



Project Strengthening Institutional and Economic Resilience in Yemen (SIERY)

مشروع / تعزيز المرونة المؤسسية والاقتصادية في اليمن (SIERY)

BOQs for Supplying and installing of solar energy system and a medical devices for (2) health centers in Al-Mudhaffar District - Taiz Governorate.

جدول الكميات والمواصفات لتوريد وتشغيل منظومة الطاقة الشمسية والمعدات الطبية لعدد ٢ مراكز صحية في مديرية المظفر - محافظة تعز



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تعليمات عامة:

- يجب علي المقاول تقديم خطة تفصيلية لتنفيذ الاعمال مع مراعاة الفترة الزمنية باقل فترة ممكنة لتنفيذ الاعمال من خلال تكثيف فرع العمل وبما لا يخل بالجودة.
- علي المقاول تقديم جميع الكتلوجات وصور ومواصفات المواد والمعدات التي سيقوم بتوريدها ورافقها ضمن وثائق العطاء.
- المقاول مسؤولاً عن تقديم دورة تدريبية تركز علي تشغيل النظام الشمسي وصيانتة وإدارته، ويجب ان يقترح المقاول نطاق التدريب والجدول الزمني ويوافق عليه الاستشاري.
- المقاول مسؤولاً عن تقديم دورة تدريبية تركز علي تشغيل الأجهزة الطبية وإدارته، ويجب ان يقترح المقاول نطاق التدريب والجدول الزمني ويوافق عليه الاستشاري.
- يجب علي المقاول قبل وضع اسعارة زيارة الموقع والتحقق من واقع الحال، ودراسة فصل الاحمال الثقيلة قبل التنفيذ. وفحص الكابلات الكهربائية ولوحات التوزيع، ووضع الحلول لكل ماسبق وعلى حسابة
- يجب ان يتم تصنيع جميع المعدات الموردة من قبل مصنعين عالميين مشهورين وذات جودة عالية درجة أولى ومعايير معتمدة وشهادة اختبار من طرف ثالث مستقل ويجب أن يكون جميع المواد والمعدات مدعومة بكافة التفاصيل والبيانات الفنية وعلي. احضار عينات قبل التوريد لاعتمادها من قبل المهندس الاستشاري ولن تقبل أي مواد لم يتم اعتمادها مسبقاً.
- يجب علي المقاول إجراء تقارير اختبار طرف ثالث للبطاريات والعاكسات، الألواح الشمسية، قواطع الدائرة، والكابلات، إلخ، الخ حسب المعايير المعمول بها .
- المقاول مسؤول عن صيانة النظام لمدة عام بما في ذلك زيارات الصيانة الوقائية.
- علي المقاول عمل دليل تشغيل وصيانة ولوحة ارشادية بأجراءات التشغيل في الاوقات الطبيعية وفي حالة حدوث اي حوادث.

سيكون المقاول مسؤولاً عن صيانة النظام لمدة عام بما في ذلك زيارات الصيانة الوقائية

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الخلاصة - Summary

No	Item Name	الوحدة	الكمية	سعر الوحدة			إجمالي السعر \$
				\$Unit Price			
				المعدات الطبية	الأثاث	نظام الطاقة الشمسية	
Unit	Quantity	Equipment	furniture	solar energy system	Total USD\$		
1	AL-WAFAA HEALTH CENTER	NO.	1				
2	AI-THAWRA HEALTH CENTER	NO.	1				
Estimated Cost \$							



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Part (1) : Supplying and installing of solar energy system

اولاً: توريد وتركيب نظام الطاقة الشمسية

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solar energy system - Al-thawra health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الثورة الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price	Total USD\$
General Conditions:					
<p>1. This BoQ shall be read in conjunction with the Electrical Drawings and technical specifications as well as these General Conditions .</p> <p>2. Contractor shall visit & verify existing site condition, location and condition of the existing MDBs, SDBs, heavy loads, inspect the electrical and other cables attached to them, which must be moved & put solutions on his account and load them into the items, as well as the location of the solar panels and any interferences in them. Also, the location of the control room and any interferences in it.</p> <p>3. The contractor should take into account The site condition in terms of obstacles and shadings Outdoor cables shall be housed inside galvanized steel cable trays.</p> <p>4. Supply of materials and equipment. All equipment shall be manufactured by a world wide well known manufactures, high quality, approved standard and test certificate from inde-pendent third part. All materials and equipment to be supported by all details and technical data.</p> <p>5. The unit price of each item shall include the supply, installation, delivery and testing of materials. As well as all civil works, removing concrete, previous blocks, and relocating all obstacles such as water tanks, electric cables, and any obstacles reconnect them again as before and transporting waste to the specified sites, as well as supplying, installing and repairing and operating anything that caused damage during work, such as electricity and telephone cables, water and sewage pipes, etc., and according to the directions of the GWQ engineer.</p> <p>6. The contractor should do third party test reports for battery, inverters , solar panels, circuit breakers , cables, MDB...etc. as per applicable standards.</p> <p>7. The contractor will be responsible for providing training course focusing on system operation, maintenance and management, the scope of training and schedule shall be proposed by the contractor and approved by GWQ engineer.</p> <p>8. The contractor will be responsible for maintenance of the system one year Including Preventive Maintenance Visits.</p> <p>9. Earthing test should be done in commissioning stage.</p> <p>10. The contractor must remove the waste as soon as possible from the project site to the places specified by the competent authorities.</p> <p>11. The Contractor shall the protection of nearby persons and property throughout the progress of the work to provide safe working conditions for workers and citizens. It must put protective barriers around the project and put up guiding signs for citizens and cars passing near the project.</p> <p>12. The contractor shall be fully responsible for the coordination and liaison with all Government Dept. and Semi Government Dept. (Ministry of education, education office, etc.) for obtaining all required approvals, permits and licenses for all electrical systems and service.</p>					
ملاحظة: على المقاول ارفاق جميع التكنولوجيات والمواصفات وصور العينات ضمن العطاء المقدم					
1	Solar PV Module:				
1.1	<p>Supply, install, test, and commissioning of solar panels 550 W should be comprising of either mono-crystalline or polycrystalline;</p> <p>- The module type must conform with CE and IEC 61215, IEC 61730, IEC 61701 or equivalent standards;</p> <p>- Module conversion efficiency should be equal to or greater than 19.5 % under STC;</p> <p>- The PV manufacturer should be approved as tier-1;</p> <p>- The PV module shall perform satisfactorily in temperature between – 40 oC to +85 oC;</p> <p>- The rated output power of any supplied module shall have tolerance of 0-5 W;</p> <p>- The module shall be provided with a junction box with IP68;</p> <p>- The supplied module DC voltage should be not less than 1000 VDC;</p> <p>- The product warranty should be at least 10 years.</p>	Pcs	24.00		

