

Renewable Energy for All Photo Voltaic Cells for Gaza hospitals



*Empowered lives.
Resilient nations.*

Bill of Quantity (BOQ)

Project: Renewable Energy for All Photo Voltaic Cells for Gaza hospitals

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
	<p>Pre-Ambls:</p> <ul style="list-style-type: none"> • The system is designed to cover the Essential loads in 4 Hospitals for Laboratory department. • The system will be grid interactive connected with battery backup system, which will allow many power sources options. The system will import from the grid when loads are being more than the generated from PV and supply surplus electricity to the batteries when PV generates more than the loads, the batteries can be charged from Grid if PV output is not enough for loads and batteries. • The contractor should prepare and Submit a complete documents and catalogues for overall the system and schedule for completing installation under the required consideration and what meet the internal electrical network at the facility/site. • The contractor should submit required documentation and System Manual (system design review, approval required, user manual, calculation sheets, and as built drawing...) • The contractor should make Cooperation and coordination with the relevant/responsible people through the stages of action and implementation. • The contractor should submit one year bank Maintenance Guarantee for the project. • The contractor should Carry out a periodic testing/maintenance of the systems for one year from the date of handover. • All Grid inverters and Battery inverters shall be from the same brand, type, nominal ratings, and clearly labeled. • The contractor should submit complete parts lists and specifications, and brand and country of origin for the overall system and individual components, including all electrical components, PV and mechanical components and other equipment required for installing the systems. • The contractor will maintain monthly visits during the maintenance period to carry out the necessary maintenance processes needed and respond promptly to any emergency needed to keep the system performance perfect. • Contractor shall submit full detailed shop drawings for all architectural, civil, electrical and a complete photovoltaic solar system works, including a single line diagram showing all the components of the PV system, DC and AC distribution boards, PV Arrays lay out and with connections and cables, wires cross section for all the system and voltage drop calculations to be approved by the Engineer before executing the work. • Contractor shall submit the catalogs of each component showing the requested specifications stated at the bill of quantity. <ul style="list-style-type: none"> • The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, spare parts regular (as recommended by manufacturer , maintenance manuals and manufacturers warranty for all PV system components. • As-built drawings and writing setting parameters shall be submitted after handing over the work and approved by the supervision team. • All junction boxes and DBs will be lockable type and Brand Name. • Upon completion of the installation, the contractor shall organize an on site training program involving nominated employer's staff for operation , maintenance and trouble shooting. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates. • The price includes all builders' works, making good and reinstatement including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully. • All the following items include supply, install, commission and operate of the complete PV solar system. • The unit rates include solving all the obstacles that will face on the hospitals roofs such as water tanks, desalination unit, solar system including all mirrors, stands and all other components, water and electrical network, air-condition units and any other obstacles. And he will be responsible for dismantling, removing and re-installing them in other places and operate them successfully with any additional new materials to complete the job to provide the required space to install the structures for the photovoltaic panels. Also, the contractor must repair any damages in the insulation works and make water inspections for the insulation of the roof top before the installation of structure and after the installation in the presence of the supervision team. All works will be in close coordination with owners. • The unit rates of the PV structure include shop drawings, calculation sheet for the proposed PV structure and calculation sheet for the existing trusses to assure safety, designs. The price also includes all required materials to support the existing steel trusses if needed according to the calculation sheet including supply and install all required materials, scaffolding, workmanship etc. • Writing setting parameters shall be submitted before the programming and must approved by the supervision team. • The winner contactor should start operating and programming all the components of the system in the presence of the MOH team and supervisor engineer. • As-built drawings and writing setting parameters shall be submitted after handing over the work and approved by the supervision team. 						

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
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	<p>General:</p> <ul style="list-style-type: none"> The system is designed to cover the Essential loads for Laboratory Department in Shohada Al Aqsa Hospital. The system will be grid interactive connected with battery backup system, which will allow many power sources options. The system will receive surplus Electricity from the grid when loads are being more than the generated from PV, then it will supply surplus electricity to the batteries when PV generates KW more than the loads, the batteries can be charged from Grid if PV output loads is not enough. <p>* Contractor shall submit Detailed shop drawings for all architectural, civil, electrical and a complete photovoltaic solar system works, including (single line diagram, Equipment Layout inside room, PV distribution panels, DC & AC distribution bards, PV Arrays lay out and battery backup systems connections and cables, wires cross section...etc.) for the proposed PV system to be approved by the Engineer before commencement of the work.</p> <p>* Contractor shall submit the catalogs of each component with all certified calculation sheets and testing results for the requested specifications stated in Bill of Quantity.</p> <ul style="list-style-type: none"> The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, spare parts regular (as recommended by manufacturer , maintenance manuals and manufacturers warranty for each components of the system. As-built drawings and writing setting parameters shall be submitted after handing over the work and approved by the supervision team. All junction boxes and DBs will be lockable type. Upon completion of the installation, the contractor shall organize an on site training program for operation and maintenance purpose involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates. The price includes all builders' works, making good and reinstatement including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully. The work includes maintenance period for each device according to BOQ and Specifications. All the following items include supply, install, commission and operate of the following items with all the required materials to complete the job in accordance with the BOQ, drawings, specifications and the supervising engineer's instructions. 						
A1	<p>PV Modules – 25 KWp:</p> <p>Supply, install, connect and operate Mono Crystalline Photovoltaic Solar Modules with all materials needed to have complete job ready for installing high quality PV modules with total arrays capacity to achieve 25 KWp. The unit rates include supply, install & connect the following:</p> <ul style="list-style-type: none"> Water proof PV combiner boxes IP65 for all connected strings including 1000V (DC double pole Fuses, DC double pole surge arrestors, bus bars, terminals, PVC ducts to be fixed under the PV modules, supports, clamps & labels suitable to the PV arrays loads. Solar DC cables appropriately sized to connect the PV solar modules together and to the combiner box and from combiner box to the grid inverters directly to have a complete operational circuit with all conduits, clamps, hot galvanized channel trays with covers along the DC cable routing and cable end terminations which shall be DC plug and socket connectors. The DC cables must be sized in accordance with the installation requirements applicable on site, the allowable voltage drop for DC cables between PV Arrays and grid inverter less than 1%. <p>*The contractor has to obtain 25kWp from PV system as minimum. In case the proposed PV modules results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 25KWp.</p> <ul style="list-style-type: none"> The unit rates include solving all the obstacles that will face on the hospital roofs such as water tanks, desalination unit, solar system including all mirrors, stands and all other components, water and electrical network, air-condition units and any other obstacles. The contractor will be responsible for dismantling, removing and re-installing them in other places and operate them successfully with all needed new materials and workmanship to provide the required space to install the structures for the photovoltaic panels as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully. Contractor must submit all the required certificates for each PV solar panel as well as manufacturer warrantee as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	KWp	25				

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A2	<p><u>Inverters – 30 KW:</u> Supply, install, connect and operate DC/AC On-Grid 3-phase Inverters with data communication unit with Ethernet connection . (Type is SMA or equivalent). The inverters must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also. The DC max power input rating should be equal or more than 30 KW of the PV modules capacity at standard test condition. The inverter unit shall be suitable for indoor and outdoor installations with IP65. The inverter AC nominal power output rating must be equal or greater than 30 KW compatible with the AC loads design. The inverters must include the safety and communication management devices such as (cutting edge grid management functions, integrated plant control, Ground fault and grind monitoring, dc reverse polarity protection n, DC side disconnect device, Graphic Display, DC surge arrester type 2, Multistring capability, DC input voltage up to 1000 V DC) to ensure max availability. Total inverters capacity must be divided at least 2 inverters. The unit rates include :</p> <ul style="list-style-type: none"> • Supply, install, connect and operate (Communication unit (monitoring device) with power supply inside water proof IP 65 box for system monitoring, recording data and controlling PV system compatible with the inverters, with all needed materials, DC & Ac power supply unit, interface modules, data & communication cables and ducts to connect all inverters and other devices to the monitoring system. The price includes an ethernet device with cables and modem router Or using a WIFI bridge complete units with all connections needed to complete and connect the monitoring system to existing data networks Ethernet in the hospital. • Supply, install and connect all AC power cables appropriately sized in accordance with the installation requirements and to connect the On-Grid inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 30KW from PV inverters capacity as minimum. In case the proposed PV inverters capacity results in extra kw than this is deemed to be accounted for the proposed ratio. Contract will be pay only 30KW. • The contractor must submit manufacturer warranty for each inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
A3	<p><u>Battery Inverter – 6KW:</u> Supply, install, connect and operate Battery Inverter compatible with on grid inverters with total rated power 6 KW with all necessary interface modules and connections for masters & slaves , electrical cables and data communication unit with Ethernet connection, connectable in parallel and modularly extendable. (Type is SMA or equivalent). The Battery Inverter must include the following concepts such as (Ac and DC coupling, High efficiency, intelligent battery management for maximum battery life, charge level calculation, extreme overload capability, and battery temperature sensing and battery current measurements). The unit rates include:</p> <ul style="list-style-type: none"> • Supply, install and connect Remote Control Units (RC Unit) for the installed battery inverters with all data & communication cables and connection needed to complete the job. • Supply, install and connect DC cables with appropriately sized in accordance with the installation requirements to connect the battery inverters with DC battery fuses box, The allowable voltage drop for DC cables between battery inverter and batteries less than 1%, the allowable voltage drop for DC cables between battery inverters and DC battery fuses box less than 1%. • Supply, install and connect all AC power cables for (AC1 & AC2) with appropriately sized in accordance with the installation requirements and to connect the Battery inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 6kw from Battery inverters capacity as minimum. In case the proposed battery inverters capacity results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 6KW. • The contractor must submit manufacturer warranty for each battery inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	No	3				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
A4	<p><u>Battery Bank :</u> Supply, install, connect and operate VRLA tubular design deep cycle batteries, the total demand energy is 150 KWh, @ C10 , 1.8V per cell, 2800-3000 cycle @ C10. The battery bank voltage is 48 Vdc, each battery 2 volt. (Type is EUROPE MADE BRAND NAME) The batteries must provide high-quality and achieving superior performance, the manufacturing date must be new and not more than 6 months, suitable type for PV solar renewable system applications, designed Service Life 10 years with low internal resistance, designed to be deeply discharged. The Battery should provide benefits of being maintenance free, case flame retardant & non-hazardous. The unit rates include supply, install & connect the followings:</p> <ul style="list-style-type: none"> • All necessary DC cables between the batteries together and to the battery fuse box to have a complete operational circuit with all bus bars, conduits, clamps, stainless steel bolts, washers and cable end terminations and all needed materials to complete the job. All DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • Battery Banks original rack from the same manufacturer of the batteries with dividers and all needed accessories to finish the job. the rack must be enough to carry all the weight of the required batteries for the system. • Battery temperature sensor (BTS) with all needed connections and fuse protection. • The contractor has to obtain minimum 150 KWh functional battery bank. In case the proposed batteries in stings provide more capacity. The contract will pay only for 150KWh and contractor will include in his price the extra KWh on the relevant ratio. • The contractor must submit manufacturer warranty for each battery cell as recommended by manufacturer not less than two years. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	KWh	150				
A5	<p><u>PV Mounting structure:</u> Supply and install Module mounting structure from hot galvanized steel Angles foundation suitable to the dimension of selected PV modules and PV numbers, the mounting provides a fixed inclination of the modules 26-30 degree with vertical supports, plates, screws and casting concrete foundations B250 (0.3*0.3*0.3) m3 for each leg. The PV structure must covered with approved type of Epoxy painting with approved color with painting layers approved types with all testing, the structure includes bracing and double hot galvanized angles for dividers. The contractor should submit shop drawings with calculation sheets to the mounting structures and the foundations, which must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads, weight of the devices and equipment etc.) that might occur according to the Site conditions. The mounting structure components are connected together to stabilize the structure . The price includes retesting Leakage of the roof insulation for the whole roof before starting works and after completion of installation of PV system and making good of any damages to insulation membrane if occurred. All works and materials must be according to drawings, specifications and supervisor instructions and approval.</p>	L.S	1				
A6	<p><u>Battery Fuse Box:</u> Supply, install, connect and operate battery DC fuse box (500*375*225 mm) as an external DC distributor to protect the battery banks connections of the battery inverters . (Type is EUROPE MADE BRAND NAME). The box must be water proof protection with IP65, simple wall mounting, suitable connections for three battery inverters and up to six DC connections inlet on the battery side, the item includes (2 LTL 250/400A , 6 fuses 250A DC Types) , cable glands, with all necessary DC cables from the battery bank and to the fuse box and from the fuse box to the battery inverters to have a complete operational circuit with all conduits, clamps, stainless steel bolts, washers and cable end terminations needed to fix, all DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • The contractor must submit manufacturer warranty for each battery fuse box for a period not less than 1 years. All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				

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A7	<u>AC Air Condition:</u> Supply , install, test and commission air conditioning Inverter type Split Unit, composed of outdoor unit. filled with environment friendly refrigerant such as (R410, R407c,..) and COP not less than 3.5,Condensing unit shall be complete with Inverter compressor/s & air cooled condenser with fan, Well supported on hot galvanized steel base on the roof, indoor unit with plasma filter as indicated on drawings to be tights installed completed with all necessary supports, hangers, drain pipes from indoor unit to the nearest floor drain, (PVC Ø 1"), copper pipes , sleeves, thermostat , Remote control and including supply and install all required electrical power cables from SDB inside the room to the unit according to drawings and engineers approval. CAPACITY:(18000 BTU/HR). (Type is ELECTRA or equivalent) .	No	1				
A8	<u>Wall mounted exhaust:</u> Supply , install and operate 6" diameter 250m3/hr. wall mounted extract fan with louver and all needed material ,cables, pipes, boxes...etc. The work includes supply and install control unit with all required Timer 24,Relays, selector switch, Circuit breakers and all protection devices to operate automatic to complete the work as per the engineer instructions. (Type is Venta or equivalent)	No	1				
A9	<u>3-Phase SMART Bidirectional Digital KWH Meter:</u> Supply,install,connect and operate 3-phase 3x100 A SMART Bidirectional digital KWH meter, with 3 CT's,LTL 3(32/6A) any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Holley or equivalent) -OPTIONAL	No	1				
A10	<u>3-Phase Digital KWH Meter:</u> Supply,install,connect and operate 3-phase digital KWH meter, with all 3 CT's,LTL 3(32/6A) and any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Schneider MP 3210 or equivalent)	No	2				
A11	<u>Earthing System For AC Side:</u> Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the unite rates include (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the AC system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.	Unit	1				
A12	<u>Earthing for PV Structure:</u> Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the item includes (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the PV system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.	Unit	1				
Total Of Bill (1) - USS							

