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Jericho Agro-Industrial Park (JAIP)

Wastewater Pumping Station and Force Main

Bill Of Quantities

**Wastewater Pumping Station and Forcemain
Bill Of Quantities**

WASTEWATER PUMP STATION & FORCEMAIN - Civil Works

Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
	<p>GENERAL:</p> <p>* This section shall be read in conjunction with the contract general and particular technical specifications, Drawings, amendments, invitation to bid and contract conditions.</p> <p>* The unit price for all items in this Section shall include for Supply, installation, connecting, testing, and commissioning, unless otherwise specifically mentioned or instructed by the engineer.</p> <p>* Preparing of coordinated workshop drawings and submitting to engineer for approval, coordination with other activities and services, material storage, removing away from site the remnant of works and handling over the works to engineer is contractor's responsibility.</p> <p>* Any discrepancies in contract documents will be explicated for the favor of client.</p> <p>* The contractor must consider coordination with different service providers for temporary and permanent services connections.</p> <p>* Reading and understanding technical specifications is contractor's responsibility, he accepts to consider technical specifications as expansion and complimentary for BOQ items.</p> <p>In case of duplication in any BOQ items, the item with the lowest unit rate will prevail.</p> <p>* It is the contractor responsibility to implement contract documents and adhere to international related codes and standards.</p>				

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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
1	Bill No. 1 - Earth Works:-				
	Preamble:				
	<p>1. Excavation & Backfilling will be measured in net cubic meters.</p> <p>2. No allowance shall be made for increase in bulk, or for extra working space required and the contractor shall allow these and any other incidental expenses in his unit rates.</p> <p>3. Selected excavated material approved by the Engineer will be used in backfilling around foundations and ground beams and forcemain.</p> <p>4. The rates of excavations shall include for excavations in all types of soil, including rock, and removing surplus material from the site to approved municipal dump site</p> <p>5. The rates of backfilling shall include for watering, and compacting in layers max. 20cm or as specified and additional material necessary to make up levels</p> <p>6. The rates for excavation includes temporary retaining framework where needed.</p> <p>7. approved selected material should be used for back-filling in layers (20cm max. each & compaction test not less than 100% of modified proctor) selected from approved excavated soil or imported. Price shall includes supply, watering, compacting, transporting, testing, as per drawings, specifications and related codes.</p>				
1.1	<u>Site Cleaning</u> Removal of existing trees and any obstacles. Debris material shall be disposed of to approved municipal dump site. The Price includes Cleaning the proposed site from all dirt or any un-required top soil up to 25cm and leveling the site, all according to drawings, specifications, engineer instructions.	L.S	1		
1.2	<u>Excavation Works</u> Excavation in any type of soil according to the elements' dimensions of the tank shown on the drawings with all required works. Price include backfilling with selected or imported fill material around footings and walls for wet pit & bar screen to design levels on layers not more than 25cm thick each with compaction. The compaction tests must exceed 97% of modified proctor. The price also includes transportation of excavated material to approved dump area according to engineer's instructions, and includes using shutter bracing to the excavation sides.	M ³	1800		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
1.3	<u>Backfill</u> Supply and spread hard riverbed rock layer 2m or 1m thick as mentioned on drawings under compacted basecourse for all mat foundation of tanks and where is needed or mentioned, the price includes all needed work to perform the layer as per specification, drawings and Engineer's instructions.	M ³	700		
1.4	<u>Basecourse</u> Supply and spread compacted basecourse 20 cm , 40 cm thick in layers not more than 25 cm thick including watering, compacting (compaction not less than 98% from modified proctor) under the tank foundations, well spread, leveled and compacted, including preparation and compaction of sub grade up to 97% MDD, all according to drawings, specifications, and the engineer's instructions.	M ³	100		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
2	Bill No. 2 - Concrete and Insulation Works:-				
	Preamble - Concrete Works				
	<p>1. Prices for all concrete items shall include shuttering, steel reinforcement, testing for steel reinforcement and concrete, supply and placing of concrete, vibrating, curing, polyethylene sheet (for any concrete contact with the soil), painting by hot bitumen (one coat of primer & min. 2-coats of hot bitumen 75/25) for underground concrete external surfaces, workmanship, all ducts, sleeves, opening areas, the concrete surface (footing & Roofs) shall be finished with mechanical steel trowel, the price shall include steel troweling with smooth face and anywhere else needed as per drawings, specifications, and engineer's instructions.</p> <p>2. The contractor should submit accumulation tank scaffolding calculation sheet for approval before starting any work activity.</p> <p>3. The Contractor shall use tie bolts 8mm in the wall shuttering (Battant, minimum cover space 2.5 cm).</p> <p>4. Rates for concrete shall include supplying of all materials, storage, equipment, tools, admixtures, trial mixes, mixing, sampling, shuttering, testing and all required works or materials to complete the works .</p> <p>5. The contractor is responsible for testing concrete mix and component of concrete separately.</p> <p>6. The supervisor engineer has the right to take concrete sample for every mixer to test the concrete compressive strength on the contractor expense.</p> <p>7. Reinforcement steel used is 4100 Kg per cm2 yielding strength.</p> <p>8. Concrete curing shall be at least 7 days after casting and applying suitable watering.</p> <p>9. It is the contractor full responsibility to add any additional material required to improve the concrete quality (salinity resistance, super plasticizers ... etc.).</p> <p>10. In general, excavation works include the preparation and compaction of sub grade (Min. 97% MDD) before starting any works above this layer.</p>				
	Preamble - Insulation Works				
	<p>1. Cleaning of internal or external surfaces before applying the insulation materials.</p> <p>2. Leakage test should be performed before applying the insulation layer. The leakage test duration not be less than 72 hours.</p> <p>3. The price includes insulation tests, disinfection, microbiological tests, and leakage treatment.</p>				

