GTP Compliance Sheet

The following technical data shall be furnished and filled by the bidders:

Electrical Item / PV Monocrystalline Solar Panels:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Electrical specs		
1.1	Make/Brand/Model:		
1.2	Name of manufacturer	Q-Cell, Bluesun, LG, Gamko, or equivalent	
1.3	Country of Origin	European / USA/ JAPAN or equivalent	
1.4	Type of Module	Monocrystalline / Half-cut	
1.5	Max. power output	Min 440W	
1.6	Max. power output tolerances	0~ +5W	
1.7	Module efficiency	≥ % 20.5	
1.8	Voltage at max power	41- 43 V	
1.9	Current at max power	9 - 11 A	
1.10	Open circuit voltage	49 - 50 V	
1.11	Short circuit current	11 - 12A	
1.12	System Voltage	Not less than 1000 VDC	
1.13	Certification and regulatory standards	CE, IEC 61215/ 61730/ 61701/62716, TUV, ISO 9001/ISO 14001, UL certificates or equivalent standards.	
2	Mechanical specs		
2.1	Module Dimension	2008×1002×40 mm or as per manufacturer	
2.2	Cells	Half Cut (144 cells = 6*24)	

2.3	Weight (kg)	20 – 25 kg	
2.4	Glass	High transmission glass 3.2mm	
2.5	anti-reflective coating type	Anti-reflection glass	
2.6	Junction box IP rating	IP67 1500VDC 3 bypass diode	
2.7	Cable	$4mm^2$	
2.8	Connector type	MC4 compatible	
2.9	Fire performance	Class C	
3	Working Conditions & Temperature		
3.1	Temperature coefficient (Pmax)	-0.36%/°C	
3.2	Temperature coefficient (Isc)	+0.048%/°C	
3.3	Temperature coefficient (Voc)	-0.28%/°C	
3.4	Operation Temperature	-40 to +85 °C	
3.5	Maximum system voltage (IEC/UL)	1500V DC	
3.6	Max series fuse rating	15A	
4	Warranty	Power output warranty: not less than 10 years over 90%, 25 years over 80%.	
5	Submit Manufacturer certification and test reports		
6	Submit Detail drawing brochure catalogue.		

Electrical Item / Mounting Structure:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make/Brand/Model:	Philadelphia , EAE or equivalent	

2	Name of manufacturer		
3	Country of Origin	Jordan , turkey , China or equivalent	
4	Number of solar panels	Tables of 2x18 solar panels (2008×1002mm)	
5	Panels Platform dimensions	L 18 m X W 2 m	
6	Height	1.8-2 m	
7	Number of supports	3 supports per each stand, M10L30 and M8L80 mm	
8	Material of the panel	Aluminum	
9	Structure	Aluminum EN AW-6063 T66.	
10	Module Rail	Aluminum EN AW-6063 T66.	
11	Material of the fixtures	Aluminum EN AW-6063 T66.	
12	Material of clamps	Z and U profiles are aluminum	
13	Max. wind load	Up to 120km/hr	
14	Type	Fixed structure	
15	Panel orientation	landscape or portrait	
16	Product Warranty	10 Years	
17	Submit Manufacturer certification and test reports	Submit Manufacturer certification and test reports.	
18	Submit Detail drawing brochure catalogue.	Submit Detail drawings brochure catalogue.	

Electrical Item / 25 kW Hybrid Solar Pump Controller

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Electrical Specification		
1.1	Make/Brand/Model:		

1.2	Name of manufacturer	Gefran, ABB, INVT, Fronius, SHAKTI , or equivalent	
1.3	Country of Origin	Western Europe or equivalent	
1.4	Nominal Power	25 KW	
1.5	Three-Phase Voltage Output	380-440 Vac	
1.6	MPPT Tracking Voltage	400-650 V	
1.7	MPPT Efficiency	> 99.9%	
1.8	Maximum Motor Power	26 KW	
1.9	Maximum output current	57 A	
1.10	Overload Capacity	150% (60 sec)/ 200% (0.5 Sec)	
1.11	Maximum permitted voltage with motor stop Vmax	800 V dc	
1.12	Minimum voltage Vmin allowed with motor off	400 V dc	
1.13	dV/dT filter for 200 m borehole depth	Should be included	
1.14	Hybrid Mode with connection ports to national grid / generator	Should be included	
1.15	Working IP	IP 54	
1.16	Integrated DC combiner	Should Include - Min. 8x20A	
1.17	AC Auxiliary protection switch	63A-3P	
1.18	Over-voltage Protection on DC & AC Line	Yes/No if yes with detail	
1.19	Connection terminal for DC Input & AC Output	Yes/NO	
2.	Communication and Monitoring		

