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United Nations Development Programme

ITB 2017-080

Bill of Quantities

Project Name: Package 4 : Pump Station and Water Well

PAL10-00099398 / Rehabilitate GIE Infrastructure

Bill A :Industrial Sewage Pump Station					
ITEM No	**DESCRIPTION**	**Unit**	**QTY.**	**RATE (US$)**	**AMOUNT (US$)**
	Mechanical Works:-				
	1-The contractor shall submit complete and detailed method statement for all relevant mechanical and electrical installations of the pump for approval prior to the work commencement. The contractor has to take into account that the working hours are limited to six hours maximum daily and coordination will be needed for allowing to work. 2-It is the contractor's responsibility to carry out site visit before submission of his tender to check all required work activities associated with mechanical and electrical components for safe connections of the pump, which will be his complete own responsibility. 3-The contractor shall perform all standard testing, commissioning, programming and setting of all parameters for the new and existing KSB pumps; all in accordance with pump manufacturer's recommendations. 4-By the end of the work the contractor shall submit a complete set of as built drawing as per contract's requirements in addition to stating all settings and operating schemes. 5-All materials should be submitted inclusive of manufacturer brochures and workshop drawings for approval of UNDP Committee of Materials prior to ordering or purchasing 6-The contractor should remove and/or dismantle, the existing manifold and all damaged or malfunctioned parts and materials and transfer them to locations or sites approved by the Engineer. 7-Price shall include operation and commissioning of the whole system in connection with the proper functioning of the sewage pumping station. Any materials that may be deemed needed for proper operation are considered included within the prices of the items below. 8-The price of the new manifold shall include all needed works and required items including, flanges, fittings (min thickness 22mm), couplings, reducers, connections, SS bolts, nuts, gaskets, adjustable jack supports, thrust blocks … etc., complete all as described in the Specifications, tender drawings and as directed by the Engineer. The works also include all requirements to reconnect the new manifold with the existing network.				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
1	***Main Sewage Pumping Station***				
1.1	Supply and install submersible wet sewage pump 6" of flow (Q)= 26 liter/s, operating Head(H) =18-24 M, with efficiency not lass than 78% Motor : 3 phase , Rated voltage 400 V , 50 Hz , 14 KW, Rated Speed : 1460 1/min Flygt type CP3152.181, KSB , or approved equivalent ,the two pumps will be operating in alternate turns using PLC. The price of this item should cover the following: - The pump shall be equipped with discharge connection, thermal & liquid protection system sensors, and marine type electric cable of sufficient length to connect to Electrical main board, one set of spare parts as specified by the manufacturer and frame, all in accordance with enclosed relevant technical specifications, hydraulic performance curves and the engineer's instructions. The works should include all associated supporting, electrical and mechanical connection accessories (flanges, steel base, stainless steel bolts, gaskets, chains, stainless steel wires grade 316, washers, sleeves, ...etc.) and items shown on the drawings. All electrical protection controllers should be supplied and installed in accordance with the manufacturer recommendation such as (humidity detector, stator over heating protection, bearing temperature sensor, float switch). The environment temperature between 10C - 35C The work includes but not limited to replacing all the broken parts of the valves, elbows, flanges, Tees...etc., including stems, wheels, knives, S.S bolts and nots	No.	2		
Total of Page 1 - Mechanical Works - Main Sewage Pumping Station US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
1.2	Supply, install and fix pump guide line from the top of the Pump to the outlet of the pump, 2x3" diameter stainless steel pipe grade 316 , 3/16 inches thickness, around 7m long.	No.	2		
1.3	Supply and install discharge stainless steel pumps' rizers , made of 6" diameter pipe, grade 316 , PN16 connecting five pumps with all the fittings grade 316 SS PN 16. The price include cutting and welding required , jointing with pumps' discharge, tees , flanges , fittings, elbows, vertical and horizontal bends , flanged reducers, flanged couplings, SS bolts & screws & nuts & washers , gaskets, adjustable jacks with rubber base, connections, blind flanges, flanged reducers, flanged dressers type JONSON or equivalent , fixation plates with welding and anchors , by- pass and its connections are included all according to the direction of engineer and what included in drawings.	L.M	50		
1.4	Supply and install gate valves , PN16 , Type Hakokhav or equivalent approved with all bolts , nuts, gaskets , washers , screws , flanges , anchor blocks , adjustable jacks with rubber base epoxy coated internally and externally and all required fittings for proper installation & operation. All bolts should be stainless steel grade 316 , All the materials must be suitable to be used for sewage works.				
a	size 6"	No.	5		
b	size 10"	No.	3		
1.5	Supply and install Non-return valves of swing , PN16 , type Hakokhav or equivalent approved with micro switch , arm and all required bolts , nuts , gaskets , washers , screws , flanges , anchor blocks , adjustable jacks with rubber base equipped with an outside lever and counter weights , The valve is made of cast iron with high resistance against surge effects , with an enamel inside coating , outside levers should be of stainless steel and all required flanged fittings for proper installation & operation , All bolts should be stainless steel grade 316 , All the materials must be suitable to be used for sewage works.				
a	size 6"	No.	5		
b	size 10"	No.	1		
1.6	Supply and install 2" single automatic air release valve with flange , (working pressure is 16 bar) , Type ARI or equivalent approved , epoxy coated , both kinetic and automatic air release functions , including 3" flanged gate valve with pipe and all required fittings and accessories for proper installation & operation , All bolts should be stainless steel grade 316, All the materials must be suitable to be used for sewage works.	No.	6		
Total of Page 2 - Mechanical Works - Main Sewage Pumping Station US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
1.7	Supply and install manifold , made of 10" diameter steel pipe coated externally with Epoxy primer and two layers of extruded polyethylene coating and internal cement mortar lining factory made fit for waste water, PN16 connecting five risers from pumps with all the fittings PN 16. The price include cutting and welding required , jointing with 6" SS manifold with flanged reducers and couplings, tees , flanges , fittings, elbows, reducers, vertical and horizontal bends , flanged couplings, SS bolts & screws & nuts & washers , gaskets, adjustable jacks with rubber base, excavation, backfilling with Safia sand, .connections with existing underground pipe, blind flanges, flanged reducers, flanged dressers type JONSON or equivalent , socket flanges, concrete thrust blocks, by- pass and its connections are included all according to the direction of engineer and what included in drawings.	L.M	30		
1.8	Supply and install 4" S.steel pipe for pump cleaning , 4" stainless steel pipe grade 316 , 3/16 inches thickness , welding and assembly of gate valves 4" , flanged dressers and all other required fittings , The price includes all caps , adopters , flanged tees and vertical and horizontal bends in different angles , bolts , nuts , adjustable jack with rubber base gaskets and excavation , construction , backfilling with Safia sand, fixation plates to walls with welding and anchors. All according to drawings and Engineer instructions.	L.M	15		
1.9	Supply and install 1/2" pressure gauge with manometer dials of 100 mm diameter , with scale reading extending from (0) to 10/kg/cm2 , with (3) way valves as per "MEGO" model 3-400 / GP or equivalent , including 2" gate valve, 2" bypass pipe with all fittings and connections needed , These gauges are connected to the manifold , by pass & air release valves . All fittings shall be	No.	5		
1.10	Supply and install HDPE sluice gate of clear opening 0.8x0.8m to be installed in open channel 1.0m wide by 1.10m deep, complete with thread spindle, cross bar, gides grouting, door, sealant manually operated by hand wheel, complete with all fittings needed for proper installation and operation in its place as indicated in the drawing, specification and manufacturer instructions.	No.	1		
1.11	Supply and install ladder made of solid stainless steel sections in the wet pit and screening unit. The price include all required bolts, weld, angles, plates, and all required accessories.	LM	20		
1.12	Supply and install 2 tons electrical hoist with overhead bridge crane IP66 motor , four directions of motion ,Type STAHL or YALE Germany made, model ST20 or equivalent, with I-beams (600x125x10.5)mm IPN300 including painting with sufficient length for loading & unloading on trucks and galvanized chain Dia.10 mm of adequate length with motor drive , 380 volt , 50 HZ , Work includes all electrical connections & electrical panel , the work includes supply & installation of the control circuit , cables , wiring, supports , gear , operating buttons with emergency stop , hook , remote control and all accessories as per specifications and engineer's approval .	No.	1		
Total of Page 3 - Mechanical Works - Main Sewage Pumping Station US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
1.13	Manufacture, supply and install rectangular access door cover C3 size 105x120cm made of stainless steel 316 openable with hinges including frame, hinges, stopping chains, lock and all accessories.as per drawing and engineer approval . the work includes supply and fix protective approved wire mesh 20x20mm, openings with pvc coated steel .	No.	1		
1.14	Ditto. But size 115x150 cm	No.	10		
1.15	Pump Casing and Repair: The pump casing, repair work of existing KSB pump includes cutting, welding, filling, grinding, cleaning, sand blasting and base paint with two coats of epoxy. The work includes but not limited to removing the pump from the pit taking it to workshop if needed, cleaning, greasing and returning and refix pump at the base in the pit for normal operation. The work includes supply , install and connect WP cable 5*25mm2 of sufficient length to connect the pump with the electrical main board	L.S	2		