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	4. The contractor shall submit the catalogue of the insulation material or internal painting indicating the suitability for wastewater. 5. All the following items shall be completed according to drawings, specifications, contract conditions and relevant codes. 6. The contractor should provide the required maintenance to prevent leakage, honeycomb ...etc and surface flatness.				
2.1	<u>Plain Concrete</u> Supply and cast in place B200 Plain concrete of, 10cm thick below foundation (base slab) or likes with all required works.	M ²	120		
2.2	<u>Raft Foundations</u> Supply and cast Reinforced concrete B350 in Raft Foundations (Base of tank shall be smooth face) with all required works (sulfate resistant cement SRC MUST BE USED)	M ³	32		
2.3	<u>Walls</u> Ditto, but fair face concrete for Walls (sulfate resistant cement SRC MUST BE USED)	M ³	105		
2.4	<u>Roof Slab</u> Ditto as item 2.2 above, but for roof slab (bottom of slab is fair face and top is smooth face). Sulfate resistant cement SRC MUST BE USED	M ³	14		
2.5	<u>Slab On Grade</u> Supply and cast monolithic concrete pad grade B250 10 CM thick for all project site. The price to include mechanical surface finishing with helicopter machine ,2 cm expansion joint at 10 meters spacing including polystyrene and mastic filler. Reinforcement as shown on the details or drawings (slab on grade details)	M ²	400		
2.6	<u>Ground Beams</u> Supply and cast ready mix concrete B350 ground parameter beam for fence 40cm width by 70cm depth including steel reinforcement and ϕ 2.5" GI pipe sleeve as per drawings, specifications and engineer instructions.	M ³	25		
2.7	<u>Flood light and power hoist Footing</u> Supply and cast ready mix concrete B350 spread footings of 70cm length by 70cm width by 100cm depth including steel reinforcement and ϕ 6" GI pipe sleeve as per drawings, specifications and the engineer instructions.	M ³	3		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
2.8	<u>Strainer Manhole</u> Supply and cast complete reinforced concrete STRAINER MANHOLE of 1.5m internal diameter, B300 with (sulfate resistant cement SRC) including required inserts and strainer rails as per specifications and drawings. The item includes Reinforcing steel 410 MPA ,excavation, supporting the trench sides and backfilling using clean sand with watering, compaction after approval of the engineer.	No.	1		
2.9	<u>Pressure Manhole</u> Supply and cast in place with ready mix Concrete B350 with reinforcement for 2x2x2.5 m pressure Manhole, the price includes excavation, backfilling in layer not more than 25 cm, plain concrete 10cm thick, two heavy duty cast iron cover (8) ton, opening diameter 60cm, cast iron steps every 30cm, benching, hot bituminous 70/25 paint for underground external walls, with all needed accessories all according to drawings, specifications and engineer instructions.	No.	1		
2.10.	<u>Water Stopper</u> Supply and install fix water stopper swelled hydrophilic solid rubber strip (Sika V- 24E or equivalent) size 10x250mm cross section construction joint. The price shall include workmanship with all required works.	MR	32		
2.11	<u>Internal Faces Painting</u> Supply and apply painting for internal faces (walls,ring beams and roof slab) at minimum 2-coats of Epoxy painting (SikaTop-Seal 107 or equivalent) for wetted surfaces (water). The price includes water testing and workmanship. All according to specifications and contract conditions.	M²	530		
2.12	<u>External Faces Painting</u> Supply and apply painting for external faces (walls, roof slab with one coat of repellent material (SikaGard 550W or equivalent) to fill voids as approved and two coats of Dekguard FC (FOSROC or equivalent) . The price should include water testing and workmanship. As per specifications, drawings and engineer instructions.	M²	280		
2.13	<u>Concrete Bases</u> Supply and cast ready mix concrete B350 foundations for pumps, electric generator, exposed valve conc.pad thickness of 20, or 30 cm including steel reinforcement as per details and drawings and related standards.	M³	4		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
2.14	<u>Fence</u> Supply, install and fix proposed 4mm hot dip Galvanized site boundary fence with necessary accessories as per drawings, specifications and engineer instructions.	M ²	200		
2.15	<u>Fence Gate</u> Supply, install and fix the main 4m double swing gate of lifting station site. the price to include all accessories to perform the gate as per drawings, specifications.	M ²	8		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
3	Bill No. 3 - Miscellaneous Works:-				
3.1	Aluminum Access Hatch Supply & install of 1m x 1m of 6mm thick chaquer Aluminum grade 5251 plate openable cover with frame, hinges and suitable lock for the wet well & screen chamber hatch covers with 316 stainless steel bolts, nuts washers and approved bituminous based paint suitable for sewage with all needed fitting for fixation to the concrete as shown in the drawings, specifications and engineer instructions.	No.	4		
3.2	Stainless Steel Ladder Supply & install stainless steel ladder 60cm width consist of 2" S.S pipe (2.77mm thick) and 3/4" S.S steps (2.11 mm thick) every 30 cm, including fixing accessories to walls by S.S plate every 90 cm max. with all needed fitting, welding and necessary accessories as shown in drawings, specifications and as per engineer instructions.	ML	10		
3.3	Dumping Trolley Supply and installation of 1.0 m3 wheeled dumping trolley made of 2mm thick GI steel painted with prime coat and tow coats of oil paint to suit municipality car for the bar screen including wheels brakes & barrier, as per recommendation of Jericho municipality.	No.	1		
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	Total of Civil Works				