2.1	Input Terminal for Pressure Sensor	Yes /No	
2.2	Terminals of Level Control Probes	Yes /No	
2.3	Keyboard with LED Display	Yes /No	
2.4	RS485 communication output Modbus RTU	Yes /No	
2.5	EMC filters included	Yes /No	
3	Environmental Condition and General data:		
3.1	Ambient temperature	-10°C … +55 °C	
3.2	Altitude	> 1000 m without derating	
3.3	Cooling Method	Fan cooling	
3.4	Ambient Humidity	95% RH	
3.5	Dimension (H*W*D)	600x800x250 mm	
3.6	Gross Weight	40-50 kg	
3.7	Efficiency	>97 %	
3.8	Reference standard	- EN 61800-3-:2004/ A1 :2012 - EN 61800-5-1:2007	
3.9	Device Warranty	Min 3 years	
4	Submit Manufacturer certification and test reports		
5	Submit Detail drawing brochure catalogue.		

Electrical Item / 10 kW Hybrid Solar Pump Controller

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Electrical Specification		
1.1	Make/Brand/Model:		
1.2	Name of manufacturer	Gefran, ABB, INVT, Fronius,SHAKTI , or equivalent	

1.3	Country of Origin	Western Europe or equivalent	
1.4	Nominal Power	10 KW	
1.5	Three-Phase Voltage Output	380-440 Vac	
1.6	MPPT Tracking Voltage	400-650 V	
1.7	MPPT Efficiency	> 99.9%	
1.8	Maximum Motor Power	10.5 KW	
1.9	Maximum output current	40 A	
1.10	Overload Capacity	150% (60 sec)/ 200% (0.5 Sec)	
1.11	Maximum permitted voltage with motor stop Vmax	600 V dc	
1.12	Minimum voltage Vmin allowed with motor off	250 V dc	
1.13	dV/dT filter for 200m borehole depth	Should be included	
1.14	Hybrid Mode with connection ports to national grid / generator	Should be included	
1.15	Working IP	IP 54	
1.16	Integrated DC combiner	Should Include - Min. 8x20A	
1.17	AC Auxiliary protection switch	40A-3P	
1.18	Overvoltage Protection on DC & AC Line	Yes/No if yes with detail	
1.19	Connection terminal for DC Input & AC Output	Yes/NO	
2	Communication and Monitoring		
2.1	Input Terminal for Pressure Sensor	Yes /No	
2.2	Terminals of Level Control Probes	Yes /No	

2.3	Keyboard with LED Display	Yes /No	
2.4	RS485 communication output Modbus RTU	Yes /No	
2.5	EMC filters included	Yes /No	
3	Environmental Condition and General data:		
3.1	Ambient temperature	-10°C … +55 °C	
3.2	Altitude	> 1000 m without derating	
3.3	Cooling Method	Fan cooling	
3.4	Ambient Humidity	95% RH	
3.5	Dimension (H*W*D)	600x800x250 mm	
3.6	Gross Weight	40-50 kg	
3.7	Efficiency	>97 %	
3.8	Reference standard	- EN 61800-3-:2004/ A1 :2012 - EN 61800-5-1:2007	
3.9	Device Warranty	Min 3 years	
4	Submit Manufacturer certification and test reports		
5	Submit Detail drawing brochure catalogue.		