1.16	Clean and remove sand, garbage and all unwanted materials from the wet pit and valve room then transfer to municipal dump site or locations according to the engineer instructions. The work includes provision of a municipality sewage car (jetter) to clean all sewage and organic materials out of wet pet and discharge it to approved dump site.	L.S.	1		
1.17	Supply & install a Vertical Automatic Basket Screen unit (Siniaver) type or equivalent, with a size capable to handle a maximum flow of 150 m3/hr., all submersible parts of Back Raked Screen made from stainless steel. Complete with a Basket Material (S.Steel 304 spacing between bar 20 mm), Guides (S.Steel 304 fixed to sump wall with S.Steel Bolts), Door and Door Frame, Basket Door, Basket Guide and Lifting Eye (S.S. 304), Rake Frame (G.S.), Legs Stabilizer (G.S), Sliding Gate (S.S. 304), Cable Holder (S.S. 304), Gear Motor (1.5 HP 3ph 400 vac 50HR), Proximity Switch (N.C. Φ30 mm. 24 VDC NPN), Control cabinet (reinforced polyesterd), Lifting & Steel Cable (S.S. 316), Dead Plate & Hopper (S.steel 304), Door Weight & Slide Gate Weight (Steel), Pully & Wheel (Bronze)	No.	1		
1.18	Supply & install a manual bar screen (75*80 cm) unit with maximum flow 42 L/S which consists of stainless steel frame & channel, and two (U) shape beams size 90*50*5 mm to use in lifting up and down the screen as approved shop drawings, all the work must be executed as per drawing, specifications and Engineer instructions.	Unit	1		
1.19	Supply for wheeled solid wastewater container 1 cubic meter capacity with	No.	2		
1.20	Supply and install 100cm pre-cast circular shape reinforced concrete slab of sewage manholes B300 complete with 60cm cast iron cover (25 tons capacity), frame, ring. The item also includes inside cast iron steps each step 30 cm maximum and safety measures	No.	2		
1.21	Supply and erecting 10" electromagnetic Macmaster split type flow meter type seimens, ABB or equivalent approved with remote electronics for wastewater and suitable for out door installation, with stainless steel AISI 304 inner body, steel outer cases. Flow meter should be externally panted with epoxy and a tube lining of hard rubber with all accessories (Sensors, Display ,cable). the working pressure is 16 bar.	No.	1		
1.22	Supply and install Danfos type hand adjusted modulating High & Low pressure switch (0-10bar), (0-2 bar) respectively and connect it to the electrical board.	No.	1		
Total of Page 4 - Mechanical Works - Main Sewage Pumping Station US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
2	***Substation***				
2.1	Supply and install Ø2'' approved stainless steel pipe 4 mm thick , as a guide for existing pumps complete all as described in the Specifications as directed by the Engineer.	LM	12		
2.2	Supply and install 4" *S.steel riser pipe for pump* , 4" stainless steel pipe grade 316 , 3/16 inches thickness , welding and assembly of gate valves 4" , flanged dressers and all other required fittings , The price includes all caps , adopters , flanged tees and vertical and horizontal bends in different angles , bolts , nuts , adjustable jack with rubber base gaskets and excavation , construction , backfilling with Safia sand, fixation plates to walls with welding and anchors. All according to drawings and Engineer instructions.	LM	12		
2.3	Supply and install DN 4" diameter, 90 degree flange steel long radius bend with internal alumina lined (concrete mortar) and external epoxy paint completed with all necessary jointing assembly or any needed fitting and completely welding with main discharge pipe and proper installation of the bend in its place all as indicated in specifications, drawing. and engineer instructions	No.	2		
2.4	Supply and install *gate valves size 4" , PN16 , Type Hakokhav* or equivalent approved with all bolts , nuts, gaskets , washers , screws , flanges , anchor blocks , adjustable jacks with rubber base epoxy coated internally and externally and all required fittings for proper installation & operation. All bolts should be stainless steel grade 316 , All the materials must be suitable to be used for sewage works.	No.	2		
2.5	Supply and install *Non-return valves size 4"of swing , PN16 , type Hakokhav* or equivalent approved with micro switch , arm and all required bolts , nuts , gaskets , washers , screws , flanges , anchor blocks , adjustable jacks with rubber base equipped with an outside lever and counter weights , The valve is made of cast iron with high resistance against surge effects , with an enamel inside coating , outside levers should be of stainless steel and all required flanged fittings for proper installation & operation , All bolts should be stainless steel grade 316 , All the materials must be suitable to be used for sewage works.	No.	2		
2.6	Supply and install DN 4" diameter (PN16) complete flange dresser with ears and tie rods, flanges, bolts and gaskets as indicated in the drawings, specifications and according to the manufacturer & engineer's instructions.	No.	2		
2.7	Supply and install *2" single automatic air release valve* with flange , (working pressure is 16 bar) , *Type ARI* or equivalent approved , epoxy coated , both kinetic and automatic air release functions , including 3" flanged gate valve with pipe and all required fittings and accessories for proper installation & operation , All bolts should be stainless steel grade 316, All the materials must be suitable to be used for sewage works.	No.	2		
2.8	Supply and install *1/2" pressure gauge* with manometer dials of 100 mm diameter , with scale reading extending from (0) to 10/kg/cm2 , with (3) way valves as per *"MEGO"* model 3-400 / GP or equivalent , including 2" gate valve, 2" bypass pipe with all fittings and connections needed , These gauges are connected to the manifold , by pass & air release valves . All fittings shall be suitable for waste water	No.	2		
Total of Page 5 - Mechanical Works - Substation US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
2.9	Refreshment & Maintenance of the existing sluice gate80x80, The Maintenance should include supply & install for all required materials (thread spindle, cross bar, gides grouting, door, sealant manually, etc....)	L.S	1		
2.10	Supply and install ladder made of solid stainless steel sections in the wet pit and screening unit. The price include all required bolts, weld, angles, plates, and all required accessories.	LM	20		
2.11	Supply and install galvanized chain Dia.10 mm. for load of pumps not less than 2 ton , with Work includes supports , hook and all accessories as per specifications and engineer's approval .	LM	20		
2.12	Manufacture, supply and install rectangular access door cover C3 size 110x110cm made of stainless steel 316 openable with hinges including frame, hinges, stopping chains, lock and all accessories.as per drawing and engineer approval . the work includes supply and fix protective approved wire mesh 20x20mm, openings with pvc coated steel .	No.	6		
2.13	Clean and remove sand, garbage and all unwanted materials from the wet pit and valve room then transfer to municipal dump site or locations according to the engineer instructions. The work includes provision of a municipality sewage car (jetter) to clean all sewage and organic materials out of wet pet and discharge it to approved dump site.	L.S	1		
2.14	Supply & install a manual bar screen (75*80 cm) unit with maximum flow 36 L/S which consists of stainless steel frame & channel, and two (U) shape beams size 90*50*5 mm to use in lifting up and down the screen as approved shop drawings, all the work must be executed as per drawing, specifications and Engineer instructions.	Unit	1		
2.15	Maintenance of existing room MANIFOLD Treatment of cracks including cleaning, rubbing, open, filling with one coat of repellent material (Sika Gard 550W or equivalent) to fill voids as approved and two coats of Dekguard FC (FOSROC or equivalent)to match the existing as per specifications and painting with epoxy painting according specifications and Eng. Instructions. The work includes refix existing pump with supply new base in the bit for normal operation with all necessary to complete the works.	L.S	1		
Total of Page 6 - Mechanical Works - Substation US$					
Total of Mechanical Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
3	***Miscellaneous Works:-***				
3.1	Supply and install steel shed for the Well & Pump Station 4.0 m Height including Double steal profile 80x80x3 mm thick for each, with steel base plate 300×300×6mm to be fixed to the concrete foundation using another leveling bearing steel plate 300×300×6 mm with Anchor bolts complete with all washers nuts, supports, and all needed accessories to perform the required works as per specifications, drawings and the instruction of the supervisor Engineer. The works include all sheeting (cladding) works with corrugated steel sheets 0.55mm with fixation double and single channels 80×40× 3mm thick. The item includes min. 1.0m upper vertical cladding and all required accessories, bolts, nuts … etc., and painting with one primer coat and three coats of approved oil paint. All of that according Drawings.	M^2	105		
3.2	Supply and install boundary fence 240 cm high with 3 barbed wire top 4mm tension bars, also 3 G.S wires 4 mm Dia. along the fence and galvanized steel wire mesh 4mm, PVC coated, 40x40mm, openings with galv. steel (Rectangular hollow section) RHS cap profile 80x40x4mm posts at 3m interval, including 80x40x4mm RHS profile supported every 12m, and 80x40x4mm GS Profiles supporters at the corners and double RHS profile 80x40x4mm posts where expansion joints every 24m with tension bars, and accessories as per drawings, specifications and Engineer's instructions, all the works shall be according to the drawings, specification and the Engineer's instructions, all steel elements shall include painting and welding point with approved paint.	LM	60		
3.3	Supply and install double swing steel main gate 200 cm x 500 cm with galv. steel RHS cap profile 80x40x4 mm, bracing 70cm x 70cm x 70cm concrete foundation, and galvanized steel wire mesh 4mm, PVC coated, 40x40mm,two galv. steel RHS profile posts 150x150x5 mm, two galv. steel RHS profile 60x40x3 mm for each swing as a bracing with barbed wire top tension 4mm, lock type heavy duty one Wally or equivalent and all necessary accessories as per approved drawings, specifications and the Engineer's instruction, the work shall include painting the welding point with approved paint. All of that according Drawings.	No.	1		
