

LIST OF COMMUNITY/ PUBLIC FACILITIES TO BE SOLARISED - BALOCHISTAN - LOT#1

Sr. No.	Facility Name	Province	District	Coordinates	Sector
1	Sub Campus of Sardar Bahadur Khan Women's University Located at Pishin	Balochistan	Pishin	30.58803, 67.00987	Education
2	Government Boys Primary School Police Line Quetta	Balochistan	Quetta	30.20246, 67.02180	Education
3	University of Balochistan (Communication Department only)	Balochistan	Quetta	30.1640° N, 66.9908° E	Education
4	Government Girls High School KILLI ALAM KHAN	Balochistan	Quetta	30°13'42.28"N 66°59'30.92"E	Education
5	Government Girls High School KILLI SHAIKHAN QUETTA	Balochistan	Quetta	30°10'47.53"N 66°59'15.45"E	Education
6	Government Girls High School POSTAL COLONY QUETTA	Balochistan	Quetta	30°12'1.18"N 67° 0'16.91"E	Education
7	Government Girls High School NAWAB MUHAMMAD AKBAR BUGTI	Balochistan	Quetta	30° 6'20.95"N 66°58'41.64"E	Education
8	Government Girls High School RAILWAY COLONY	Balochistan	Quetta	30°11'20.98"N 66°59'46.35"E	Education
9	Government Girls High School AHMED QUARY ROAD	Balochistan	Quetta	30°10'57.93"N 67° 0'46.11"E	Education
10	Government Boys High School KOTWAL QUETTA	Balochistan	Quetta	30°14'15.50"N 67° 0'37.06"E	Education
11	Government Boys High School KILLI JEO	Balochistan	Quetta	30°10'19.74"N 66°57'27.18"E	Education
12	Government Boys High School NAWAB MUHAMMAD AKBAR BUGTI	Balochistan	Quetta	30° 6'35.57"N 66°58'31.27"E	Education
13	Government Boys High School PASHTOON ABAD	Balochistan	Quetta	30°10'30.27"N 67° 0'58.07"E	Education
14	Government Boys Middle School Yate Road Quetta	Balochistan	Quetta	30°11'37.18"N 67° 0'47.23"E	Education
15	Government Collage of Elementary Education for Girls Quetta	Balochistan	Quetta	30.217023, 66.990165	Education
16	Government Girls High School Killi Shaboo Quetta	Balochistan	Quetta	30.222917, 66.992750	Education
17	Technical Training Centre for Male	Balochistan	Quetta	30°10.42'0.47"N 67° 0.47'2.8"E	Livelihood
18	Pakistan Industrial Technical Assistance Centre Quetta	Balochistan	Quetta	30°11.09'5.6"N 67° 0.78'4.69"E	Livelihood
19	Government Polytechnic Institute for Girls Quetta	Balochistan	Quetta	30°8.67'4.06"N 67° 58'2.58"E	Livelihood

SOLARIZATION OF SUB-CAMPUS SARDAR BAHADUR KHAN WOMEN UNIVERSITY, PISHIN			
BILL OF QUANTITIES (BOQ)			
S.#	Description	Unit	Qty
1	PV System Capacity: 52.3 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 45 kVA		
3	Lithium Ion Battery: 17 kWh		
4	PV Mounting Structure		
a	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	52300
5	Misc Items		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to DC combiner box to Inverter	R.M	300
b	Single Core DC Flexible Copper Cables 50mm sq from DC combiner box to Inverter	R.M	60
c	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	10
d	150A-4P DC Breakers between DC combiner box and Inverter	Each	1
e	100 Amp/48V 4-P DC Breaker b/w inverter & battery bank	Each	1
f	AC Cables 50 mm sq (4 core) from Main Distribution Box (MDB) to inverter then back to MDB	R.M	30
g	80 Amp 4-P AC Breaker btw WAPDA & Inverter, Inverter & Load	Each	2
h	10 Amp AC Breaker 1-P b/w inverter & Load	Each	21
i	Changeover Switches 100 Amp	No	1
j	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	2
k	Inauguration/Sign Board	No	1
l	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), DC Combiner box, Surge Protection Device at DC & AC input, complete in all respect.	Job	1
6	Application for Net-Metering and Installation of Bi-Directional Energy Meter		
a	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 Middle School Police Line Colony Quetta			
BILL OF QUANTITIES (BOQ)			
S.#	Description	Unit	Qty
1	PV System Capacity: 13.3 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 10 kVA		
3	Lithium Ion Battery: 10 kWh		
4	PV Mounting Structure		
a	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	13260
5	Misc Items		
a	Single Core DC Flexible Copper Cables 6mm sq from PV module to Inverter	R.M	80
b	Single Core DC Flexible Copper Cables 35mm sq for battery connections	R.M	5
c	DC Breakers 32A-2P between PV Modules and Inverter	Each	1
d	200 Amp/48V DC Breaker 4-P String b/w inverter & battery bank	Each	1
e	AC Cables 7/0.036 (4 mm sq.) from inverter to Main Distribution Box	R.M	50
f	AC Cables 7/0.029 (2.5 mm sq.) for MDB to switch board	R.M	180
g	AC Cables 3/0.029 (1.5 Sq. mm) from switch board to Load	R.M	1440
h	63 Amp AC Breaker 2-P in Main Distribution Box	Each	1
i	10 Amp AC Breaker 1-P b/w inverter & Load	Each	10
j	Changeover Switches 30 Amp	No	1
k	Lightening Arrestor having 1" dia & 1m long rod with 5 spikes ball & base, Earthing Plate 1x1ft, Earthing Rod 5 Feet Long 16 mm Dia, and Earthing Cable conductor, all made of Copper material, and Earthing powder.	Each	1
l	Inauguration/Sign Board	No	1
m	Civil foundation work, stainless steel nuts & bolts for PV structure, HDPE Pipe, Flexible PVC Pipe, PVC Duct Patti etc. for cable ducting, Switches 10/15 Amp : On/Off Switches, Distribution Board, Copper Thimbles, Sleeves, Butt Joint Connectors, Ring Thimbles, PVC Shrouds, Heat Shrink Tubes for all termination, connection and jointing as per International Practices. Inverter, Batteries and Protective Devices must be Labelled Properly along with detail user manual, Cabinet for Complete System (Inverter, Breakers, changeover etc.), Surge Protection Device at DC & AC input, complete in all respect.	Job	1

