



## Rehabilitation of Pumping Stations No.08 , 03 and 02 in Khan Younis for KY WWTP

### Tender Documents

### BOQ

Executing Entity: UNDP/

PAPP Employer: UNDP/PAPP

January 2020

## Bill of Quantities

### Preamble to the Bill of Quantities

- 1 Metric units of measurements have been adopted. All dimensions given in the item descriptions of the Bill of Quantities are in millimeters unless stated otherwise.
- 2 General instructions and detailed descriptions of work and materials are not necessarily repeated in the Bill of Quantities. Reference should be made to the Conditions of Contract, Specification and the Drawings for this information and these documents are to be read in conjunction with the Bill of Quantities.
- 3 The Tenderer is deemed to have visited the project site and fully acquainted himself as to the location of each of the project components to be carried out and to all conditions which may affect the performance of the works, including but not limited to:
  - Access to each of the roads in which the pipes will be installed.
  - Access for the plant, equipment and materials.
  - Surface conditions.
  - Restrictions applicable to working in Gaza Strip area.
  - All safety regulations and employer site safety procedures.The Tenderer is also deemed to have surveyed the actual condition of the site and made his own assessment of the type and extent of the works prior to submitting his offer.
- 4 The unit prices inserted in the Bill of Quantities by the Contractor (when tendering) shall be full inclusive value of the work described under the respective items including all necessary labour, installation supply of equipment and goods, plant, materials and temporary works, and all other costs and expenses which may be required in, and for the construction of the Works described, together with all risks, liabilities and obligations set forth or implied in the Tender Documents, except only those works for which provision is made under separate items in the Bill of Quantities.

Unless clearly stated otherwise in the Bill of Quantities, the unit prices entered against the various Bill items shall include for executing such items in all locations in accordance with the Contract Documents and shall include for all associated temporary works.
- 5 The Contractor (when tendering) shall not enter any new items in the Bill of Quantities except as where expressly provided for.
- 6 The unit prices quoted by the Contractor (when tendering) shall inter alia be deemed to cover tolerances, waste, cutting to waste, working round obstructions, overbreak and for a proportion of the works being in small quantities.
  - 6.1 The equipment and fittings supplied under the Contract, the unit prices shall also include for boxing out, fixing, building in, making good, and all other incidental work.
  - 6.2 The quantities shown in the Bill of Quantities are approximate only and the work will be measured strictly net to the limits indicated on the Drawings or as otherwise defined.
- 7 Where items are provided for the removal and reinstatement of specific features the unit prices shall include for the cost of removal of such features and for cleaning, storing and reinstatement on completion of the appropriate section of work.
- 8 The unit prices shall allow for the maintenance, temporary diversion, support and protection of existing services, sewers and the like and also for working in a manner such as to avoid causing them damage.
  - 8.1 Where the Works may affect adjacent structures or services the unit prices in the Bill of Quantities shall be deemed to cover any temporary works which may be necessary to prevent damage to the structures or services during the construction of the Works including any temporary diversion of services which may be necessary.

### Bill of Quantities

- 8.2 The unit prices in the Bill of Quantities shall also be deemed to cover any permanent measures required to support and protect such structures and services except insofar as specific provision is made in the Contract for payment for such work.
- 9 All the equipment will be paid on the basis of a lump sum rate per unit for completion of the works, including design, manufacture, transport, installation, fixing, concrete embedding if necessary, electrical connections to distribution panels for all motorized equipment, drains up to sump if required, water supply to the equipment from the municipal water supply network if required, testing, commissioning and all other contingencies to deliver the work in accordance with the technical specifications and drawings and to the satisfaction of the Engineer.
- 10 The unit prices for values include, unless otherwise specified, all fittings of equipment, joints, nuts, flanges adaptors, flanges, ...
- 11 The works, materials or activities listed in the following shall always be considered as auxiliary works to be included in the Unit Prices bid for any item in the Bill of Quantities:
- Any measurement for execution and payment of the works, including the provision of measuring instruments, gauges, setting out marks, marking paint and relevant tools, labor, etc., the maintenance and preservation of gauges and setting-out marks during the execution of the works.
  - Provision of small tackle tools or any other equipment required for the execution of the works.
  - Supply of consumable for the Contractor's equipment.
  - Removal of all contamination (refuse, debris, building rubbish and the like) arising from or in connection with the Contractor's work.
  - Protection of the executed works and of the items made available for execution of the works from damage, fire, inclement weather, vandalism and theft, etc., to the time of final acceptance.
  - Transportation of all materials and structural components from the storage places on site to the points of use and return transportation, if required.
  - Submitting and transporting any samples required.
  - Carrying out tests on materials and works, etc., that is required by the Engineer.
  - Fuel and lubricants for operation of Contractor's equipment.
  - All safety precautions and measures for safeguarding labor as well as securing surrounding areas.
  - Lighting of the work site.
- 12 The contractor shall consider in his price that all pump stations (PS8, PS2 & PS3) are under operation and he should take all precautions during installing and erecting of pipes or equipment, etc.. and make all necessary coordination with all parties during the work, and also he should consider in his price dewatering of sewage water when needed for any kind of works required, after full coordination with CMWU and Khan Younis municipality for stopping of pumping and specifying the allowed place for disposal of sewage.