3.4	Supply and cast reinforced concrete B250, 40cm height , 20cm thick (edge beam) for required interlock tiles (2Ø 12 mm upper reinforcement and 2Ø 12 mm lower reinforcement and 5Ø 8 mm stirrups every 1meter), according to Drawings, Specifications and instructions of the Engineer the work includes cut, fill, compaction, construction joint, sika flex, polyethylene sheets, impregnated fiber boards . with all required works as per drawings, specifications and engineer instructions.	M^3	8		
3.5	Supply and cast reinforced concrete B250, (ground base slab) for required sheds base including steel reinforcement , according to Drawings, Specifications and instructions of the Engineer the work includes dismantle of existing interlock tiles, cut, fill, leveling, compaction, construction joint, sika flex, polyethylene sheets, impregnated fiber boards, all required mechanical and electrical piping and conduits . with all required works as per drawings, specifications and engineer instructions.	M^3	15		
Total of Miscellaneous Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4	***Electrical Works:-***				
	The price shall include but not limited to the following: *The contractor must visit the site before tender pricing . *The exact quantities that be executed , will be determined during implementation . *The price of the items in general shall include conduits, connection boxes, controls, wires, connectors, clamps, bolts, cable trays, pvc ducts and connecting the cables to switchboards. *The contractor should repair any damage of the existing infrastructures. *Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. *Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. * The price should include commissioning works for the PLC, GSM systems and operating all the new and the existing equipment's to complete the job according to the specifications. *The price in the following items also include removal of any damaged Mechanicl or Electrical materials according to engineer instructions * As-built drawings for all works (existing and new works) shall be submitted after handing over the work. *Dismantling and removal of the existing electrical equipment such as(MDB, SDB , fluorescent lighting ,socket outlets ,poles, any electrical equipments... etc.) with all accessories from the existing site then transport to locations nominated by engineer. . The prices include all the required workmanship, transportation ,machinery,...etc. for installation according to engineer's instruction. *All the electrical works shall be executed according to Standards, specifications and engineer instructions.				
	Lighting Fittings				
4.1	Supply, install, connect and test water proof fluorescent lighting fixture 2x36w complete with lighting tubes 36, choke, condensers, starters , external PVC conduits , J. boxes, fixing screws (Galv.) and wiring. (Type is GA'ASH or equivalent).	No.	6		
4.2	Supply, install and connect hot galvanized octagonal steel lighting pole, 8m long (one piece) the pole is made of 4mm thickniss, the door cover is connected to the pole by galvanized steel chain, with all accessories according to drawings and supervising engineer's instructions. The price includes Supply, install and operate :- one arm with one lighting lantern units 150W-HPS-220V, with lamps type is Gaash. hot galvanized base with 80*80*100cm B250 concrete foundation , lattice 4x1.25" bolts (base) to fix the pole; operation unit inside the pole with fiber glass plate 20cmx12cm at minimum, CBs 6A, with all needed 3*2.5 xlpe cables and accessories to complete the job. All works according to drawing and engineer instruction (Optional)	No.	2		
	Switches and sockets				
4.3	Supply and install , external water proof one way, one gang switch , including all need xlpe cable 3*1.5 , external pipe , ... (Type is GEWISS or equivalent).	No.	2		
4.4	Ditto, but one way, three gang switch	No.	2		
4.5	Supply and install external waterproof single phase socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits, junction boxes, xlpe 3*2.5, and all necessary accessories. (Type is GEWISS or equivalent)	No.	3		
	MDB Switch Board:				
4.6	Supply, install and connect, MDB switch board as specified and shown on drawings,The panel sizes should be 210 cm height, 40 cm depth while the width to be determined after shop drawings and that all internal components were agreed upon. The price includes 2mm galv. steel frame with antistatic paint including: bus bars, neutral bus bar and earthing bus bar, all needed cables , wires , and accessories , extract fans with thermostats for cabinets , cabinet heaters and all necessary accessories to make it operate properly. All needed civil works like trench , sleeves , ... lockable type with key switch for one lock for each panel All panels must be water proof , and protect with shield The panel shall include but not limited to the followings:	Set	1		
	Total of Page 1 - Electrical Works US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.7	Supply and install LTL fuse 3x250/160A , type is Moller or eq.	No.	1		
4.8	Supply, install 3X(160A/5A) current transformer .	Set	5		
4.9	Supply, install 3-Phase kWh meter (5A , 400 V)	No.	1		
4.10	Supply, install 1-phase kWh meter (5A , 230 V)	No.	3		
4.11	Supply, install 3-Phase kVARh meter (5A , 400V)	No.	1		
4.12	MCCB 3x160 A with external hand, (Type is NZM-N2-160A or eq).	No.	2		
4.13	Supply and install MCCB 3x63A. (Type is MOELLER NZMB1-A63 or equivalent).	No.	3		
4.14	MCB 1x6/10/16A (Type is Eaton or equivalent).	No.	5		
4.15	MCB 3x10 A (Type is Eaton or equivalent).	No.	1		
4.16	MCB 3x40/32/25/16A (Type is Eaton or equivalent).	No.	4		
4.17	MCB 2x6/10/16A (Type is Eaton or equivalent).	No.	3		
4.18	MCB 1x20 A (Type is Eaton or equivalent).	No.	2		
4.19	RCCB 4*40/0.03 A (Type is Eaton or equivalent).	No.	1		
4.2	Supply and install control circuit for external lighting , include photo cell (type is kaga) selector switch , contactor , mcb 3*16A , 3mcb 1*10A , and all needed as per drawing	Unit	1		
4.21	Supply and install 230/24V Isolating transformer 1000VA.	No.	1		
4.22	Supply and install Digital Multi Meter with selector and with LTL fuse3x36/6A (Type is ENTES or equivalent).	Set	2		
4.23	Supply and install Digital Ampere Meter with, curretn transformers and PKZM 0-6A (Type is ENTES or equivalent).	Set	4		
4.24	Supply, install 3 color indicating lamps, including 3-phase push button with LTL & fuse protection.	Set	2		
4.25	Supply, install selector switch Test with load/Auto/Test without load)	No.	3		
4.26	Supply, install adjustable timer relay 24v or 220v, type is KRK	No.	6		
4.27	Supply, install electrical control relay 24v or 220v, type is Finder	No.	10		
4.28	Supply, install emergency bush-putton switch , type is Eaton	No.	4		
4.29	Supply, install temperature relay , complete with all needed sensors , wires , and connect it to pump , type is EMT6	No.	3		
4.30	Supply, install 3-phase contactor, 3 poles, 380v, 30kw with 4 auxiliary contacts, 220V coil. AC3 category (By-pass) (Type is Eaton or equivalent).	No.	3		
4.31	Supply, install automatic power factor regulation 5-stages unit, the price includes supply and install capacitor banks , with 3x80A main MCCB , contactors Dilk-12 with all needed mcb's 3x25A, toggle switches the price includes all needed materials and workmanship as per drawings, specifications and engineer instructions.	Unit	1		
Total of Page 2 - Electrical Works US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.32	Supply, install, program and test 3-phase solid state reduced voltage starter for 22kw pump, fully featured digital microprocessor based, complete with all required control, as per drawings, specifications and engineer's instructions Type is SOLCON RVS-DN 58 or equivalent.	No.	3		
4.33	Supply, install phase failure, loss of phase, under voltage, and phase sequence relay complete with all needed pkzm 6A , ...	No.	2		
4.34	Supply, install panel mounted electrical digital hour counter 3,5 digits, supply voltage 24V dc and/or 230V AC.	No.	3		
4.35	Supply and install NO push button switch 10A 24V dc and/or 230V AC.	No.	6		
4.36	Supply, install Toggle switch 10A ,24V dc and/or 230V AC.	No.	2		
4.37	Supply and install surge arrestor protection at the incoming feeder 3- phase 40KA including connection to the ground with flexible 16 mm2 yellow/green cable with LTL 3*160/100A moeller type. The system shall protect the switch panel against the lightning shocks. (Type Furse or equivalent).	Unit	1		
4.38	Supply, install and connect electrical serine, 24v dc or 220v AC, IP65, for external use (including connecting cables and protection).	No.	2		
4.39	Supply, install signal lamp, 24v dc and/or 230V AC, 22mm diam.	No.	35		
4.40	Supply, install, program and Operate Ultrasonic Level Transmitter for measuring the volume and the wet pit, complete with all needed power supply, separate LCD display with keyboard, IP 68, Type is Pulsar ultra5 or equivalent. The price includes supply and install all required connectors, flanges, make the suitable opening in the wet pit, metallic and non-metallic supports, control and power cables from ultrasonic level meter to the control panel and PLC, with all required excavations and backfilling, all required relaysm control, circuit breakers, LTL, also connect it into remote control system with all needed materials and workmanship as per specifications and engineer instructions.	L.S	1		
4.41	Supply, install, connect and test Programmable logic controller PLC in the control panel, , 128 input and 128 output points, with hand programmer, computer software, interface HMI with keyboard & screen, 16KB E2PROM, 2x16KB memory packs, and logic memory 2x16 KB, as per specifications and engineer's instructions. The price include programming the PLC to operate the sewage pumping station with 4 pumps, as specified by the engineer and according to the sequence to operate the pumps equal times, including all necessary extra relays and/or switches, cables and conductors, according to specifications and engineer's instructions. Also, the price includes all required circuit breakers, relays, timers, switched, adjustable under voltage relays, PKZM, fuses, protection devices, auxiliary contacts and control wires terminals ducts, bus bars, supports, labels with all needed materials and workmanship as per specifications and engineer instructions. The contractor should provide the required onsite training courses 15 houres for at least 2 persons from PADICO staff to be familiar with the project components. The training should cover the operation, maintenance and monitoring for the PLC system.	L.S	1		