Electrical Item / 5.5 kW Hybrid Solar Pump Controller

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Electrical Specification		
1.1	Make/Brand/Model:		
1.2	Name of manufacturer	Gefran, ABB, INVT, Fronius,SHAKTI , or equivalent	
1.3	Country of Origin	Western Europe or equivalent	

1.4	Nominal Power	5.5 KW	
1.5	Three-Phase Voltage Output	380-440 Vac	
1.6	MPPT Tracking Voltage	400-650 V	
1.7	MPPT Efficiency	> 99.9%	
1.8	Maximum Motor Power	7 KW	
1.9	Maximum output current	22 A	
1.10	Overload Capacity	150% (60 sec)/ 200% (0.5 Sec)	
1.11	Maximum permitted voltage with motor stop Vmax	450 V dc	
1.12	Minimum voltage Vmin allowed with motor off	250 V dc	
1.13	dV/dT filter for 200m borehole depth	Should be included	
1.14	Hybrid Mode with connection ports to national grid / generator	Should be included	
1.15	Working IP	IP 54	
1.16	Integrated DC combiner	Should Include - Min. 8x20A	
1.17	AC Auxiliary protection switch	32A-3P	
1.18	Overvoltage Protection on DC & AC Line	Yes/No if yes with detail	
1.19	Connection terminal for DC Input & AC Output	Yes/NO	
2	Communication and Monitoring		
2.1	Input Terminal for Pressure Sensor	Yes /No	
2.2	Terminals of Level Control Probes	Yes /No	
2.3	Keyboard with LED Display	Yes /No	

2.4	RS485 communication output Modbus RTU	Yes /No	
2.5	EMC filters included	Yes /No	
3	Environmental Condition and General data:		
3.1	Ambient temperature	-10°C … +55 °C	
3.2	Altitude	> 1000 m without derating	
3.3	Cooling Method	Fan cooling	
3.4	Ambient Humidity	95% RH	
3.5	Dimension (H*W*D)	600x800x250 mm	
3.6	Gross Weight	40-50 kg	
3.7	Efficiency	>97 %	
3.8	Reference standard	- EN 61800-3-:2004/ A1 :2012 - EN 61800-5-1:2007	
3.9	Device Warranty	Min 3 years	
4	Submit Manufacturer certification and test reports		
5	Submit Detail drawing brochure catalogue.		

Electrical Item / 3 kW Hybrid Solar Pump Controller:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Electrical Specification		
1.1	Make/Brand/Model:		
1.2	Name of manufacturer	Gefran, ABB, INVT, Fronius,SHAKTI , or equivalent	
1.3	Country of Origin	Western Europe or equivalent	
1.4	Nominal Power	3 KW	

1.5	Three-Phase Voltage Output	380-440 Vac	
1.6	MPPT Tracking Voltage	400-650 V	
1.7	MPPT Efficiency	> 99.9%	
1.8	Maximum Motor Power	5 KW	
1.9	Maximum output current	15 A	
1.10	Overload Capacity	150% (60 sec)/ 200% (0.5 Sec)	
1.11	Maximum permitted voltage with motor stop Vmax	250 V dc	
1.12	Minimum voltage Vmin allowed with motor off	48 V dc	
1.13	dV/dT filter for 200m borehole depth	Should be included	
1.14	Hybrid Mode with connection ports to national grid / generator	Should be included	
1.15	Working IP	IP 54	
1.16	Integrated DC combiner	Should Include - Min. 8x20A	
1.17	AC Auxiliary protection switch	16A-3P	
1.18	Overvoltage Protection on DC & AC Line	Yes/No if yes with detail	
1.19	Connection terminal for DC Input & AC Output	Yes/NO	
2	Communication and Monitoring		
2.1	Input Terminal for Pressure Sensor	Yes /No	
2.2	Terminals of Level Control Probes	Yes /No	
2.3	Keyboard with LED Display	Yes /No	
2.4	RS485 communication output Modbus RTU	Yes /No	

2.5	EMC filters included	Yes /No	
3	Environmental Condition and General data:		
3.1	Ambient temperature	-10˚C … +55 ˚C	
3.2	Altitude	> 1000 m without derating	
3.3	Cooling Method	Fan cooling	
3.4	Ambient Humidity	95% RH	
3.5	Dimension (H*W*D)	600x800x250 mm	
3.6	Gross Weight	40-50 kg	
3.7	Efficiency	>97 %	
3.8	Reference standard	- EN 61800-3-:2004/ A1 :2012 - EN 61800-5-1:2007	
3.9	Device Warranty	Min 3 years	
4	Submit Manufacturer certification and test reports		
5	Submit Detail drawing brochure catalogue.		