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
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Bill No. (2) PV Solar System for Al-Najjar Hospital							
*	<p>General:</p> <ul style="list-style-type: none">The system is designed to cover the Essential loads for Laboratory Department in Al-Najjar Hospital.The system will be grid interactive connected with battery backup system, which will allow many power sources options. The system will receive surplus Electricity from the grid when loads are being more than the generated from PV, then it will supply surplus electricity to the batteries when PV generates KW more than the loads, the batteries can be charged from Grid if PV output loads is not enough.Contractor shall submit Detailed shop drawings for all architectural, civil, electrical and a complete photovoltaic solar system works, including (single line diagram, Equipment Layout inside room, PV distribution panels, DC & AC distribution bards, PV Arrays lay out and battery backup systems connections and cables, wires cross section...etc.) for the proposed PV system to be approved by the Engineer before commencement of the work.Contractor shall submit the catalogs of each component with all certified calculation sheets and testing results for the requested specifications stated in Bill of Quantity.The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, spare parts regular (as recommended by manufacturer , maintenance manuals and manufacturers warranty for each components of the system.As-built drawings and writing setting parameters shall be submitted after handing over the work and approved by the supervision team.All junction boxes and DBs will be lockable type.						
*	<ul style="list-style-type: none">Upon completion of the installation, the contractor shall organize an on site training program for operation and maintenance purpose involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates.The price includes all builders' works, making good and reinstatement including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.The work includes maintenance period for each device according to BOQ and Specifications.						
*	<ul style="list-style-type: none">All the following items include supply, install, commission and operate of the following items with all the required materials to complete the job in accordance with the BOQ, drawings, specifications and the supervising engineer's instructions.						
B1	<p>PV Modules – 20 KWp:</p> <p>Supply, install, connect and operate Mono Crystalline Photovoltaic Solar Modules with all materials needed to have complete job ready for installing high quality PV modules with total arrays capacity to achieve 20 KWp. The unit rates include supply, install & connect the following:</p> <ul style="list-style-type: none">Water proof PV combiner boxes IP65 for all connected strings including 1000V (DC double pole Fuses, DC double pole surge arrestors, bus bars, terminals, PVC ducts to be fixed under the PV modules, supports, clamps & labels suitable to the PV arrays loads.Solar DC cables appropriately sized to connect the PV solar modules together and to the combiner box and from combiner box to the grid inverters directly to have a complete operational circuit with all conduits, clamps, hot galvanized channel trays with covers along the DC cable routing and cable end terminations which shall be DC plug and socket connectors. The DC cables must be sized in accordance with the installation requirements applicable on site, the allowable voltage drop for DC cables between PV Arrays and grid inverter less than 1%. <p>•The contractor has to obtain 20kWp from PV system as minimum. In case the proposed PV modules results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 20KWp.</p> <ul style="list-style-type: none">The unit rates include solving all the obstacles that will face on the hospital roofs such as water tanks, desalination unit, solar system including all mirrors, stands and all other components, water and electrical network, air-condition units and any other obstacles. The contractor will be responsible for dismantling, removing and re-installing them in other places and operate them successfully with all needed new materials and workmanship to provide the required space to install the structures for the photovoltaic panels as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.Contractor must submit all the required certificates for each PV solar panel as well as manufacturer warrantee as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	KWp	20				

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B2	<p><u>Inverters – 30 KW:</u> Supply, install, connect and operate DC/AC On-Grid 3-phase Inverters with data communication unit with Ethernet connection . (Type is SMA or equivalent). The inverters must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also. The DC max power input rating should be equal or more than 30 KW of the PV modules capacity at standard test condition. The inverter unit shall be suitable for indoor and outdoor installations with IP65. The inverter AC nominal power output rating must be equal or greater than 30 KW compatible with the AC loads design. The inverters must include the safety and communication management devices such as (cutting edge grid management functions, integrated plant control, Ground fault and grind monitoring, dc reverse polarity protection n, DC side disconnector device, Graphic Display, DC surge arrester type 2, Multistring capability, DC input voltage up to 1000 V DC) to ensure max availability. Total inverters capacity must be divided at least 2 inverters. The unit rates include :</p> <ul style="list-style-type: none"> • Supply, install, connect and operate (Communication unit (monitoring device) with power supply inside water proof IP 65 box for system monitoring, recording data and controlling PV system compatible with the inverters, with all needed materials, DC & Ac power supply unit, interface modules, data & communication cables and ducts to connect all inverters and other devices to the monitoring system. The price includes an ethernet device with cables and modem router Or using a WIFI bridge complete units with all connections needed to complete and connect the monitoring system to existing data networks Ethernet in the hospital. • Supply, install and connect all AC power cables appropriately sized in accordance with the installation requirements and to connect the On-Grid inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 30KW from PV inverters capacity as minimum. In case the proposed PV inverters capacity results in extra kw than this is deemed to be accounted for the proposed ratio. Contract will be pay only 30KW. • The contractor must submit manufacturer warranty for each inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
B3	<p><u>Battery Inverter – 6KW:</u> Supply, install, connect and operate Battery Inverter compatible with on grid inverters with total rated power 6 KW with all necessary interface modules and connections for masters & slaves , electrical cables and data communication unit with Ethernet connection, connectable in parallel and modularly extendable. (Type is SMA or equivalent). The Battery Inverter must include the following concepts such as (Ac and DC coupling, High efficiency, intelligent battery management for maximum battery life, charge level calculation, extreme overload capability, and battery temperature sensing and battery current measurements). The unit rates include:</p> <ul style="list-style-type: none"> • Supply, install and connect Remote Control Units (RC Unit) for the installed battery inverters with all data & communication cables and connection needed to complete the job. • Supply, install and connect DC cables with appropriately sized in accordance with the installation requirements to connect the battery inverters with DC battery fuses box, The allowable voltage drop for DC cables between battery inverter and batteries less than 1%, the allowable voltage drop for DC cables between battery inverters and DC battery fuses box less than 1%. • Supply, install and connect all AC power cables for (AC1 & AC2) with appropriately sized in accordance with the installation requirements and to connect the Battery inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 6kw from Battery inverters capacity as minimum. In case the proposed battery inverters capacity results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 6KW. • The contractor must submit manufacturer warranty for each battery inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	No	3				
B4	<p><u>Battery Bank :</u> Supply, install, connect and operate VRLA tubular design deep cycle batteries, the total demand energy is 150 KWh, @ C10 , 1.8V per cell, 2800-3000 cycle @ C10. The battery bank voltage is 48 Vdc, each battery 2 volt. (Type is EUROPE MADE BRAND NAME) The batteries must provide high-quality and achieving superior performance, the manufacturing date must be new and not more than 6 months, suitable type for PV solar renewable system applications, designed Service Life 10 years with low internal resistance, designed to be deeply discharged. The Battery should provide benefits of being maintenance free, case flame retardant & non-hazardous. The unit rates include supply, install &connect the followings:</p> <ul style="list-style-type: none"> • All necessary DC cables between the batteries together and to the battery fuse box to have a complete operational circuit with all bus bars, conduits, clamps, stainless steel bolts, washers and cable end terminations and all needed materials to complete the job. All DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • Battery Banks original rack from the same manufacturer of the batteries with dividers and all needed accessories to finish the job. the rack must be enough to carry all the weight of the required batteries for the system. • Battery temperature sensor (BTS) with all needed connections and fuse protection. • The contractor has to obtain minimum 150 KWh functional battery bank. In case the proposed batteries in stings provide more capacity. The contract will pay only for 150KWh and contractor will include in his price the extra KWh on the relevant ratio. • The contractor must submit manufacturer warranty for each battery cell as recommended by manufacturer not less than two years. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	KWh	150				

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				Local Material	Coordination Material	Local Material	Coordination Material
B5	<p><u>PV Mounting structure:</u> Supply and install Module mounting structure from hot galvanized steel Angles foundation suitable to the dimension of selected PV modules and PV numbers, the mounting provides a fixed inclination of the modules 26-30 degree with vertical supports, plates, screws and casting concrete foundations B250 (0.3*0.3*0.3) m3 for each leg, The PV structure must covered with approved type of Epoxy painting with approved color with painting layers approved types with all testing, the structure includes bracing and double hot galvanized angles for dividers. The contractor should submit shop drawings with calculation sheets to the mounting structures and the foundations, which must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads, weight of the devices and equipment etc.) that might occur according to the Site conditions. The mounting structure components are connected together to stabilize the structure . The price includes retesting Leakage of the roof insulation for the whole roof before starting works and after completion of installation of PV system and making good of any damages to insulation membrane if occurred. All works and materials must be according to drawings, specifications and supervisor instructions and approval.</p>	L.S	1				
B6	<p><u>Battery Fuse Box:</u> Supply, install, connect and operate battery DC fuse box (500*375*225 mm) as an external DC distributor to protect the battery banks connections of the battery inverters . (Type is EUROPE MADE BRAND NAME). The box must be water proof protection with IP65, simple wall mounting, suitable connections for three battery inverters and up to six DC connections inlet on the battery side, the item includes (2 LTL 250/400A , 6 fuses 250A DC Types) , cable glands, with all necessary DC cables from the battery bank and to the fuse box and from the fuse box to the battery inverters to have a complete operational circuit with all conduits, clamps, stainless steel bolts, washers and cable end terminations needed to fix, all DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • The contractor must submit manufacturer warranty for each battery fuse box for a period not less than 1 years. All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
B7	<p><u>AC Air Condition:</u> Supply , install, test and commission air conditioning Inverter type Split Unit, composed of outdoor unit, filled with environment friendly refrigerant such as (R410, R407c,..) and COP not less than 3.5, Condensing unit shall be complete with Inverter compressor/s & air cooled condenser with fan, Well supported on hot galvanized steel base on the roof, indoor unit with plasma filter as indicated on drawings to be tights installed completed with all necessary supports, hangers, drain pipes from indoor unit to the nearest floor drain, (PVC Ø 1"), copper pipes , sleeves, thermostat , Remote control and including supply and install all required electrical power cables from SDB inside the room to the unit according to drawings and engineers approval. CAPACITY:(18000 BTU/HR). (Type is ELECTRA or equivalent) .</p>	No	1				
B8	<p><u>Wall mounted exhaust:</u> Supply , install and operate 6" diameter 250m3/hr. wall mounted extract fan with louver and all needed material ,cables, pipes, boxes...etc. The work includes supply and install control unit with all required Timer 24,Relays, selector switch, Circuit breakers and all protection devices to operate automatic to complete the work as per the engineer instructions. (Type is Venta or equivalent)</p>	No	1				
B9	<p><u>3-Phase SMART Bidirectional Digital KWH Meter:</u> Supply,install,connect and operate 3-phase 3x100 A SMART Bidirectional digital KWH meter, with 3 CT's,LTL 3(32/6A) any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Holley or equivalent) -OPTIONAL</p>	No	1				
B10	<p><u>3-Phase Digital KWH Meter:</u> Supply,install,connect and operate 3-phase digital KWH meter, with all 3 CT's,LTL 3(32/6A) and any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Schneider MP 3210 or equivalent)</p>	No	2				
B11	<p><u>Earthing System For AC Side:</u> Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the unite rates include (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the AC system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
B12	<p><u>Earthing for PV Structure:</u> Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the item includes (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the PV system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
Total Of Bill (2) - USS							

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No. (3) PV Solar System for Beit Hanoun Hospital .							
*	<p>General:</p> <ul style="list-style-type: none">• The system is designed to cover the Essential loads for Laboratory Department in Beit Hanoun Hospital.• The system will be grid interactive connected with battery backup system, which will allow many power sources options. The system will receive surplus Electricity from the grid when loads are being more than the generated from PV, then it will supply surplus electricity to the batteries when PV generates KW more than the loads, the batteries can be charged from Grid if PV output loads is not enough.• Contractor shall submit Detailed shop drawings for all architectural, civil, electrical and a complete photovoltaic solar system works, including (single line diagram, Equipment Layout inside room, PV distribution panels, DC & AC distribution bards, PV Arrays lay out and battery backup systems connections and cables, wires cross section...etc.) for the proposed PV system to be approved by the Engineer before commencement of the work.• Contractor shall submit the catalogs of each component with all certified calculation sheets and testing results for the requested specifications stated in Bill of Quantity.• The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, spare parts regular (as recommended by manufacturer , maintenance manuals and manufacturers warranty for each components of the system.• As-built drawings and writing setting parameters shall be submitted after handing over the work and approved by the supervision team.• All junction boxes and DBs will be lockable type. <p>*</p> <ul style="list-style-type: none">• Upon completion of the installation, the contractor shall organize an on site training program for operation and maintenance purpose involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates.• The price includes all builders' works, making good and reinstatement including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.• The work includes maintenance period for each device according to BOQ and Specifications. <p>*</p> <ul style="list-style-type: none">• All the following items include supply, install, commission and operate of the following items with all the required materials to complete the job in accordance with the BOQ, drawings, specifications and the supervising engineer's instructions.						
C1	<p>PV Modules – 20 KWp:</p> <p>Supply, install, connect and operate Mono Crystalline Photovoltaic Solar Modules with all materials needed to have complete job ready for installing high quality PV modules with total arrays capacity to achieve 20 KWp. The unit rates include supply, install & connect the following:</p> <ul style="list-style-type: none">• Water proof PV combiner boxes IP65 for all connected strings including 1000V (DC double pole Fuses, DC double pole surge arrestors, bus bars, terminals, PVC ducts to be fixed under the PV modules, supports, clamps & labels suitable to the PV arrays loads.• Solar DC cables appropriately sized to connect the PV solar modules together and to the combiner box and from combiner box to the grid inverters directly to have a complete operational circuit with all conduits, clamps, hot galvanized channel trays with covers along the DC cable routing and cable end terminations which shall be DC plug and socket connectors. The DC cables must be sized in accordance with the installation requirements applicable on site, the allowable voltage drop for DC cables between PV Arrays and grid inverter less than 1%. <p>•The contractor has to obtain 20kWp from PV system as minimum. In case the proposed PV modules results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 20KWp.</p> <ul style="list-style-type: none">• The unit rates include solving all the obstacles that will face on the hospital roofs such as water tanks, desalination unit, solar system including all mirrors, stands and all other components, water and electrical network, air-condition units and any other obstacles. The contractor will be responsible for dismantling, removing and re-installing them in other places and operate them successfully with all needed new materials and workmanship to provide the required space to install the structures for the photovoltaic panels as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.• Contractor must submit all the required certificates for each PV solar panel as well as manufacturer warrantee as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	KWp	20				