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.42	Supply, install un-interruptible power supply UPS 1KVA rating , 230V sine wave output (type is Axpert), including one 100 Ah Gel battery (Trujan type or equivalent). The price includes all cables, wiring requirements, terminals, MTS 2*32 A type is Hager and all needed protection devices (circuit brakers , fuses) to be included to complete the job as per specifications, and engineer's instructions.	Unit	1		
4.43	Supply, install, and connect local disconnect, start stop, outdoor local isolator switch for pump, including 3X63A, 25kA disconnecting switch with external hand, stop push buttons, cable glands, cable tray , locking switch and all accessories. The box shall be IP66 heavy duty polyester 65cmx40cm (type is Hager or equivalent) mounted on galvanized plate as per drawing the price should include galvanized steel plates and installation of the actuation handle on the front panel.	Set	1		
4.44	Supply, install, and connect external water proof electrical isolating switch 32A for the hoist , including all needed external pipes from hoist to MDB	Unit	1		
4.45	Supply, install, and connect external water proof electrical isolating switch 32A for the bar screen , including all needed external pipes from bar screen to MDB	Unit	1		
4.46	Supply and install electrical float switch inside the sewage water wet well, IP 68 with NO and NC 10A contacts points, supply voltage 24V DC and/or 230V AC according to specifications and engineer's instructions, including pedestal mounted weather proof junction box out side the wet well. All float switches should be protected by 4" UPVC pipe fixed to the wet pit wall. These floats shall be for min level and the extra high level alarm and stop. The price includes all needed power and control cables from MDB & PLC panel with all pvc pipes and all needed materials and workmanship as per specifications and engineer instructions. EU made	Unit	2		
4.47	Supply and install complete earthing system including 4 manholes (60cm) around all the site with wire copper50 mm2, electrodes dia 18 mm, L= 1.5m. The resistance of earthing must be <=5 ohm	L.S	1		
Total of Page 3 - Electrical Works US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.48	Pay fees for enlarge electricity subscription to 3x160A for GEDCO .	L.S	1		
4.49	Supply , and install 4" PVC pipe , the work include 90 cm excavation, backfilling and warning tape, sleeves, link-seal as per engineer instructions	LM	50		
4.50	Ditto, but 3" PVC pipe	LM	50		
4.51	Ditto, but 3" corrugated PVC pipe	LM	290		
4.52	Ditto, but 80 cm Power Manhole with 8 Ton cover	No.	1		
4.53	Ditto, but 60 cm Power Manhole with 8 Ton cover	No.	7		
4.54	Supply, install, connect (3X95+50) mm2 XLPE cupper cable , The work also includes all needed civil works like excavation trench in any type of soil,Pipes from MDB to the nearest transformer , backfilling with safia sand, first layers 50cm deep , then supply & install 45x45x5cm concrete slabs with flexural strength (5 Mpa), along with 5 cm thick safia sand topped with warning tape. then backfilling with safia sand up to the pavement layers. The work includes watering & compaction to 100% each layer with maximum 25cm depth.	L.M	350		
4.55	Ditto, but 5x16 mm2 XLPE cupper power cable .	L.M	130		
4.56	Ditto, but 5x10 mm2 XLPE cupper power cable .	L.M	35		
4.57	Ditto, but 5X6 mm2 .	L.M	45		
4.58	ditto but 5x4 mm2 .	L.M	30		
4.59	Ditto, but 5x1.5.	L.M	50		
4.60	Ditto, but control cable 8x1.5 mm2.	L.M	100		
4.61	Ditto, but 12x1.5mm2 control cable	L.M	100		
Total of Page 4 - Electrical Works US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	REMOTE MONITORING AND CONTROL				
	GENERAL: The contractor shall be qualified for this type of work and shall be familiar with the sites and the type of electrical components existing in each site. The works shall be carried out in accordance with specifications, types of work and Engineer instruction and shall be coordinated in all stages with owner . The engineer has the right to omit any items listed here below without any price adjustment the contractor may claim. Shop drawings prepared by the contractor shall be submitted to the Engineer to take his approval prior work commencement. The type of materials of control system shall be consistent with the attached specifications or approved equivalent. The contractor will be responsible for any defect resulting from his work. Training of the local staff including maintenance inspection is also included in the unit prices work consists of the following:				
4.62	Supply and install a solenoid stainless steel valve with 12-24V for automatic cooling purposes of approved type at the pump cooling system in parallel with the existing manual tap. The installation includes all pipe fittings(valves, elbows, nipples etc.) and control circuitry (timers, relays, wires, etc.)	Set	1		
4.63	Supply, install and connect GSM/ GPRS remote terminal unit (RTU) Type is R-Log of Ramon type or equivalent according to the Engineer instruction summarized as : 1- 8 inputs, 2 digital Output and RS 232 Port. 2- PLC protocols (Mode bus), Omron, Matsushita, unitronics, izumi and others 3- PLC channels up to 64 register network interface technology GSM 850/1900 MHZ, EGSM 900/1800 MHZ with SMS, GPRS protocol 4- Flash Memory 2 MB 5- Data download method SMS, SMTP, GPRS The work include all site programming of the R-Log, electrical wirings and control protection as per site requirements and Engineer instructions The work also include completion the configurations of the R-Log RTU including programming, parameter setting and commissioning of the remote monitoring and control system. The supplier shall provide configuration software with original license. The parameters to be monitored and controlled shall be specified by the Engineer. The final programming shall provide GSM/GPRS and Web interface Also modify the owner web interface program to include all new R-logs, All parameters of wells specified by the Engineer shall be included in the unit price	Set	1		
4.64	Supply and install RS 232/RS 485 mode bus converter	No.	1		
4.65	Supply and install expansion module for R-Log mentioned in previous item of 8-digital inputs, 4-digital outputs of Omni Instruments type or equivalent shown in the specifications with RS 485 communication port supporting mode bus protocol.	No.	1		
	Total of Page 5 - Electrical Works US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.66	Supply install and connect Panel mounted AC power Digital Multi Meter-DMM of Socomec type or equivalent to read voltage, current, KW, KVAR, HZ, KWH, KVAR, KVA, Power factor, Hour meter, and engaged with RS 485 communication port supporting mode bus protocol .	No.	1		
4.67	Supply and install Digital Flow transmitter with 0-20mA remote signal to be connected with the R-Log for monitoring the flow and the flow rate. The ratings of the transmitter shall be suitable for the Existing conditions. All Pipes works and fittings are included. All electrical connections are also included in the unit price.	No.	1		
4.68	Supply and install Digital Pressure transmitter with 0-20mA remote signal to be connected with the R-Log. The ratings of the transmitter shall be suitable for the Existing conditions in each site. All Pipes works and fittings are included. All electrical connections are also included in the unit price.	No.	1		
	Total of Page 6 - Electrical Works US$				
	Total of Electrical Works US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	Bill B :Rehabilitation of Water Well				
ITEM No	**DESCRIPTION**	**UNIT**	**QTY.**	**RATE (US$)**	**AMOUNT (US$)**
1	**Rehabilitation of well** **General Notes:** § All works and installations listed here below should be carried out, tested and commissioned by specialized responsible contractor in full coordination with UNDP, 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 requirement of the contract. § The contractor should supply all mechanical and electrical materials, fittings and accessories that may be required for completing the installations, and any necessary works to install the equipment properly as specified, shown on the Drawings and directed by the Engineer. In case of any discrepancies or ambiguities it should be raised during the tendering stage, otherwise, the contractor will be held responsibility for the proper completion of the works according to the engineer interpretation at no extra cost. § Complete detailed shop drawings should be delivered to the Engineer to take the approval prior the commencement of work. Samples of all materials shall also be delivered to the Engineer to take the approval, § The price for underground pipes and connections works shall include excavation, leveling, compaction, pipes laying including all piping works such as proper jointing, welding, cutting and shaping, testing, disinfection, required microbiological tests, bedding by supplying material under, surrounding, and above the pipe clean dune sand, backfilling by supplying proper and approved material or suitable and approved selected excavated materials, the backfilling should be in layers not exceeding 25cm with compaction, removing surplus excavated material outside the site to places as instructed by the Engineer, and reinstatement to original condition of all roads and areas used or disturbed by the Contractor to the satisfaction of the Engineer. The price shall include execute thrust blocks for elbows, tees…etc. and all other necessary works, all above should be according to the drawings, specification, standards along with supply of all necessary materials for proper completion of the works under the supervision and direction of the Engineer. § Wherever, the pipes and connections fittings installed above the ground (none buried), the pipes connections fittings shall be coated with three layers of epoxy. The pipes, welded joints and fittings underground (buried) shall be coated with epoxy primer and two layers of extruded polyethylene coating. § Interior surfaces of all steel pipe and fittings shall be lined with cement mortar lining, factory made according to ASTM standards. § All used bolts, washers, nuts … etc. should be made of stainless steel grade 316L for the water well and for the desalination plant. § All existing items (fittings, pipes,valves, pumps …etc) should be dismanteled cautiously and delivered to a proper location according to the instruction of the Engineer. § For steel shed works, all measurements will be taken on the horizontal projection. The works include the temporary moving and reconnection of the existing facilities and all temporary works need to be implemented until finishing all activities.		`		