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
2	MPPT Inverter (8kW, 50Hz, 220V, 48V, 120A) Built-in MPPT Solar Charger				
2.1	<p>Supply, install, test, and commissioning of Single Phase, Pure Sine wave, 230 V, 50 Hz, 8 kW, Built-in MPPT Solar Charger, including all accessories required for parallel operation as per technical specifications and drawings:</p> <p>A. Input (DC):</p> <ul style="list-style-type: none"> - Max. PV input voltage = at least 500v. Min PV input voltage = < 100v. Startup voltage = < 120v. No. of MPPTs = 2. - Max. number of PV strings per MPPT = at least 2. Max. PV input current = at least 25A. <p>B. Output (AC)</p> <ul style="list-style-type: none"> - AC output power = > 8KW. Max. AC output current = > 36A. AC voltage = 220v. Frequency = 50Hz. Total harmonic distortion (THD) < 3 % (of nominal power). <p>C. Battery input:</p> <ul style="list-style-type: none"> - Battery Voltage= 48v. Maximum charging/discharging current(A)=> 120A. <p>D. Protection:</p> <ul style="list-style-type: none"> - Protections required: AC overload and load short circuit, overvoltage, overheating and battery reverse polarity, PV reverse connection protection, Leakage current protection. Grid monitoring. PV string current monitoring. DC switch. <p>E. General Data</p> <ul style="list-style-type: none"> - Efficiency = > 92%. Operating ambient temperature -25 °C to 60 . Allowable relative humidity (non-condensing) = 0 – 100 %. Display: LCD. Communication: Wi-Fi, RS485. To be certified to meet at least CE and UL marking and complaint with IEC 62109; The inverter should allow the plate matrix voltage of at least 500 volts. The inverter shall have Parallel capability connection characteristic with many Cells. The inverter shall allow internet connection for remote monitoring; Product warranty shall be 5 years. 	Pcs	2.00		
3	Solar Battery with Racks				
3.0	<p>Supply, installation, test and commissioning of a high voltage battery bank with DC air conditioned cabinet :</p> <p>Supply, install, test, and commissioning of a high voltage Battery bank with built in battery rack and air conditioned cabinet, the bank voltage will be more than 600 volts, and shall meet the following specifications:</p> <ul style="list-style-type: none"> - Batteries shall be LiFePO4 \ B-LFP48-200E Battery bank - Battery lifecycle shall be at least 6000 cycles at 80% depth of discharge (DOD). - Built-in intelligent BMS and RS, CAN, Modbus, and other necessary kits and protocols to communicate with the inverter, monitor the battery remotely & real time, and protect the battery pack at any time. - Active Battery Optimizer and equalizer - Overcharge Safety Device. - Reliable performance at high operating temperatures of up to 45° C. - Wires connected to batteries shall utilize appropriately sized and rated lugs or terminals, - Battery shall be installed in a secured, well-ventilated powerhouse. - Product warranty shall be 10 years; warranty certificates shall be provided by the manufacturer; - One brand of battery shall be used for the entire installation. - The battery must allow connection with the inverters offered by the supplier. In addition, the batteries must allow the parallel connection multiple racks. - Battery to be certified CE or UL and to meet at least one for the following or equivalent standards UL1642, UL2054, UN38.3, IEC/EN 62133, ISO14001 and ISO9001. \ IEC62619/CE/UN38.3, IEC62619/UL1973/CE - Battery Rack with built in busbars should be configured for 300 VDC mentioned below, powder coated with a corrosion acid proof powder, the battery rack busbars shall be covered. <p>Including all required accessories and any additional communication kits or devices for the successful operation of the battery bank with the inverter to complete the item according to the recommendations of the supervision team and as per specs</p>				
3.1	Lithium-Ion Battery with Rated Capacity of 9.6 kWh@48 VDC , 200A	pc	3.00		

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
4	DC Cabling				
4.0	Supply, install, test, and commissioning of DC Cabling 1KV, Flexible stranded copper per EN 60228 , TUV certified. Insulation: Halogen-free, thermoset polyolefin. Jacke :low smoke non-halogenated, flame retardant, oil, abrasion, chemical and sunlight resistant meeting UL 44, UL 854. - All cables shall be marked properly according to approved design so that cable can be easily traced and identified; PV array to battery circuit(s) to be sized for maximum 3% voltage drop at rated array power (Imp); Cable ends connections are to be made through suitable lugs or terminals, crimped properly & with use of cable glands; this item is including the cables and cable trays Cable Tray :- 1mm thickness, Perforated type Galvanized steel cable trays, cable tray covers, clamping bolts and other cable tray accessories such as coupler plates, bends, tees, reducers, vertical elbows in manufactured accordance with ASTM A653 SS, Grade 33, coating designation G90.			Note	
4.1	(1C*10 sqr.mm) (Red& Black)	M	264.00		
4.2	(1C*70 sqr.mm) (Red& Black)	M	30.00		
5	AC Cabling				
5.0	Supply, install, test, and commissioning of AC Cabling Stranded type, TUV certified, double insulating material 1kv XPLE/PVC/CU - All cables shall be marked properly according to approved design so that cable can be easily traced and identified; - All outdoor exposed wiring to be protected from UV radiation and physical damage, all cabling above ground should be suitably mounted inside cable trays with proper covers; - XLPE insulated and PVC seathed single or multi core flexible copper cables meeting IEC 60227 and IEC 60502; - Cable ends connections are to be made through suitable lugs or terminals, crimped properly & with use of cable glands;			Note	
5.1	2C*16 sqr.mmIncludes cable trunk, good fixing, and making holes in the wall when necessary	M	20.00		
5.2	2C*35 sqr.mmIncludes cable trunk, good fixing, and making holes in the wall when necessary	M	40.00		
6	Inverter DC Breakers Box				
6.1	Supply, install, test, and commissioning DC breakers box including 4X25 A DC breaker and all the required accessires as per drawings	Pc	1.00		
7	Battery DC Breakers Box				
7.1	Supply, install, test, and commissioning DC breakers box including 2X125 A & 1x250 DC breaker and all the required accessires as per drawings	Pc	1.00		
8	AC Coupling Panel				
8.1	Supply, install, test, and commissioning of Metal Enclosure, Indoor, Built in SPD, RCCB, MCCB as shown on schematic wiring diagram - Internal connection should be through busbars; - Ingress protection must be at least IP41; - Enclosure material should be galvanized steel sheets; - Fault level for the main breaker: At least 25 kA; - advised to use high quality breakers; - The EMDB should be in accordance with the drawings; - Warranty: at least 1 year.	Pc	1.00		

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
9	NEW Main Distribution Board (New-MDB)				
9.1	supply and installation of a main electrical distribution board for the building model (New-MDB) with a magnetic main circuit breaker MCCB single phase - 230 V - 50 Hz - 2 pole 200 A (25KA) Bus bar 300A with sub circuit breakers number4 sub circuit breaker single phase installs 4 circuit breakers below and leave the rest space for expansion In the future: 4 x 100 A single phase 2 pole MCCB TP (25KA). The plate cover and the outer frame of the sheet shall be thickness of 1.5 mm and painted electrostatic. Resistant to moisture, echo and water (Powder Coated). The price includes a metal base for the plate with a height of 60 cm and all the necessary accessories for the plate and the control in addition to the aforementioned voltage and current measuring devices, signal lamps, current transformers and so on.The price includes all the supplies for fixing, numbering and preparing for cable entry slots so that they are regular circular holes with the installation of copper and plastic glides compatible with cable clips and main and subsidiary extensions with the assignment of the main and branch cables ends with special copper wicker with all accessories Installation and operation. The main and subsidiary partitions of the plates shall be thermomagnetic in number, capacity and type according to drawings and specifications and according to the rules of workmanship and the instructions of the supervising engineer.	Pc	1.00		
10	Automatic Transfer Switch				
10.1	Supply, install, test, and commissioning of Low Voltage ATS 4P, 100A, 2 ways as per technical specifications including metal enclosure	Pcs	2.00		