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
C2	<p><u>Inverters – 30 KW:</u> Supply, install, connect and operate DC/AC On-Grid 3-phase Inverters with data communication unit with Ethernet connection . (Type is SMA or equivalent). The inverters must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also. The DC max power input rating should be equal or more than 30 KW of the PV modules capacity at standard test condition. The inverter unit shall be suitable for indoor and outdoor installations with IP65. The inverter AC nominal power output rating must be equal or greater than 30 KW compatible with the AC loads design. The inverters must include the safety and communication management devices such as (cutting edge grid management functions, integrated plant control, Ground fault and grind monitoring, dc reverse polarity protection n, DC side disconnect device, Graphic Display, DC surge arrester type 2, Multistring capability, DC input voltage up to 1000 V DC) to ensure max availability. Total inverters capacity must be divided at least 2 inverters. The unit rates include :</p> <ul style="list-style-type: none"> • Supply, install, connect and operate (Communication unit (monitoring device) with power supply inside water proof IP 65 box for system monitoring, recording data and controlling PV system compatible with the inverters, with all needed materials, DC & Ac power supply unit, interface modules, data & communication cables and ducts to connect all inverters and other devices to the monitoring system. The price includes an ethernet device with cables and modem router Or using a WIFI bridge complete units with all connections needed to complete and connect the monitoring system to existing data networks Ethernet in the hospital. • Supply, install and connect all AC power cables appropriately sized in accordance with the installation requirements and to connect the On-Grid inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 30KW from PV inverters capacity as minimum. In case the proposed PV inverters capacity results in extra kw than this is deemed to be accounted for the proposed ratio. Contract will be pay only 30KW. • The contractor must submit manufacturer warranty for each inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
C3	<p><u>Battery Inverter – 6KW:</u> Supply, install, connect and operate Battery Inverter compatible with on grid inverters with total rated power 6 KW with all necessary interface modules and connections for masters & slaves , electrical cables and data communication unit with Ethernet connection, connectable in parallel and modularly extendable. (Type is SMA or equivalent). The Battery Inverter must include the following concepts such as (Ac and DC coupling, High efficiency, intelligent battery management for maximum battery life, charge level calculation, extreme overload capability, and battery temperature sensing and battery current measurements). The unit rates include:</p> <ul style="list-style-type: none"> • Supply, install and connect Remote Control Units (RC Unit) for the installed battery inverters with all data & communication cables and connection needed to complete the job. • Supply, install and connect DC cables with appropriately sized in accordance with the installation requirements to connect the battery inverters with DC battery fuses box, The allowable voltage drop for DC cables between battery inverter and batteries less than 1%, the allowable voltage drop for DC cables between battery inverters and DC battery fuses box less than 1%. • Supply, install and connect all AC power cables for (AC1 & AC2) with appropriately sized in accordance with the installation requirements and to connect the Battery inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 6kw from Battery inverters capacity as minimum. In case the proposed battery inverters capacity results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 6KW. • The contractor must submit manufacturer warranty for each battery inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	No	3				

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
C4	<p>Battery Bank : Supply, install, connect and operate VRLA tubular design deep cycle batteries, the total demand energy is 150 KWh, @ C10 , 1.8V per cell, 2800-3000 cycle @ C10. The battery bank voltage is 48 Vdc, each battery 2 volt. (Type is EUROPE MADE BRAND NAME) The batteries must provide high-quality and achieving superior performance, the manufacturing date must be new and not more than 6 months, suitable type for PV solar renewable system applications, designed Service Life 10 years with low internal resistance, designed to be deeply discharged. The Battery should provide benefits of being maintenance free, case flame retardant & non-hazardous. The unit rates include supply, install & connect the followings:</p> <ul style="list-style-type: none"> • All necessary DC cables between the batteries together and to the battery fuse box to have a complete operational circuit with all bus bars, conduits, clamps, stainless steel bolts, washers and cable end terminations and all needed materials to complete the job. All DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • Battery Banks original rack from the same manufacturer of the batteries with dividers and all needed accessories to finish the job. the rack must be enough to carry all the weight of the required batteries for the system. • Battery temperature sensor (BTS) with all needed connections and fuse protection. • The contractor has to obtain minimum 150 KWh functional battery bank. In case the proposed batteries in stings provide more capacity. The contract will pay only for 150KWh and contractor will include in his price the extra KWh on the relevant ratio. • The contractor must submit manufacturer warranty for each battery cell as recommended by manufacturer not less than two years. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	KWh	150				
C5	<p>PV Mounting structure: Supply and install Module mounting structure from hot galvanized steel Angles foundation suitable to the dimension of selected PV modules and PV numbers, the mounting provides a fixed inclination of the modules 26-30 degree with vertical supports, plates, screws and casting concrete foundations B250 (0.3*0.3*0.3) m3 for each leg, The PV structure must covered with approved type of Epoxy painting with approved color with painting layers approved types with all testing, the structure includes bracing and double hot galvanized angles for dividers. The contractor should submit shop drawings with calculation sheets to the mounting structures and the foundations, which must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads, weight of the devices and equipment etc.) that might occur according to the Site conditions. The mounting structure components are connected together to stabilize the structure . The price includes retesting Leakage of the roof insulation for the whole roof before starting works and after completion of installation of PV system and making good of any damages to insulation membrane if occurred. All works and materials must be according to drawings, specifications and supervisor instructions and approval.</p>	L.S	1				
C6	<p>Battery Fuse Box: Supply, install, connect and operate battery DC fuse box (500*375*225 mm) as an external DC distributor to protect the battery banks connections of the battery inverters . (Type is EUROPE MADE BRAND NAME). The box must be water proof protection with IP65, simple wall mounting, suitable connections for three battery inverters and up to six DC connections inlet on the battery side, the item includes (2 LTL 250/400A , 6 fuses 250A DC Types) , cable glands, with all necessary DC cables from the battery bank and to the fuse box and from the fuse box to the battery inverters to have a complete operational circuit with all conduits, clamps, stainless steel bolts, washers and cable end terminations needed to fix, all DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • The contractor must submit manufacturer warranty for each battery fuse box for a period not less than 1 years. All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
C7	AC Air Condition: Supply , install, test and commission air conditioning Inverter type Split Unit, composed of outdoor unit. filled with environment friendly refrigerant such as (R410, R407c,..) and COP not less than 3.5,Condensing unit shall be complete with Inverter compressor/s & air cooled condenser with fan, Well supported on hot galvanized steel base on the roof, indoor unit with plasma filter as indicated on drawings to be tights installed completed with all necessary supports, hangers, drain pipes from indoor unit to the nearest floor drain, (PVC Ø 1"), copper pipes , sleeves, thermostat , Remote control and including supply and install all required electrical power cables from SDB inside the room to the unit according to drawings and engineers approval. CAPACITY:(18000 BTU/HR). (Type is ELECTRA or equivalent) .	No	1				
C8	Wall mounted exhaust: Supply , install and operate 6" diameter 250m3/hr. wall mounted extract fan with louver and all needed material ,cables, pipes, boxes...etc. The work includes supply and install control unit with all required Timer 24,Relays, selector switch, Circuit breakers and all protection devices to operate automatic to complete the work as per the engineer instructions. (Type is Venta or equivalent)	No	1				
C9	3-Phase SMART Bidirectional Digital KWH Meter: Supply,install,connect and operate 3-phase 3x100 A SMART Bidirectional digital KWH meter, with 3 CT's,LTL 3(32/6A) any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Holley or equivalent) -OPTIONAL	No	1				
C10	3-Phase Digital KWH Meter: Supply,install,connect and operate 3-phase digital KWH meter, with all 3 CT's,LTL 3(32/6A) and any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Schneider MP 3210 or equivalent)	No	2				
C11	Earthing System For AC Side: Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the unite rates include (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the AC system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.	Unit	1				
C12	Earthing for PV Structure: Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the item includes (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the PV system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.	Unit	1				
Total Of Bill (3) - USS							

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No. (4) PV Solar System for Emirati RC maternity Hospital .							
	<u>General:</u> <ul style="list-style-type: none">• The system is designed to cover the Essential loads for Laboratory Department in Emirati RC Maternity Hospital.• The system will be grid interactive connected with battery backup system, which will allow many power sources options. The system will receive surplus Electricity from the grid when loads are being more than the generated from PV, then it will supply surplus electricity to the batteries when PV generates KW more than the loads, the batteries can be charged from Grid if PV output loads is not enough.• Contractor shall submit Detailed shop drawings for all architectural, civil, electrical and a complete photovoltaic solar system works, including (single line diagram, Equipment Layout inside room, PV distribution panels, DC & AC distribution bards, PV Arrays lay out and battery backup systems connections and cables, wires cross section...etc.) for the proposed PV system to be approved by the Engineer before commencement of the work.• Contractor shall submit the catalogs of each component with all certified calculation sheets and testing results for the requested specifications stated in Bill of Quantity.• The contractor shall submit the Manufacture testing certificate, country of origin, certified characteristics, test performance curves, spare parts regular (as recommended by manufacturer , maintenance manuals and manufacturers warranty for each components of the system.• As-built drawings and writing setting parameters shall be submitted after handing over the work and approved by the supervision team.• All junction boxes and DBs will be lockable type.						
*	<ul style="list-style-type: none">• Upon completion of the installation, the contractor shall organize an on site training program for operation and maintenance purpose involving nominated employer's staff. Such a program shall be carried out during the commissioning phase. The cost of the training shall be deemed to have been included in the tendered rates.• The price includes all builders' works, making good and reinstatement including necessary materials and workmanship as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.• The work includes maintenance period for each device according to BOQ and Specifications.						
*	<ul style="list-style-type: none">• All the following items include supply, install, commission and operate of the following items with all the required materials to complete the job in accordance with the BOQ, drawings, specifications and the supervising engineer's instructions.						