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	§ the contractor shall include in items' price all inspection visits' costs to manufacturers factories for at least two engineers to inspect the materials before shipping into Gaza. § The unit prices shall include cost for all needed safety precautions to protect neighbor's utilities, persons and works according to the approved safety plans by the Engineer. § Tiling works shall include, excavation, leveling and preparation, watering, and compaction up to 98% MDD of all layers including the sub-grade (after performing any excavation works in general) and base course layers (not more than 20cm), the works include disposal of surplus excavated material to a proved site, all shall complete as described in the Specifications, as shown on the Drawings, and as directed by the Engineer. The contractor shoud submitted a specified Method of statement to UNDP Eng. included the time needed to complete the works within One month with specified work hours daily not more than 6 hours depends on time coordination which specified from mean aouthorities.				
1	**Earth & Demolition Works**				
	1. Contractor shall take into consideration that all – direct and indirect works and expenses required for the completion of the following items are included in the unit price. 2.All works must be according to drawings, specification and engineer instructions. Rates shall include : 3. Cleaning the site and removing all debris and rubbles to approved dump site. 4. Backfilling in layers not more than 25cm thick for each layer and compaction to 98% of MDD. 5. Safety precautions to protect neighbor's utilities and persons. 6. All required Tests should be accommodated by an approved lab. 7. price include leveling and backfilling from imported sand to make up level around buildings up to the top of external ground beams levels.				
1.1	Removing safely and demolish the existing destroyed buildings. The price shall include removing all defected materials inside and outside the building to approved dump sites and dismantle doors, windows, electrical boards, water tanks, buffet marble, interlock tiles, existing steel shed, manifold and under ground steel pipes 6",4" and upvc pipes and deliver approved locations as directed by the engineer with all required works to keep the existing well safe as per the engineer's instructions. The work includes remove existing concrete (depth more than 50 cm).	M^3	100		
Total of Earth & Demolition Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
2	**Steel Works**				
	Steel work should be hot dipped galvanised steel painted with two coats of oil paint & one primer coat (polyzinc).The price shall include removing the damaged aluminum and steel works and delivered to sites approved by the Engineer. All maintenance works include all needed accessories and reinstatement materials.				
2.1	Supply and install steel shed for the Well & Pump Station 4.0 m Height including Double steal profile 80x80x3 mm thick for each, with steel base plate 300×300×6mm to be fixed to the concrete foundation using another leveling bearing steel plate 300×300×6 mm with Anchor bolts complete with all washers nuts, supports, and all needed accessories to perform the required works as per specifications, drawings and the instruction of the supervisor Engineer. The works include all sheeting (cladding) works with corrugated steel sheets 0.55mm with fixation double and single channels 80×40× 3mm thick. The item includes min. 1.0m upper vertical cladding and all required accessories, bolts, nuts … etc, and painting with one primer coat and three coats of approved oil paint. All of that according Drawings.	M^2	50		
2.2	Supply and install boundary fence 240 cm high with 3 barbed wire top 4mm tension bars, also 3 G.S wires 4 mm Dia. along the fence and galvanized steel wire mesh 4mm, PVC coated, 40x40mm, openings with galv. steel (Rectangular hollow section) RHS cap profile 80x40x4mm posts at 3m interval, including 80x40x4mm RHS profile supported every 12m, and 80x40x4mm GS Profiles supporters at the corners and double RHS profile 80x40x4mm posts where expansion joints every 24m with tension bars, and accessories as per drawings, specifications and Engineer's instructions, all the works shall be according to the drawings, specification and the Engineer's instructions, all steel elements shall include painting and welding point with approved paint.	LM	200		
2.3	Supply and cast reinforced concrete B250 for tie beam 40*20 cm , under the fence of the basin (required to fix the fence) ,50*40*40 cm foundations of the fence and also gate foundations, the work including expansion joints, the price includes excavation for the ground beam ,reinforcement shall be as drawings. All the works shall be done as described in the specifications and as shown on the Drawings and directed by the Engineer.	M^3	4		
2.4	Supply and install double swing steel main gate 200 cm x 500 cm with galv. steel RHS cap profile 80x40x4 mm, bracing 70cm x 70cm x 70cm concrete foundation, and galvanized steel wire mesh 4mm, PVC coated, 40x40mm,two galv. steel RHS profile posts 150x150x5 mm,two galv. steel RHS profile 60x40x3 mm for each swing as a bracing with barbed wire top tension 4mm, lock type heavy duty one Wally or equivalent and all necessary accessories as per approved drawings, specifications and the Engineer's instruction, the work shall include painting the welding point with approved paint. All of that according Drawings.	No.	1		
Total of Steel Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
3	MISCELLANEOUS WORKS				
	Rates of Concrete Works shall include:- 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. 2. Supplying, Casting, vibrating and curing as per specifications. 3. Approved additives and admixtures. 4. Developing new Concrete Job Mix Designs, Sampling , testing and providing test results certificates, storing and saving of samples. 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. 6. Preliminary installations for Electrical, plumbing and floor drainage in floor slabs including final floor slab. 7. Compaction and testing under the foundation, ground beams, ground slabs and Apron. the compaction should not be less than 98% of MDD. 8. All works according to specifications , drawings and supervisor engineer instructions 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 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 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. 12. All rehabilitation works will include the necessary extra steel reinforcement and concrete to be applied in layers if necessary in addition to the necessary special materials (to make bond between old and new concrete) and accessories. 13. The Contractor shall consider in his price the costs or expenses of all requirements stipulated in the section entitled “General and Preambles” preceding this Bill. 14. The exact lengths of the required pipes, the exact number of the required valves and the exact quantities of concrete will be determined during the implementation of the Works. 15. Price should include all excavation, backfilling, supporting of trenches and all associated works. 16. The Contractor shall consider in his price the costs or expenses of tests of materials used (concrete, steel bars, base coarse, block, cement …etc.				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
3.1	Construct walkways interlock tiles (B450) 6cm thick including 15 cm base coarse (100% compaction) , CBR 80% with 5 cm sand. Levels, colors and shapes all determined according to drawings, specifications and the Engineer's instructions.	M^2	50		
3.2	Supply and cast reinforced concrete B250, 40cm height , 20cm thick (edge beam) for required interlock tiles (2Ø 12 mm upper reinforcement and 2Ø 12 mm lower reinforcement and 5Ø 8 mm stirrups every 1meter), according to Drawings, Specifications and instructions of the Engineer the work includes cut, fill, compaction, construction joint, sika flex, polyethylene sheets, impregnated fiber boards . with all required works as per drawings, specifications and engineer instructions.	M^3	3		
3.3	Supply and cast reinforced concrete B250, (ground slab) for required sheds base including steel reinforcement , according to Drawings, Specifications and instructions of the Engineer the work includes dismantle of existing interlock tiles, cut, fill, leveling, compaction, construction joint, sika flex, polyethylene sheets, impregnated fiber boards, all required mechanical and electrical piping and conduits . with all required works as per drawings, specifications and engineer instructions.	M^3	15		
Total of Miscellaneous Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4	**Mechanical Works**				
	1- All works and installations listed here below should be carried out, tested and commissioned by specialized responsible contractor by coordination with UNDP and PWA, all in accordance with drawings, specifications and relevant standards, and the instruction of the Supervisor Engineer. The Engineer has the right to reject any component of the work not complying with the specifications and the requirement of the contract. 2. Price should include all excavation, warning tape backfilling, supporting of trenches and all associated works. 3. The price includes all fittings, supports, and special fittings and elements (diffusers, steel mesh … etc.) required to finish the works. 4. The prices should include all required tests and any temporary works such as the temporary installation of fittings (blind flanges, thrust blocks … etc.). 5.The works include the complete dismantling and replacement of existing 4" pipe which connect to network with a new one and complete epoxy painted carbon steel, Sch.40, Ø6" diameter pipe according to specifications. The new network shall include all needed works and required items including, flanges, fittings (min thickness 22mm), couplings, reducers, connections, SS bolts, nuts, gaskets, jack supports, thrust blocks … etc., complete all as described in the Specifications and as directed by the Engineer. The works also include all requirements to reconnect the new piping system to the existing distribution pipes. 6. Interior surfaces of all steel pipe and fittings shall be lined with cement mortar lining, factory made.				
4.1	WATER PUMPING UNIT: Dismantle the existing submersible turbine pump, for the full existing depth, with all Existing pipes and fittings , the work includes for specified location determined by Eng. to complete the work according to specifications and engineer's instructions.	L.S.	1		