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
11	Earthing System				
11.1	Supply, install, test and commissioning Earthing System As per technical specifications and drawings including cabling, cable lugs, earthing rods and all required accessories - Each array structure of the PV modules should be grounded properly; - All metal casing/shielding of the system and its components should be thoroughly grounded; -Earthing pit - Earth resistance should be tested in presence of the GWQ representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. - Earthing installation in accordance with the IEE Wiring regulations, BS 7671 - All conductive materials shall be copper. - The size of conductor shall be according to table 54.7 of IEE – BS 7671 – IEC 60365-5-54.	Unit	1.00		
12	Lightning Protection System				
12.1	Supply, install, test and commissioning Lightning Protection System As per technical specifications and drawings including cables, mast and all required accessories - lightning arrester shall be copper. - All metal casing/shielding of the system and its components should be thoroughly grounded; -Earthing pit - Earth resistance should be tested in presence of the GWQ representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. - Earthing installation in accordance with the IEE Wiring regulations, BS 7671 - All conductive materials shall be copper. - The size of conductor shall be according to table 54.7 of IEE – BS 7671 – IEC 60365-5-54.	SYSTEM	1.00		
13	Lightings & Fans				
13.1	Supply, install, test and commissioning of LED light bulb (1X 12 w) as per technical specifications - Lamp luminous efficacy: not less than 90 lm/W; - Cap type & base: bayonet bulbs- B22d-BC/ E27; - Color temperatures (CCT): 5000 K to 6500 K; - Input Voltage and frequency: 220V, 50 Hz; - Working Lifetime (Hour): at least 15,000 h; - Operation temperature rang: up to 50°C; - Certification: All related certificates shall be provided such CE, RoHS; - Warranty: at least two years.	Pcs	10.00		
13.2	Supply, install, test and commissioning of wall Mounted fans 30W) - fan 30 W; - Voltage rating: 220-240 VAC, 50 Hz ±2%; - Working life time: not less than 15,000; - Wall Mounted type; - Warranty: at least one years. The work should include all the required accessories, Switch, cables(3*2.5mm2), trays, civil works and any component to ensure a professional installation according to the supervisor engineer.	Pcs	5.00		
14	Smoke and Heat Detectors :				
14.1	Smoke and Heat Detector: Supply, install and testing Smoke and heat detector, including button for false alert. Battery for three years long life, warning sound delivers sounds of >85 Db	Pcs	1.00		
15	Extinguishers :				
15.1	Supply, install, test and commissioning 5kg Carbon Dioxide (CO2) Extinguisher - Warranty: at least two years.	Pcs	1.00		
15.2	Supply, install, test and commissioning 6kg Powder extinguisher - Warranty: at least two years.	Pcs	1.00		

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
16	Rooftop Mounting Structure				
16.1	The item shall include the following: <ul style="list-style-type: none"> • Surveying and conducting all site levelling and disposal of debris to authorized area prior to the commencing of work. • Supplying, fabricating, delivering at site, hoisting and fixing in position, including all temporary staging and supporting work and making all structural steel work as per in the shop drawings and the technical specifications of mounting structures. • Supply and implementation of (0.60x0.60x0.20)m reinforced concrete C25 for all mounting bases, including anchor bolts and all necessary related works according to the shop drawings, technical specifications and the instructions of the supervising Engineer. • Fabrication and erection in position columns, rafters, bracing and others made out of Cold-formed galvanized steel (min galvanized 80~120mic) sections with minimum yield strength of 240Mpa including cutting, grinding, drilling, hoisting, fixing in position at all heights and levels. The rate includes all connections nuts, bolts, washer plates and all necessary related work according to the shop drawings and technical specifications.. • Supply and installation of galvanized HSS steel purlins (60x30x1.25) (min galvanized 80~120mic) with all necessary connections as detailed in the drawings, complete as per drawing and the direction of supervising engineer in Charge. As AISC all bolts is A325 or A490 high strength bolts (Hardness equal 8.8).	Sq.m	68.00		
17	Aluminum wall to close off the battery room				
17.1	Supply and installation of an aluminum wall measuring (2*3.5) m, consisting of vertical studs, horizontal beams, and tubes measuring 4 x 8 cm in cross-section. It includes installation and fixing the studs well in three places at the top and bottom using screws and threads, and installing all the metal pieces, screws, and angles necessary for installation. Made of aluminum with all door accessories, including shutters, handles, hinges, installation corners, etc., first class. The price includes installation, transportation, and installation. Installation is not completed until the supervising engineer approves the sample and the appropriate location for the wall. Work is done according to the technical principles of the work and the instructions of the supervising engineer.	Sq.m	7.00		
18	Project sign boards				
18.1	In number: Supply and installation of a metal Signboard in the name of the project in the dimensions shown in drawing and the price includes the following : <ul style="list-style-type: none"> - Digging soil depth of 60 cm for the two bases then the pouring of plain concrete and water treatment period required- Implementation of two concrete footings in dimension (50X50) cm and a depth of 50 cm of 0.8 m3 aggregate and 0.4 m3 sand with 250 kg\m3 cement with water treatment and all necessary - Galvanized Steel Pipe Plates 2 " , it is covered from above with a tight cover ,and at the bottom two metal plates are made of 2 mm thickness, 30 cm long and 5 cm width, which are well bonded with two + shaped welds and are fixed at the bottom of the base before casting. - Supply and installation of metal sheets (sheets) Made of heavy black iron, 1.5 mm thick in dimensions 120*150 cm and distribution shown in the model With internal strengthening in the space so that no traces appear on the painting, and so that the pieces of the painting are welded from all sides so that no space (filled with putty) is left for rain water to enter. - Painting of writing boards and standing with a resistant paint 3 faces and then painting the writing boards With putty, foundation and fire paint in the specified color 3 faces to getting smooth surface with out any roughness. - Writing on the painting in clear script, distinctive writing and color specified in Arabic and English With fiery paint, and the writing is on two sides in white. - Install the Signboard in the appropriate place determined by the supervisor and the price includes the supply and installation and all necessary for it to work. 	Pcs	1.00		
Estimated Cost \$					

Project Strengthening Institutional and Economic Resilience in Yemen (SIERY)

BOQs for Supplying and installing of solar energy system and a medical devices for (2) health centers in Al-Mudhaffar District - Taiz Governorate.

جدول الكميات والمواصفات لتوريد وتشغيل منظومة الطاقة الشمسية والمعدات الطبية لعدد ٢ مراكز صحية في مديرية المظفر - محافظة تعز

solar energy system - Al-thawra health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الثورة الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price	Total USD\$
General Conditions:					
<p>1. This BoQ shall be read in conjunction with the Electrical Drawings and technical specifications as well as these General Conditions .</p> <p>2. Contractor shall visit & verify existing site condition, location and condition of the existing MDBs, SDBs, heavy loads, inspect the electrical and other cables attached to them, which must be moved & put solutions on his account and load them into the items, as well as the location of the solar panels and any interferences in them. Also, the location of the control room and any interferences in it.</p> <p>3. The contractor should take into account The site condition in terms of obstacles and shadings Outdoor cables shall be housed inside galvanized steel cable trays.</p> <p>4. Supply of materials and equipment. All equipment shall be manufactured by a world wide well known manufactures, high quality, approved standard and test certificate from inde-pendent third part. All materials and equipment to be supported by all details and technical data.</p> <p>5. The unit price of each item shall include the supply, installation, delivery and testing of materials. As well as all civil works, removing concrete, previous blocks, and relocating all obstacles such as water tanks, electric cables, and any obstacles reconnect them again as before and transporting waste to the specified sites, as well as supplying, installing and repairing and operating anything that caused damage during work, such as electricity and telephone cables, water and sewage pipes, etc., and according to the directions of the GWQ engineer.</p> <p>6. The contractor should do third party test reports for battery, inverters , solar panels, circuit breakers , cables, MDB...etc. as per applicable standards.</p> <p>7. The contractor will be responsible for providing training course focusing on system operation, maintenance and management, the scope of training and schedule shall be proposed by the contractor and approved by GWQ engineer.</p> <p>8. The contractor will be responsible for maintenance of the system one year Including Preventive Maintenance Visits.</p> <p>9. Earthing test should be done in commissioning stage.</p> <p>10. The contractor must remove the waste as soon as possible from the project site to the places specified by the competent authorities.</p> <p>11. The Contractor shall the protection of nearby persons and property throughout the progress of the work to provide safe working conditions for workers and citizens. It must put protective barriers around the project and put up guiding signs for citizens and cars passing near the project.</p> <p>12. The contractor shall be fully responsible for the coordination and liaison with all Government Dept. and Semi Government Dept. (Ministry of education, education office, etc.) for obtaining all required approvals, permits and licenses for all electrical systems and service.</p>					
ملاحظة: على المقاول ارفاق جميع التكنولوجيات والمواصفات وصور العينات ضمن العطاء المقدم					
1	Solar PV Module:				
1.1	<p>Supply, install, test, and commissioning of solar panels 550 W should be comprising of either mono-crystalline or polycrystalline;</p> <p>- The module type must conform with CE and IEC 61215, IEC 61730, IEC 61701 or equivalent standards;</p> <p>- Module conversion efficiency should be equal to or greater than 19.5 % under STC;</p> <p>- The PV manufacturer should be approved as tier-1;</p> <p>- The PV module shall perform satisfactorily in temperature between – 40 oC to +85 oC;</p> <p>- The rated output power of any supplied module shall have tolerance of 0-5 W;</p> <p>- The module shall be provided with a junction box with IP68;</p> <p>- The supplied module DC voltage should be not less than 1000 VDC;</p> <p>- The product warranty should be at least 10 years.</p>	Pcs	24.00		