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
D1	<p><u>PV Modules – 20 KWp:</u> Supply, install, connect and operate Mono Crystalline Photovoltaic Solar Modules with all materials needed to have complete job ready for installing high quality PV modules with total arrays capacity to achieve 20 KWp. The unit rates include supply, install & connect the following:</p> <ul style="list-style-type: none"> Water proof PV combiner boxes IP65 for all connected strings including 1000V (DC double pole Fuses, DC double pole surge arrestors, bus bars, terminals, PVC ducts to be fixed under the PV modules, supports, clamps & labels suitable to the PV arrays loads. Solar DC cables appropriately sized to connect the PV solar modules together and to the combiner box and from combiner box to the grid inverters directly to have a complete operational circuit with all conduits, clamps, hot galvanized channel trays with covers along the DC cable routing and cable end terminations which shall be DC plug and socket connectors. The DC cables must be sized in accordance with the installation requirements applicable on site, the allowable voltage drop for DC cables between PV Arrays and grid inverter less than 1%. <p>•The contractor has to obtain 20KWp from PV system as minimum. In case the proposed PV modules results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 20KWp.</p> <p>• The unit rates include solving all the obstacles that will face on the hospital roofs such as water tanks, desalination unit, solar system including all mirrors, stands and all other components, water and electrical network, air-condition units and any other obstacles. The contractor will be responsible for dismantling, removing and re-installing them in other places and operate them successfully with all needed new materials and workmanship to provide the required space to install the structures for the photovoltaic panels as well as removal of unwanted materials to dump sites approved by the engineer to complete the job successfully.</p> <p>• Contractor must submit all the required certificates for each PV solar panel as well as manufacturer warrantee as recommended by manufacturer.</p> <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	KWp	20				
D2	<p><u>Inverters – 30 KW:</u> Supply, install, connect and operate DC/AC On-Grid 3-phase Inverters with data communication unit with Ethernet connection . (Type is SMA or equivalent). The inverters must be suited to any PV module configuration, and depending on the system design and installation proposed and for the future extended also.</p> <p>The DC max power input rating should be equal or more than 30 KW of the PV modules capacity at standard test condition. The inverter unit shall be suitable for indoor and outdoor installations with IP65.</p> <p>The inverter AC nominal power output rating must be equal or greater than 30 KW compatible with the AC loads design. The inverters must include the safety and communication management devices such as (cutting edge grid management functions, integrated plant control, Ground fault and grind monitoring, dc reverse polarity protection n, DC side disconnector device, Graphic Display, DC surge arrestor type 2, Multistring capability, DC input voltage up to 1000 V DC) to ensure max availability. Total inverters capacity must be divided at least 2 inverters. The unit rates include :</p> <ul style="list-style-type: none"> Supply, install, connect and operate (Communication unit (monitoring device) with power supply inside water proof IP 65 box for system monitoring, recording data and controlling PV system compatible with the inverters, with all needed materials, DC & Ac power supply unit, interface modules, data & communication cables and ducts to connect all inverters and other devices to the monitoring system. The price includes an ethernet device with cables and modem router Or using a WIFI bridge complete units with all connections needed to complete and connect the monitoring system to existing data networks Ethernet in the hospital. Supply, install and connect all AC power cables appropriately sized in accordance with the installation requirements and to connect the On-Grid inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. <p>•The contractor has to obtain 30KW from PV inverters capacity as minimum. In case the proposed PV inverters capacity results in extra kw than this is deemed to be accounted for the proposed ratio. Contract will be pay only 30KW.</p> <p>• The contractor must submit manufacturer warranty for each inverter as recommended by manufacturer.</p> <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
D3	<p>Battery Inverter – 6KW: Supply, install, connect and operate Battery Inverter compatible with on grid inverters with total rated power 6 KW with all necessary interface modules and connections for masters & slaves , electrical cables and data communication unit with Ethernet connection, connectable in parallel and modularly extendable. (Type is SMA or equivalent). The Battery Inverter must include the following concepts such as (Ac and DC coupling, High efficiency, intelligent battery management for maximum battery life, charge level calculation, extreme overload capability, and battery temperature sensing and battery current measurements). The unit rates include:</p> <ul style="list-style-type: none"> • Supply, install and connect Remote Control Units (RC Unit) for the installed battery inverters with all data & communication cables and connection needed to complete the job. • Supply, install and connect DC cables with appropriately sized in accordance with the installation requirements to connect the battery inverters with DC battery fuses box, The allowable voltage drop for DC cables between battery inverter and batteries less than 1%, the allowable voltage drop for DC cables between battery inverters and DC battery fuses box less than 1%. • Supply, install and connect all AC power cables for (AC1 & AC2) with appropriately sized in accordance with the installation requirements and to connect the Battery inverters with PV AC distribution board with all needed conduits, clamps, hot galvanized trays and cable terminations end, the allowable voltage drop for AC cables between inverters and PV AC distribution board not less than 1%. •The contractor has to obtain 6kw from Battery inverters capacity as minimum. In case the proposed battery inverters capacity results in extra KW than this is deemed to be accounted for the proposed ratio. Contract will be pay only 6KW. • The contractor must submit manufacturer warranty for each battery inverter as recommended by manufacturer. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instructions and approval.</p>	No	3				
D4	<p>Battery Bank : Supply, install, connect and operate VRLA tubular design deep cycle batteries, the total demand energy is 150 KWh, @ C10 , 1.8V per cell, 2800-3000 cycle @ C10. The battery bank voltage is 48 Vdc, each battery 2 volt. (Type is EUROPE MADE BRAND NAME) The batteries must provide high-quality and achieving superior performance, the manufacturing date must be new and not more than 6 months, suitable type for PV solar renewable system applications, designed Service Life 10 years with low internal resistance, designed to be deeply discharged. The Battery should provide benefits of being maintenance free, case flame retardant & non-hazardous. The unit rates include supply, install & connect the followings:</p> <ul style="list-style-type: none"> • All necessary DC cables between the batteries together and to the battery fuse box to have a complete operational circuit with all bus bars, conduits, clamps, stainless steel bolts, washers and cable end terminations and all needed materials to complete the job. All DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • Battery Banks original rack from the same manufacturer of the batteries with dividers and all needed accessories to finish the job. the rack must be enough to carry all the weight of the required batteries for the system. • Battery temperature sensor (BTS) with all needed connections and fuse protection. • The contractor has to obtain minimum 150 KWh functional battery bank. In case the proposed batteries in stings provide more capacity. The contract will pay only for 150KWh and contractor will include in his price the extra KWh on the relevant ratio. • The contractor must submit manufacturer warranty for each battery cell as recommended by manufacturer not less than two years. <p>All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	KWh	150				

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
D5	<p><u>PV Mounting structure:</u> Supply and install Module mounting structure from hot galvanized steel Angles foundation suitable to the dimension of selected PV modules and PV numbers, the mounting provides a fixed inclination of the modules 26-30 degree with vertical supports, plates, screws and casting concrete foundations B250 (0.3*0.3*0.3) m3 for each leg, The PV structure must covered with approved type of Epoxy painting with approved color with painting layers approved types with all testing, the structure includes bracing and double hot galvanized angles for dividers. The contractor should submit shop drawings with calculation sheets to the mounting structures and the foundations, which must be designed structurally to be suitable to withstand all static loads (weight of modules, wind loads, weight of the devices and equipment etc.) that might occur according to the Site conditions. The mounting structure components are connected together to stabilize the structure . The price includes retesting Leakage of the roof insulation for the whole roof before starting works and after completion of installation of PV system and making good of any damages to insulation membrane if occurred. All works and materials must be according to drawings, specifications and supervisor instructions and approval.</p>	L.S	1				
D6	<p><u>Battery Fuse Box:</u> Supply, install, connect and operate battery DC fuse box (500*375*225 mm) as an external DC distributor to protect the battery banks connections of the battery inverters . (Type is EUROPE MADE BRAND NAME). The box must be water proof protection with IP65, simple wall mounting, suitable connections for three battery inverters and up to six DC connections inlet on the battery side, the item includes (2 LTL 250/400A , 6 fuses 250A DC Types) , cable glands, with all necessary DC cables from the battery bank and to the fuse box and from the fuse box to the battery inverters to have a complete operational circuit with all conduits, clamps, stainless steel bolts, washers and cable end terminations needed to fix, all DC cables must be sized in accordance with the installation requirements applicable on site ,the allowable voltage drop must be less than 1%. • The contractor must submit manufacturer warranty for each battery fuse box for a period not less than 1 years. All works and materials must be according to the drawings, specifications and supervisor engineer instruction's and approval.</p>	Unit	1				
D7	<p><u>AC Air Condition:</u> Supply , install, test and commission air conditioning Inverter type Split Unit, composed of outdoor unit, filled with environment friendly refrigerant such as (R410, R407c,..) and COP not less than 3.5,Condensing unit shall be complete with Inverter compressor/s & air cooled condenser with fan, Well supported on hot galvanized steel base on the roof, indoor unit with plasma filter as indicated on drawings to be tights installed completed with all necessary supports, hangers, drain pipes from indoor unit to the nearest floor drain, (PVC Ø 1"), copper pipes , sleeves, thermostat , Remote control and including supply and install all required electrical power cables from SDB inside the room to the unit according to drawings and engineers approval. CAPACITY:(18000 BTU/HR). (Type is ELECTRA or equivalent) .</p>	No	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
D8	Wall mounted exhaust: Supply , install and operate 6" diameter 250m3/hr. wall mounted extract fan with louver and all needed material ,cables, pipes, boxes...etc. The work includes supply and install control unit with all required Timer 24,Relays, selector switch, Circuit breakers and all protection devices to operate automatic to complete the work as per the engineer instructions. (Type is Venta or equivalent)	No	1				
D9	3-Phase SMART Bidirectional Digital KWH Meter: Supply,install,connect and operate 3-phase 3x100 A SMART Bidirectional digital KWH meter, with 3 CT's,LTL 3(32/6A) any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Holley or equivalent) -OPTIONAL	No	1				
D10	3-Phase Digital KWH Meter: Supply,install,connect and operate 3-phase digital KWH meter, with all 3 CT's,LTL 3(32/6A) and any other material needed to have a complete job ,The KWh meter has monitoring LCD with all needed data & interface cables to connect with the Monitoring System .All works and materials must be according to the drawings, catalogues, specifications and supervisor engineer instruction's and approval. (Type is Schneider MP 3210 or equivalent)	No	2				
D11	Earthing System For AC Side: Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the unite rates include (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the AC system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.	Unit	1				
D12	Earthing for PV Structure: Supply,install,connect and operate complete independent earthing system for PV solar system, must be separated of the main earthing system to obtain 2 ohm max resistance. the item includes (all required copper electrodes 15mm2 driven into ground to achieve the resistance low than 2 ohm, manholes with iron cover, earth joints, clamps, ducts , conduits and 25 mm2 flexible earthing copper wires and cables from the PV system components to the electrodes and civil works with removing and re installing tiles with excavations and backfilling and all other civil works to match the existing to complete the job as specifications and supervisor engineer instruction's and approval.	Unit	1				
Total Of Bill (4) - US\$							