Electrical Item / 3 kW Hybrid Solar Inverter:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make/Brand/Model:		
2	Name of manufacturer	SERVO MATIK, Gefran, ABB, SMA,MUST	
3	Country of Origin	GERMANY ,Turkey,France,USA or equivalent	
4	Nominal output Power	3000 W	
5	Input data		
A	PV source		
A.1	Max. Recommended DC Power	3300 W	

A.2	Surge Power	5000VA	
A.3	Max DC Voltage	550 V	
A.4	MPPT Voltage Range	125 V - 500 V	
A.5	Max input Current	12 A	
A.6	Max Short circuit Current	15 A	
A.7	NO. of MPP Trackers	1	
A.8	Strings per MPP Tracker	2	
B	AC Input		
B.1	Input Voltage	230Vac/50 or 60HZ, Single Phase	
B.2	Nominal current (RMS)	13.0A	
B.3	Power Factor	0.7 inductive to 0.7 capacitive	
B.4	Power and VA capability		
6	Output Data		
6.1	Output Voltage	230Vac/50 or 60HZ, Single Phase	
6.2	Output current (RMS)	13 A rms	
6.3	Output Frequency	0-50HZ/60 HZ	
7	Protection		
7.1	Surge Protection	Yes	
7.2	Over voltage Protection	Yes	
7.3	Under voltage Protection	Yes	
7.4	Locked pump protection	Yes	
7.5	Open circuit protection	Yes	

7.6	Dry run protection	Yes	
8	Environmental Condition and General data:		
8.1	Cooling Method	Fan Cooling	
8.2	Operating Temperature	-10 ˚C ~ 60 ˚C	
8.3	Ambient Humidity	95% RH	
8.4	Altitude	≤ 1000 m	
8.5	Efficiency	>93 %	
8.6	Protection Degree	IP 65	
8.7	Standards	IEC 62109-2:2011 IEC 62109-1:2010 CE, ISO 9001:2008	
8.8	Warranty	Min. 3 years	
9	Submit Manufacturer certification and test reports		
10	Submit Detail drawing brochure catalogue.		

Electrical item/ Street lighting pole (10 m):

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make:	Original manufacturer (locally assembled not acceptable)	
2	Name of manufacturer		
3	Country of origin		
4	Ambient temperature:	Maximum:55/C Minimum: -10/C	
5	Air humidity:	92% maximum	
6	Altitude:	1000M above MSL	
7	Nominal voltage:	400V	

8	Reference standard	According to Iraqi/ MOE specification no. D-13 and EN 10025, NFEN 10/49 for steel grades, NFP 22- 470, 22-471 and 22-473 for welding, ASTMA 123, BS729, NF A 91-121 for galvanization.	
9	Effective length of pole	10 m	
10	Weight	kg	
11	Max wind velocity	140 km/hr	
12	Minimum Lantern weight to be supported	30kg	
13	Thickness of the shaft wall minimum	4mm	
14	Dimension of pole at top	mm	
15	Dimension of pole at bottom	mm	
16	Dimension of base plate	mm	
17	Type of corrosion prevention system used	Hot dip galvanized	
18	Minimum thickness of zinc coatings	≥85µm	
19	Minimum density	500 gm/m2	
20	**Submit Manufacturer certification:**		
21	**Submit type test certificates or reports :**		
22	**Submit Detail drawings, brochures and catalogues:**		

Electrical item / Distribution Transformer (11/0.416 kV, 250 kVA):

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make/Brand/Model:		
2	Name of manufacturer		
3	Type:	Oil-immersed hermetically sealed - bolted type	
4	Country of origin		
5	Reference standard	According to Iraqi/MOE specification no. D-26 and IEC 60076-1, 2,3,5,8, IEC 60214, IEC 60137	
6	Ambient temperature:	Maximum: 55/C Minimum: -10/C	
7	Air humidity:	92% maximum	
8	Altitude:	1000M above MSL	
9	Number of poles	3	
10	Indoor or outdoor	Outdoor	
11	Highest system voltage	12 kV	
12	Short circuit current on 11 kV side	• 25 KA at 11000 volts • The duration of the short circuit to rise the temperature of windings from 105 C° to 250 C° should be not less than (5 Sec.)	
13	11 kV system earthing	Neutral isolated / earthed through a resistor	
14	Low voltage side earthing	Neutral solidly earthed	