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solar energy system - Al-thawra health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الثورة الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
2	MPPT Inverter (8kW, 50Hz, 220V, 48V, 120A) Built-in MPPT Solar Charger				
2.1	Supply, install, test, and commissioning of Single Phase, Pure Sine wave, 230 V, 50 Hz, 8 kW, Built-in MPPT Solar Charger, including all accessories required for parallel operation as per technical specifications and drawings: A. Input (DC): - Max. PV input voltage = at least 500v. Min PV input voltage = < 100v. Startup voltage = < 120v. No. of MPPTs = 2. Max. number of PV strings per MPPT = at least 2. Max. PV input current = at least 25A. B. Output (AC) - AC output power = > 8KW. Max. AC output current = > 36A. AC voltage = 220v. Frequency = 50Hz. Total harmonic distortion (THD) < 3 % (of nominal power). C. Battery input: - Battery Voltage= 48v. Maximum charging/discharging current(A)=> 120A. D. Protection: - Protections required: AC overload and load short circuit, overvoltage, overheating and battery reverse polarity, PV reverse connection protection, Leakage current protection. Grid monitoring. PV string current monitoring. DC switch. E. General Data - Efficiency = > 92%. Operating ambient temperature -25 °C to 60 . Allowable relative humidity (non-condensing) = 0 – 100 %. Display: LCD. Communication: Wi-Fi, RS485. To be certified to meet at least CE and UL marking and complaint with IEC 62109; The inverter should allow the plate matrix voltage of at least 500 volts. The inverter shall have Parallel capability connection characteristic with many Cells. The inverter shall allow internet connection for remote monitoring; Product warranty shall be 5 years.	Pcs	2.00		
3	Solar Battery with Racks				
3.0	Supply, installation, test and commissioning of a high voltage battery bank with DC air conditioned cabinet : Supply, install, test, and commissioning of a high voltage Battery bank with built in battery rack and air conditioned cabinet, the bank voltage will be more than 600 volts, and shall meet the following specifications: - Batteries shall be LiFePO4 \ B-LFP48-200E Battery bank - Battery lifecycle shall be at least 6000 cycles at 80% depth of discharge (DOD). - Built-in intelligent BMS and RS, CAN, Modbus, and other necessary kits and protocols to communicate with the inverter, monitor the battery remotely & real time, and protect the battery pack at any time. - Active Battery Optimizer and equalizer - Overcharge Safety Device. - Reliable performance at high operating temperatures of up to 45° C. - Wires connected to batteries shall utilize appropriately sized and rated lugs or terminals, - Battery shall be installed in a secured, well-ventilated powerhouse. - Product warranty shall be 10 years; warranty certificates shall be provided by the manufacturer; - One brand of battery shall be used for the entire installation. - The battery must allow connection with the inverters offered by the supplier. In addition, the batteries must allow the parallel connection multiple racks. - Battery to be certified CE or UL and to meet at least one for the following or equivalent standards UL1642, UL2054, UN38.3, IEC/EN 62133, ISO14001 and ISO9001. \ IEC62619/CE/UN38.3, IEC62619/UL1973/CE - Battery Rack with built in busbars should be configured for 300 VDC mentioned below, powder coated with a corrosion acid proof powder, the battery rack busbars shall be covered. Including all required accessories and any additional communication kits or devices for the successful operation of the battery bank with the inverter to complete the item according to the recommendations of the supervision team and as per specs				
3.1	Lithium-Ion Battery with Rated Capacity of 9.6 kWh@48 VDC , 200A	pc	3.00		
4	DC Cabling				
4.0	Supply, install, test, and commissioning of DC Cabling 1KV, Flexible stranded copper per EN 60228 , TUV certified. Insulation: Halogen-free, thermoset polyolefin. Jacke :low smoke non-halogenated, flame retardant, oil, abrasion, chemical and sunlight resistant meeting UL 44, UL 854. - All cables shall be marked properly according to approved design so that cable can be easily traced and identified; PV array to battery circuit(s) to be sized for maximum 3% voltage drop at rated array power (Imp); Cable ends connections are to be made through suitable lugs or terminals, crimped properly & with use of cable glands; this item is including the cables and cable trays Cable Tray :- 1mm thickness, Perforated type Galvanized steel cable trays, cable tray covers, clamping bolts and other cable tray accessories such as coupler plates, bends, tees, reducers, vertical elbows in manufactured accordance with ASTM A653 SS, Grade 33, coating designation G90.			Note	
4.1	(1C*10 sqr.mm) (Red& Black)	M	264.00		
4.2	(1C*70 sqr.mm) (Red& Black)	M	30.00		