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No (5)							
Electrical Works For Shohada Al Aqsa Hospital							
	<p>General:</p> <ul style="list-style-type: none">• The items in general shall also include conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network are included in the unit price.• Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work.• As-built drawings shall be submitted after handing over the work.• All the electrical works shall be executed according to Standards, drawings, specifications and supervisor engineer instructions. <p>All installation shall be in accordance with :</p> <ul style="list-style-type: none">• The drawings , specifications and instructions and demands of the engineer.• The electricity law and electrical code requirements of the BRITISH Standards.• The contractor should refer to the drawings , specifications and other Contract Documents . <p>• The prices will be deemed to include for the full cost as described in all Documents.</p>						
E1	SOLAR POWER MAIN DISTRIBUTION BOARD (MDB)						
1	Supply, install and commission solar power PV distribution panel board (PVMDB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories and civil works to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent) .	unit	1				
	The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:						
2	Supply, install M.C.C.B 4x63A .(Type Moeller NZMN1-4-63/50A or approved equivalent).	No.	2				
3	Ditto, but MCB 4X63/50A. (Type is MOELLER FAZ-B 63-50/4 or approved equivalent).	No.	1				
4	Ditto, but MCB 4X32A. (Type is MOELLER FAZ-B 32/4 or approved equivalent).	No.	1				
5	Ditto, but MCB 4X25A. (Type is MOELLER FAZ-B 25/4 or approved equivalent).	No.	2				
6	Ditto, but MCB 3X32A. (Type is MOELLER FAZ-B 32/3 or approved equivalent).	No.	1				
7	Ditto, but MCB 2X32A. (Type is MOELLER FAZ-C 32/2 or approved equivalent).	No.	1				
8	Ditto, but MCB 2X32A. (Type is MOELLER FAZ-B 32/2 or approved equivalent).	No.	3				
9	Ditto, but RCD 2X40,0.03A. (Type is MOELLER RCCB 40/2/0.03 or approved equivalent).	No.	1				
10	Ditto, but LTL 3x100/63A with 63 fuses . (Type Moeller or approved equivalent).	Set	1				
11	Ditto, but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	5				
12	Ditto, but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	2				
13	Ditto, but RCD 4X63/0.03A. (Type is MOELLER RCCB 63/4/0.03 or equivalent).	No.	1				
14	Supply, install ac Surge protection device of 40KA short circuit capacity to secure the over all system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories. (Type Moeller or equivalent.)	No.	1				
15	Supply and install Digital Multi Meter with 3 CT's and with LTL fuse 3x36/6A (Type is ENTES or equivalent).	Set	1				
16	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
E2	SOLAR POWER MAIN ATS DISTRIBUTION BOARD (ATS-DB)						
1	Supply, install and commission solar power main ATS distribution panel board (ATS-DB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent). The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:	Unit	1				
2	Supply &Install Digital multimeter complete with needed C.Ts (80/5A) and with needed protection LTL 3x6A and all needed works and wirings to complete the job according to specifications and supervisor engineer instructions.	Set	1				
3	Supply & install 3 PH Manual Transfere Switch (MTS) 100A/ 4poles - 400V Type Socomec complete or approved equivalent with external hand, all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions.	Set	1				
4	Supply, install and commission Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two contactors 80A / 4 poles @AC3 complete with (Mechanical & electrical Interlock) all needed ACU control unit includes timers , relays, adjustable under/over voltage relay with protections...etc. ,or approved equivalent as per drawings with all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions. (Type is Moeller or equivalent).	Unit	1				
5	Supply, install M.C.C.B 4x63/40A .(Type Moeller NZMN1-4-63/40A or approved equivalent).	No.	4				
6	Ditto, but M.C.C.B 3x63/40A . (Type Moeller NZMB1-63/40A or approved equivalent).	No.	1				
7	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses.	Set	3				
8	Supply and install 3 ph. Failure, loss of phase, under voltage ,over voltage and phase sequence relay(LRST), adjustable type with four poles contactor 4*80A Moeller and all needed protection devices ,control devices and accessories approved type according to drawings & supervisor engineer instructions.	Unit	2				
9	Supply and install Phase failure, loss of phase, under voltage, and phase sequence relay, with LTL fuse3x36/6A and with all necessary control. Type Foxtam or approved equivalent	Set	1				
10	Supply, install MCB 3x32/25A .(Type is MOELLER FAZ-C 32-25/3 or approved equivalent).	No.	2				
11	Ditto, but MCB 3x20/16A .(Type is MOELLER FAZ-C 20-16/3 or approved equivalent).	No.	2				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
E3	SOLAR SUB DISTRIBUTION BOARD (SDB-LAB)						
1	Supply, install and commission solar sub distribution panel board (SDB-Lab) of size 80x60x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	1				
2	Supply, install MCB 3x40A .(Type is MOELLER FAZ-C 40/3 or approved equivalent).	No.	2				
3	Ditto, but MCB 3X32. (Type is MOELLER FAZ-C 32/3 or approved equivalent).	No.	1				
4	Ditto, but MCB 3X16. (Type is MOELLER FAZ-C 16/3 or approved equivalent).	No.	1				
5	Ditto, but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	12				
6	Supply, install Manual Changeover Switch (MTS) 4X40.(Type is Hager or equivalent).	No.	1				
7	Ditto, but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	1				
8	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				
E4	SOLAR SUB DISTRIBUTION BOARD (SDB1.2)						
1	Supply, install and commission solar sub distribution panel board (SDB) of size 60x40x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	2				
2	Supply and install plastic board 24 C.B IP 65 .The item includes busbars, wiring, insulations, plastic ducts, terminal blocks and all necessary civil works ,equipment's for installation and operation as per drawings, specifications and engineer instructions.	Unit	2				
E5	CABLES AND CODUITES						
	Supply, install and connect of the following XLPE CU cables with all required electrical and civil works including PVC ducts, hot galvanized channel cable trays with all accessories and angles supports for the routing of the cables from power source to loads distribution boards. Cable must be fixed properly with using plastic clamps with labeling. The works include dismantling and re install and connect the existing cables if required. All works must be according to specifications, instructions, and demands of the supervising engineer. as follows:						
1	XLPE multi core Cu cable (3x25+16+1*16 mm2) mm2.	L.M.	50				
2	XLPE multi core Cu cable (5x16 mm2) mm2.	L.M.	120				
3	XLPE multi core Cu cable 5x10 mm2 .	L.M.	70				
4	XLPE multi core Cu cable 5x6 mm2 .	L.M.	70				
5	XLPE cable 5x4 mm2	L.M.	20				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
E6	MISCELLANEOUS						
1	Supply, install, connect and test AC LED tube lamp T8, 120 cm, (14-16) W, Cap-Base G13/G5,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 100 Lm/W ,European Brand Name . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	100				
2	Supply, install, connect and test AC LED tube lamp T8, 60 cm, 9W, Cap-Base G13/G5 ,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 120 Lm/W ,European made . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	80				
3	Supply, install, connect and test Ac LED lamp 10-12 W, Flux more than 800 Lumen, Color temperature 3000-4500, Power factor > 95%.(Type is NISKO or equivalent).	NO.	20				
4	Supply, install, connect and test Led lighting fixture 2x18w complete with AC LED tube lamp T8, 120 cm, 18W, 160-260 Volt, more than 40000H Philips lamps, with PVC conduits, Boxes, fixing screws (Galv.) and wiring. (Type is GA'ASH or equivalent)	No.	3				
5	Ditto but round bulk head light, water proof IP54, with LED lighting lamp 14W . (Type is GAASH or equivalent).	No.	1				
6	Supply, install connect and, testing single pole one way switch with covers, 220v, 13A, complete with PVC conduits, ducts, Boxes, wiring, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chorus or equivalent)	No.	1				
7	Ditto, but double pole switch.(Type is Gewiss-Chorus or equivalent)	No.	1				
8	Supply, install connect and, testing single socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits, ducts, Boxes, wiring 3x2.5mm2, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chorus or equivalent)	No.	2				
9	Ditto, but for AC split units 20A with switch socket outlet, with XLPE Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
10	Supply, install connect and, testing complete STP RJ45 Data outlet (Type is Premium Line or equivalent). The unit rates include supply, install and terminate Cat 6 SFTP cable (D-Link or equivalent) from outlet inside the room to the nearest patch panel in the hospital with all needed ducts , boxes, covers and all needed connection and accessories to complete the job .	No.	1				
11	Ditto, but AC split units 20A with switch socket outlet with xlpe Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
12	Supplying and installing Portable ABC Powder Fire Extinguisher as per engineer instructions and the following specifications: <ul style="list-style-type: none"> • 6kg • 14Bar operating pressure • Suitable to Electrical equipment fires • Up to 6m range of throw The item includes all necessary equipment's for installation and operation as per specifications and engineer instructions.	No.	1				
13	Supply , install and operate water spray pump of 1.8kW and 120bar, 220V for the used of washing the PV modules with all control and protection. <ul style="list-style-type: none"> • the item includes all required heavy flexible 3x2.5 mm2 power & control cables with length from the nearest DB to the PV panels, and all required 1/2 inch water pressure pipes 50m and connections from the nearest source in order to operate the pump with auto stop function. The item includes all necessary equipment's, materials, accessories and workmanship for installation and operation as per specifications and engineer instructions.	L.S	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
14	Supply and test laptop 6th Generation Intel® Core™ i5 processor. (Type is HP or equivalent) as per the following specifications: CPU 6th Generation Intel® Core™ i5 processor. Chipset Chipset is integrated with processor. memory 4 GB DDR4-2133 SDRAM. Internal drive 500 GB SATA (7200 rpm) 15.6" with Full Keyboard with integrated numeric keypad Graphics Integrated: Intel® HD Graphics Ports 2 USB 3.1 Gen 1 1 USB 2.0 1 HDMI 1.4b 1 VGA 1 RJ-45 1 headphone/microphone combo 1 AC power 10 Expansion slots 1 multi-format digital media reader (Supports SD, SDHC, SDXC.)	Unit	1				
	Audio 2 Integrated stereo speakers Camera HP True Vision HD camera; HP VGA camera 11,14 Keyboard Full-sized island-style with numeric keypad Pointing device Touchpad with multi-touch gestures enabled. Taps enabled as default Network interface GbE NIC (10/100/1000) Wireless Realtek 802.11b/g/n (1x1) and Bluetooth® 4.2 Combo Intel® Dual Band Wireless-AC 3168 802.11 a/b/g/n/ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo (non-vPro™) Energy efficiency ENERGY STAR® certified and EPEAT® Silver registered configurations available 21 Power supply 65 W AC adapter Battery type 4-cell, 41 Wh Li-ion. Free Dos/1Year warranty./with case, brand name wireless mouse.						
15	Supply, Install & Commissioning of 3KVA Online UPS -1 Ph for Lab instruments (Type is Gamatronic or Equivalent). • True on-line sine design, pure sine wave output without pollution • Intelligent DCP/ CPU design with 0.98 PFC • Local and remote-control capability with RS232 or UBS. • Port compatible with SNMP. • Self-diagnosis and protection function. Output 2.4 KWatts / 3.0 kVA Max Configurable Power (Watts) 2.4 KWatts / 3.0 kVA Nominal Output Voltage Single phase 220V , ±1% Zero Transfer time ensuring the reliability of the load operation. Output Voltage Distortion Output Frequency (sync to mains) 50 Hz Maximum Output Current 13A Output Voltage THD < 2% linear load and Bypass Built-in Maintenance Bypass Input Nominal Input Voltage Single phase 220V Input frequency 50 Hz Input Connections Hard Wire 3-wire (1PH + N + G) Input voltage range for main operations 160 - 276 V Maximum Input Current 13 A Input Power Factor at Full Load 0.98 Approvals (Standards) / CE, EN/IEC 62040-1/2, EN/IEC 62040-2, EN/IEC 62040-3, Standard warranty 1 year	L.S	1				
	Total Of Bill (5) - USS						

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No (6)							
Electrical Works For Al-Najjar Hospital							
	<p>General:</p> <ul style="list-style-type: none">• The items in general shall also include conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network are included in the unit price.• Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work.• As-built drawings shall be submitted after handing over the work.• All the electrical works shall be executed according to Standards, drawings, specifications and supervisor engineer instructions. <p>All installation shall be in accordance with :</p> <ul style="list-style-type: none">• The drawings , specifications and instructions and demands of the engineer.• The electricity law and electrical code requirements of the BRITISH Standards.• The contractor should refer to the drawings , specifications and other Contract Documents . <p>• The prices will be deemed to include for the full cost as described in all Documents.</p>						
F1	SOLAR POWER MAIN DISTRIBUTION BOARD (MDB)						
1	Supply, install and commission solar power PV distribution panel board (PVMDB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories and civil works to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent) . The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:	unit	1				
2	Supply, install M.C.C.B 4x63A .(Type Moeller NZMN1-4-63/50A or approved equivalent).	No.	2				
3	Ditto, but MCB 4X63/50A. (Type is MOELLER FAZ-B 63-50/4 or approved equivalent).	No.	1				
4	Ditto, but MCB 4X32A. (Type is MOELLER FAZ-B 32/4 or approved equivalent).	No.	1				
5	Ditto, but MCB 4X25A. (Type is MOELLER FAZ-B 25/4 or approved equivalent).	No.	2				
6	Ditto, but MCB 3X32A. (Type is MOELLER FAZ-B 32/3 or approved equivalent).	No.	1				
7	Ditto, but MCB 2X32A. (Type is MOELLER FAZ-C 32/2 or approved equivalent).	No.	1				
8	Ditto, but MCB 2X32A. (Type is MOELLER FAZ-B 32/2 or approved equivalent).	No.	3				
9	Ditto, but RCD 2X40,0.03A. (Type is MOELLER RCCB 40/2/0.03 or approved equivalent).	No.	1				
10	Ditto, but LTL 3x100/63A with 63 fuses . (Type Moeller or approved equivalent).	Set	1				
11	Ditto, but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	5				
12	Ditto, but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	2				
13	Ditto, but RCD 4X63/0.03A. (Type is MOELLER RCCB 63/4/0.03 or equivalent).	No.	1				
14	Supply, install ac Surge protection device of 40KA short circuit capacity to secure the over all system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories. (Type Moeller or equivalent.)	No.	1				
15	Supply and install Digital Multi Meter with 3 CT's and with LTL fuse 3x36/6A (Type is ENTES or equivalent).	Set	1				
16	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
F2	SOLAR POWER MAIN ATS DISTRIBUTION BOARD (ATS-DB)						
1	Supply, install and commission solar power main ATS distribution panel board (ATS-DB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent). The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:	Unit	1				
2	Supply &Install Digital multimeter complete with needed C.Ts (80/5A) and with needed protection LTL 3x6A and all needed works and wirings to complete the job according to specifications and supervisor engineer instructions.	Set	1				
3	Supply & install 3 PH Manual Transfere Switch (MTS) 100A/ 4poles - 400V Type Socomec complete or approved equivalent with external hand, all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions.	Set	1				
4	Supply, install and commission Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two contactors 80A / 4 poles @AC3 complete with (Mechanical & electrical Interlock) all needed ACU control unit includes timers , relays, adjustable under/over voltage relay with protections...etc. ,or approved equivalent as per drawings with all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions. (Type is Moeller or equivalent).	Unit	1				
5	Supply, install M.C.C.B 4x63/40A .(Type Moeller NZMN1-4-63/40A or approved equivalent).	No.	4				
6	Ditto, but M.C.C.B 3x63/40A . (Type Moeller NZMB1-63/40A or approved equivalent).	No.	1				
7	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses.	Set	3				
8	Supply and install 3 ph. Failure, loss of phase, under voltage ,over voltage and phase sequence relay(LRST), adjustable type with four poles contactor 4*80A Moeller and all needed protection devices ,control devices and accessories approved type according to drawings & supervisor engineer instructions.	Unit	2				
9	Supply and install Phase failure, loss of phase, under voltage, and phase sequence relay, with LTL fuse3x36/6A and with all necessary control. Type Foxtam or approved equivalent	Set	1				
10	Supply, install MCB 3x32/25A .(Type is MOELLER FAZ-C 32-25/3 or approved equivalent).	No.	2				
11	Ditto, but MCB 3x20/16A .(Type is MOELLER FAZ-C 20-16/3 or approved equivalent).	No.	2				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
F3	SOLAR SUB DISTRIBUTION BOARD (SDB-LAB)						
1	Supply, install and commission solar sub distribution panel board (SDB-Lab) of size 80x60x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	1				
2	Supply, install MCB 3x40A .(Type is MOELLER FAZ-C 40/3 or approved equivalent).	No.	2				
3	Ditto, but MCB 3X32. (Type is MOELLER FAZ-C 32/3 or approved equivalent).	No.	1				
4	Ditto, but MCB 3X16. (Type is MOELLER FAZ-C 16/3 or approved equivalent).	No.	1				
5	Ditto, but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	12				
6	Supply, install Manual Changeover Switch (MTS) 4X40.(Type is Hager or equivalent).	No.	1				
7	Ditto, but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	1				
8	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				
F4	SOLAR SUB DISTRIBUTION BOARD (SDB1,2)						
1	Supply, install and commission solar sub distribution panel board (SDB) of size 60x40x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	2				
2	Supply and install plastic board 24 C.B IP 65 .The item includes busbars, wiring, insulations, plastic ducts, terminal blocks and all necessary civil works ,equipment's for installation and operation as per drawings, specifications and engineer instructions.	Unit	2				
F5	CABLES AND CODUITES						
	Supply, install and connect of the following XLPE CU cables with all required electrical and civil works including PVC ducts, hot galvanized channel cable trays with all accessories and angles supports for the routing of the cables from power source to loads distribution boards. Cable must be fixed properly with using plastic clamps with labeling. The works include dismantling and re install and connect the existing cables if required. All works must be according to specifications, instructions, and demands of the supervising engineer. as follows:						
1	XLPE multi core Cu cable (3x25+16+1*16 mm2) mm2.	L.M.	70				
2	XLPE multi core Cu cable (5x16 mm2) mm2.	L.M.	120				
3	XLPE multi core Cu cable 5x10 mm2 .	L.M.	70				
4	XLPE multi core Cu cable 5x6 mm2 .	L.M.	70				
5	XLPE multi core Cu cable 5x4 mm2 .	L.M.	20				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
F6	MISCELLANEOUS						
1	Supply, install, connect and test AC LED tube lamp T8, 120 cm, (14-16) W, Cap-Base G13/G5,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 100 Lm/W ,European Brand Name . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	50				
2	Supply, install, connect and test AC LED tube lamp T8, 60 cm, 9W, Cap-Base G13/G5 ,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 120 Lm/W ,European made . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	100				
3	Supply, install, connect and test Ac LED lamp 10-12 W, Flux more than 800 Lumen, Color temperature 3000-4500, Power factor > 95%.(Type is NISKO or equivalent).	NO.	20				
4	Supply, install, connect and test Led lighting fixture 2x18w complete with AC LED tube lamp T8, 120 cm, 18W, 160-260 Volt, more than 40000H Philips lamps, with PVC conduits, Boxes, fixing screws (Galv.) and wiring. (Type is GA'ASH or equivalent)	No.	3				
5	Ditto but round bulk head light, water proof IP65, with LED lighting lamp 16W . (Type is GAASH or equivalent).	No.	1				
6	Supply, install connect and, testing single pole one way switch with covers, 220v, 13A, complete with PVC conduits, ducts, Boxes, wiring, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chorus or equivalent)	No.	1				
7	Ditto, but double pole switch.(Type is Gewiss-Chorus or equivalent)	No.	1				
8	Supply, install connect and, testing single socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits, ducts, Boxes, wiring 3x2.5mm2, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chorus or equivalent)	No.	2				
9	Ditto, but for AC split units 20A with switch socket outlet, with XLPE Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
10	Supply, install connect and, testing complete STP Rj45 Data outlet (Type is Premium Line or equivalent). The unit rates include supply, install and terminate Cat 6 SFTP cable (D-Link or equivalent) from outlet inside the room to the nearest patch panel in the hospital with all needed ducts , boxes, covers and all needed connection and accessories to complete the job .	No.	1				
11	Ditto, but AC split units 20A with switch socket outlet with xlpe Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
12	<p>Supplying and installing Portable ABC Powder Fire Extinguisher as per engineer instructions and the following specifications:</p> <ul style="list-style-type: none"> • 6kg • 14Bar operating pressure • Suitable to Electrical equipment fires • Up to 6m range of throw <p>The item includes all necessary equipment's for installation and operation as per specifications and engineer instructions.</p>	No.	1				
13	<p>Supply, install and operate water spray pump of 1.8kW and 120bar, 220V for the used of washing the PV modules with all control and protection.</p> <ul style="list-style-type: none"> • the item includes all required heavy flexible 3x2.5 mm2 power & control cables with length from the nearest DB to the PV panels, and all required 1/2 inch water pressure pipes 50m and connections from the nearest source in order to operate the pump with auto stop function. <p>The item includes all necessary equipment's, materials, accessories and workmanship for installation and operation as per specifications and engineer instructions.</p>	L.S	1				
14	<p>Supply, Install & Commissioning of 3KVA Online UPS -1 Ph for Lab instruments (Type is Gamatronic or Equivalent).</p> <ul style="list-style-type: none"> • True on-line sine design, pure sine wave output without pollution • Intelligent DCP/ CPU design with 0.98 PFC • Local and remote-control capability with RS232 or UBS. • Port compatible with SNMP. • Self-diagnosis and protection function. <p>Output</p> <p>2.4 KWatts / 3.0 kVA Max Configurable Power (Watts) 2.4 KWatts / 3.0 kVA Nominal Output Voltage Single phase 220V , ±1% Zero Transfer time ensuring the reliability of the load operation. Output Voltage Distortion Output Frequency (sync to mains) 50 Hz Maximum Output Current 13A Output Voltage THD < 2% linear load and Bypass Built-in Maintenance Bypass</p> <p>Input</p> <p>Nominal Input Voltage Single phase 220V Input frequency 50 Hz</p> <p>Input Connections Hard Wire 3-wire (1PH + N + G) Input voltage range for main operations 160 - 276 V Maximum Input Current 13 A Input Power Factor at Full Load 0.98 Approvals (Standards) / CE, EN/IEC 62040-1/2, EN/IEC 62040-2, EN/IEC 62040-3, Standard warranty 1 year</p>	L.S	1				
Total Of Bill (6) - US\$							