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WASTEWATER PUMP STATION & FORCEMAIN - Electrical Works					
Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
	<p>GENERAL:</p> <p>* This Section shall be read and construed in conjunction with Contract General & Particular Technical Specifications, Drawings, Amendments & Addendums (if any), Invitation to Bid and Contract Conditions.</p> <p>* The unit price for all items in this section shall include for the supply, installation (S&I), connection, testing, and commissioning of the works unless otherwise specifically mentioned or instructed by the Engineer.</p> <p>* Preparing coordinated workshop drawings and submitting to Engineer for approval, coordination with other activities and services, materials storage, removing away from site the remnant of works and handing over the Works to the Engineer are all contractor's sole responsibility.</p> <p>* Any discrepancies in contract documents will be explicated in favor of UNDP.</p> <p>* The contractor must consider coordination with different service providers for temporary and permanent services connections.</p> <p>* Reading and understanding the stipulated specifications is contractor's responsibility, he must consider the Technical Specifications as expansion and complimentary document for BOQ items.</p> <p>* If there is duplication for a certain item within the bill, where two or more different unit rates are quoted for the same item under the same conditions, the lowest unit rate will be considered for remuneration.</p> <p>* It is contractor's responsibility to put contract documents into effect and to adhere to local norms and practices, in addition to international related codes and standards.</p> <p>* It is contractor's responsibility to coordinate with JDECO for supplying the site with electricity.</p>				