4.2	Supply, install and connect to the electrical board, multistage Vertical Turbine Pump, Saudi National Pump, Hamecdash, Paterson type complete with all associated fittings and accessories recommended for installations by the pump manufacturer, with FAT tested electrical motor US motors type or equivalent with hollow shaft,60 HP, 1450rpm, IP55, stator winding fitted with PT100 temperature sensors. The motor should be capable to operate the system and should be selected according to the manufacturer recommendation. The unit should be comprised of vertical line shaft driven turbine pump of cast iron bowls with rubber bearings, bronze semi-open impellers, suction strainer, bronze line shaft bearings with rubber inserts, including stainless steel grade (ASTM A582 grade 416 stainless steel) 1¼" Dia. column drive shafts, and epoxy painted steel column pipes 6" diameter. Sch. 40 (min thick 7.92 mm) with minimum total length of 75 m, well head foundation, steel discharge head 6/6" epoxy painted, and 3'' galvanized steel pipe for measuring water level, in addition to any fittings and components required for the satisfactory operation of the system and all necessary works according to specifications, drawings, and instructions by the Engineer. The works, installations and prices should include for all mechanical pipe work installations, electrical installations with cables including builders work installations with all associated reinforced concrete plinths specified by the manufacturer's installation manual. The operating point of the pump is (70) M3/hr. at a total dynamic head (TDH) of 120m at minimum 78% pump efficiency. The pump largest diameter must not exceed 8" . the price included also:	No.	1		
	500 liters polyethylene water tank for cooling with all associated HDPE 25 mm pipe and its relevant fittings and accessories connected to the vertical discharge pipe of the pump to cool around the drive shaft. The work shall include concrete trench with concrete cover for galvanized steel base holding tray. - Supply and install solenoid valve along with all electrical connections to the existing electrical board, conduits in addition to all necessary accessories. -Certified motor characteristics, shop test performance curves, regular spare parts (as recommended by manufacturer) and maintenance catalogues. The Manufacture testing certificate should be provided for the pump and the contractor will cover the cost and provide the necessary arrangements for the factory inspection of two of the supervision team regarding the pump, motor, lagers, shaft and manifold mechanical components before transporting to Gaza				
Total of Page 1 -Mechanical Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.3	Transport to the site the contractors pumping equipment. Works include assembly and dismantling that equipment and flushing the well by pumping water to the proper location identified by the Engineer. The item includes install and fix 1.5 inch PVC sleeve pipe from the top to the bottom of the well, to insert the probe of the water level meter during the pumping test.	L.S.	1		
4.4	Ditto but for Pumping test and required measurements including detailed bacteriological and chemical analysis tests from certified laboratory approved by the engineer in charge including detailed hydrological report. The item includes arranging and coordination with municipality and others for location and method of damping the extracted water during the well flushing and pumping test.	Hr.	10		
	Water Well Manifold and Connections: GENERAL : The works include the complete new and complete epoxy painted carbon steel, Sch.40, Ø6" diameter pumping manifold according to the attached drawings. The new manifold shall include all needed works and required items including, flanges, fittings, couplings, reducers, connections, SS bolts, nuts, gaskets, jack supports, thrust blocks … etc., complete all as described in the Specifications and as shown on the Drawings and as directed by the Engineer. The works also include all requirements to reconnect the new manifold piping system to the existing distribution pipes. The height of manifold will have to be compatible with the pump header and at least 80 cm from the finished floor level for maintenance .				
4.5	Supply and install 2" double action PN 16 Air Release Valve A.R.I type or equivalent with all necessary fittings including 2" ball valve (to be connected to the electrical boards).	No.	1		
4.6	Supply and install Ø6" PN16 ARI or equivalent non-return valve. The non-return valve should be supplied and installed with counter weight, limit switch connected to the control panel, and any required connections fittings and accessories.	No.	1		
4.7	Supply and install 6" water hydro cyclone PN16 of AYTOK type. Its wall is 8mm min. thick steel with all required pipes of 3/16 inch steel pipes wall thickness or equivalent approved type with all below associated fittings: - 3 butterfly flanged valves and stainless steel bolts and nuts - 3 steel dresser coupling - 3 steel elbows 90 degree - 2 " ARV A.R.I type - 4 " flushing ball valve - 4" blind steel flange - B 250 Plain Concrete base 120X75X30 cm and all needed accessories and couplings according to drawings, specifications and the instructions of the Engineer (the cyclone should be checked from inside before closure).	L.S.	1		
4.8	Supply and install 100 mm diameter, 0-15 bar, GORDON type or equivalent approved Pressure Gauge with all associated 1/2" isolating valve and other pipe work connection and accessories.	No.	2		
4.9	Supply and install Danfos type hand adjusted modulating High & Low pressure switch (0-10bar), (0-2 bar) respectively and connect it to the electrical board including all required pipes , fittings, conduits , cables….etc. necessary to complete the works .	No.	1		
Total of Page 2 - Mechanical Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
4.10	Supply and install Flow Meter, Ø6'' – PN 16 bar ARAD type or equivalent with all associated fittings, flanges, connections as per specifications, drawings and as directed by Specifications and the Engineer's instructions.	No.	1		
4.11	Supply and install Ø6'' approved stainless steel pipe 4 mm thick provided with Ø1/2'' feeding point for disinfection, complete all as described in the Specifications and as shown on the Drawings and as directed by the Engineer.	L.M	1		
4.12	Supply, and install aboveground Gate Valve Ø6'' – PN16 Hakokhav type or equivalent. complete including but not limited to the following: flanges, couplings, extruder, adjustable jack support with rubber base, stainless steel bolts and gaskets	No.	3		
4.13	Supply and install above ground Ø6'' 45 Steel Elbow X 3/16" thickness Steel pipes coated externally with Epoxy primer and two layers of extruded polyethylene coating, complete all as shown on the Drawings and as directed by the Engineer.	No.	2		
4.14	Ditto, but underground with concrete thrust block	No.	2		
4.15	Supply and install non-buried Ø6'' diameter X 3/16" thickness Steel pipes coated externally with Epoxy primer and two layers of extruded polyethylene coating factory made with required adjustable jack supports, dressers, necessary flanges and including all required works.	L.M	15		
4.16	Ditto, but underground (buried) pipes.	L.M	15		
4.17	Connect the new pump manifold to the existing 4"Dia pipe. with. The price should include Supply and install all required fittings (Tees, elbows, Flanges, reducers/extruders, couplings, spigots, required steel pipes, gaskets, SS bolts, … etc., to satisfaction of the engineer.	L.S.	1		
4.18	Chlorine Disinfection system Supply, Installation, Commissioning and Testing of complete chlorination system including the following: Complete Sodium hypochlorite dosing system comprising of solenoid, adjustable dosing and injection pump of PROMINENT type or equivalent approved type with dosing capacity range 0-2 Liter/hour at 16 bar back pressure. 500 Liter polyethylene white chlorination tank filled with 500 liters of sodium hypochlorite with built in factory made manual fiber glass mixer in addition to motorized mixer. The works and installations should include for all associated fittings and accessories required to accommodate and connect the desired tank feeding point through underground ½" stainless steel pipe, all according to specifications and instructions by the Engineer. The work includes painted galvanized steel base 120x120x100 cm comprised of 4 mm thick angles 4x4 cm topped with wooden base 5 cm thick under the tank. The chlorine pump works will include stainless steel 316 base with dimensions of 20x15x .3 cm and 40x40x 20 cm closed galvanized box with louvered door and WALI type lock to put the pump and plate inside it. The box will be anchored to concrete base under the box.	L.S.	1		
Total of Page 3 - Mechanical Works - US$					
Total of Mechanical Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
5	**Electrical Works for Water Well.**				
	General: The price shall include but not limited to the following: *The contractor must visit the site before tender pricing . *The exact quantities that be executed , will be determined during implementation . *The price of the items in general shall include conduits, connection boxes, controls, wires, connectors, clamps, bolts, cable trays, pvc ducts and connecting the cables to switchboards. *The contractor should repair any damage of the existing infrastructures. *Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. * As-built drawings for all works (existing and new works) shall be submitted after handing over the work. *Dismantling and removal of the existing electrical equipment such as(MDB, SDB , fluorescent lighting ,socket outlets ,poles, any electrical equipments... etc.) with all accessories from the existing site then transport to locations nominated by engineer. . The prices include all the required workmanship, transportation ,machinery,...etc. for installation according to engineer's instruction. *All the electrical works shall be executed according to Standards, specifications and engineer instructions.				
	LIGHTINGS FITTINGS				
5.1	Supply, install, connect and test water proof fluorescent lighting fixture 2x36w complete with lighting tubes 36, choke, condensers, starters , external PVC conduits , J. boxes, fixing screws (Galv.) and wiring. (Type is GA'ASH or equivalent).	No.	6		
5.2	Supply, install and connect hot galvanized octagonal steel lighting pole, 8m long (one piece) the pole is made of 4mm thickniss, the door cover is connected to the pole by galvanized steel chain, with all accessories according to drawings and supervising engineer's instructions. The price includes Supply, install and operate :- one arm with one lighting lantern units 150W-HPS-220V, with lamps type is Gaash. hot galvanized base with 80*80*100cm B250 concrete foundation , lattice 4x1.25" bolts (base) to fix the pole; operation unit inside the pole with fiber glass plate 20cmx12cm at minimum, CBs 6A, with all needed 3*2.5 xlpe cables and accessories to complete the job. All works according to drawing and engineer instruction (Optional)	No.	2		
	SWITCHES AND SOCKETS				
5.3	Supply and install , external water proof one way, one gang switch , including all needs xlpe cable 3*1.5 , external pipe , ... (Type is GEWISS or equivalent).	No.	2		