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No (7)							
Electrical Works For Beit Hanoun Hospital							
	<p>General:</p> <ul style="list-style-type: none">• The items in general shall also include conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network are included in the unit price.• Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work.• As-built drawings shall be submitted after handing over the work.• All the electrical works shall be executed according to Standards, drawings, specifications and supervisor engineer instructions. <p>All installation shall be in accordance with :</p> <ul style="list-style-type: none">• The drawings , specifications and instructions and demands of the engineer.• The electricity law and electrical code requirements of the BRITISH Standards.• The contractor should refer to the drawings , specifications and other Contract Documents . <p>• The prices will be deemed to include for the full cost as described in all Documents.</p>						
H1	SOLAR POWER MAIN DISTRIBUTION BOARD (MDB)						
1	Supply, install and commission solar power PV distribution panel board (PVMDB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories and civil works to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent) .	unit	1				
	The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:						
2	Supply, install M.C.C.B 4x63A .(Type Moeller NZMN1-4-63/50A or approved equivalent).	No.	2				
3	Ditto.but MCB 4X63/50A. (Type is MOELLER FAZ-B 63-50/4 or approved equivalent).	No.	1				
4	Ditto.but MCB 4X32A. (Type is MOELLER FAZ-B 32/4 or approved equivalent).	No.	1				
5	Ditto.but MCB 4X25A. (Type is MOELLER FAZ-B 25/4 or approved equivalent).	No.	2				
6	Ditto.but MCB 3X32A. (Type is MOELLER FAZ-B 32/3 or approved equivalent).	No.	1				
7	Ditto.but MCB 2X32A. (Type is MOELLER FAZ-C 32/2 or approved equivalent).	No.	1				
8	Ditto.but MCB 2X32A. (Type is MOELLER FAZ-B 32/2 or approved equivalent).	No.	3				
9	Ditto,but RCD 2X40,0.03A. (Type is MOELLER RCCB 40/2/0.03 or approved equivalent).	No.	1				
10	Ditto, but LTL 3x100/63A with 63 fuses . (Type Moeller or approved equivalent).	Set	1				
11	Ditto.but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	5				
12	Ditto,but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	2				
13	Ditto,but RCD 4X63/0.03A. (Type is MOELLER RCCB 63/4/0.03 or equivalent).	No.	1				
14	Supply, install ac Surge protection device of 40KA short circuit capacity to secure the over all system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories. (Type Moeller or equivalent.)	No.	1				
15	Supply and install Digital Multi Meter with 3 CT's and with LTL fuse 3x36/6A (Type is ENTES or equivalent).	Set	1				
16	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
H2	SOLAR POWER MAIN ATS DISTRIBUTION BOARD (ATS-DB)						
1	Supply, install and commission solar power main ATS distribution panel board (ATS-DB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	1				
	The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:						
2	Supply & Install Digital multimeter complete with needed C.Ts (80/5A) and with needed protection LTL 3x6A and all needed works and wirings to complete the job according to specifications and supervisor engineer instructions.	Set	1				
3	Supply & install 3 PH Manual Transfere Switch (MTS) 100A/ 4poles - 400V Type Socomec complete or approved equivalent with external hand, all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions.	Set	1				
4	Supply, install and commission Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two contactores 80A / 4 poles @AC3 complete with (Mechanical & elctrical Interlock) all needed ACU control unit includes timers , relays, adjustable under/over volatge relay with protections...etc ,or approved equivalent as per drawings with all needed fittings and accessoriesto complete the job according to specifications and supervisor engineer instructions. (Type is Moeller or equivalent).	Unit	1				
5	Supply, install M.C.C.B 4x63/40A .(Type Moeller NZMN1-4-63/40A or approved equivalent).	No.	4				
6	Ditto,but M.C.C.B 3x63/40A .(Type Moeller NZMB1-63/40A or approved equivalent).	No.	1				
7	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses.	Set	3				
8	Supply and install 3 ph. Failure,loss of phase, under voltage ,over voltage and phase sequence relay(LRST), adjustable type with four poles contactor 4*80A Moeller and all needed protection devices ,control devices and accessories approved type according to drawings & supervisor engineer instructions.	Unit	2				
9	Supply and install Phase failure, loss of phase, under voltage, and phase sequence relay, with LTL fuse3x36/6A and with all necessary control.type Foxtam or approved equivalent	Set	1				
10	Supply, install MCB 3x32/25A .(Type is MOELLER FAZ-C 32-25/3 or approved equivalent).	No.	2				
11	Ditto,but MCB 3x20/16A .(Type is MOELLER FAZ-C 20-16/3 or approved equivalent).	No.	2				
H3	SOLAR SUB DISTRIBUTION BOARD (SDB-LAB)						
1	Supply, install and commission solar sub distribution panel board (SDB-Lab) of size 80x60x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	1				
2	Supply, install MCB 3x40A .(Type is MOELLER FAZ-C 40/3 or approved equivalent).	No.	2				
3	Ditto,but MCB 3X32. (Type is MOELLER FAZ-C 32/3 or approved equivalent).	No.	1				
4	Ditto,but MCB 3X16. (Type is MOELLER FAZ-C 16/3 or approved equivalent).	No.	1				
5	Ditto,but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	12				
6	Supply, install Manual Changeover Switch (MTS) 4X40.(Type is Hager or equivalent).	No.	1				
7	Ditto,but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	1				
8	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
H4	SOLAR SUB DISTRIBUTION BOARD (SDB1.2)						
1	Supply, install and commission solar sub distribution panel board (SDB) of size 60x40x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	2				
2	Supply and install plastic board 24 C.B IP 65 .The item includes busbars, wiring, insulations, plastic ducts, terminal blocks and all necessary civil works ,equipment's for installation and operation as per drawings, specifications and engineer instructions.	Unit	2				
H5	CABLES AND CODUTES						
	Supply, install and connect of the following XLPE CU cables with all required electrical and civil works including PVC ducts, hot galvanized channel cable trays with all accessories and angles supports for the routing of the cables from power source to loads distribution boards. Cable must be fixed properly with using plastic clamps with labeling. The works include dismantling and re install and connect the existing cables if required. All works must be according to specifications, instructions, and demands of the supervising engineer. as follows:						
1	XLPE multi core Cu cable (3x25+16+1*16 mm2) mm2.	L.M.	70				
2	XLPE multi core Cu cable (5x16 mm2) mm2.	L.M.	120				
3	XLPE multi core Cu cable 5x10 mm2 .	L.M.	70				
4	XLPE multi core Cu cable 5x6 mm2 .	L.M.	70				
5	XLPE multi core Cu cable 5x4 mm2 .	L.M.	20				
H6	MISCELLANEOUS						
1	Supply, install, connect and test AC LED tube lamp T8, 120 cm, (14-16) W, Cap-Base G13/G5,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 100 Lm/W ,European Brand Name . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	50				
2	Supply, install, connect and test AC LED tube lamp T8, 60 cm, 9W, Cap-Base G13/G5 ,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 120 Lm/W ,european made . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	100				
3	Supply, install, connect and test Ac LED lamp 10-12 W, Flux more than 800 Lumen, Color temperature 3000-4500, Power factor > 95%.(Type is NISKO or equivalent).	NO.	20				
4	Supply, install, connect and test Led lighting fixture 2x18w complete with AC LED tube lamp T8, 120 cm, 18W, 160-260 Volt, more than 40000H Philips lamps, with PVC conduits, J,boxes, fixing screws (Galv.) and wiring. (Type is GA'ASH or equivalent)	No.	3				
5	Ditto but round bulk head light, water proof IP65, with LED lighting lamp 16W . (Type is GAASH or equivalent).	No.	1				
6	Supply, install connect and, testing single pole one way switch with covers, 220v, 13A, complete with PVC conduits, ducts, Boxes, wiring, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chourus or equivalent)	No.	1				
7	Ditto,but double pole switch.(Type is Gewiss-Chourus or equivalent)	No.	1				
8	Supply, install connect and, testing single socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits,ducts, J,boxes, wiring 3x2.5mm2, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chourus or equivalent)	No.	2				
9	Ditto,but for AC split units 20A with switch socket outlet, with XLPE Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
10	Supply, install connect and, testing complete STP RJ45 Data outlet (Type is Premium Line or equivalent). The unit rates include supply, install and terminate Cat 6 SFTP cable (D-link or equivalent) from outlet inside the room to the nearest patch panel in the hospital with all needed ducts , boxes, covers and all needed connection and accessories to complete the job.	No.	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
11	Ditto, but AC split units 20A with switch socket outlet with xlpe Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
12	Supplying and installing Portable ABC Powder Fire Extinguisher as per engineer instructions and the following specifications: <ul style="list-style-type: none"> • 6kg • 14Bar operating pressure • Suitable to Electrical equipment fires • Up to 6m range of throw The item includes all necessary equipments for installation and operation as per specifications and engineer instructions.	No.	1				
13	Supply, install and operate water spray pump of 1.8kW and 120bar, 220V for the used of washing the PV modules with all controll and protection. <ul style="list-style-type: none"> • the item includes all required heavy flexible 3x2.5 mm2 power & control cables with length from the nearest DB to the PV panels, and all required 1/2 inch water pressure pipes 50m and connections from the nearest source in order to operate the pump with auto stop function. The item includes all necessary equipments, materials, accessories and workmanship for installation and operation as per specifications and engineer instructions.	L.S	1				
14	Supply, Install & Commissioning of 3KVA Online UPS -1 Ph for Lab instruments (Type is Gamatronic or Equivalent) . <ul style="list-style-type: none"> • True on-line sine design, pure sine wave output without pollution • Intelligent DCP/ CPU design with 0.98 PFC • Local and remote-control capability with RS232 or UBS. • Port compatible with SNMP. • Self-diagnosis and protection function. Output <ul style="list-style-type: none"> 2.4 KWatts / 3.0 kVA Max Configurable Power (Watts) 2.4 KWatts / 3.0 kVA Nominal Output Voltage Single phase 220V , ±1% Zero Transfer time ensuring the reliability of the load operation. Output Voltage Distortion Output Frequency (sync to mains) 50 Hz Maximum Output Current 13A Output Voltage THD < 2% linear load and Bypass Built-in Maintenance Bypass Input <ul style="list-style-type: none"> Nominal Input Voltage Single phase 220V Input frequency 50 Hz Input Connections Hard Wire 3-wire (1PH + N + G) Input voltage range for main operations 160 - 276 V Maximum Input Current 13 A Input Power Factor at Full Load 0.98 Approvals (Standards) / CE, EN/IEC 62040-1/2, EN/IEC 62040-2, EN/IEC 62040-3, Standard warranty 1 year 	L.S	1				
Total Of Bill (7) - USS							