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solar energy system - Al-thawra health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الثورة الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
5	AC Cabling				
5.0	Supply, install, test, and commissioning of AC Cabling Stranded type, TUV certified, double insulation material 1kV XLPE/PVC/CU - All cables shall be marked properly according to approved design so that cable can be easily traced and identified; - All outdoor exposed wiring to be protected from UV radiation and physical damage, all cabling above ground should be suitably mounted inside cable trays with proper covers; - XLPE insulated and PVC sheathed single or multi core flexible copper cables meeting IEC 60227 and IEC 60502; - Cable ends connections are to be made through suitable lugs or terminals, crimped properly & with use of cable glands;			Note	
5.1	2C*16 sqm.m Includes cable trunk, good fixing, and making holes in the wall when necessary	M	20.00		
5.2	2C*35 sqm.m Includes cable trunk, good fixing, and making holes in the wall when necessary	M	40.00		
6	Inverter DC Breakers Box				
6.1	Supply, install, test, and commissioning DC breakers box including 4X25 A DC breaker and all the required accessories as per drawings	Pc	1.00		
7	Battery DC Breakers Box				
7.1	Supply, install, test, and commissioning DC breakers box including 2X125 A & 1x250 DC breaker and all the required accessories as per drawings	Pc	1.00		
8	AC Coupling Panel				
8.1	Supply, install, test, and commissioning of Metal Enclosure, Indoor, Built in SPD, RCCB, MCCB as shown on schematic wiring diagram - Internal connection should be through busbars; - Ingress protection must be at least IP41; - Enclosure material should be galvanized steel sheets; - Fault level for the main breaker: At least 25 kA; - advised to use high quality breakers; - The EMDB should be in accordance with the drawings; - Warranty: at least 1 year.	Pc	1.00		
9	NEW Main Distribution Board (New-MDB)				
9.1	supply and installation of a main electrical distribution board for the building model (New-MDB) with a magnetic main circuit breaker MCCB single phase - 230 V - 50 Hz - 2 pole 200 A (25KA) Bus bar 300A with sub circuit breakers number 4 sub circuit breaker single phase installs 4 circuit breakers below and leave the rest space for expansion in the future: 4 x 100 A single phase 2 pole MCCB TP (25KA). The plate cover and the outer frame of the sheet shall be thickness of 1.5 mm and painted electrostatic. Resistant to moisture, echo and water (Powder Coated). The price includes a metal base for the plate with a height of 60 cm and all the necessary accessories for the plate and the control in addition to the aforementioned voltage and current measuring devices, signal lamps, current transformers and so on. The price includes all the supplies for fixing, numbering and preparing for cable entry slots so that they are regular circular holes with the installation of copper and plastic glides compatible with cable clips and main and subsidiary extensions with the assignment of the main and branch cables ends with special copper wicker with all accessories Installation and operation. The main and subsidiary partitions of the plates shall be thermomagnetic in number, capacity and type according to drawings and specifications and according to the rules of workmanship and the instructions of the supervising engineer.	Pc	1.00		
10	Automatic Transfer Switch				
10.1	Supply, install, test, and commissioning of Low Voltage ATS 4P, 100A, 2 ways as per technical specifications including metal enclosure	Pcs	2.00		

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solar energy system - Al-thawra health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الثورة الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
11	Earthing System				
11.1	Supply, install, test and commissioning Earthing System As per technical specifications and drawings including cabling, cable lugs, earthing rods and all required accessories - Each array structure of the PV modules should be grounded properly; - All metal casing/shielding of the system and its components should be thoroughly grounded; -Earthing pit - Earth resistance should be tested in presence of the GWQ representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. - Earthing installation in accordance with the IEE Wiring regulations, BS 7671 - All conductive materials shall be copper. - The size of conductor shall be according to table 54.7 of IEE – BS 7671 – IEC 60365-5-54.	Unit	1.00		
12	Lightning Protection System				
12.1	Supply, install, test and commissioning Lightning Protection System As per technical specifications and drawings including cables, mast and all required accessories - lightning arrester shall be copper. - All metal casing/shielding of the system and its components should be thoroughly grounded; -Earthing pit - Earth resistance should be tested in presence of the GWQ representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. - Earthing installation in accordance with the IEE Wiring regulations, BS 7671 - All conductive materials shall be copper. - The size of conductor shall be according to table 54.7 of IEE – BS 7671 – IEC 60365-5-54.	SYSTEM	1.00		
13	Lightings & Fans				
13.1	Supply, install, test and commissioning of LED light bulb (1X 12 w) as per technical specifications - Lamp luminous efficacy: not less than 90 lm/W; - Cap type & base: bayonet bulbs- B22d-BC/ E27; - Color temperatures (CCT): 5000 K to 6500 K; - Input Voltage and frequency: 220V, 50 Hz; - Working Lifetime (Hour): at least 15,000 h; - Operation temperature rang: up to 50°C; - Certification: All related certificates shall be provided such CE, RoHS; - Warranty: at least two years.	Pcs	10.00		
13.2	Supply, install, test and commissioning of wall Mounted fans 30W) - fan 30 W; - Voltage rating: 220-240 VAC, 50 Hz ±2%; - Working life time: not less than 15,000; - Wall Mounted type; - Warranty: at least one years. The work should include all the required accessories, Switch, cables(3*2.5mm2), trays, civil works and any component to ensure a professional installation according to the supervisor engineer.	Pcs	5.00		
14	Smoke and Heat Detectors :				
14.1	Smoke and Heat Detector: Supply, install and testing Smoke and heat detector, including button for false alert. Battery for three years long life, warning sound delivers sounds of >85 Db	Pcs	1.00		
15	Extinguishers :				
15.1	Supply, install, test and commissioning 5kg Carbon Dioxide (CO2) Extinguisher - Warranty: at least two years.	Pcs	1.00		
15.2	Supply, install, test and commissioning 6kg Powder extinguisher - Warranty: at least two years.	Pcs	1.00		

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solar energy system - Al-thawra health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الثورة الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
16	Rooftop Mounting Structure				
16.1	The item shall include the following: <ul style="list-style-type: none"> • Surveying and conducting all site levelling and disposal of debris to authorized area prior to the commencing of work. • Supplying, fabricating, delivering at site, hoisting and fixing in position, including all temporary staging and supporting work and making all structural steel work as per in the shop drawings and the technical specifications of mounting structures. • Supply and implementation of (0.60x0.60x0.20)m reinforced concrete C25 for all mounting bases, including anchor bolts and all necessary related works according to the shop drawings, technical specifications and the instructions of the supervising Engineer. • Fabrication and erection in position columns, rafters, bracing and others made out of Cold-formed galvanized steel (min galvanized 80~120mic) sections with minimum yield strength of 240Mpa including cutting, grinding, drilling, hoisting, fixing in position at all heights and levels. The rate includes all connections nuts, bolts, washer plates and all necessary related work according to the shop drawings and technical specifications.. • Supply and installation of galvanized HSS steel purlins (60x30x1.25) (min galvanized 80~120mic) with all necessary connections as detailed in the drawings, complete as per drawing and the direction of supervising engineer in Charge. As AISC all bolts is A325 or A490 high strength bolts (Hardness equal 8.8).	Sq.m	68.00		
17	Aluminum wall to close off the battery room				
17.1	Supply and installation of an aluminum wall measuring (2*3.5) m, consisting of vertical studs, horizontal beams, and tubes measuring 4 x 8 cm in cross-section. It includes installation and fixing the studs well in three places at the top and bottom using screws and threads, and installing all the metal pieces, screws, and angles necessary for installation. Made of aluminum with all door accessories, including shutters, handles, hinges, installation corners, etc., first class. The price includes installation, transportation, and installation. Installation is not completed until the supervising engineer approves the sample and the appropriate location for the wall. Work is done according to the technical principles of the work and the instructions of the supervising engineer.	Sq.m	7.00		
18	Project sign boards				
18.1	In number: Supply and installation of a metal Signboard in the name of the project in the dimensions shown in drawing and the price includes the following : <ul style="list-style-type: none"> - Digging soil depth of 60 cm for the two bases then the pouring of plain concrete and water treatment period required- Implementation of two concrete footings in dimension (50X50) cm and a depth of 50 cm of 0.8 m3 aggregate and 0.4 m3 sand with 250 kg\m3 cement with water treatment and all necessary - Galvanized Steel Pipe Plates 2 " , it is covered from above with a tight cover ,and at the bottom two metal plates are made of 2 mm thickness, 30 cm long and 5 cm width, which are well bonded with two + shaped welds and are fixed at the bottom of the base before casting. - Supply and installation of metal sheets (sheets) Made of heavy black iron, 1.5 mm thick in dimensions 120*150 cm and distribution shown in the model With internal strengthening in the space so that no traces appear on the painting, and so that the pieces of the painting are welded from all sides so that no space (filled with putty) is left for rain water to enter. - Painting of writing boards and standing with a resistant paint 3 faces and then painting the writing boards With putty, foundation and fire paint in the specified color 3 faces to getting smooth surface with out any roughness. - Writing on the painting in clear script, distinctive writing and color specified in Arabic and English With fiery paint, and the writing is on two sides in white. - Install the Signboard in the appropriate place determined by the supervisor and the price includes the supply and installation and all necessary for it to work. 	Pcs	1.00		
Estimated Cost \$					