5.4	Ditto, but one way, three gang switch	No.	2		
5.5	Supply and install external waterproof single phase socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits, junction boxes, xlpe 3*2.5, and all necessary accessories. (Type is GEWISS or equivalent)	No.	2		
	Total of PAGE 1 Electrical Works for Water Well WORKS - US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	MAIN DISTRIBUTION BOARD (MDB , MCC)				
5.6	Supply, install and connect, MDB switch board as specified and shown on drawings, the panel sizes should be 210 cm height, 40 cm depth while the width to be determined after shop drawings and that all internal components were agreed upon. The price includes 2mm galv. steel frame with antistatic paint including: bus bars, neutral bus bar and earthing bus bar, all needed cables , wires , and accessories , extract fans with thermostats for cabinets , cabinet heaters and all necessary accessories to make it operate properly. All needed civil works like trench , sleeves , ... lockable type with key switch for one lock for each panel All panels must be water proof , and protect with shield The panel shall include but not limited to the followings:	Set	1		
5.7	Supply and install Over-load, current limiting switch, with over load and short circuit releases, adjustable 4-10A. (Type is MOELLER PKZM0-10 or equivalent).	No.	3		
5.8	Supply and install Signal indication lamp R S T with resistance 220V,with LTL fuse3x36/6A	Set	1		
5.9	Supply and install Current transformer (100/5A).	No.	15		
5.10	Supply and install Kwh meter 3 phase 3x5A.(Type is ISKRA or equivalent)	No.	1		
5.11	Supply and install KVAR meter, 3 phase 3x5A(Type is ISKRA or equivalent)	No.	1		
5.12	Supply and install Kwh meter, 1 phase 1x5A.(Type is ISKRA or equivalent)	No.	3		
5.13	Supply and install Digital Ampere Meter with LTL fuse3x36/6A (Type is ENTES or equivalent).	No.	3		
5.14	Supply and install Digital Multi Meter with selector and with LTL fuse3x36/6A (Type is ENTES or equivalent).	No.	2		
5.15	Supply and install LTL fuse 3x250A/100A with 100A fuses.(Type is JEAN MUELLER or equivalent)	No.	1		
5.16	Supply and install main breaker MCCB 3x100 A. (Type is MOELLER NZMN2-AE100 or equivalent with external panel handle.	No.	2		
5.17	Supply and install RCCB 3*40/0.03A.	No.	1		
5.18	Ditto but MCB 3X32A. (Type is MOELLER FAZ-C32/3 or equivalent).	No.	2		
5.19	Ditto but MCB 3X25A. (Type is MOELLER FAZ-C25/3 or equivalent).	No.	2		
5.20	Ditto but MCB 1X10/16/20A. (Type is MOELLER FAZ-B 10,16,20/1 or equivalent).	No.	3		
5.21	Supply and install Isolating transformer 380/220V,24V of 750VA capacity.	No.	1		
5.22	Supply and install Contactor 4 poles,220V, with auxiliary contacts,220V coil, AC3 category (Type is MOELLER DILM-10 or equivalent).	No.	1		
5.23	Supply and install Contactor 4 poles,380V, 20kVAr, with 2 auxiliary contacts,220V coil, AC3 category (Type is MOELLER DIL00MK-25 or equivalent).	No.	1		
5.24	Supply and install Three phase static capacitor bank 20Kvar (Type is Ducati or equivalent).	No.	1		
	Total of PAGE 2 Electrical Works for Water Well WORKS - US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
5.25	Supply and install Toggle switch 10A, 230VAC (1,0,2) (Type is MOELLER or equivalent).	No.	2		
5.26	Supply and install surge arrestor protection at the incoming feeder 3- phase 40KA including connection to the ground with flexible 25 mm2 yellow/green cable. The system shall protect the switch panel against the lightning shocks. (Type Furse or equivalent).	No.	1		
5.27	Supply and install LTL fuse 3x160A/63A with 63A fuses.(Type is JEAN MUELLER or equivalent)	No.	1		
5.28	Supply and install MCCB 3x80A/3X80TA. (Type is MOELLER NZMB1-A80 or equivalent).	No.	1		
5.29	Supply and install Three-phase solid state reduced voltage starter,75 HP, for pump, fully featured, digital microprocessor based, with its control, as per specifications and engineer's instructions (Type is Solcon. RVS-DN-145).	No.	1		
5.30	Supply and install Three poles, 380V, 75 HP, with 2 auxiliary contacts,220V coil, AC3 category (By-pass). (Type is MOELLER DILM/ 115 or equivalent).	No.	1		
5.31	Supply and install Electrical digital hour counter 3.5 digits, supply voltage 24V dc and/or 230V ac, panel mounting.(Type is MOELLER or equivalent).	No.	1		
5.32	Supply and install Emergency push button switch.(Type is MOELLER or equivalent).	No.	1		
5.33	Supply and install Phase failure, loss of phase, under voltage, and phase sequence relay, with the necessary control.(Type is MOELLER or equivalent).	No.	1		
5.34	Supply and install Time delay electronic relay, with one N.O. and one N.C. 10A output contacts, and 2 sensor input points, supply voltage 24V dc and/or 230V ac, according to specifications and engineer's instructions.(Type is KRK or equivalent).	No.	5		
5.35	Supply and install Control relay, with N.O. and N.C. 10A output contacts, supply voltage 24V dc and/or 230V ac, according to specifications and engineer's instructions.(Type is Finder or equivalent).	No.	5		
5.36	Supply and install Push button switch with N.C. and N.O. contacts 10A, 24V and/or 230V AC(Type is MOELLER or equivalent).	set	2		
5.37	Supply and install Humidity sensitive relay, with N.O. and N.C. 10A output contacts, supply voltage 24V dc and/or 230V ac, according to specifications and engineer's instructions.	No.	1		
5.38	Supply and install Temperature control relay, with N.O. and N.C. 10A output contacts, supply voltage 24V dc and/or 230V ac, according to specifications and engineer's instructions.(Type is MOELLER EMT6 or equivalent).	No.	1		
5.39	Supply, install External lighting control unit including contractor (DIL 10AM), selector switch 10A, photocell (KAJA type), 24 hours timer, 1X6A MCB.	Set	1		
Total of PAGE 3 Electrical Works for Water Well WORKS - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	CABLES AND CONDUITS				
5.40	Supply , and install 4" PVC pipe , the work include 90 cm excavation, backfilling and warning tape, sleeves, link-seal as per engineer instructions .	L.M	50		
5.41	Ditto, but 3" PVC pipe	L.M	50		
5.42	Ditto, but 3" corrugated PVC pipe	L.M	290		
5.43	Ditto, but 80 cm Power Manhole with 8 Ton cover	No.	1		
5.44	Ditto, but 60 cm Power Manhole with 8 Ton cover	No.	7		
5.45	Supply, install, connect (3X95+50) mm2 XLPE cupper cable , The work also includes all needed civil works like excavation trench in any type of soil,Pipes from MDB to the nearest transformer , backfilling with safia sand, first layers 50cm deep , then supply & install 45x45x5cm concrete slabs with flexural strength (5 Mpa), along with 5 cm thick safia sand topped with warning tape. then backfilling with safia sand up to the pavement layers. The work includes watering & compaction to 100% each layer with maximum 25cm depth.	L.M	350		
5.46	Ditto, but 3*50+25 mm2 XLPE cupper power cable .	L.M	30		
5.47	Ditto, but 5x10 mm2 XLPE cupper power cable .	L.M	35		
5.48	Ditto, but 5X6 mm2 .	L.M	45		
5.49	ditto but 5x4 mm2 .	L.M	30		
5.50	Ditto, but 5x1.5.	L.M	50		
5.51	Ditto, but control cable 8x1.5 mm2.	L.M	50		
5.52	Ditto, but 12x1.5mm2 control cable	L.M	50		
	MISCELLANEOUS				
5.53	Supply and install complete earthing system including 2 manholes (60cm) around all the site with wire copper50 mm2, electrodes dia 18 mm, L= 1.5m. The resistance of earthing must be <=5 ohm	L.S.	1		
5.54	Pay fees for enlarge electricity subscription to 3x100A for GEDCO .	L.S.	1		
5.55	Supplying and erecting micro-switches connected to NVRs on the check valves.	No.	1		
5.56	Supply and install Danfos type hand adjusted modulating High & Low pressure switch (0-10bar), (0-2 bar) respectively and connect it to the electrical board.	No.	1		
5.57	Supply and install a solenoid stainless steel valve with 12-24V for automatic cooling purposes of approved type at the pump cooling system in parallel with the existing manual tap. The installation includes all pipe fittings(valves, elbows, nipples etc.) and control circuitry (timers, relays, wires, etc.)	L.S.	1		
5.58	(optional) Relocate and install the existing MDB switch board from warehouse to station building. The price also include all needed civil works like trench , sleeves , ...,reprograming the soft start , reoperate the MDB as drawing and engineer instruction, any needed wires , glass for khw meter window ,accessories , ...etc	No.	1		
	Total of PAGE 4 Electrical Works for Water Well WORKS - US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	REMOTE MONITORING AND CONTROL (FOR THE WELL)				
	GENERAL: The contractor shall be qualified for this type of work and shall be familiar with the sites and the type of electrical components existing in each site. The works shall be carried out in accordance with specifications, types of work and Engineer instruction and shall be coordinated in all stages with owner . The engineer has the right to omit any items listed here below without any price adjustment the contractor may claim. Shop drawings prepared by the contractor shall be submitted to the Engineer to take his approval prior work commencement. The type of materials of control system shall be consistent with the attached specifications or approved equivalent. The contractor will be responsible for any defect resulting from his work. Training of the local stall including maintenance inspection is also included in the unit prices work consists of the following:				
5.59	Supply and install a solenoid stainless steel valve with 12-24V for automatic cooling purposes of approved type at the pump cooling system in parallel with the existing manual tap. The installation includes all pipe fittings(valves, elbows, nipples etc.) and control circuitry (timers, relays, wires, etc.)	Set	1		
5.60	Supply, install and connect GSM/ GPRS remote terminal unit (RTU) Type is R-Log of Remmon type or equivalent according to the Engineer instruction summarized as : 1- 8 inputs, 2 digital Output and RS 232 Port. 2- PLC protocols (Mode bus), Omron, Mutsuhito, unitronics, izumi and others 3- PLC channels up to 64 register network interface technology GSM 850/1900 MHZ, EGSM 900/1800 MHZ with SMS, GPRS protocol 4- Flash Memory 2 MB 5- Data download method SMS, SMTP, GPRS The work include all site programming of the R-Log, electrical wirings and control protection as per site requirements and Engineer instructions The work also include completion the configurations of the R-Log RTU including programming, parameter setting and commissioning of the remote monitoring and control system. The supplier shall provide configuration software with original license. The parameters to be monitored and controlled shall be specified by the Engineer. The final programming shall provide GSM/GPRS and Web interface Also modify the owner web interface program to include all new R-logs, All parameters of wells specified by the Engineer shall be included in the unit price	Set	1		
	Total of Page 5 - Electrical Works - US$				