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	<p><u>Mobilization:</u> the contractor is required to supply and install the following:</p> <ul style="list-style-type: none"> - Two project signs 1,5x2,5m in size all with sturdy frames and supports; one to be erected at the entrance of Jericho city and the second at convenient location in the vicinity of JAIP. - Two plaques from marble 100cmX80cm each; one for each project to be placed at the corresponding project entrance. - A decent site office of a 20 feet container size, equipped with A/C, lavatory, desk with orthopedic chair, meeting table with 8 chairs, water & electricity, desktop, multi-function printer, landline or mobile router, and any other utensils needed for proper and easy office operations. Water and electricity for two JAIP projects, which were constructed recently in the neighborhood of the sewage pumping station, were purchased by the implementing contractors from Messrs. Hassouna (steel factory in the neighborhood). 	LS	1		

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4	ELECTRICAL WORKS				
Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
4.1	<u>MDB</u> Supply, install, connect, test and commission cubical-type panel made of galvanized iron (GI) sheet, duly painted with oven baked powder coating in grey color (or any other approved) after chemical cleaning and rinsing, well ventilated including, dust and vermin proof, conforming IEC 61439-1 and IP-55, ATS, power factor correction unit, surge arrestor, 16A industrial T.P socket outlet, 16A S.P socket outlet, MCCBs, PLC control of the same components source with software and programming, autodialer, transformer, 5.7" HMI unit, CTs, signal lamps, digital metering device, relays, electrolytic grade copper bus- bar, interphase barriers and insulators, sun shading, high tensile nuts and bolts with spring washers, bus-bar, color coded with heat shrinkable PVC sleeves, the panel door has neoprene rubber gasket of 25mm wide and 6 mm thick, hinged door with locking arrangement, bottom plate suitable for incoming and outgoing cables with glands at all knock-outs. The following MDB main components, in addition to others, shall be supplied as per drawings, specifications and related codes.	No.	1		
4.2	<u>Service Panel:</u> As above, but to contain JDECO KWH meter and necessary components as per JDECO requirements.	No.	1		
4.3	<u>Hydroranger</u> Supply and Install ; 4-20 mA scaleable 6 relay module multichannel hydroranger (siemens or AE) with inverse change over and stainless steel housing with all necessary wires and connections.	No.	1		
4.4	<u>CCTV</u> Supply and install 1" PVC conduit for future CCTV and SCADA with pull wire according to engineer instructions.	MR	120		
4.5	EARTHING SYSTEMS				
4.5.1	<u>Earth Rods & Earthing Cables</u> Supply, install, test and commission earthing system, Earth resistance should be less than 1.5 ohm. The work includes earthing manholes 50x50cm with CI cover , bonding clamps and copper conductor (70mm ² , 25mm ²) buried @ 50cm below ground level, electrodes 3m long 19mm dia., Cadweld, Exothermic weld, and all necessary accessories as per drawing, specifications and related international standards.	LS	1		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
4.5.2	<u>Earthing in Foundations</u> Supply, install, test and commission water tank foundation earthing system; the work includes (30/3 mm GI strip) including welding and connecting to earth bus-bar @ MDB and all necessary accessories as per drawing, specifications and related international standards.	LS	1		
4.6	<u>Lightning Protection</u> Supply, install, connect, test and commission early streaming lightning protection system or equal including pulsar, 70mm ² bared Cu cable, testing point in CI box and 70 mm ² Cu cable connected to earth rods with all accessories, surge arrestor for MDB, surge arrestor for Patch Panels and earth rods with 50x50cm earth pit and cast iron covers as per specification, and related code.	LS	1		
4.7	<u>Cables</u> Supply, install, connect, test and commission the following CU, XLPE cables, cable glands and cable shoes connections to electrical panels with required conduits and ducts as per drawings, specifications and related standards.				
4.7.1	(4x70+35)mm ²	MR	430		
4.7.2	(5*6)mm ²	MR	25		
4.7.3	(5x16)mm ²	MR	25		
4.7.4	Supply and Install 2x1 mm ² shielded twisted control cable in 3/4" PVC conduit from field devices to panel with all necessary connections and fittings.	MR	115		
4.8	<u>Lighting Poles</u> Supply and Install 6 m height wood lighting pole with 300W HPS flood light, including brackets, choke coil, condenser, ballast, arms, IP 65 control box with 1x16 A MCB, terminal connections, concrete foundation, photocell & override switch, 3X4 mm ² cable in 1" PEX pipe clipped to pole .The work includes excavation in the soil as per drawings, specifications and related standards.	No.	4		
4.9	<u>Intake Ducts</u> Supply, install, connect, test and commission the following UPVC conduits, including excavation, backfilling with selected materials ,draw wire and terminating to MDB and MLVB as per drawings, specifications and related codes. - 1x4" PVC SN5 conduit.	MR	430		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
4.10.	<u>Telephone System</u> Supply, install, connect, test and commission telephone points including conduits, 4X0.5mm ² tel. cable, boxes, tel. socket outlets, tel. terminal blocks for MTTB, in MDB for auto-dialer as per specifications, drawings and related standards.	No.	1		
4.11	<u>Sockets</u> Supply, install, connect, test and commission 16A waterproof power socket outlet including double pole switch, conduit, terminal block, boxes, cables and receptacle as per drawings, specifications and related standards.	No.	4		
4.12	<u>Diesel Generator Set</u> Supply, install, connect, test and commission standby package electric power generator as made by Caterpillar, Perkins, or equally approved, 3PH, 400V, 50Hz and 50 kVA capacity @ 0.8 PF and 1450 RPM, c/w original factory-built weather proof sound attenuation canopy with sound power level reduction down to 70dB @ 10 meters, powered by Caterpillar, Perkins or approved equal diesel engine, and coupled with Leroy Somer, Stamford, or approved equal alternator, including auto-filling diesel fuel system (from underground tank to genset built-in tank with gear type fuel pump, primary and secondary fuel filters, foot valve, isolating valves, fittings, ON/OFF pump operation and solenoid valve actuation controlled by low/high fuel level sensors in genset built-in tank, low fuel level in underground tank indicating signal; lamp on panel door, insulated black steel pipes and fittings, etc.), anti-vibration mounting arrangement, heavy duty maintenance-free battery, battery charger during stand-by mode, battery charger during operation period, water-in-fuel separator, residential silencer (muffler), built-in fuel daily tank, water jacket heater, anti-condensation heater, built-in control and power panel with main circuit breaker and all accessories and electric gadgets. The genset should be supplied with a provision for future connection to remote management control and parallel operation systems.	LS	1		
4.13	<u>Manhole</u> Supply, install, connect, test and commission of the following electrical manholes, including masonry and concrete works, concrete covers as per specifications, drawings and related standards. - Ø 60 cm, height = 50cm manhole	No.	15		
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Total of Electrical Works					