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Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>BILL 1: Pumping station Works PS8</b>					
	<p>The unit price shall be deemed to include the following:</p> <p>1-The contractor shall consider in his price that all pump stations (PS8, PS2 &amp; PS3) are under operation and he should take all precautions during installing and erecting of pipes or equipment, etc.. and make all necessary coordination with all parties during the work, and also he should consider in his price dewatering of sewage water when needed for any kind of works required, after full coordination with CMWU and Khan Younis municipality for stopping of pumping and specifying the allowed place for disposal of sewage.</p> <p>2-All the materials must suit the raw wastewater usage</p> <p>3-All the stainless steel materials grade 316 L</p> <p>4-The contractor shall submit a complete and detailed method of statements for all relevant mechanical and electrical installations of the pump for approval prior to the work commencement.</p> <p><b>5-The contractor shall consider in his unit price of the items in this BOQ dismantling, cleaning and separating all existing temporary manifold components (pipes, fittings, valves, elbows etc.) which is under operation in Pumping station No. 8, and transferring them to Khan Younis municipality stores. as per engineer instruction.</b></p> <p>6- It is the contractor's responsibility to check all required works and all the associated mechanical and electrical components for safe connections of the pump, which will be supplied, fixed and completed on his account.</p> <p>7- The contractor shall perform all standard testing, commissioning, programming and parameters setting; all in accordance with pump manufacturer's recommendations.</p> <p>8- By the end of the work the contractor shall submit a complete set of operation and maintenance manuals and xyz as built drawings operation.</p> <p>9-All the following items shall be completed according to the Specification and Engineer instructions.</p>				

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>1.1</b>	<b>Metal and Steel works</b>				
1.1.1	Maintain, repair and fix the existing manual bar screen, the works include supply and install any missing or damaged parts and material. The unit price includes commissioning of the screen to work as per specification and Engineer instruction.	L.S.	1		
1.1.2	General Overhauling Rehabilitation, electromechanical maintenance, repair and operate of the auto-mechanical bar screen and mechanical conveyor, the price includes changing (Supply and install), the damaged and deteriorated parts but not limited to:- Replacement of worn-out and / or damaged parts.- Electrical and automation system Rehabilitation, the price includes motor repair, control panel overhauling, changing deteriorated electrical parts, components, cables, PLC, connections, approximate (eye), sensors, etc.-Changing all the bearings and pulleys. - Changing the rope (316 L stainless steel cables) -supply one extra set of rope (316 L stainless steel cables) - Replacement of unpredictable Defects Parts of Bar Screen and classifier i.e. Skelton, jacks, channels etc, to bring it back in good working condition.- The item is including all necessary electrical works and parts to supply electrical from the main DB and shall include any MCCBs, CBs, wiring , cabling, ducting, cable trays, etc..-The Price includes all necessary components and connections to complete maintenance and operation of bar screen, all according to engineer instructions and approvals.	LS.	1		
1.1.3	General Overhauling Rehabilitation, maintenance, repair and operate of the existing sluice gates, the works includes replacement, supply and install any missing, damaged parts and material, and all necessary parts and fittings for complete maintenance and operation of the sluice gate, all as per engineer approval and instructions.	No.	5		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.1.4	Supply, Fabricate, Manufacture and install grating size 110x75cm, made from S.S 316L 5mm thickness, the space between straps 3 cm, the height of frame should be matched with the existing frame, the work includes frame, angles, straps etc., the price includes all metaling works for existing covers (opining gate) to match the new grating, the works include removing the old paint for the cover and the frame using sand air compressor and repaint with two primer coat (zinc rich) and two coats of HAMAR finish (total film thickness 200 micron) by using spray machine , all as per engineer approval and instructions. Measurement for top horizontal projection of grating	m2	10		
1.1.5	Supply, Fabricate, Manufacture and install grating, made from S.S 316L, 5mm thickness, the space between straps 3 cm, the height of frame 5 cm, with frame for covering of screen chamber channels all as per engineer approval and instructions. Measurement for top horizontal projection of grating	m2	6		
1.1.6	Maintain and paint the existing cover (opining gate) for the inlet chamber the price include removing the old paint for the cover and the frame using sand air compressor and repaint with two primer coat (zinc rich) and two coats of HAMAR finish (total film thickness 200 micron) by using spray machine , all as per engineer approval and instructions. Measurement for top horizontal projection of the cover including frame	m2	2		
1.1.7	Supply and install a complete stainless 316 L steel ladder of 60 cm width, it consists of two vertical hollow pipes 38mm diameter and horizontal pipes 32 mm diameter ladder steps, thickness of all pipes not less than 1.5 mm. The ladder has to be fixed by pipes (32 mm) and 7/8 inch SS bolts on the wall plates (size 200*200*3 mm), as per the attached drawings. the price includes supply and install new Stainless-steel protection grade 316 L similar to the existing one with the same dimensions and minimum thickness of 1.5 mm, the price includes the supporting SS pipes outside the manhole as the existing one. The work includes dismantling the old steel protection and ladder. All the works should be according to the engineer's instructions. Measurement only inside manhole.	L.M.	15		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.1.8	Maintain, fix, adjust and paint the existing Galvanized steel entrance main gate around 5X3 m (Width X Height), the works include supplying & installing a new suitable lock for the gate, the price includes replacing the bottom profile with new one with the same size and thickness with all required works by fixing, welding and painting. the price includes removing the old paint using sand air compressor and repaint with two primer coat (zinc rich) and two coats of HAMAR finish (total film thickness 200 micron) by using spray machine. The unit price include replacement of all existing Steel panels sheets fixed on the door with new panels with the same type and thicknesses, all as per engineer approval and instructions.	L.S.	1		
1.1.9	Maintain, repair and fix the existing steel doors, frames ,steel protections for windows and external steel ladder and hand rail in the service building, the works include replacement of all damaged accessories, locks and associated materials, with new approved materials, the price includes preparing the surface, cleaning, smoothing, and re-painting them again with primer and approved oil paint. all as per engineer approval and instructions.	LS	1		
1.1.10	Maintain, repair, fix the existing galvanized steel hand rail, the price includes removing the old paint using sand air compressor and repaint with two primer coat (zinc rich) and two coats of HAMAR finish (total film thickness 200 micron) by using spray machine all as per engineer approval and instructions.	L.M.	50		
<b>1.2</b>	<b>Piping and fitting works</b>				
1.2.1	Supply, Install and Weld stainless steel pipes, grade 316 L and Schedule 10S for the fabrication of the manifold with DN 28" ( 700 mm), min wall thickness of 7.92 mm, the works include supply and install all required, all according to the specifications, drawings and the engineer instructions.	L.M.	10		
1.2.2	Ditto, but DN 16" (400 mm) stainless steel pipes 316L with min wall thickness 4.78 mm, to connect between discharge pipes and the manifold header also for the flow meter connections.	L.M.	30		
1.2.3	Ditto, but DN 4" (100 mm) stainless steel pipes with min wall thickness 3.05 mm, for washing lines between the discharge lines.	L.M.	7		