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Project Strengthening Institutional and Economic Resilience in Yemen (SIERY)

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solar energy system - Al-Wafaa health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الوفاء الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	جمالي السعر
		Unit	Qty	Unit Price\$	Total USD\$
General Conditions:					
<p>1. This BoQ shall be read in conjunction with the Electrical Drawings and technical specifications as well as these General Conditions .</p> <p>2. Contractor shall visit & verify existing site condition, location and condition of the existing MDBs, SDBs, heavy loads, inspect the electrical and other cables attached to them, which must be moved & put solutions on his account and load them into the items, as well as the location of the solar panels and any interferences in them. Also, the location of the control room and any interferences in it.</p> <p>3. The contractor should take into account The site condition in terms of obstacles and shadings Outdoor cables shall be housed inside galvanized steel cable trays.</p> <p>4. Supply of materials and equipment. All equipment shall be manufactured by a world wide well known manufactures, high quality, approved standard and test certificate from inde-pendent third part. All materials and equipment to be supported by all details and technical data.</p> <p>5. The unit price of each item shall include the supply, installation, delivery and testing of materials. As well as all civil works, removing concrete, previous blocks, and relocating all obstacles such as water tanks, electric cables, and any obstacles reconnect them again as before and transporting waste to the specified sites, as well as supplying, installing and repairing and operating anything that caused damage during work, such as electricity and telephone cables, water and sewage pipes, etc., and according to the directions of the GWQ engineer.</p> <p>6. The contractor should do third party test reports for battery, inverters , solar panels, circuit breakers , cables, MDB...etc. as per applicable standards.</p> <p>7. The contractor will be responsible for providing training course focusing on system operation, maintenance and management, the scope of training and schedule shall be proposed by the contractor and approved by GWQ engineer.</p> <p>8. The contractor will be responsible for maintenance of the system one year Including Preventive Maintenance Visits.</p> <p>9. Earthing test should be done in commissioning stage.</p> <p>10. The contractor must remove the waste as soon as possible from the project site to the places specified by the competent authorities.</p> <p>11. The Contractor shall the protection of nearby persons and property throughout the progress of the work to provide safe working conditions for workers and citizens. It must put protective barriers around the project and put up guiding signs for citizens and cars passing near the project.</p> <p>12. The contractor shall be fully responsible for the coordination and liaison with all Government Dept. and Semi Government Dept. (Ministry of education, education office, etc.) for obtaining all required approvals, permits and licenses for all electrical systems and service.</p>					
ملاحظة: على المقاول ارفاق جميع الكتلوجات والمواصفات وصور العينات ضمن العطاء المقدم					
1	Solar PV Module:				
1.1	Supply, install, test, and commissioning of solar panels 700 W should be comprising of N-Type mono-crystalline, half-cell PV Module; - The module type must conform with CE and IEC 61215, IEC 61730, IEC 61701 or equivalent standards; - Module conversion efficiency should be equal to or greater than 22% under STC; - The PV manufacturer should be approved as tier-1; - The PV module shall perform satisfactorily in temperature between – 40 oC to +85 oC; - The rated output power of any supplied module shall have tolerance of 0-5 W; - The module shall be provided with a junction box with IP68; - The supplied module DC voltage should be not less than 1500 VDC; - The product warranty should be at least 15 years.	Pcs	12.00		
2	MPPT Inverter (8 kW, 50Hz, 220V, 48V, 120A) Built-in MPPT Solar Charger				
2.1	Supply, install, test, and commissioning of Single Phase, Pure Sine wave, 230 V, 50 Hz, 8 kW, Built-in MPPT Solar Charger, including all accessories required for parallel operation as per technical specifications and drawings: A. Input (DC): - Max. PV input voltage = at least 500v. Min PV input voltage = < 100v. Startup voltage = < 120v. No. of MPPTs = 1. Max. number of PV strings per MPPT = at least 2. Max. PV input current = at least 25A. B. Output (AC) - AC output power = > 8KW. Max. AC output current = > 36A. AC voltage = 220v. Frequency = 50Hz. Total harmonic distortion (THD) < 3 % (of nominal power). C. Battery input: - Battery Voltage= 48v. Maximum charging/discharging current(A)=> 120A. D. Protection: - Protections required: AC overload and load short circuit, overvoltage, overheating and battery reverse polarity, PV reverse connection protection, Leakage current protection. Grid monitoring. PV string current monitoring. DC switch. E. General Data - Efficiency = > 92%. Operating ambient temperature -25 °C to 60 . Allowable relative humidity (non-condensing) = 0 – 100 %. Display: LCD. Communication: Wi-Fi, RS485. To be certified to meet at least CE and UL marking and complaint with IEC 62109; The inverter should allow the plate matrix voltage of at least 500 volts. The inverter shall have Parallel capability connection characteristic with many Cells. The inverter shall allow internet connection for remote monitoring; Product warranty shall be 5 years.	Pcs	1.00		



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solar energy system - Al-Wafaa health center - Al Mudhaffar - Taiz

توريد وتركيب نظام الطاقة الشمسية لمركز الوفاء الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
3	Solar Battery with Racks				
3.0	Supply, installation, test and commissioning of a high voltage battery bank with DC air conditioned cabinet : Supply, install, test, and commissioning of a high voltage Battery bank with built in battery rack and air conditioned cabinet, the bank voltage will be more than 600 volts, and shall meet the following specifications: - Batteries shall be LiFePO4 \ B-LFP48-200E Battery bank - Battery lifecycle shall be at least 6000 cycles at 80% depth of discharge (DOD). - Built-in intelligent BMS and RS, CAN, Modbus, and other necessary kits and protocols to communicate with the inverter, monitor the battery remotely & real time, and protect the battery pack at any time. - Active Battery Optimizer and equilizer - Overcharge Safety Device. - Reliable performance at high operating temperatures of up to 45° C. - Wires connected to batteries shall utilize appropriately sized and rated lugs or terminals, - Battery shall be installed in a secured, well-ventilated powerhouse. - Product warranty shall be 10 years; warranty certificates shall be provided by the manufacturer; - One brand of battery shall be used for the entire installation. - The battery must allow connection with the inverters offered by the supplier. In addition, the batteries must allow the parallel connection multiple racks. - Battery to be certified CE or UL and to meet at least one for the following or equivalent standards UL1642, UL2054, UN38.3, IEC/EN 62133, ISO14001 and ISO9001. \ IEC62619/CE/UN38.3, IEC62619/UL1973/CE - Battery Rack with built in busbars should be configured for 300 VDC mentioned below, powder coated with a corrosion acid proof powder, the battery rack busbars shall be covered. Including all required accessories and any additional communication kits or devices for the successful operation of the battery bank with the inverter to complete the item according to the recommendations of the supervision team and as per specs				
3.1	Lithium-Ion Battery with Rated Capacity of 9.6 kWh@48 VDC , 200A	pc	2.00		
4	DC Cabling				
4.0	Supply, install, test, and commissioning of DC Cabling 1KV, Flexible stranded copper per EN 60228 , TUV certified. Insulation: Halogen-free, thermoset polyolefin. Jacke :low smoke non-halogenated, flame retardant, oil, abrasion, chemical and sunlight resistant meeting UL 44, UL 854. - All cables shall be marked properly according to approved design so that cable can be easily traced and identified; PV array to battery circuit(s) to be sized for maximum 3% voltage drop at rated array power (Imp); Cable ends connections are to be made through suitable lugs or terminals, crimped properly & with use of cable glands; this item is including the cables and cable trays Cable Tray :- 1mm thickness, Perforated type Galvanized steel cable trays, cable tray covers, clamping bolts and other cable tray accessories such as coupler plates, bends, tees, reducers, vertical elbows in manufactured accordance with ASTM A653 SS, Grade 33, coating designation G90.			Note	
4.1	(1C*10 sqr.mm) (Red& Black)	M	90.00		
4.3	(1C*95 sqr.mm) (Red& Black)	M	30.00		
5	AC Cabling				
5.0	Supply, install, test, and commissioning of AC Cabling Stranded type, TUV certified, double insulation material 1kv XPLE/PVC/CU - All cables shall be marked properly according to approved design so that cable can be easily traced and identified; - All outdoor exposed wiring to be protected from UV radiation and physical damage, all cabling above ground should be suitably mounted inside cable trays with proper covers; - XLPE insulated and PVC sheathed single or multi core flexible copper cables meeting IEC 60227 and IEC 60502; - Cable ends connections are to be made through suitable lugs or terminals, crimped properly & with use of cable glands;			Note	
5.1	2C*35 sqr.mm Includes cable trunk, good fixing, and making holes in the wall when necessary	M	75.00		
6	Inverter DC Breakers Box				
6.1	Supply, install, test, and commissioning DC breakers box including 2X25 A DC breaker and all the required accessories as per drawings	Pc	1.00		



