIELEI	30		
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	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	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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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	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	6		

	SOLARIZATION Of Govt Primary School Mamu Khatki, Peshawar				
	BILL OF QUANTITIES (BOQ)				
	BILL OF QUANTITIES (BOQ)				
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 12 kW		ROVIDED		
2	OFF-GRID HYBRID INVERTERS: 10 kVA	-	NHCR		
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 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	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	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) compilated 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		
42					
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	12		

	SOLARIZATION Of Govt Primary School Baadeen Payan, Peshawar				
	BILL OF QUANTITIES (BOQ)				
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 6 kW		ROVIDED		
2	OFF-GRID HYBRID INVERTERS: 5 kVA		NHCR		
3	Lithium Ion Battery: 7 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 10 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	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	90		
	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	180		
	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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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 Primary School Nahaqi No. 1, Peshawar						
	BILL OF QUANTITIES (BOQ)						
Sr. No	Description	Unit	Qty				
1	PV System Capacity: 12 kW		ROVIDED				
2	OFF-GRID HYBRID INVERTERS: 10 kVA		NHCR				
3	Lithium Ion Battery: 12 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 36 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	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	130				
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	130				
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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of	Job	1				
	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.						
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 Primary School Shakrapura, Peshawar					
	BILL OF QUANTITIES (BOQ)					
Sr. No	Description	Unit	Qty			
1	PV System Capacity: 6 kW		ROVIDED			
2	OFF-GRID HYBRID INVERTERS: 5 kVA		NHCR			
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 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 08 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	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	130			
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	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	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	130			
11	Power System Earth					
	<ul> <li>Providing &amp; 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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect.</li> <li>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</li> <li>Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.</li> </ul>	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			
	Additional Electrical Works	No	1			
	Installation and transportation of equipment to site	Per kW	6			

SOLARIZATION Of Govt Girls Middle School Shakrapura, Peshawar					
	BILL OF QUANTITIES (BOQ)				
	DIEL OF QUARTITIES (DOQ)				
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 12 kW		ROVIDED		
2	OFF-GRID HYBRID INVERTERS: 10 kVA		NHCR		
3	Lithium Ion Battery: 12 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. <b>Note</b> : 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				
	<ul> <li>Providing &amp; 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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect.</li> <li>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</li> <li>Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.</li> </ul>	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 Girls Middle School Bhatian, Peshawar					
	BILL OF QUANTITIES (BOQ)				
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 12 kW	TO BE P	ROVIDED		
2	OFF-GRID HYBRID INVERTERS: 10 kVA	TO BE PROVIDED BY UNHCR			
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. <b>Note</b> : 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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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	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 Naguman, Peshawar			
	BILL OF QUANTITIES (BOQ)		
Sr. No	Description	Unit	Qty
1	PV System Capacity: 6 kW	TO BE P	
2	OFF-GRID HYBRID INVERTERS: 5 kVA	TO BE PROVIDED BY UNHCR	
3	Lithium Ion Battery: 4 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 10 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	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	90
	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	180
	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		
	<ul> <li>Providing &amp; 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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect.</li> <li>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</li> <li>Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.</li> </ul>	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 Middle School Isakhel Hameed, Peshawar					
	BILL OF QUANTITIES (BOQ)				
	DILL OF QUANTILES (DOQ)				
Sr. No	Description	Unit	Qty		
1	PV System Capacity: 12 kW				
2	OFF-GRID HYBRID INVERTERS: 10 kVA	TO BE PROVIDED BY UNHCR			
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 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. <b>Note:</b> 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				
	<ul> <li>Providing &amp; 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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect.</li> <li>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</li> <li>Note: Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.</li> </ul>	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 Bhatian, Peshawar			
	BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty	
1	PV System Capacity: 12 kW			
2	OFF-GRID HYBRID INVERTERS: 10 kVA	TO BE PROVIDED BY UNHCR		
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 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.	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	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	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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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	Job	1	
40				
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"			
	Supply and Election copper tape, including copper staple & copper, hairs/Sciew etc Size 1.5 x1/6 copper rape 1.5 x1/6 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 Pak Afghan Dosti Hospital Torkham, Khyber			
	BILL OF QUANTITIES (BOQ)		
Sr. No	Description	Unit	Qty
1	PV System Capacity: 12 kW		
2	OFF-GRID HYBRID INVERTERS: 10 kVA		ROVIDED NHCR
3	Lithium Ion Battery: 7 kWh	ВГО	MICK
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 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. <b>Note:</b> 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	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	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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated 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	Job	1
	<b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.		
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
1	Installation and transportation of equipment to site	Per kW	12

	SOLARIZATION Of Basic Health Unit Torkham, Khyber			
	BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty	
1	PV System Capacity: 24 kW		ROVIDED	
2	OFF-GRID HYBRID INVERTERS: 20 kVA		NHCR	
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	24,000	
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 30 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	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	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	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 o 1200 x 50 x 50mm (L x W x T) Inspection Pit of 300 x 300 x 450 mm (L x W x D) compilated with all respect.	Job	1	
	6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects <b>Note:</b> Bore Type Earth having similar specification can also be installed as per the permission/direction of The Employer/Engineer.	αυι	I	
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	5	
	Additional Electrical Works	No	1	
	Installation and transportation of equipment to site	Per kW	24	