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WASTEWATER PUMP STATION AND FORCEMAIN - Mechanical Bill					
Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
	<p>GENERAL:</p> <p>The BoQ shall be read and construed in conjunction with the Contract General & Particular Technical Specifications, Drawings, Addendums & Amendments (if any), Invitation to Bid and Contract Conditions.</p> <p>The unit price for all items in the bill shall include for the supply and installation (S&I) of the designated materials/equipment, and -where applicable- should also cover for the cost of connection, testing, adjusting, balancing and commissioning, including all required fees and expenses for testing materials and instruments, unless otherwise specifically mentioned or instructed by the Engineer.</p> <p>Furnishing coordinated workshop drawings and obtaining Engineer's approval, in addition to close coordination with other activities and services, material storage, removing away from site the remnant of works and handing over the works to the Engineer is contractor's sole responsibility.</p> <p>Any discrepancy in contract documents will be explicated in favor of client.</p> <p>The contractor must consider coordination with different service providers for temporary and permanent services and utilities connection.</p> <p>Reading and understanding technical specifications is contractor's responsibility, where he must consider the Technical Specifications as expansion and complimentary for the BOQ items description.</p> <p>If there is duplication for a certain item within the bill, where two or more different unit rates are quoted for the same item under the same conditions, the lowest unit rate will be considered for remuneration.</p> <p>It is mechanical works contractor's responsibility to coordinate and supervise all electrical connections of electro-mechanical equipments.</p> <p>It is contractor's responsibility to coordinate with related authorities to get the required permits.</p> <p>It is contractor's responsibility to match all stipulated works with the relevant local norms, as well as, international related Codes and Standards.</p>				