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توريد وتركيب نظام الطاقة الشمسية لمركز الوفاء الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	جمالي السعر
7	Battery DC Breakers Box				
7.1	Supply, install, test, and commissioning DC breakers box including 1x200 A DC breaker and all the required accessories as per drawings	Pc	1.00		
8	AC Coupling Panel				
8.1	Supply, install, test, and commissioning of Metal Enclosure, Indoor, Built in SPD, RCCB, MCCB as shown on schematic wiring diagram - Internal connection should be through busbars; - Ingress protection must be at least IP41; - Enclosure material should be galvanized steel sheets; - Fault level for the main breaker: At least 25 kA; - advised to use high quality breakers; - The EMDB should be in accordance with the drawings; - Warranty: at least 1 year.	Pc	1.00		
9	NEW Main Distribution Board (New-MDB)				
9.1	supply and installation of a main electrical distribution board for the building model (New-MDB) with a magnetic main circuit breaker MCCB single phase - 230 V - 50 Hz - 2 pole 200 A (25KA) Bus bar 300A with sub circuit breakers number4 sub circuit breaker single phase installs 4 circuit breakers below and leave the rest space for expansion In the future: 4 x 100 A single phase 2 pole MCCB TP (25KA). The plate cover and the outer frame of the sheet shall be thickness of 1.5 mm and painted electrostatic. Resistant to moisture, echo and water (Powder Coated). The price includes a metal base for the plate with a height of 60 cm and all the necessary accessories for the plate and the control in addition to the aforementioned voltage and current measuring devices, signal lamps, current transformers and so on.The price includes all the supplies for fixing, numbering and preparing for cable entry slots so that they are regular circular holes with the installation of copper and plastic glides compatible with cable clips and main and subsidiary extensions with the assignment of the main and branch cables ends with special copper wicker with all accessories Installation and operation. The main and subsidiary partitions of the plates shall be thermomagnetic in number, capacity and type according to drawings and specifications and according to the rules of workmanship and the instructions of the supervising engineer.	Pc	1.00		
10	Automatic Transfer Switch				
10.1	Supply, install, test, and commissioning of Low Voltage ATS 4P, 100A, 2 ways as per technical specifications including metal enclosure	Pcs	2.00		
11	Earthing System				
11.1	Supply, install, test and commissioning Earthing System As per technical specifications and drawings including cabling, cable lugs, earthing rods and all required accessories - Each array structure of the PV modules should be grounded properly; - All metal casing/shielding of the system and its components should be thoroughly grounded; -Earthing pit - Earth resistance should be tested in presence of the GWQ representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. - Earthing installation in accordance with the IEE Wiring regulations, BS 7671 - All conductive materials shall be copper. - The size of conductor shall be according to table 54.7 of IEE – BS 7671 – IEC 60365-5-54.	Unit	2.00		
12	Lightning Protection System				
12.1	Supply, install, test and commissioning Lightning Protection System As per technical specifications and drawings including cables, mast and all required accessories - lightning arrester shall be copper. - All metal casing/shielding of the system and its components should be thoroughly grounded; -Earthing pit - Earth resistance should be tested in presence of the GWQ representative by calibrated earth tester, the earth resistance should not be more than 5 Ohm. - Earthing installation in accordance with the IEE Wiring regulations, BS 7671 - All conductive materials shall be copper. - The size of conductor shall be according to table 54.7 of IEE – BS 7671 – IEC 60365-5-54.	SYSTEM	2.00		
13	Lightings & Fans				



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Item No.	Item Name	الوحدة	الكمية	سعر الوحدة	جمالي السعر
13.1	Supply, install, test and commissioning of LED light fixture (20 W) 1200 mm length to replace existing florescent including dismantling the old units as per technical specification - Mount type: Surface Mount; - Color: White; - Lamp luminous efficacy: not less than 100 lm/W; - Housing: Metal; - Input Voltage and frequency: 220-240V, 50 Hz; - Working Lifetime (Hour): at least 10,000 h; - Certification: All related certificates shall be provided such CE, RoHS; - Warranty at least two years.	Pcs	19.00		
13.2	Supply, install, test and commissioning of LED light bulb (1X 12 w) as per technical specifications - Lamp luminous efficacy: not less than 90 lm/W; - Cap type & base: bayonet bulbs- B22d-BC/ E27; - Color temperatures (CCT): 5000 K to 6500 K; - Input Voltage and frequency: 220V, 50 Hz; - Working Lifetime (Hour): at least 15,000 h; - Operation temperature rang: up to 50°C; - Certification: All related certificates shall be provided such CE, RoHS; - Warranty: at least two years.	Pcs	5.00		
13.3	Supply, install, test and commissioning of energy efficient ceiling fans 1200 mm length to replace existing ceiling fans including dismantling the old units as per technical specification - No. of blades:3 - Air delivery : not less than 200CMM ; -speed controller & Remote control - metal components must be rust proof - Input Voltage and frequency: 220-240V, 50 Hz; - Certification: All related certificates shall be provided such CE, RoHS; - Warranty at least two years.	Pcs	5.00		
13.4	Supply, install, test and commissioning of wall Mounted fans 30W) - fan 30 W; - Voltage rating: 220-240 VAC, 50 Hz ±2%; - Working life time: not less than 15,000; - Wall Mounted type; - Warranty: at least one years. The work should include all the required accessories, Switch, cables(3*2.5mm2), trays, civil works and any component to ensure a professional installation according to the supervisor engineer.	Pcs	5.00		
14	Smoke and Heat Detectors :				
14.1	Smoke and Heat Detector: Supply, install and testing Smoke and heat detector, including button for false alert. Battery for three years long life, warning sound delivers sounds of >85 Db	Pcs	1.00		
15	Extinguishers :				
15.1	Supply, install, test and commissioning 5kg Carbon Dioxide (CO2) Extinguisher - Warranty: at least two years.	Pcs	1.00		
15.2	Supply, install, test and commissioning 6kg Powder extinguisher - Warranty: at least two years.	Pcs	1.00		



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توريد وتركيب نظام الطاقة الشمسية لمركز الوفاء الطبي