SOLARIZATION Of University of Balochistan (Communication Department) Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 54 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 45 kVA		
3	Lithium Ion Battery: 35 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	54,000
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 70 Outgoing Circuit Breakers of 10 A and 10 Outgoing Circuit Breakers of 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	360
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	1,260
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	2,520
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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	360
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) 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	54
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 Government Girls High School KILLI ALAM KHAN, Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 36 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 30 kVA		
3	Lithium Ion Battery: 38 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	36,000
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 50 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. 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	810
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,620
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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	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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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	7
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	36
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 Government Girls High School KILLI SHAIKHAN QUETTA			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 18 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 15 kVA		
3	Lithium Ion Battery: 19 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 40 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	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	1,080
	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	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	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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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	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 Government Girls High School POSTAL COLONY QUETTA			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 36 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 30 kVA		
3	Lithium Ion Battery: 42 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	36,000
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 45 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	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	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	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	7
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	36

SOLARIZATION Of Government Girls High School NAWAB MUHAMMD AKBAR BUGTI Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 24 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 20 kVA		
3	Lithium Ion Battery: 30 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 45 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	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	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	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	5
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	24

SOLARIZATION Of Government Girls High School RAILWAY COLONY

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 48 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 40 kVA		
3	Lithium Ion Battery: 45 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 50 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. Note: 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	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	2
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	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 70mms S/Core copper bare conductor 125 (FT) Earth Connection Point of 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	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 Government Girls High School AHMED QUARY ROAD Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 24 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 20 kVA		
3	Lithium Ion Battery: 30 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 40 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 fuses	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	630
	Providing and Fixing of Single Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,260
	Providing and Fixing of Single Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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	5
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	24

SOLARIZATION Of Government Boys High School KOTWAL QUETTA

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 30 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 25 kVA		
3	Lithium Ion Battery: 37 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	30,000
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 47 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	810
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,620
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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	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	30

SOLARIZATION Of Government Boys High School KILLI JEO Quetta

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: 23 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 40 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	630
	Providing and Fixing of Single Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,260
	Providing and Fixing of Single Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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	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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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 Government Boys High School NAWAB MOHD AKBAR BUGTI Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 30 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 25 kVA		
3	Lithium Ion Battery: 31 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	30,000
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 55 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	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	810
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,620
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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	30

SOLARIZATION Of Government Boys High School PASHTOON ABAD Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 24 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 20 kVA		
3	Lithium Ion Battery: 31 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 30 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	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	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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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	5
	Additional electrical works	No	1
	Installation and transportation of equipment to site	Per kW	24

SOLARIZATION Of Government Boys Middle School Yate Road Quetta

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 30 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 25 kVA		
3	Lithium Ion Battery: 36 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	30,000
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 10 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. 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	630
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	1,260
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	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	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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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	8
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	30

SOLARIZATION Of Government Collage of Elementary Education for Girls Quetta			
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 Government Girls High School Killi Shaboo Quetta

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 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) complied with all respect. 6 mm sq (Bare Copper Conductor) 99% Pure Copper for earthing of PV Modules including grounding nuts (imported) made of pure copper (tin coated) complete in all respects 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 Technical Training Centre for Male Quetta

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 48 kW	TO BE PROVIDED BY UNHCR	
2	ON-GRID HYBRID INVERTERS: 40 kVA		
3	Lithium Ion Battery: 57 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 Boxes made of 16 SWG, Galvanized Iron with Digital Multimeter (Voltmeter and Ammeter), Selectable Switches showing Current and Voltage of Phase and, if required, Separate Bus Bars for Phase, Neutral and Earth Connection and having 5 Incoming Circuit Breakers and at least 50 Outgoing Circuit Breakers of 10 A rating for connection of critical and non-critical load specified in electrical load section, AC Voltage Protection device, complete in all aspects. Note: 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	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	30
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	2
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 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	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	6
	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 Pakistan Industrial Technical Assistance Centre Quetta			
BILL OF QUANTITIES (BOQ)			
Sr. No	Description	Unit	Qty
1	PV System Capacity: 24 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 20 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	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 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	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	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	270
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	5
	Additional Electrical Works	No	1
	Installation and transportation of equipment to site	Per kW	24

SOLARIZATION Of Government Polytechnic Institute for Girls Quetta

BILL OF QUANTITIES (BOQ)

Sr. No	Description	Unit	Qty
1	PV System Capacity: 54 kW	TO BE PROVIDED BY UNHCR	
2	OFF-GRID HYBRID INVERTERS: 45 kVA		
3	Lithium Ion Battery: 67 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	54,000
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 80 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	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	1,260
	Providing and Fixing of Single-Phase Wiring of Size 4 mm sq in PVC Duct Patti (where required) from inverter to main power access points on each floor as per the directions/instructions of The Employer/Engineer	Meter	2,520
	Providing and Fixing of Single-Phase Wiring of Size 6 mm sq in PVC Duct Patti (where required) from main power access points to air conditioning units on each floor as per the directions/instructions of The Employer/Engineer	Meter	90
10	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 lightning 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	54
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