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No (8)							
Electrical Works For Emirati RC Hospital							
	<p>General:</p> <ul style="list-style-type: none">• The items in general shall also include conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network are included in the unit price.• Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work.• As-built drawings shall be submitted after handing over the work.• All the electrical works shall be executed according to Standards, drawings, specifications and supervisor engineer instructions. <p>All installation shall be in accordance with :</p> <ul style="list-style-type: none">• The drawings , specifications and instructions and demands of the engineer.• The electricity law and electrical code requirements of the BRITISH Standards.• The contractor should refer to the drawings , specifications and other Contract Documents . <p>• The prices will be deemed to include for the full cost as described in all Documents.</p>						
G1	SOLAR POWER MAIN DISTRIBUTION BOARD (MDB)						
1	Supply, install and commission solar power PV distribution panel board (PVMDB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories and civil works to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent) . The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:	unit	1				
2	Supply, install M.C.C.B 4x63A .(Type Moeller NZMN1-4-63/50A or approved equivalent).	No.	2				
3	Ditto, but MCB 4X63/50A. (Type is MOELLER FAZ-B 63-50/4 or approved equivalent).	No.	1				
4	Ditto, but MCB 4X32A. (Type is MOELLER FAZ-B 32/4 or approved equivalent).	No.	1				
5	Ditto, but MCB 4X25A. (Type is MOELLER FAZ-B 25/4 or approved equivalent).	No.	2				
6	Ditto, but MCB 3X32A. (Type is MOELLER FAZ-B 32/3 or approved equivalent).	No.	1				
7	Ditto, but MCB 2X32A. (Type is MOELLER FAZ-C 32/2 or approved equivalent).	No.	1				
8	Ditto, but MCB 2X32A. (Type is MOELLER FAZ-B 32/2 or approved equivalent).	No.	3				
9	Ditto, but RCD 2X40,0.03A. (Type is MOELLER RCCB 40/2/0.03 or approved equivalent).	No.	1				
10	Ditto, but LTL 3x100/63A with 63 fuses . (Type Moeller or approved equivalent).	Set	1				
11	Ditto, but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	5				
12	Ditto, but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	2				
13	Ditto, but RCD 4X63/0.03A. (Type is MOELLER RCCB 63/4/0.03 or equivalent).	No.	1				
14	Supply, install ac Surge protection device of 40KA short circuit capacity to secure the over all system (data and power) against lightnings and surges strikes, including connecting the device to earthing system and all needed accessories. (Type Moeller or equivalent.)	No.	1				
15	Supply and install Digital Multi Meter with 3 CT's and with LTL fuse 3x36/6A (Type is ENTES or equivalent).	Set	1				
16	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
G2	SOLAR POWER MAIN ATS DISTRIBUTION BOARD (ATS-DB)						
1	Supply, install and commission solar power main ATS distribution panel board (ATS-DB) with 30% free space, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent). The panel size must achieve at least 30% free space and the size of panel will be determined after shop drawings and that all internal components were agreed upon. The panel size shall include but not limited to the followings:	Unit	1				
2	Supply &Install Digital multimeter complete with needed C.Ts (80/5A) and with needed protection LTL 3x6A and all needed works and wirings to complete the job according to specifications and supervisor engineer instructions.	Set	1				
3	Supply & install 3 PH Manual Transfere Switch (MTS) 100A/ 4poles - 400V Type Socomec complete or approved equivalent with external hand, all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions.	Set	1				
4	Supply, install and commission Automatic Transfer Switch (ATS) 3 phase system. The ATS consist of two contactors 80A / 4 poles @AC3 complete with (Mechanical & electrical Interlock) all needed ACU control unit includes timers , relays, adjustable under/over voltage relay with protections...etc. ,or approved equivalent as per drawings with all needed fittings and accessories to complete the job according to specifications and supervisor engineer instructions. (Type is Moeller or equivalent).	Unit	1				
5	Supply, install M.C.C.B 4x63/40A .(Type Moeller NZMN1-4-63/40A or approved equivalent).	No.	4				
6	Ditto, but M.C.C.B 3x63/40A . (Type Moeller NZMB1-63/40A or approved equivalent).	No.	1				
7	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses.	Set	3				
8	Supply and install 3 ph. Failure, loss of phase, under voltage ,over voltage and phase sequence relay(LRST), adjustable type with four poles contactor 4*80A Moeller and all needed protection devices ,control devices and accessories approved type according to drawings & supervisor engineer instructions.	Unit	2				
9	Supply and install Phase failure, loss of phase, under voltage, and phase sequence relay, with LTL fuse3x36/6A and with all necessary control. Type Foxtam or approved equivalent	Set	1				
10	Supply, install MCB 3x32/25A .(Type is MOELLER FAZ-C 32-25/3 or approved equivalent).	No.	2				
11	Ditto, but MCB 3x20/16A .(Type is MOELLER FAZ-C 20-16/3 or approved equivalent).	No.	2				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
G3	SOLAR SUB DISTRIBUTION BOARD (SDB-LAB)						
1	Supply, install and commission solar sub distribution panel board (SDB-Lab) of size 80x60x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	1				
2	Supply, install MCB 3x40A .(Type is MOELLER FAZ-C 40/3 or approved equivalent).	No.	2				
3	Ditto, but MCB 3X32. (Type is MOELLER FAZ-C 32/3 or approved equivalent).	No.	1				
4	Ditto, but MCB 3X16. (Type is MOELLER FAZ-C 16/3 or approved equivalent).	No.	1				
5	Ditto, but MCB 1X10/16/20A. (Type is MOELLER FAZ-C10/16/20/ or equivalent).	No.	12				
6	Supply, install Manual Changeover Switch (MTS) 4X40.(Type is Hager or equivalent).	No.	1				
7	Ditto, but RCD 4X40/0.03A. (Type is MOELLER RCCB 40/4/0.03 or equivalent).	No.	1				
8	Supply and install 3 Indication Lamps R-S-T the item includes Triple poles Fused Switch Moeller (LTL) 6/10A With HRC fuses and test push button.	Set	1				
G4	SOLAR SUB DISTRIBUTION BOARD (SDB1.2)						
1	Supply, install and commission solar sub distribution panel board (SDB) of size 60x40x20cm, the panel made of galvanized steel sheet and frame 2mm thick, painted with anti-static primer paint and 2coats of final polyester paint . As required by the engineer. The panel should be factory assembled c/w pvc coated cu bus bars of adequate sizes and all other accessories and civil works that may needed to complete the job and hand over in operable conditions trenches, power and control wires, terminals bus bars neutral bus bar, earthing bus bar ducts, supports, labels and numbers and all necessary accessories to complete the work. According to Standards, drawings, specifications and supervisor engineer instructions. (Type is MOELLER or equivalent).	Unit	2				
2	Supply and install plastic board 24 C.B IP 65 .The item includes busbars, wiring, insulations, plastic ducts, terminal blocks and all necessary civil works ,equipment's for installation and operation as per drawings, specifications and engineer instructions.	Unit	2				
G5	CABLES AND CODUITES						
	Supply, install and connect of the following XLPE CU cables with all required electrical and civil works including PVC ducts, hot galvanized channel cable trays with all accessories and angles supports for the routing of the cables from power source to loads distribution boards. Cable must be fixed properly with using plastic clamps with labeling. The works include dismantling and re install and connect the existing cables if required. All works must be according to specifications, instructions, and demands of the supervising engineer. as follows:						
1	XLPE multi core Cu cable (3x25+16+1*16 mm2) mm2.	L.M.	70				
2	XLPE multi core Cu cable (5x16 mm2) mm2.	L.M.	120				
3	XLPE multi core Cu cable 5x10 mm2 .	L.M.	70				
4	XLPE multi core Cu cable 5x6 mm2 .	L.M.	70				
5	XLPE multi core Cu cable 5x4 mm2 .	L.M.	20				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
G6	MISCELLANEOUS						
1	Supply, install, connect and test AC LED tube lamp T8, 120 cm, (14-16) W, Cap-Base G13/G5,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 100 Lm/W ,European Brand Name . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	50				
2	Supply, install, connect and test AC LED tube lamp T8, 60 cm, 9W, Cap-Base G13/G5 ,160-260 Volt, more than 40000H life time, with 0.9 PF at least, Efficacy not less than 120 Lm/W ,European made . The price include dismantling the existing fluorescent lamps ,ballasts ,condensers, Cap-Bases and supply any required new materials and accessories and rewiring the lighting unit to be compatible with instant Start and allows fixture to maintain original compliance. All works and materials shall be according to standards and specifications and the approval of the supervisor engineer. All the dismantle fluorescent lamps, starter, chock coil shall be handed over to the hospital team. (Type is PHILIPS or equivalent)	NO.	100				
3	Supply, install, connect and test Ac LED lamp 10-12 W, Flux more than 800 Lumen, Color temperature 3000-4500, Power factor > 95%.(Type is NISKO or equivalent).	NO.	20				
4	Supply, install, connect and test Led lighting fixture 2x18w complete with AC LED tube lamp T8, 120 cm, 18W, 160-260 Volt, more than 40000H Philips lamps, with PVC conduits, Boxes, fixing screws (Galv.) and wiring. (Type is GA'ASH or equivalent)	No.	3				
5	Ditto but round bulk head light, water proof IP65, with LED lighting lamp 16W . (Type is GAASH or equivalent).	No.	1				
6	Supply, install connect and, testing single pole one way switch with covers, 220v, 13A, complete with PVC conduits, ducts, Boxes, wiring, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chorus or equivalent)	No.	1				
7	Ditto, but double pole switch.(Type is Gewiss-Chorus or equivalent)	No.	1				
8	Supply, install connect and, testing single socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits, ducts, Boxes, wiring 3x2.5mm2, and all necessary accessories. The work include dismantle the old one .(Type is Gewiss-Chorus or equivalent)	No.	2				
9	Ditto, but for AC split units 20A with switch socket outlet, with XLPE Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
10	Supply, install connect and, testing complete STP Rj45 Data outlet (Type is Premium Line or equivalent). The unit rates include supply, install and terminate Cat 6 SFTP cable (D-Link or equivalent) from outlet inside the room to the nearest patch panel in the hospital with all needed ducts , boxes, covers and all needed connection and accessories to complete the job .	No.	1				
11	Ditto, but AC split units 20A with switch socket outlet with xlpe Cu. Cable 3x4mm2 (Type is GEWISS CHORUS or equivalent).	No.	1				
12	Supplying and installing Portable ABC Powder Fire Extinguisher as per engineer instructions and the following specifications: <ul style="list-style-type: none"> • 6kg • 14Bar operating pressure • Suitable to Electrical equipment fires • Up to 6m range of throw The item includes all necessary equipment's for installation and operation as per specifications and engineer instructions.	No.	1				
13	Supply , install and operate water spray pump of 1.8kW and 120bar, 220V for the used of washing the PV modules with all control and protection. <ul style="list-style-type: none"> • the item includes all required heavy flexible 3x2.5 mm2 power & control cables with length from the nearest DB to the PV panels, and all required 1/2 inch water pressure pipes 50m and connections from the nearest source in order to operate the pump with auto stop function. The item includes all necessary equipment's, materials, accessories and workmanship for installation and operation as per specifications and engineer instructions.	L.S	1				

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
14	<p>Supply and test laptop 6th Generation Intel® Core™ i5 processor. (Type is HP or equivalent) as per the following specifications:</p> <p>CPU 6th Generation Intel® Core™ i5 processor. Chipset Chipset is integrated with processor. memory 4 GB DDR4-2133 SDRAM. Internal drive 500 GB SATA (7200 rpm) 15.6" with Full Keyboard with integrated numeric keypad Graphics Integrated: Intel® HD Graphics Ports 2 USB 3.1 Gen 1 1 USB 2.0 1 HDMI 1.4b 1 VGA 1 RJ-45 1 headphone/microphone combo 1 AC power 10 Expansion slots 1 multi-format digital media reader (Supports SD, SDHC, SDXC.) Audio 2 Integrated stereo speakers Camera HP TrueVision HD camera; HP VGA camera 11,14 Keyboard Full-sized island-style with numeric keypad Pointing device Touchpad with multi-touch gestures enabled. Taps enabled as default Network interface GbE NIC (10/100/1000) Wireless Realtek 802.11b/g/n (1x1) and Bluetooth® 4.2 Combo Intel® Dual Band Wireless-AC 3168 802.11 a/b/g/n/ac (1x1) Wi-Fi® and Bluetooth® 4.2 Combo (non-vPro™) Energy efficiency ENERGY STAR® certified and EPEAT® Silver registered configurations available 21 Power supply 65 W AC adapter Battery type 4-cell, 41 Wh Li-ion. Free Dos/1Year warranty./with case, brand name wireless mouse.</p>	Unit	1				
15	<p>Supply, Install & Commissioning of 3KVA Online UPS -1 Ph for Lab instruments (Type is Gamatronic or Equivalent).</p> <ul style="list-style-type: none"> • True on-line sine design, pure sine wave output without pollution • Intelligent DCP/ CPU design with 0.98 PFC • Local and remote-control capability with RS232 or UBS. • Port compatible with SNMP. • Self-diagnosis and protection function. <p>Output 2.4 KWatts / 3.0 kVA Max Configurable Power (Watts) 2.4 KWatts / 3.0 kVA Nominal Output Voltage Single phase 220V , ±1% Zero Transfer time ensuring the reliability of the load operation. Output Voltage Distortion Output Frequency (sync to mains) 50 Hz Maximum Output Current 13A Output Voltage THD < 2% linear load and Bypass Built-in Maintenance Bypass</p> <p>Input Nominal Input Voltage Single phase 220V Input frequency 50 Hz Input Connections Hard Wire 3-wire (1PH + N + G) Input voltage range for main operations 160 - 276 V Maximum Input Current 13 A Input Power Factor at Full Load 0.98 Approvals (Standards) / CE, EN/IEC 62040-1/2, EN/IEC 62040-2, EN/IEC 62040-3, Standard warranty 1 year</p>	L.S	1				
Total Of Bill (8) - USS							