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
5.61	Supply and install RS 232/RS 485 mode bus converter	No.	1		
5.62	Supply and install expansion module for R-Log mentioned in previous item of 8-digital inputs, 4-digital outputs of Omni Instruments type or equivalent shown in the specifications with RS 485 communication port supporting mode bus protocol.	No.	1		
5.63	Supply install and connect Panel mounted AC power Digital Multi Meter-DMM of Socomec type or equivalent to read voltage, current, KW, KVAR, HZ, KWH, KVAR, KVA, Power factor, Hour meter, and engaged with RS 485 communication port supporting mode bus protocol .	No.	1		
5.64	Supply, install un-interruptible power supply UPS 1KVA rating , 230V sine wave output (type is Axpert), including one 100 Ah Gel battery (Trujan type or equivalent). The price includes all cables, wiring requirements, terminals, MTS 2*32 A type is Hager and all needed protection devices (circuit brakers , fuses) to be included to complete the job as per specifications, and engineer's instructions.	Unit	1		
5.65	Supply and install Digital Flow transmitter with 0-20mA remote signal to be connected with the R-Log for monitoring the flow and the flow rate. The ratings of the transmitter shall be suitable for the Existing conditions. All Pipes works and fittings are included. All electrical connections are also included in the unit price.	No.	1		
5.66	Supply and install Digital Pressure transmitter with 0-20mA remote signal to be connected with the R-Log. The ratings of the transmitter shall be suitable for the Existing conditions in each site. All Pipes works and fittings are included. All electrical connections are also included in the unit price.	No.	1		
Total of Page 6 - Electrical Works - US$					
Total of Electrical Works - US$					

ITEM No	DESCRIPTION	Unit	QTY.	RATE (US$)	AMOUNT (US$)
	Summary				
Item	Description				Amount (US$)
1	Total of Mechanical Works - US$				
2	Total of Miscellaneous Works - US$				
3	Total of Electrical Works - US$				
	Bill A :Total of Industrial Sewage Pump Station Works				
1	Total of Earth & Demolition Works - US$				
2	Total of Steel Works - US$				
3	Total of Miscellaneous Works - US$				
4	Total of Mechanical Works - US$				
5	Total of Electrical Works for Water Well - US$				
	Bill B: Total of Rehabilitation of Water Well Works				
	Total of Bills A & B				
	Discount Rate (%)				
	Discount Amount				
	Net Total				

NET TOTAL SUM (in words):

SIGNED AND SEALED :

AUTHORIZED :

TITLE :

SIGNATURE :

DATE :