15	Voltage Ratio	11 / 0.416 kV 11(+2 x 2.5% / -2 x 2.5%)	
16	Type of cooling	ONAN	
17	Rated power- Continuous	250 kVA	
18	Rated Frequency	50Hz	
19	Altitude:	1000M above MSL	
20	Resistance of HV winding per phase at 20 C	Ω	
21	Resistance of LV winding per phase at 200 C	Ω	
22	Resistance voltage at full load and at 75C.	%	
23	Reactance voltage at full load and at 75C.	%	
24	Impedance voltage at full load 75C:		
25	At nominal tap	4 %	
	At highest tap	%	
	At lowest tap	%	
26	Nominal Voltage of winding a) H.V.	11 kV	
	b) L.V	0.416 kV	
27	Insulation level 11 kV a) Lightning Impulse b) AC power frequency	75 kV 28 kV	

28	Insulation level LV - phases/neutral AC power frequency	3 V	
29	Winding temperature rise at rated power	50 C	
30	Top oil temperature rise at rated power	45 C	
31	Iron losses at 50 HZ		
	At 90% rated voltage.	KW To be filled in	
	At 100% rated voltage.	KW To be filled in	
	At 110% rated voltage.	KW To be filled in	
32	Copper losses at full load (on rating) and at 75 C	KW To be filled in	
33	Total losses.	KW To be filled in	
34	Guaranteed magnetizing current	…….A	
35	Maximum flux density in iron at rated frequency and at rated voltage ratio at nominal voltage	≤ 1.65 Tesla	
36	The efficiency (at unity power factor and 100% of rated power) of the transformer	>= 98.6%	
37	Current density in windings for		
	a) H.V. winding	(Amps/sq.cm)	
	b) L.V. winding	(Amps/sq.cm)	
38	No load current at rated voltage	…A	

39	Material of windings	Copper	
40	Type of winding a) H.V. b) L.V.		
41	Type of insulation of winding a) H.V. b) L.V.		
42	Type of insulation of a) Core assembly b) Core laminations	Varnish Paper	
43	Thickness of transformer a) tank b) sides c) bottom	 Minimum 3 mm Minimum 3 mm Minimum 3 mm	
44	Thickness of radiator plates and for cooling tube	….. mm	
45	Winding connection a) H.V. b) L.V.	 Delta Star (Neutral brought out)	
46	Vector group symbol	Dyn11	
47	Type of core	Core – Cold Rolled Grain Oriented	
48	Core sheet materials		
49	Off-load tap changer	Off-load tap changer with 5 positions in the HV winding	
	Manufacturer	To be filled in	
	Tapping range	+5% / -5%	
	Tapping step	2.5%	

50	11 kV side terminal arrangement	as per D26	
51	Low voltage terminal arrangement	Suitable for terminating copper cables as per D26	
52	Test pressure of oil leak test of tank		
53	Noise level at 0.3 m distance	≤ 55 dB	
54	Transformer oil		
1	Type of oil	IEC60296 class 1	
2	Manufacturer		
3	Place of manufacture		
4	Manufacturer's type designation		
5	Applied IEC standard	IEC 60296	
6	Kinematic viscosity mm^2/s		
	At 40 deg	≤ 16.5	
	At -15 deg	≤ 800	
7	Flash point	≥ 140 C	
8	Pour point	≤ - 30 C	
9	Density at 20 deg C – kg/ dm3	≤ 0.895	
10	Breakdown strength	kV	
55	Dimensions of transformer	L. (1230 mm) x W. (700mm) x H. (1300mm)	
56	Weight of transformer	kg	

57	Type of corrosion protection on steel parts a) Inside tank b) Outside tank	Oil resistant paint Metalized, aluminum paint or equivalent	
58	11 kV bushings		
1	Name of manufacturer		
2	Make/Brand/Model:		
3	Reference standard	IEC 60137	
4	Type of bushing	Ceramic	
5	Rated current	A	
6	Rated voltage	12kV	
7	Material	Porcelain	
8	Color	Brown	
9	Creepage distance	300 mm	
59	L V bushings		
1	Name of manufacturer		
2	Make/Brand/Model:		
3	Reference standard	IEC 60137	
4	Type of bushing		
5	Rated current	A	
6	Rated voltage	1kV	
7	Material	Porcelain	
8	Color	Brown	
9	Creepage distance	70 mm	
60	Warranty period	One year	
61	Submit Manufacturer certification:		