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No (9)							
Civil Works							
	<p>General Notes:</p> <p>1- Complete detailed shop drawings should be delivered to the Engineer to take his approval prior the commencement of work. Samples of all materials shall also be delivered to the Engineer to take his approval,</p> <p>2-All works and installations listed here below should be carried out, tested and commissioned by specialized responsible skilled labours in full coordination with engineering office , all in accordance with drawings, specifications and relevant standards, and the instruction of the Engineer. The Engineer has the right to reject any component of the work not complying with the specifications and the terms of the contract.</p> <p>3- The contractor shall submit detailed implementation work plan and method of statement Coordination with the engineer .</p> <p>4-Contractor shall take into consideration that all – direct and indirect works and expenses required for the completion of Earth works items' Prices. Excavation item shall include the removal of any buried structure not to be part of the proposed construction, including transport of excavated, surplus material and buried structure (not to be part of the proposed construction) to a location approved by the engineer or his representative outside the site, workmanship and any where else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer.</p> <p>5-Contractor shall take into consideration that all – direct and indirect works and their relevant expenses required for proper implementation of the project including temporary facilities, fencing, securing utilities (water, wastewater, telephone and electricity systems) as well as making access to project implementation location area is running safely without disturbance. The contractor will be accountable for all necessary equipment, materials and activities to assure the safety of people within the vicinity, where an approved safety plan will be prerequisite to initiating activities along with installing all required components and materials necessary for safety of workers, project team as well as people at the project. All relevant costs are deemed to be included in the unit price in addition to the required re-instatement works needed to bring the original facilities to its original status before addition of temporary works.</p> <p>6- Safety precautions to protect neighbor utilities and persons.</p> <p>7- All required Tests should be accommodated by an approved lab.</p> <p>8-All the above mentioned and following specifications is part of the contractor obligations.</p> <p>9- The Price for excavation includes Cleaning the site and demolishing and removal of any existing structures. Debris material shall be disposed off to approved site as directed by the Engineer.</p> <p>10- Cleaning the site and removing all debris, surplus unwanted materials and rubbles to approved dump site.</p> <p>11-All existing Material dismantled must be transferred to places as specified by the supervisor Engineer</p> <p>12- The price shall include all required demolishing works for skylights (slab and walls) in addition to the cost of supplying and installing galvanized steel skorite to cover the skylights.</p>						

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
9.1	Concrete Works:						
	<p>Rates of Concrete Works shall include:-</p> <p>1. All form works and shuttering (new lumber for shuttering painted by special oil (fuel or burnt oil is not accepted) in any form, shape and size. Making chamfered and curved edges, allowing for and making grooves and sleeves and using Tie Rods (Batant) for concrete walls; removal of forms and cleaning of all exposed tie wires and rods. Steel forms must be used in shuttering the external decorations.</p> <p>2. Supplying, Casting, vibrating and curing as per specifications.</p> <p>3. Approved additives and admixtures.</p> <p>4. Developing new Concrete Job Mix Designs, Sampling , testing and providing test results certificates, storing and saving of samples.</p> <p>5. Painting of exposed surfaces of underground reinforced concrete elements with two coats of hot bituminous paint (75/25) after primer layer , the strokes of each layer to be opposite to each other.</p> <p>6. Preliminary installations for Electrical, plumbing and floor drainage in floor slabs including final floor slab.</p> <p>7. Compaction and testing under the foundation, ground beams, ground slabs and Apron. the compaction should not be less than 98% of MDD.</p> <p>8. All works according to specifications, drawings and supervisor engineer instructions</p> <p>9. Supply, fabricate and fix reinforcement steel (fy= 410 N/mm2) for all the structural elements according to drawings and engineer's instructions for any grade, size and length as detailed in the drawings, storing on site including cutting, bending and fixing in position and providing all tying wires, spacers, shop drawings, testing and bar bending schedules .All works according to specifications , drawings and supervisor engineer instructions</p> <p>10. In rehabilitation works, supply fabricate and fix steel dowels to the existing concrete using special materials. In case of lapping with existing steel reinforcement, rates will include cleaning rust and treatment with special materials</p> <p>11. In case after excavation the new columns locations and relevant footings coincide with the existing ones, the contractor will make modification to adapt implementation to the existing conditions and deemed to include in his rates relevant costs accordingly.</p> <p>12. The unit price includes cutting at bitumen insulation at roof and foam concrete, demolish and removal of any required elements to complete the work according to the new design.</p> <p>13. The unit price includes repairing bitumen insulation beside the new walls of the control rooms and testing the hole work area at roof as specifications and engineer instructions.</p> <p>14. All rehabilitation works will include the necessary excavation , backfilling with clear sand to the design level , extra steel reinforcement and concrete to be applied in layers if necessary in addition to the necessary special materials and accessories.</p>						
9.1.1	Supply and cast ready mix reinforced concrete B250 kg/ cm2 for suspended hollow block slab 25 cm thick , including the reinforced steel, drop and inverted beams, hollow cement block 40*25*17, and all other materials needed to finish the work as per specifications and drawings. drainage, electrical, air conditioning, mechanical ducts & workmanship with all required works as per Engineer instructions.	m2	100				
9.1.2	Ditto but for control room Bottom Beams and Foundation, works including supplying and laying polythene sheets with 200 micron thickness under the beams and foundation.	m3	5				
9.1.3	Ditto but for lintels and sills.	m3	2				
9.1.4	Ditto but B (250) kg/cm2 for ground slab (10cm - under tiles or without tiles) including reinforcement (1T8mm @ 20cm in both directions), leveling, and compacting the soil beneath the slab to 98% of MDD of sub-grade with all required works including supplying and laying polythene sheets with 200 micron thickness under the slab.	m2	100				
9.1.5	Ditto but B300, for columns and column necks	m3	5				
	Total Of Bill (9/1) - US\$						
9.2	BLOCK WORKS:						
	<p>The price include:</p> <p>1- supplying hollow cement block from good and approved factory in perfect dimension and build it in good manner with a compressive strength 35 kg/cm2 for hollow block. This item will include cement mortars, reinforced concrete infill (B250) between columns & block walls (10-20 cm wide) with 1Ø8mm/40cm horizontally and 2Ø8mm vertically according to drawings, pipes encasement, false columns 20x20 cm/4.0m among the parapet wall with 4Ø12mm and bituminous paper between block work and drop beams & all requirements needed to finish the works according to the drawings, specification and to the supervision engineer instructions.</p>						
9.2.1	Supply and build hollow cement blocks 40x20x20cm.	m2	180				
	Total Of Bill (9/2) - US\$						

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Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
9.3	Plastering Works						
	All works must be according to drawings, specification and engineer instructions. Rates shall						
9.3.1	Supply and make internal plastering 13 mm thick for ceiling,walls and soffits. The work includes rough primer nail rendering to form a key with (mix 1:1) cement sand, second layer 13mm: Base-Coat "Rendering" with (1:3:0.25) cement: sand mortar: lime and third layer: Finishing Coat with (1:4:0.50) cement: sand mortar: lime. Works include all materials needed to finish the works according to specifications , drawings and supervisor engineer's instructions	m2	200				
9.3.2	Supply and make external plastering 20mm thick to walls with four faces : the first is the rough nail rendering (mix 1:1) cement sand; the second is 5mm thick mortar (mix 1: 2) cement:sand, the third is the undercoat 13mm (mix 1: 3 :0.25) cement:sand:lime, the forth is two coats of Tyrolean finish (mix 1: 3) white cement to fine aggregate (Quartz) and all is according to specifications, drawings and supervisor engineer's instructions	m2	200				
	Total Of Bill (9/3) - US\$						
9.4	Painting Works:						
	1-All the painting materials used should be approved and tested by approved local laboratory and have the final approved from the supervisor engineer. 2- The surface must be dry and clean before painting. 3- All painting works should provide the required coverage. 4- All paint works must be according to specifications , drawings and supervisor engineer instructions. 5- Contractor shall take into consideration that all – direct and indirect works and expenses required for the completion of the coming items are included in the unit price. 6-Smoothen surfaces of existing plastering before the Commencement paint						
9.4.1	Supply and Paint the internal walls and ceiling with one coat primer and at least two coats of approved supercrite as specifications, drawings and supervisor engineer instructions.	m2	200				
9.4.2	Supply and Paint, external walls with one coat of Pendrole primer and at least two coats of External quality of white and colored emulsion (Weather Shield) or equal approved as specification and drawings including the maintainance of the existing tryolyne (Rashga) if needed.	m2	200				
	Total Of Bill (9/4) - US\$						
9.5	METAL works:						
	The item include supplying white aluminum windows section 7000 with two rails, with min. wall thick 1.25mm(be approved by representative engineer) as frame, glass 4 mm thick, ironmongery , accessories and hard ware as per specification and drawings. -Steel work should be Paint with two coats of oil paint & one primer (polyzinc).						
9.5.1	Supply and fix aluminum window, overall size 140x120cm.	No	4				
9.5.2	Supply and install galvanized metal door 100x 220 cm (type DS1) with new double sheet (2-mm) complete with frame, the bottom of door must be louver type as per drawings, ironmongery, for electrical room. The price shall include painting with two coats and base coat and union type lock or equivalent, all according to Drawings, Specifications and instructions of the Engineer.	No	4				
9.5.3	Supply and fix galvanized steel protection for windows over all size 140x120 cm as per drawings , Fixed on walls by steel plate ties, painting with oil paint, all according to drawing, specification and engineer instructions.	No	4				
	Total Of Bill (9.5) - US\$						

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material
9.6	Tiles & site works:						
	All works must be according to drawings, specification and engineer instructions. Rates shall include : 1. Samples for approval and all the required tests. 2. Cleaning, mechanical polishing and pointing using grout. 3. Insulation works under ceramic floor tiles for upstairs bath rooms and kitchens using primer coat, two hot bitumen coats (75/25) 4. Plastic angle beads for ceramic wall tiles and Aluminum angle for ceramic of walls at the corners and top and sides of ceramic edges. 5. Local marble must be Grade (A) free cracks and clay flaws. 6. Measuring the stockpiled quantities of tiles and obtaining the engineer approval prior to shipment to the site. 7. Transporting and carefully handling the stored quantities to the site.						
9.6.1	Supply and install terrazzo floor tiles size 25cmx25cmx2.5cm (with marble chips) laid on 2cm mortar bed and 5 cm thick sand bed and the price including terrazzo skirting of same kind and color of the floor tiles 25cmx7cm x1cm thick laid on 1 cm mortar	m2	100				
9.6.2	Supply and install granite marble (grade A) first class(Rozabitta type)3cm thick, laid on 2cm mortar bed for and 5cm sand bed for edges of main entrance, including landing of main entrance. size 25 cm wide x 3cm thick for windows sills laid on 2 cm thick mortar bed as approved by the engineer.	m.r	10				
	Total Of Bill (9.6) - US\$						
9.7	Roofing works						
	(1) Rates for foam concrete/ cement and mortar work shall include: 1. Supply and storage of cement. 2. Supply and storage of aggregates and water, 3. Mixing, 4. Hacking concrete, applying cement slurry or raking out joints of block work to form key, 5. Application to any surface, 6. Finish to surface, 7. Finish to falls and cross falls, 8. Forming bays including joints, 9. Finish to edges, 10. Making good around steel sections, pipes, tubes, bars, brackets, outlets, and the like, 11. Ends, intersections, ramps, and the like, on fillets, (2) Rates for waterproofing shall include for: 1. Preparation of surface, 2. Any area or width, 3. Cutting in edges. 4. Over laps, priming and treatment at the corners and floor drains. 5. Testing for the roof with water 6. Dressing over parapets and stub columns including forming groove to receive edge of plasticised bitumen membrane and sealing with elastic sealer. (3) Rates for roof sheets shall include: 1. Side and end laps, Fittings including bolts, hook bolts, screws and washers, 2. Sheets of any width or length.						
9.7.1	Supply and cast foam concrete with fine aggregates for roof screeding of average thickness 8 cm as shown in drawing. The item will include making the angle fillet 5x5cm around the boundary of the parapet and around opening in roof if exists.	M2	100				
9.7.2	Supply and lay one layer of plasticized bitumen roofing membrane with chipping 4 mm thick, including priming concrete surface prior to laying, dressing into rain water outlets to form water proofing seal and cover the angle fillets. The rate include verticals parts skirting as per specification and drawings. Note: Measurement will be for the horizontal projection only.	M2	100				
9.7.3	Supply, Install, test, and commission 4" UPVC Floor Drain for rain water , completed with collector with St. Steel strainer mesh for cover. the floor drain and Its installation should be according to the relevant international standards and with all connections vents and pipes 4" UPVC ,sn.4 to the hospital building roof floor according to Drawings, Specifications, and Engineers instructions.	No.	4				
	Total Of Bill (9) - US\$						

Project: ITB-PAL-0000049519 - Construction Of Solar Panels To Operate Four Vital Healthcare Units							
Item	Description	Unit	QTY	Unit Rate (USD)		Total (USD)	
				Local Material	Coordination Material	Local Material	Coordination Material

Project: Renewable Energy for All: Photo Voltaic Cells for Gaza hospitals

Summary

<u>Bill No.</u>	<u>Description</u>	<u>Total Amount \$</u>
1	PV works for Al-Aqsa hospital-25KWp	
2	PV works for Al-Najjar Hospital 20KWp	
3	PV works for Beit Hanoun hospital-20KWp	
4	PV works for Emirati RC -20KWp	
5	Electrical Works for Al-Aqsa hospital-25KWp	
6	Electrical Works for Al-Najjar Hospital 20KWp	
7	Electrical Works for Beit Hanoun hospital-20KWp	
8	Electrical Works for Emirati RC -20KWp	
9	Civil Works for 4 hospitals	
	TOTAL (\$)	

Contractor's Company Name

Contractor Representitative Name

Contractor Representitative Signature

Stamp

Date