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Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.2.4	Supply and install stainless steel-316L- 45 degrees' long radius pipe elbow DN 28" (700 mm), with min. thickness according Schedule 10S, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	No.	2		
1.2.5	Ditto, but DN 16" (400 mm) 90 degrees stainless steel bend 316L .	No.	2		
1.2.6	Ditto, but DN 16" (400 mm) 45 degrees stainless steel bend 316L .	No.	4		
1.2.7	Supply and install stainless steel 316L reducer DN 28" to 16", with min. thickness according Schedule 10S, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	No.	2		
1.2.8	Connect, supply and install all required parts and fittings to connect the new S.S 316L pipe manifold to the existing pressure steel pipe 24" dia., the item includes pipes, flanges, gaskets, 316L bolts sets etc., the work includes cutting, welding, excavation, backfilling, watering, reinstatement, all as per specification, drawings and engineer approval and instructions.	L.S.	1		
1.2.9	Supply and install stainless steel Tee 316L DN 16"X16"X16", with min. thickness according Schedule 10S, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	No.	2		
1.2.10	Supply and install stainless steel blank flange 28", 48 mm thickness, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	No.	1		



## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.2.11	Supply and install a Stainless steel (316L) air release valve DN 4", PN16. Model: D-020 ARI type or equivalent, for wastewater usage, the works includes but not limited to supply and install all required fittings, accessories and associated materials e.g. flanges, flanged couplings, gaskets, bolt nuts, washers, gate valve 4" dia., drainage pipes, 4" steel pipe ,etc.) and any other necessary parts for complete installation and operation of ARV, all as per drawings and engineer instructions.	No.	4		
1.2.12	Supply and install a complete horizontal check valve DN 16", PN16 with counterweight and limit switch assembly (micro switch including relays, 24V dc and/or 230V ac.), Swinging type with top bolted cover for wastewater usage, ARI type or equivalent, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No.	4		
1.2.13	Supply and install a complete gate valve DN 16", PN 16, for wastewater usage, Raphael, AVK type or equivalent, supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No.	7		
1.2.14	Ditto, but DN 4" gate valve.	No.	7		
1.2.15	Supply, install a diaphragm pressure gauge liquid filled dial (0-10 bar) 100mm diameter for wastewater usage, Wika type or equivalent, the works include supply and install all required parts and fittings e.g. stainless steel tee, two stainless steel ball valves, nipples and strainer and all required fittings, etc., all according to the specifications, drawings and the engineer instructions.	No.	5		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.2.16	Supply and install an electro-magnetic flanged flow meter DN 16" for sewage use, Siemens, ABB or equivalent the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., needed for proper installation and operation of the flowmeter as per manufacturer recommendation all according to the specifications, drawings and the engineer instructions.	No.	1		
1.2.17	Supply and install a complete flanged dresser with ears and stainless steel 316L tie rods DN 16", with min. PN 16 bar, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No.	7		
1.2.18	Ditto, but DN 4".	No.	3		
1.2.19	Supply & install sluice gate TBS type or equivalent HDPE (high-density polyethylene) adequate for concrete pipe 1000 mm Diameter, with a minimum thickness of 30 mm and provided with: (running into the guides), solid shaft and extended stem. For inlet pipe in the inlet chamber the works include supplying and installing all the parts and fittings which required for proper installation and operation of the gate all according to the specifications and drawings, catalogues and manufacturer instructions, also the works include the dismantling the existing sluice gate and transfer it to CMWU stores.	No.	1		
1.2.20	Ditto but for the wet pet entrance pipe	No.	1		

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Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.3	<b>Mechanical and Electrical equipment's</b>				
1.3.1	<p>Supply, install, connect and test a new KSB type sewage submersible pumping unit model KRTK 250-403/1104.UNG-S with the following specifications:            Voltage: 400 volts            Frequency: 50 Hz            Motor power: 110 kw            Pumping Capacity: 1100 m3/hr. at head 26 meter (Duty point)            Rotation Speed: 1480 rpm            Hard iron Impeller, the Pump electrical cables not less than 30m length            the works will include but not limited supply and install all its associated accessories, all required kinds of protection sensors and their receptive devices in the control panel, disconnecting switch, all required electrical cables and electrical components and programming, pump base, Steel Base L Shape 3 cm thickness, Stainless Steel 316 L( chain, wire guides, guide holder 316L, Bolts, anchors Bolts nuts), Steel Plate 10mm for fixing the guide holder. <b>The new pump must suit the existing pump base</b> also the works include cleaning the pumping wet pits several times for installation and testing the new package, dewatering the pumping wet pits, and transfer the garbage outside the site ,, ,,etc., all as per engineer approval and instructions.,            the price will also include Extra set of:            1- Repair kit set (e.g. O rings set)            2- Mechanical seal set            3- Bearing set (upper and Lower)            4- One Impeller</p>	unit	3		