62	Submit type test certificates or reports :	
63	Submit Detail drawings, drawings of HV and LV bushings, details of accessories, brochures and catalogues:	

Electrical item / Outdoor LV Switchgear Cabinets - Pole Mounted - 400 A

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Name of manufacturer:	Original manufacturer (locally assembled not	
2	Country of origin:		
3	Reference standards	According to Iraqi/ MOE specification no. D-09 and IEC 60439	
4	Ambient temperature:	Maximum:55/C Minimum: -10/C	
5	Relative Humidity:	92% maximum	
6	Altitude:	1000M above MSL	
7	Rated voltage	416/240 Volts	
8	Frequency	50 Hz	
9	Switchgear type:	Outdoor type, pole mounted cabinet	
10	Rated impulse withstand voltage	kV	
11	Rated power frequency withstand	2.5 kV	
12	Rated current at the maximum	400 A	
13	The cabinet type:	Outdoor type	
14	Thickness of sheets	Minimum 2mm	
15	Painting type	Electro-static and thermal painting.	
16	IP class	IP 55 for the cabinet and IP34 for	
17	Dimensions of the LV switchgear cabinet	L mm x W mm x H mm	

18	Weight of the LV	Kg	
19	Circuit breaker	MCCB - shall be accommodated inside the panel for outgoing feeder and shall comply with IEC	
1	Country of manufacture	To be filled	
2	Name of manufacturer	To be filled	
3	Model No-	To be filled	
4	Rated operating voltage	V … To be filled	
5	Rated insulating voltage	V …..To be filled	
6	Rated impulse withstand voltage	kV….. To be filled	
7	Rated power frequency withstand	kV…… To be filled	
8	Rated current at the maximum operating temperature	A…… To be filled	
9	Thermal overload and magnetic	Yes / No	
10	Circuit breaker ultimate breaking	kA	
11	Circuit breaker service breaking	kA	
12	Short circuit making capacity	kA	
20	Submit Manufacturer certification		
21	Submit type test certificates or		
22	Submit Detail drawings, brochures and catalogues of cabinet		

Electrical item / Lattice Steel Poles 11 m:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make:	Original manufacturer (locally assembled not acceptable)	
2	Name of manufacturer		
3	Country of origin		
4	Ambient temperature:	Maximum:55/C Minimum: -10/C	
5	Air humidity:	92% maximum	
6	Altitude:	1000M above MSL	
7	Nominal voltage:	Medium voltage (11 kV), and low voltage (0.4 kV)	
8	Reference standard	According to Iraqi/MOE specification no. D-46 and JIS-G-3101 (STK-51) , BS-4360 (Steel 52) , and DIN-17100 (ST-52).	
9	Effective length (m)	11	
10	Properties of steel		
10.1	Type of steel used		
10.2	Tensile strength -min	Kgf/mm2	
10.3	Yield strength -min	Kgf/mm2	
10.4	Design bending stress- min	Kgf/mm2	
11	Weight	Kg	
12	Working load (Ps)	Kgf	

13	Deflection at (Pp)		
14	Breaking load (Pb)	kgf	
15	Factor of safety	Min 2	
16	Type of corrosion prevention system used	Hot dip galvanized	
17	Manufacturing	Confirmation that the lattice pole shall be manufactured as per the specification No. D 46 and the drawing attached to the specification	
18	**Submit Manufacturer certification:**		
19	**Submit type test certificates or reports:**		
20	**Submit Detail drawings, brochures and catalogues:**		

Electrical item / Tubular Steel Poles 11 m:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make:	Original manufacturer (locally assembled not acceptable)	
2	Name of manufacturer		
3	Country of origin		
4	Ambient temperature:	Maximum:55/C Minimum: -10/C	
5	Air humidity:	92% maximum	
6	Altitude:	1000M above MSL	
7	Nominal voltage:	Medium voltage (11 kV), and low voltage (0.4 kV	