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
16	Rooftop Mounting Structure				
16.1	The item shall include the following: <ul style="list-style-type: none"> • Surveying and conducting all site levelling and disposal of debris to authorized area prior to the commencing of work. • Supplying, fabricating, delivering at site, hoisting and fixing in position, including all temporary staging and supporting work and making all structural steel work as per in the shop drawings and the technical specifications of mounting structures. • Supply and implementation of (0.60x0.60x0.20)m reinforced concrete C25 for all mounting bases, including anchor bolts and all necessary related works according to the shop drawings, technical specifications and the instructions of the supervising Engineer. • Fabrication and erection in position columns, rafters, bracing and others made out of Cold-formed galvanized steel (min galvanized 80~120mic) sections with minimum yield strength of 240Mpa including cutting, grinding, drilling, hoisting, fixing in position at all heights and levels. The rate includes all connections nuts, bolts, washer plates and all necessary related work according to the shop drawings and technical specifications.. • Supply and installation of galvanized HSS steel purlins (60x30x1.25) (min galvanized 80~120mic) with all necessary connections as detailed in the drawings, complete as per drawing and the direction of supervising engineer in Charge. As AISC all bolts is A325 or A490 high strength bolts (Hardness equal 8.8). 	Sq.m	40.00		
17	Project sign boards				
17.1	In number: Supply and installation of a metal Signboard in the name of the project in the dimensions shown in drawing and the price includes the following : <ul style="list-style-type: none"> - Digging soil depth of 60 cm for the two bases then the pouring of plain concrete and water treatment period required- Implementation of two concrete footings in dimension (50X50) cm and a depth of 50 cm of 0.8 m3 aggregate and 0.4 m3 sand with 250 kg\m3 cement with water treatment and all necessary - Galvanized Steel Pipe Plates 2 " , it is covered from above with a tight cover ,and at the bottom two metal plates are made of 2 mm thickness, 30 cm long and 5 cm width, which are well bonded with two + shaped welds and are fixed at the bottom of the base before casting. - Supply and installation of metal sheets (sheets) Made of heavy black iron, 1.5 mm thick in dimensions 120*150 cm and distribution shown in the model With internal strengthening in the space so that no traces appear on the painting, and so that the pieces of the painting are welded from all sides so that no space (filled with putty) is left for rain water to enter. - Painting of writing boards and standing with a resistant paint 3 faces and then painting the writing boards With putty, foundation and fire paint in the specified color 3 faces to getting smooth surface with out any roughness. - Writing on the painting in clear script, distinctive writing and color specified in Arabic and English With fiery paint, and the writing is on two sides in white. - Install the Signboard in the appropriate place determined by the supervisor and the price includes the supply and installation and all necessary for it to work. 	Pcs	1.00		
Estimated Cost \$					



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Part (1) : Supplying and installing of a medical devices and furniure

ثانياً : توريد وتركيب المعدات الطبية والأثاث

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FURNITURE FOR AL-WAFAA HEALTH CENTER - جدول الاثاث لمركز الوفاء الصحي -

ملاحظة: على المقاول ارفاق جميع الكتلوجات والمواصفات وصور العينات ضمن العطاء المقدم

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price\$	Total USD\$
1	Chairs	Pcs	6		
2	Desktop PC	Unit	1		
3	File cabinet, double door	Pcs	2		
4	Printer	Unit	1		
5	Table for Laboratory L shape	Pcs	1		
6	Steel Chairs Visitor	Unit	4		
7	L - Desk single pedestal	Pcs	1		
8	Shelves	Pcs	4		
9	Swivel Chair	Pcs	3		
Estimated Cost \$					

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EQUIPMENTS FOR AL-WAFAA HEALTH CENTER جدول المعدات لمركز الوفاء الصحي

ملاحظة: على المقاول ارفاق جميع الكتلوجات والمواصفات وصور العينات ضمن العطاء المقدم

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price\$	Total USD\$
1	Centrifuge	Unit	2		
2	I.V. stand	Pcs	3		
3	Biological microscope	Unit	1		
4	Nebulizer	Unit	1		
5	Pulse Oximeter (Finger Sensor)	Unit	2		
6	Sphygmomanometer mercury stand type	Pcs	3		
7	Stethoscope, Pediatric	Unit	3		
8	Suction machine 10L	Unit	1		
9	Ultrasound system image with/2 probes/ printer and UPS	Unit	1		
10	BED (manual mov.)	Unit	3		
11	HEAD Lamp	Unit	3		
12	Medical privacy curtains	Pcs	7		

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price\$	Total USD\$
13	<p>Training Course on the Use of Medical Equipment: This item includes providing a comprehensive training course for all concerned employees, not exceeding 5 persons approved by the center's management in the medical center, on how to use the medical equipment to be provided to the center.</p> <p>Training Objectives: The training course will cover an introduction to the equipment and its purposes of use, how to set it up and operate it properly, and routine maintenance guidelines to ensure optimal operation. The course will also include teaching safety rules to avoid accidents and injuries, and providing instructions on how to deal with common problems and emergency malfunctions. An interactive session will be organized to allow employees to try the equipment under the supervision of a certified trainer.</p> <p>Training Content: Must be approved by the supervising engineer.</p> <p>Training Duration: The training duration is 15 hours, divided into 3 days, 5 hours per day.</p> <p>Trainers: Must be specialized in the field of medical laboratories, have experience in using laboratory equipment and tools, and excellent training skills.</p> <p>Meals: The supplier must provide a daily lunch for the trainees.</p>	L.S	1		
Estimated Cost \$					

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FURNITURE FOR AI-THAWRA HEALTH CENTER - جدول الاثاث لمركز الثورة الصحي - محافظة تعز

على المقاول ارفاق جميع الكتلوجات والمواصفات وصور العينات ضمن العطاء المقدم

ملاحظة:

No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price\$	Total USD\$
1	Desktop PC	Unit	1		
2	File cabinet, double door	Pcs	2		
3	Printer	Unit	1		
4	Swivel Chair	Pcs	2		
5	Steel Chairs Visitor	Unit	3		
Estimated Cost \$					

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No	Item Name	الوحدة	الكمية	سعر الوحدة	إجمالي السعر
		Unit	Qty	Unit Price\$	Total USD\$
1	CBC machine	Unit	1		
2	ECG machine 6 channels	Unit	1		
3	Biological microscope	Unit	1		
4	Nebulizer	Unit	1		
5	Sphygmomanometer mercury stand type	Pcs	3		
6	Sphygmomanometer, one-hand manometer, velcro, adult	Pcs	2		
7	Stethoscope, Pediatric	Unit	4		
8	Ultrasound system image with/2 probes/ printer and UPS	Unit	1		
9	I.V.stand	Pcs	3		
10	Medical privacy curtains	Pcs	5		
11	<p>Training Course on the Use of Medical Equipment: This item includes providing a comprehensive training course for all concerned employees, not exceeding 5 persons approved by the center's management in the medical center, on how to use the medical equipment to be provided to the center.</p> <p>Training Objectives: The training course will cover an introduction to the equipment and its purposes of use, how to set it up and operate it properly, and routine maintenance guidelines to ensure optimal operation. The course will also include teaching safety rules to avoid accidents and injuries, and providing instructions on how to deal with common problems and emergency malfunctions. An interactive session will be organized to allow employees to try the equipment under the supervision of a certified trainer.</p> <p>Training Content: Must be approved by the supervising engineer.</p> <p>Training Duration: The training duration is 15 hours, divided into 3 days, 5 hours per day.</p> <p>Trainers: Must be specialized in the field of medical laboratories, have experience in using laboratory equipment and tools, and excellent training skills.</p> <p>Meals: The supplier must provide a daily lunch for the trainees.</p>	L.S	1		
Estimated Cost \$					