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Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
1.3.2	Supply and install a heavy duty Electric Chain Hoist four Ways Directions (Up, Down, Left and Right), STAR type or equivalent, with the following specifications: integrated motorized trolley, minimum capacity lifting load: 3200 kg, operating voltage 400 Volt, 3-phase, 50Hz., motor protected to IP55, encapsulated pendant control protected to IP65, stainless steel load chain not less than 20 meter, flexible chain container, with emergency stop, all according to the engineer instructions and approvals. The item is including all necessary electrical works to supply the hoist from the main DB and shall include any MCCBs, CBs, wiring, cabling, ducting, cable trays, etc..., made the necessary rehabilitation for existing I-beam,	No.	1		
1.3.3	Supply, and install a complete package of a heavy duty dredging, agitator sand slurry submersible wastewater dewatering pump Flygt, KSB type, Toyo or equivalent of 45 cubic meters / hour discharge capacity and 20 meters total head, solids free passage 1" dia., 30 m flexible electrical cable, complete with the drive motor assembly explosion proof motor, wet-dry drive motor, the price includes disconnecting switch, complete control panel, and all required electrical parts and fittings, also including flexible 100m discharge pipe 4" diameter, PN10 and all other necessary parts and fittings needed for proper installation and operation of the pump in its place, all as indicated in the specifications and drawings, catalogues and manufacturer instructions	No.	1		
1.3.4	Supply, and install 4mm thickness 316 stainless steel container for screenings and grit of approximately volume of one m <sup>3</sup> . The container should be provided with a removable HDPE cover and aluminum foil flexible hose connecting the cover with the mechanical bar screen delivery chute with a diameter of 40 cm to minimize odor release from the screenings, the container shall be provided with stainless steel wheels. All the works shall be as per specifications and the engineer's instructions.	No.	2		
<b>Total of Bill No. 1</b>					

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>BILL 2: Service Building, boundary walls and yard Works PS8</b>					
<b>2.1</b>	<b>Concrete Works</b>				
	<p>Rates of Concrete Works shall include: -</p> <ol style="list-style-type: none"> <li>1. All form works and shuttering (new lumber for shuttering painted by special oil) 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.</li> <li>2. Fuel or burned oil is not accepted to be used for painting the lumber before use the form.</li> <li>3. Supplying, Casting, vibrating and curing as per specifications.</li> <li>4. Approved additives and admixtures.</li> <li>5. Incurred costs on New Concrete Job Mix Designs, Sampling, testing and providing test results certificates, storing and saving of samples.</li> <li>6. 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.</li> <li>7. Compaction and testing under the foundation, ground beams, and ground slabs, the compaction should not be less than 97% of MDD.</li> <li>8.the price include adjustment for the existing ground beam top level by supply and cast reinforced concrete and prepare the existing beam by roughing it's top and fix dowel steel bars, the contractor should submit method statement for the beams leveling, the work according to specifications and engineer instructions.</li> <li>9.Fixing dowel steel bars for columns in the existing ground beam using special material epoxy with the same number and diameter of the column's reinforcement with length according to specifications and engineer instruction.</li> <li>10.Supply, fabricate and fix reinforcement steel (fy= 410 N/mm<sup>2</sup>) 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</li> </ol>				
2.1.1	Supply and cast in place reinforced concrete B300 for the foundations, beams, columns, lintels, fuel tank foundation, anchors, and others As per drawings.	m3	30		

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Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
2.2	<b>Block Works</b>				
	<p>The Rates include:</p> <p>1- supplying hollow or solid cement block from good and approved factory in perfect dimension and build it in good manner with a compressive strength 35 kg/cm<sup>2</sup> for hollow block and 60 kg/cm<sup>2</sup> for solid block. This item will include cement mortars, reinforced concrete infill (B250) between columns &amp; block walls (10-20 cm wide) with 1Ø8mm/40cm horizontally and 2Ø8mm vertically according to drawings, pipes encasement, false columns 20x20 cm/4.0m among the parapet wall with 4Ø12mm &amp; all requirements needed to finish the works according to the drawings, specification and to the supervision engineer instructions.</p> <p>2- Providing samples for approval and all the required tests.</p> <p>3.the price include adjustment for the existing ground beam top level by supply and cast reinforced concrete and prepare the existing beam by roughing it's top and fix dowel steel bars, the contractor should submit method statement for the beams leveling, the work according to specifications and engineer instructions.</p>				
2.2.1	Building with 40x20x15 cm solid concrete blocks.	m <sup>2</sup>	125		
2.3	<b>Plastering Works</b>				
	<p>All works must be according to drawings, specification and engineer instructions. Rates shall include:</p> <p>1.Supply of all needed materials, including galvanized angles for the corners, windows and external decoration as well as the use of galvanized wire mesh between concrete and block work.</p> <p>2.Preparation works by covering all conduits of electricity, water supplies, etc, with a galvanized wire mesh at least 20cm width coated by mortar (1:1) cement : sand and the work includes removal of wires and nails and cleaning of surfaces to be ready for plastering.</p> <p>3.Contractors shall take into consideration that all – direct and indirect works and expenses required for the completion of the coming items are included in the unit price.</p> <p>4.Trimming of concrete chippings, removing the wires and cleaning of existing surfaces to be ready for plastering.</p> <p>5.This should be done prior to commencement of plastering and after obtaining a written approval from the supervision engineer.</p> <p>6.Curing with water for at least three days for each coat.</p>				