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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
5	Mechanical Installations				
	<p>a- The contractor shall submit complete and detailed workshop drawings for all mechanical and related electrical installations of the lifting station for Engineer's approval.</p> <p>b- It is contractor's responsibility to check all required works and associated mechanical and electrical components for safe connections of the pump.</p> <p>c- The contractor shall perform all standard adjusting, testing and commissioning.</p> <p>d- The contractor is requested to submit all operation & maintenance manuals to Engineer.</p> <p>e- All fixing accessories shall be made of 316 stainless steel.</p> <p>f- All materials must be suitable for use in sewerage systems works.</p> <p>g- It is contractor's responsibility to supply clean water, diesel fuel, electric power for initial testing & system operation at the commissioning stage.</p>				
5.1	<p><u>Submersible Pumps</u></p> <p>Supply, install, connect, test and operate 75 m³/h, 20 m TDH, 80 mm flanged outlet, SS (N) type, non-clogging impeller and 1450 RPM submersible centrifugal pump to work in alternating mode within a set-up as shown on the drawings and in specifications, similar to Flygt FP 3127 SH 3~ 241 or approved equal, equipped with built-in electric cable 15m minimum length and cable holder, S.S chain, base and outlet size 100mm, upper guide holders & guides pipe Ø2" (S.S 2.77 mm thick). All electrical protection controllers should be supplied and installed in accordance with the manufacturer's recommendation, such as; leakage sensor, thermal contact, stator over-heating protection, bearing temperature sensor and cut-out. The pump shall be supplied with certified motor characteristics, test performance curves, list of spare parts and unit rates as recommended by the manufacturer, as well as, operation and maintenance manual, all erected and connected as per drawings, specifications and related standards.</p>	No.	3		
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5.2	<u>Vertical Mechanically Operated Screen basket:</u> Supply & install a vertical mechanically hoisted basket to serve as screening system of 0.6mx0.6mx2m dimensions and 3mm thick with 1.5" openings, where all parts of the screen are made from 316 stainless steel, complete with basket and guides including electro-mechanical hoist (winch) on bracket, all fixed to the housing manhole wall and slab. All materials and fixing accessories, such as but not limited to; bolts & washers, basket, basket door, basket guide and lifting eye, lifting cable, dead plate and all necessary parts and fittings needed for proper installation, operation of unit as indicated on the drawings and specifications, shall be made from SS316.	No.	1		
5.3	VALVES				
5.3.1	<u>12" Gate valve</u> Supply and install 12" Stainless Steel sluice valve (MIVAL/ITALY, CRANE/ENGLAND or equivalent) of working pressure 16 bars with flanges, bolts, gaskets, hand wheel and all fittings needed for proper installation and operation as indicated on the drawings, specifications and according to the manufacturer's recommendations & Engineer's instructions.	No.	2		
5.3.2	<u>12" Knife Gate Valve</u> As above but 12" knife gate valve	No.	1		
5.3.3	<u>6" Gate Valve</u> Supply and install 6" UPVC gate valve (MIVAL/ITALY, CRANE/ENGLAND or equivalent) of working pressure 16 bars with gaskets and flanges, as well as, SS316 hardware such as bolts, hand wheel and all fittings needed for proper installation and operation as indicated on the drawings, specifications and according to the manufacturer's recommendations & Engineer's instructions.	No.	1		
5.3.4	<u>4" Gate Valve</u> Ditto, but 4" diameter gate valve.	No.	6		
5.3.5	<u>Non Return Valve</u> Ditto as in 5.3.3, but 4" diameter none-return valve.	No.	3		
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5.3.6	Air Valve Supply & install double action air release valve, CRANE/ENGLAND or equivalent, 50mm diameter, complete with 50 mm flanged gate valve (PN16), 2" piping, drain pipe, with all needed fittings (flanges, bolts,...etc.) as indicated on the drawings, specifications and according to the manufacturer's recommendations & Engineer's instructions.	No.	1		