8	Reference standard	According to Iraqi/ MOE specification no. D-22 and JIS-G-3444 (ST-51) , BS-4360 , and DIN 17100 (ST-52)	
9	Effective length (m)	11	
10	**Top Section**		
10.1	Length x outside diameter (mm)	3000 x 114.3	
10.2	Minimum wall thickness (mm)	3.5	
11	**Middle Section**		
11.1	Length x outside diameter (mm)	3000 x 139.7	
11.2	Minimum wall thickness (mm)	4.5	
12	**Bottom Section**		
12.1	Length x outside diameter (mm)	5000 x 165.2	
12.2	Minimum wall thickness (mm)	5	
13	Sinking Depth (m)	2	
14	Working Load (kgf)	285	
15	Point of load application from top(m	1.2	
16	Factor of Safety	1.5	
17	yield strength (N/mm^2)	355	
18	Type of corrosion prevention system used	Hot dip galvanized	
19	**Submit Manufacturer certification:**		

20	**Submit type test certificates or reports:**	
21	**Submit Detail drawings, brochures and catalogues:**	

Electrical item / Tubular Steel Poles 9 m for LV:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make:	Original manufacturer (locally assembled not acceptable)	
2	Name of manufacturer		
3	Country of origin		
4	Ambient temperature:	Maximum:55/C Minimum: -10/C	
5	Air humidity:	92% maximum	
6	Altitude:	1000M above MSL	
7	Nominal voltage:	400V	
8	Reference standard	According to Iraqi/MOE specification no. D-22 and JIS-G-3444 (ST-51), BS-4360 , and DIN 17100 (ST-52)	
9	Effective length (m)	9	
10	**Top Section**		
10.1	Length x outside diameter (mm)	2000 x 89.1	
10.2	Minimum wall thickness (mm)	3.5	
11	**Middle Section**		
11.1	Length x outside diameter (mm)	2300 x 114.3	

11.2	Minimum wall thickness (mm)	4.5	
12	**Bottom Section**		
12.1	Length x outside diameter (mm)	4700 x 139.7	
12.2	Minimum wall thickness (mm)	5	
13	Sinking Depth (m)	1.5	
14	Working Load (kgf)	210	
15	Point of load application from top(m	0.6	
16	Factor of Safety	1.5	
17	yield strength (N/mm^2)	355	
18	Type of corrosion prevention system used	Hot dip galvanized	
19	**Submit Manufacturer certification:**		
20	**Submit type test certificates or reports:**		
21	**Submit Detail drawings, brochures and catalogues:**		

Electrical Item / ACSR Conductor (120/20 sq.mm):

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make:		
2	Name of manufacturer		
3	Country of origin		
4	Reference standards	According to Iraqi/MOE specification no. D-47 and DIN 48204 and IEC	
5	Ambient temperature:	Maximum: 50°C Minimum: -10°C	
6	Air humidity:	92% maximum	

7	Altitude:	1000M above MSL	
8	Number and diameter of stranding Aluminum/Steel	26/2.44mm 7/1.9mm	
9	Over all diameter	15.5mm	
10	Cross section area	141mm^2	
11	Rated / ultimate tensile strength (UTS) –kN	kN	
12	Weight, kg/km	kg	
13	DC resistance, ohms/km at 20°C	ohms	
14	Modulus of Elasticity of stranded conductor N/ mm2	Mpa	
15	Coefficient of linear expansion of stranded conductor, per°C		
16	Maximum continuous load current at 55 deg outdoor temperature	A	
17	Maximum length of conductor and mass of conductor per drum	2000m ± 2% per drum kg	
18	Submit Manufacturer certification:		
19	Submit type test certificates or reports:		
20	Submit Detail drawings, brochures and catalogues:		

Electrical Item / LV-ABC Cable (3*95+50+16):

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make/Brand/Model:		
2	Name of manufacturer		
3	Type :	Aerial bundle Conductors	
4	Country of origin		
5	Reference standard	According to Iraqi/MOE specification no. D-30 and IEC 60228 & 60502-1 & 60540 and 60538 and ASTM – D1693-70	
6	Ambient temperature:	Maximum: 55°C Minimum: -10°C	
7	Air humidity:	92% maximum	
8	Altitude:	1000M above MSL	
9	Rated Voltage :	0.6/1 kV, 50 HZ	
10	Insulation material of phase conductors	HDPE	
11	Short circuit current for 1 Sec. Max.	KA	
12	Construction data	5 Core -Phase 3x95 mm^2 + Neutral 50 mm^2+ street lamp cct 16 mm^2	
13	**Phase conductors-Aluminium**		
13.1	Number of strands of phase conductor		