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Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
2.3.1	Supply and make external plastering 20mm thick for four layers : the first is the rough nail rendering (mix 1:1) cement: sand, the second is 5mm thick mortar (mix 1: 2) cement: sand, the third is the undercoat 13mm (mix 1: 3 :0.25) cement : sand : lime ; the forth is with tow coat of tyrolean plaster according to engineer's instructions, all according to Drawings, Specifications and instructions of the Engineer.	m2	300		
2.4	<b>Painting Works</b>				
	<p>1.All materials and Colors should be approved by the Supervisor.</p> <p>2.All the painting materials used should be approved and tested by approved local laboratory and have the final approved from the supervisor engineer.</p> <p>3. The surface must be dry and clean before painting.</p> <p>4. All painting works should provide the required coverage.</p> <p>5. All paint works must be according to specifications, drawings and supervisor engineer instructions.</p> <p>6. Contractor shall take into consideration that all – direct and indirect works and expenses required for the completion of the coming items are included in the unit price.</p> <p>7.Smoothen surfaces of existing plastering before the Commencement paint</p> <p>8. Providing scaffolding to carry out the external painting</p> <p>9. The price includes all the above in addition to putty where needed and bondrol paint for all surfaces</p>				
2.4.1	Supply and paint two coats of emulsion paint (Supercryl) for internal walls including all the required materials as shown on the drawings.	m2	150		
2.4.2	Supply and paint bondrol primer coat and two coats of policide for the ceiling including all the required materials as shown on the drawings.	m2	100		
2.4.3	Supply and paint two coats of external quality emulsion paint (Supercryl) paint for external (tyrolean) and smooth surface color will be approved by the Client.	m2	150		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>2.5</b>	<b>Plumping Works</b>				
2.5.1	Supply, install commission and test a new electric Water Heater with capacity of 50 liter type ARISTON or equivalent completed with foam insulation, cladding and all required fittings and associated accessories e.g. sensors, thermostat, automatic air vent, valves, flexible connections, fittings, hangers, supports and clips, to connect it with cold water feeder and water distribution cabinet. The works also include the dismantle the existing electric Water Heater	No.	1		
<b>2.6</b>	<b>Fire fighting System</b>				
2.6.1	Supply and install fire extinguishers Dry powder with capacity of 6kg (lahavot type)	No.	2		
2.6.2	Supply and install fire extinguishers CO2 with capacity of 6kg (lahavot type)	No.	2		
<b>2.7</b>	<b>Yard works</b>				
2.7.1	Dismantling the interlock pavement layer in all areas in the yard of PS8, the price includes dismantling the Interlock tiles and sand, then supply, install, watering and compact new base-coarse layers with different thickness to reach the new design levels as per approved shop drawing to improve the storm water drainage system. The price also includes re-paving the existing Interlock and supply and install new Interlock with same shape instead of defected parts, the price includes supplying a complete new clean sand layer 5 cm under the interlock with all required compaction and tests as per specifications and engineer instructions., the price includes adjustment of existing manholes to suit the new levels. The works includes cleaning very well all existing manholes and pipes and replacement of any defected parts. The contractor should submit a design for the new levels of interlock in order to enhance storm water drainage system. All works should be as per approved design drawings, specifications and engineer instructions.	m2	1000		



## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>2.8</b>	<b>fence</b>				
2.8.1	Supply and install standard galvanized steel barbed wires of Ø 4 mm , the tighter galvanized wires will fixed to 1.2m height Galvanized steel profile 80*40*4 mm. above the block boundary wall, ,the galvanized steel profile will be fixed to the boundary wall concrete columns at 4 meters' intervals with all associated fittings and accessories. Steel profile at corner or edges and also at 20-meter interval must be supported from both sides by the same type of profile, the price includes required works to remove the old fence and fixing the new fence on the boundary wall, all according to Drawings, Specifications and instructions of the Engineer.	LM	150		
<b>Total of Bill No. 2</b>					

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>BILL 3: Stormwater drainage</b>					
3.1	Supply and install a concrete B300 precast rectangular storm water chamber size 2 X (0.8 X 0.4 X 0.65 m) and 1 X (0.8 X0.4 X1.3 m) complete with cast iron cover (25 tons' capacity), frame and special joint required to fix the UPVC pipes to the manhole. The item also includes B300 benching, plain concrete, two external hot bitumen coating, and backfilling in layers 25 cm maximum using suitable material with watering, compaction, the unit price includes reinstatement of the pavement layers with min. 25 cm base-course layer ...etc. all as per engineer instruction and approvals.	No.	2		
3.2	Supply and install concrete manhole B300, 80 cm 2m depth Internal diameter, complete with 60 cm storm cast iron cover (25 tons' capacity), frame and special joint required to fix the UPVC pipes to the manhole. The item also includes B300 benching, shuttering, excavation in any type of soil, plain concrete, two external hot bitumen coating, and backfilling in layers 25 cm maximum using suitable material with watering, compaction, base course, pavement and reinstatement the cut parts...etc. The item includes rings according to attached drawings. All as per engineer instruction and approvals.	No.	2		
3.3	Supply and install UPVC pipe SN8, DN 250 mm, up to 2 m depth, the item includes excavation, backfilling, supplying and laying clean sand, compaction, watering, reinstatement of the pavement layer, the unit price. The unit price includes connecting to nearest existing storm water manhole or gulley's, with all required materials to complete installation. As per engineer approval and instructions.	LM	50		
<b>Total of Bill No. 3</b>					

**Bill of Quantities**

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>BILL 4: Electrical Works</b>					
	<p>* In general The works include supply and install the associated materials e.g. conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network, all are included in the unit price.</p> <p>* Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. The shop drawings shall include detailed lists of all electrical materials specifications (manufacturer, ratings and model numbers).</p> <p>* The contractor should provide the required onsite training courses for Operator staff to be familiar with the project components and it should cover the operation, maintenance and monitoring for the PLC system.</p> <p>* All the electrical works shall be carried out according to specifications, standards, drawings, and the instructions of the engineer.</p> <p>* The contractor should remove and/or dismantle, the existing materials and components and all damaged or malfunctioned parts and materials and transfer them to locations or sites approved by the Engineer.</p> <p>* The works include dismantle of existing interlock tiles and others and re-install it without any damages as per the existing to complete the job.</p> <p>*All required modifications of the attached drawings shall be the responsibility of the contractor.</p>				