5.4	Flow Meter				
5.4.1	Flow Meter Supply and install PN 16 bar, IP67 220V/50 Hz/ 4-20 mA electromagnetic 6" flow meter, equipped and connected with data logger sensor from HONEYWELL or equivalent, including but not limited to the following: stainless steel housing, bolts, gaskets, reducers, coupling, flanges, jacking and concrete supports, as per specifications, drawings and related codes.	No.	1		
5.4.2	Dresser Supply and install DN 6" diameter (PN16) complete flange dresser with ears and tie rods, flanges, bolts and gaskets as indicated on the drawings, specifications and according to Engineer's instructions.	No.	2		
5.4.3	Ditto, but DN 4" diameter.	No.	4		
5.4.4	UPVC Pipes Supply and install DN 4" diameter, 45 degree UPVC long radius bend completed with all necessary jointing assembly or any needed fitting (flanges, bolts, gaskets,...etc) completely connected with main discharge pipe as per specifications, drawings and Engineer's instructions.	No.	4		
5.4.5	Ditto, DN 4" diameter, but 90 degree with all needed fittings, flanges, bolts, gaskets....etc .	No.	4		
5.4.6	Tee Supply and install 6"/ 4" diameter, UPVC flanged TEE with rubber gaskets, SS bolts and nuts as per drawing, specifications and Engineer's instructions	No.	4		
5.4.7	Manifold Supply & install 6" diameter manifold (header) UPVC pipe SN-10, above ground level for (force main) including flanges , gaskets, bolts, and connect with 4" pipes including concrete supports & connecting to 6" HDPE underground force main with appropriate fittings as per drawing, specifications and Engineer's instructions	L.S	1		
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Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
5.4.8	<u>Ventilation Pipe</u> Supply and installing 6" diameter HDPE ventilation pipe including all fittings, elbows, jointing, clamping to lighting pole as shown on the drawings, specifications and as per Engineer's instructions.	MR	13		
5.4.9	<u>Wash Out</u> Supply and install 4" diameter UPVC, SN-8 force main washout, connected to 6" manifold, with one gate valve (PN16), and one dresser flange with SS bolts, 90° elbow, 6"/4" tee, blind flange, the wash out to be connected to nearest public sewer network MH as per drawing, specifications and Engineer's instructions. Unit rate shall cover for all components stipulated in the item description, including 25 meter long pipe stretch buried at shallow depth.	L.S	1		
5.4.10	<u>Hoisting Crane (Blanco)</u> Supply and install of; 1000kg hoisting crane including; hoist chain, retractable telescopic beam, of sufficient length and base plate for loading & unloading on trucks, THERN--5124 or approved equal, with all necessary accessories as per drawings, specifications and related codes.	L.S	1		
5.4.11	<u>Fuel Tank</u> Supply and install 2000 Ltr. cylindrical underground fuel tank made of 6 mm thick steel, epoxy painted (1 coat primer and at least 2 coats final), complete with required isolating valves, vents, filling point and pipes, fittings, filling non-return and isolating ball valves, level indicator dip stick, excavation, concrete foundation and backfilling all according to Drawings, Specifications and local codes adopted by the PA related entity (Palestinian Petroleum Authority). The unit rate should include filling the tank to its full capacity with premium quality diesel fuel. Note: Fuel connection works and materials to the daily fuel genset tank should be carried out by the genset supplier whose responsibility will be to provide also the automatic pumping system, including lifting pump, conveying pipes and accessories from the underground tank to genset tank.	LS	1		
5.4.12	<u>Water System</u> Supply, install test and commission potable water system including 1" GI pipes, bronze collector with 2 eyes and main/branch valves as made , pex pipe and sleeve, 2 taps (garden tap with hose connection spout), all as per specifications , drawings and Engineer's instructions, all ready for connection with domestic water network.	L.S	1		
Total of Page					