13.2	Diameter of the conductor	mm	
13.3	Cross sectional area	95 mm^2	
13.4	Resistance per km		
13.5	UTS of conductors	kN	
13.6	Insulation thickness	1.6 mm	
13.7	Outside diameter	mm	
14	**Neutral conductor - Aluminium Alloy**		
14.1	Number of strands of phase conductor		
14.2	Diameter of the conductor	mm	
14.3	Cross sectional area	50 mm^2	
14.4	Resistance per km		
14.5	UTS of conductors	kN	
14.6	Insulation thickness	1.4 mm	
14.7	Outside diameter	mm	
15	**Street light circuit - Aluminium**		
15.1	Number of strands of conductor.		
15.2	Diameter of the conductor	mm	
15.3	Cross sectional area	16 mm^2	
15.4	DC Resistance per km at 20 deg	ohm/km	
15.5	UTS of conductors	kN	
15.6	Insulation thickness	1.2 mm	
15.7	Outside diameter	mm	

16	Overall diameter of cable (Approx.)	mm	
17	Marking of cable	As per the specification	
18	Net weight (Approx.) (kg/ km)	kg	
19	AC. withstand voltage	……kV for ……. Minutes	
20	Insulating resistance between phase and earth	M.ohm	
21	Standard drum length offered and tolerance	1000m ± 5% per drum	
22	**Submit Manufacturer certification:**		
23	**Submit Detail drawings, brochures and catalogues:**		
24	**Submit type test certificates or reports:**		

Electrical item/ Change Over Switch (Motorized Change Over switch): 100A

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make/Brand/Model:		
2	Name of manufacturer	ABB ,Schneider, SIEMENS Or equivalent	
3	Type :		
4	Country of origin		
5	IP	Wall or floor standing IP42 Cubicle RAL 7035 Powder coated	
6	Type of panel	Panels 100 A and above	
7	Standard	IEC 60947	
8	Rated permanent current (A)	100	

9	Rated insulation voltage and rated operational voltage (V)	1000	
10	Rated short-time withstand current (kA).	To be filled	
11	Rated short-time making capacity(kA).	To be filled	
12	Power loss / pole(W)	------	
13	Frequency (Hz)	50	
14	Components (minimum requirements)	Auto/Manual mode Mechanically and Electrically interlocked. Color-coded Power Bus bar and Control wiring. Main Source sensing: Under voltage/Over voltage, 3-phase rotation protection. 3-phase voltage unbalance/loss. Emergency Stop Terminal. Utility interrupts delay adjustable timer.	

Electrical Item / Solar Lights System 60 watts:

No.	Description	UNDP Requested specifications	Bidders Offered specification
1	Make/Brand/Model:		
2	Name of		
3	Type	LED Solar Light	

4	Country of origin	Western Europe, Japan, USA or Equivalent	
5	Working temperature:	-20℃~ +70℃	
6	Protection Level.	≥IP67	
7	Indoor or outdoor	Outdoor	
8	LED Module		
8.1	Power	60 W	
8.2	LED Type	SMD5050	
8.3	LED Qty	50-65	
8.4	LED Brand	Philips (Europe) or Cree (USA) or PMMA (JAPAN) or equivalent	
8.5	CRI	≥ 85	
8.6	CCT Range	4000 K / 6500 K	
8.7	Standards/Product certifications and others	EN 60598-2-3 CB, CE, ROHS, FCC, IP67, COC, IK10,LM79	
8.8	Warranty for product	≥ 3 years	
8.9	Light illumination	Min 8000 Lumen	
9	Battery		
9.1	Capacity	≥538 WH or as per manufacturer	
9.2	Battery Type	LifePO4	
9.3	Battery lifetime	≥ 2500 cycle 80%	
9.4	Charge time	6 hours	
9.5	Discharge time	≥ 24 hours	
9.6	Autonomy	≥ 48 hours	

10	Solar panel		
10.1	Power	120±3% W	
10.2	Solar Cell	Mono-crystalline	
10.3	Operating temperature range	-40℃- +85℃	
10.4	Control System	12V MPPT controller with η not less than 95% , IP68	
10.5	Certification of Solar panel	Module certified by TUV	
10.6	Warranty of solar system	Power output warranty: not less than 10 years over 90%, 25 years over 80%;	
10.7	Product certifications/ Standards and others	CE, IEC61215//ISO900, RoHS	