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>4.1</b>	<b>Motor Control Center (MCC)</b>				
4.1.1	<p>Supply, install and commission the following and all required components related with new pump number No.4 (P4) inside the existing blank panel, factory assembled wired and tested, including bus bars, neutral bus bar and earthing terminal, internal wires and cables to cover the loads of the new pump and all necessary civil works, ducts, all internal components. The panel shall drive pump power rate 110KW with all required power control circuits for auto / manual operation including all monitoring and protections. The contractor has to modify the components ratings to comply with the pumping system ratings were necessary. The works includes but not limited to the following supply and installations.</p> <p>1- Main Circuit breaker type NZM 250 A (Isc=50KA) with shunt trip for the pump</p> <p>2- SOLCON Soft starter of RVS-DN- 310A type with all integrated protections.</p> <p>3- By-pass contactor of DILM - 225 A (110KW) for the pumps</p> <p>4- sets of Enters type Digital voltmeter No.4, Digital Ammeter (0-800A) No.4,</p> <p>5- Digital hour meter (counter 3.4 digits, 24V dc and/or 230V) No.4, current transformers No12, emergency stops No.2 (one connected to shunt trip in main NZM in MDB and the second connected with pump control panel. Push buttons and signal lamps ...etc.</p> <p>6- Connecting to Grounding pit Flexible copper cable size (1x70) mm<sup>2</sup> from pump control panel and pump room.</p> <p>7- Panel ventilation system including one extract fan, thermistor relay, temperature sensors (30-70 OC), 16A contactor, mcb 1X10A.</p> <p>8- All required power and control circuit with all required Relays, temperature relay, PKZM, signal lamps single pole switched needed for manual and automatic operation, emergency PB ...etc.) all as per attached drawing and engineer instructions.</p>	Set	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>4.2</b>	<b>PLC Cabinet</b>				
4.2.1	<p>Supply, install and commission complete PLC system with all required components inside the existing PLC Panel in the site ,as specified and as shown on drawings, tested and in operating conditions. (Type is DELTA or equivalent).The Programmable logic controller system includes also PLC, 128 I/O points (Digital &amp; analog ), computer software and interface, with sufficient updated RAM, and two memory packs, logic memory of 16 kilo byte size (and PLC connection with laptops). The unit shall be as per drawings, specifications, and engineer's instructions and the new version manufactured at the time of tendering. The work includes programming the PLC to operate the pumping station with 4 pumps(3-duty/1-standby), as specified by the engineer and according to the sequence to operate the pumps equal times,</p> <p>including original pump protection controllers, humidity, thermistor, bearing, temperature, leakage sensitive electronic relay from same manufacturer of pumps, 10" HMI touch screen and all other necessary power and control circuits with all extra relays and/or switches, timers, PKZM, push buttons, manual changeovers, signal lamps, MCB's of FAZ type , isolating control transformers, wires, cables, terminals, and Panel ventilation system including one extract fan, thermistor relay, temperature sensors (30-70 OC), 16A contactor, mcb 1X10A. , all as according to attached drawings, specifications and engineer's instructions.</p> <p>Old control and PLC components should be removed and handed over to CMWU store.</p>	UNIT	1		
4.2.2	<p>Supplying and install uninterruptable power supply U.P.S. 1000W rating, 50-60 minutes full load discharging time,230V sine wave output, with all protection and indicators, for PLC system, The works include supply and install internal battery bank of Ultracell type or equivalent type.</p>	L.S	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
4.2.3	Supply and install two batteries, each one is 12 VDC, 40 AH, Ultra cell, First Power, Solite, Volta, Ritar, VARTA or equivalent type with charger 220 Vac/ 24 Vdc, 10A type is Datacom for Ultra sonic level device.	Unit	1		
<b>4.3</b>	<b>Cables and conduits</b>				
4.3.1	Supply, laying and termination of synergy type, copper conductors, XLPE insulation type, N2XY (3X150+70) mm <sup>2</sup> of superior type or equivalent, (For mains, pumps and generator connections)	L.M.	80		
4.3.2	Ditto, but power cable XLPE, N2XY 2(3X240+120) mm <sup>2</sup> ., but the price includes dismantling and removing the existing cables and transfer it to the KY- Municipality. (for Gen. set)	L.M.	50		
4.3.3	Ditto, but control cable 24X2.5 mm <sup>2</sup> . for switchboard and sensors (control).	L.M.	80		
4.3.4	Ditto, but control cable 3X2.5 mm <sup>2</sup> .	L.M.	80		
4.3.5	Supplying and install 3" pipe (flexible) including 100cm digging and backfilling, and a warning tape for street lighting poles.	L.M.	80		
4.3.6	Supplying and erecting UPVC pipes, including 100 cm digging and back filling with clean sand, and a warning tape 4" diameter UPVC pipe	L.M.	80		
4.3.7	Ditto but 6" diameter UPVC pipe	L.M.	80		
4.3.8	Supplying and installing concrete manhole, with 25 ton Iron cover, 80 cm diameter. The unit price include excavation, backfilling and all needed works to complete the job.	No.	5		
4.3.9	Supplying and erecting grounding unit, including 60cm diameter manhole, copper electrodes, clamps, and 150 sq.mm CU. wire, connecting to generator neutral, the work includes inspection for the earth resistance and must not exceed 2 ohm as per specifications.	Unit	3		
4.3.10	Supplying and erecting cables tray, MTK type or equivalent, different sizes range from 10-60 cm width, as per engineer instructions including all accessories, fittings and fixing materials	L.S	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>4.4</b>	<b>Miscellaneous for Electrical Works</b>				
4.4.1	Supply and install pressure switch type is Diaphragm or equivalent for high & low pressure on the main header connected to PLC panel, the switch shall be adjustable (0-10 bars). (low & high pressure) with cables and connections.	No.	4		
4.4.2	Only Supply electrical float switches inside the sewage wet pit, IP 65 category, with N.O. and N.C. 10A contacts points, supply voltage 24V dc and/or 230V ac, according to specifications and engineer's instructions type Flygt or equivalent. The price includes pedestal mounted weather proof junction box out side the wet well. All float switches should be protected by 4" PVC 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.	No.	6		
4.4.3	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 (controller), IP 68, Type is Pulsar ultra5 or equivalent. The price includes supply and install all required connectors, sensor, flanges, make the suitable opening in the wet pit, metallic and non-metallic supports, electrical bell (horn) 12VDC connected to Ultrasonic, control and power cables from ultrasonic level meter to the control panel and PLC, with all required civil works and materials, 5 no. of control relays, circuit breakers, LTL, with all needed materials and workmanship as per specifications and engineer instructions.	No.	1		
4.4.4	Supplying and erecting micro-switches connected to NVRs on the check valves including relays, 24V dc and/or 230V ac. The work also includes all needed cables and connections to the panel.	No.	4		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
4.4.5	Supplying and erecting local isolated On/Off switch 3X250 A, I <sub>sc</sub> =50KA rating with external hand, the switch shall be lockable type and to be installed close to the associated pump inside weather proof enclosure fiber glass (60X80X25cm) of IP-65 protection including also emergency stop. <b>Type Eaton, Hager or equivalent.</b> The price includes fixing the panels on galvanized plate and profiles as per drawing and engineer instructions.	No.	4		
4.4.6	Supply, install, test and commission air conditioning heat pump Split Unit with cooling and heating capacity of (24,000 BTU), air flow (650 CFM), Electra (platinum inverter) type or equivalent, composed of outdoor unit, filled with environment friendly refrigerant such as (R410A, R407) well supported on galvanized steel base on the roof of control room, indoor unit with efficient filters for wastewater P.S, and complete with all necessary supports, hangers, The works include supply and install the drain pipes 2" dia., and all required electrical cables according to engineer approval. The works include civil works from erecting, new window between control room and operation room...etc.	No.	1		
4.4.7	Ditto but 12,000 BTU.	No.	1		
4.4.8	Supply, install, connect and test Pole Mounted 120 watt LED lighting Fixture High-pressure die cast aluminum housing with powder coated finish for corrosion resistance, with high lumen efficiency, with all needed XLPE cables 3X1.5mm <sup>2</sup> and other connections as per the following:LED luminous efficiency =85-90 Lumen/W or more.Power Factor >0.92Color Temperature 3000-4000KWorking Temperature -30.C-+50.CHousing Material Aluminum AlloyInput Voltage AC (185-240V)LED Chip PHILIPS leds Total lumen not less than 10200 L.lamp's Efficiency >90%Guard Level IP65Type is (Gaash, Matix or equivalent) Old components should be removed and handed over to CMWU store if found.	No.	10		



## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
4.4.9	Electrical maintenance, repairing, renewing and rehabilitation all electrical components, wiring, cables, connectors, lamps, flourcents, horns, bells, switches, sockets, copper wires, cables (exple & abc), contactors, relays, lighting, timers,,,etc. for all pumping station units, all as per engineer approval and instructions.	LS	1		
<b>4.5</b>	<b>Generator Set</b>				
4.5.1	Supply , install, connect and operate a Prime electrical diesel generator, min. power generation 810 KVA, 400 volt 50 Hz 1500 rpm weather proof condition Caterpillar type or equivalent and connect it to the storage fuel tank, the item shall include automatic start and stop, exhaust system, fuel pump and control, with automatic float, control, protection and digital control panel, sensors for heat, speed, under voltage, over voltage, oil pressure, phase sequence and phase failure, measuring instruments, air duct, built in daily fuel tank, alternator, diesel engine, exciter, automatic charger with original batteries, main circuit breaker, sound attenuated enclosure (original) as recommended by the manufacturer and all fittings and associated accessories required for proper automatic operation and control. The price shall include supply and cast concrete pad of 20 cm thickness of B350 and vibration insulation polystyrene and foundation, excavation for foundation and stainless pipes 4", 1.5 mm thick for chimney including all required insulation to complete the works associated as per the Specifications and Engineer instructions. included Full Package European made and assembled.	No.	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
4.5.2	Supply and install Sun shed 6 m height for the generator and fuel tank, all the fabrication will be from galvanized steel, Profile 140X140X5mm, sch20, with Double steel base plate 300×300×8mm to be fixed to the concrete foundation using steel bearing plate 300×300×8mm with anchor bolts complete with all washer's nuts, supports, sheeting (cladding) works with PVC tile roof sheets 3.0 mm with fixation I-beam and single channel 100*40*15mm of 3 mm thick, the rain gutters. The works include supply fabricate construct and install all the required associated accessories and materials e.g. bolts, nuts...etc., and painting with epoxy coats. all according to the engineer instructions.	m <sup>2</sup>	50		
<b>4.6</b>	<b>Fuel tank</b>				
4.6.1	Supply and install new cylindrical black steel fuel tank with capacity of 10 m3 and with min. thickness of 6 mm the work includes all the required fitting and associated accessories e.g. valves, fuel pump, float, solenoid stainless steel valve with cables, inlet and outlet pipe works, fuel quantity monitoring system, excavation, adaption the existing concrete foundation to be fit with the new fuel tank, all according to the Engineers instructions. The work includes dismantling, remove and transport to CMWU stores the existing old fuel tank. Also The item includes filling up the new tank with fuel (full capacity).	No.	1		
<b>Total of Bill No. 4</b>					