**Wastewater Pumping Station and Force Main
Bill Of Quantities**

Item No.	Description	Unit	Qty.	Unit Price (US\$)	Total (US\$)
6	Force Main				
6.1	<u>HDPE Pipes</u> Supply and install, 150 mm diameter, 12 mm thickness, tested to 10 bar pressure HDPE force main, including all required fittings, bends, thrust blocks, handling, laying, testing, repairing, connection to pressure manhole, including warning tape with wire with all needed accessories, fittings as per drawings, specification and related codes. The price include the trench excavation in any soil (not less than 1 meter depth), and make required core cutting in concrete walls for required diameters, including sand bedding, compacted backfilling with approved selected material in layers of 25cm to design level. as per drawings, specification and related codes. The price include repairing any damages resulted because of excavation in existing facilitates all according to drawings, specification & as per the Engineer instructions.	M.R	680		
6.2	<u>Connection to Municipality Sewer Network</u> Supply, install and connect including excavation (1.5- 2.0 meters depth) & backfilling, 12" HDPE pipe 12 mm thick, between pressure manhole and existing public gravity sewer manhole with manhole connector (male & Female) to required design level and slope, with all needed fittings, complete as per Drawings. Specification and the Engineer instructions.	M.R	15		
TOTAL OF PAGE					
Total of Mechanical Works					
TOTAL WORKS					

**Wastewater Pumping Station and Forcemain
Bill of Quantities - Summary Page**

MAIN SUMMARY		
ITEM NO.	DESCRIPTION	TOTAL (\$)
1	TOTAL OF CIVIL WORKS	
2	TOTAL OF ELECTRICAL WORKS	
3	TOTAL OF MECHANICAL WORKS	
	TOTAL WORKS (\$)	
	Grand Total (including Provisional Items) - Excluding Value Added Tax (VAT)	
	Percentage of Discount or Addition (if any)	
	Amount of Discount or Addition (if any)	
	Net Total	
NET TOTAL (in words) :		
SIGNED AND SEALED :		
AUTHOURIZED :		
TITLE :		
SIGNATURE :		
DATE :		