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>BILL 5: Mechanical and elec. works for Al-Wafiya and Hesbit Alsamak PS</b>					
5.1	<p>Supply, install, connect and test new KSB type sewage submersible pumping unit for Hesbit Al-Samak Pumping Stations model KRTK 200-500 with the following specifications:</p> <p>Pumping Capacity: 800m<sup>3</sup>/hr @            Pressure head 57 meter (Duty point)            Efficiency not less than 80%,            Rotation Speed: 1485 rpm            Voltage: 400 Volts            Frequency: 50 Hz</p> <p>Hard iron Impeller, the Pump electrical cables not less than 20m length, the works will include but not limited to supply and install all its associated accessories, all required kinds of original pump protection controllers, humidity, thermistor, bearing, temperature, leakage sensitive electronic relay from same manufacturer of pumps and their receptive devices in the control panel, disconnecting switch, all required electrical cables and electrical components and programming, Stainless Steel 316 L( chain, wire guides, guide holder 316L, Steel Profile 100*100*8 mm for carrying and fixing the pump guide holder, Bolts, anchors Bolts nuts), Steel Plate 10mm for fixing the Profile, two coats of epoxy painting for all steel parts. The new pump must suit the existing pump base, also the works include cleaning the pumping wet pits several times for installation and testing the new package, dewatering the pumping wet pits, and transfer the garbage outside the site ,, ,,etc., all as per drawings and engineer approval and instructions.            Note: any not installed parts should be submitted CMWU stores.</p> <p>the price will also include Extra set of:</p> <p>1- Repair kit set (e.g. O rings, wear set....etc.)            2- Mechanical seal set            3- Bearing set (upper and Lower)            4-One Impellers</p>	Unit	2		
5.2	<p>Ditto But for Al Wafia Sewage P.S, Pumping Capacity: 600 m<sup>3</sup>/hr. at head 79 meter (Duty point), efficiency not less than 80%.</p>	Unit	2		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.3	<p>Design, manufacture, supply and commission complete 316L stainless steel automatic air surge vessel (ARAA) for Alwafiya Pumping station, dipping tube type for waste water use (Vertical) including supplying and installing all required pipes, valves, elbows, tees, reducers, joints, gauges, all fittings and accessories. The unit price shall include supply and casting reinforced concrete B300 for the base support and foundation with all required formwork and workmanship.</p> <p>The unit price shall include all the related works of dismantling, removing and reinstatement of any kind of existing infrastructure and utilities at the place of implementation of air surge vessel. The unit price shall also include making the connection between the air surge vessel and the existing waste water pumping system with supplying and installing all necessary pipes, fittings and accessories. The design should be approved by the engineer, CMWU and Khan Younis municipality.</p>	LS	1		
5.4	<p>Supply &amp; sluice gate TBS type or equivalent HDPE (high-density polyethylene) with a minimum thickness of 30 mm and provided with: ,solid shaft. for inlet pipe (1 m concrete pipe ) in the inlet chamber, extended stem similar to the existing one, the works include supplying and installing all the parts and fittings which required for proper installation and operation of the gate all according to the specifications and drawings, catalogues and manufacturer instructions, also the works include the dismantling the existing sluice gate and transfer it to CMWU stores.</p>	No.	2		
5.5	<p>Supply and install a heavy duty Electric Chain Hoist four Ways Directions (Up, Down, Left and Right), STAR type or equivalent, with the following specifications: integrated motorized trolley, minimum capacity lifting load: 5000 kg, operating voltage 400 Volt, 3-phase, 50Hz., motor protected to IP55, encapsulated pendant control protected to IP65, stainless steel load chain not less than 20 meter, flexible chain container, with emergency stop, all according to the engineer instructions and approvals. The item is including all necessary electrical works to supply the hoist</p>	Unit	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.6	Supply and install steel I beam (I.P.E 220) profiles (200*110*5.9) mm weight 26.2 Kg/m and bracing as girder beam to carry the moving electrical hoist above the pumps unit. The work includes 30mm anchor S.Steel bolts and 60x60cm Steel plates with 10 mm thickness, Steel welding, any requirements necessary for installation and proper functioning of the electrical hoist, the price includes painting with hammer primer coat then two oil painting coats.	L.M.	12		
5.7	Supply and cast in place reinforced concrete B300 for the beams, columns for Hoist and I Beam foundation, all as per drawings, engineer approval and instructions. The price includes demolishing old columns and beams of old hoist, and cleaning and transferring the demolished concrete out site the P.S as per engineer approval and instructions.	M3	14		
5.8	Supply and install a Stainless steel (316L) air release valve DN 4", PN16. Model: D-020 ARI type or equivalent, for wastewater use, the works includes supply and install G.V 4", flanges, gaskets, bolt sets S.S 316l, drain pipe, 4" steel pipes, the work includes cutting, welding, repairing and maintaining the steel pipe of 14" were the ARV installed, all as per engineer approval and instructions.	No	6		
5.9	Supply and install Cement-lined Flanged steel Tee DN 14"/14", Schedule 10S, to be installed between gate valve and check valve of discharge pipe of the first pump (west side of the wet pit) to connect the discharge pipe with pressure pipeline of DN20", the price includes dismantling and reinstall all fittings and valves of the original discharge pipe accommodation the tee in the discharge pipe and keeping discharge pipe connected to original manifold, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	LS	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.10	Supply Only a complete repair spare parts of sewage check valve DN 14", NR 040 ARI, PN16, the set includes S.S 316L complete shaft assembly, seals, seats, plugs, O-rings, counter weigh assembly, micro switch, S.S disc, S.S 316L bolts sets etc, all according to the specifications, and the engineer approval and instructions.	Set	6		
5.11	Supply Only a complete repair spare parts of sewage gate valve DN 14", PN 16, the set includes S.S 316L complete shaft-stem assembly, seals, seats, plugs, O-rings, bonnet, gaskets, wedge coated, S.S disc, S.S 316L bolts sets etc, all according to the specifications, and the engineer approval and instructions.	Set	6		
5.12	Supply only a gate valve DN 4" PN 16, sewage use, Raphael, AVK or equivalent. The price includes 316L S.S bolts Sets, As per engineer approval and instructions.	No	4		
5.13	Supply dresser DN 4" PN 16, sewage use, Raphael, AVK or equivalent. The price includes 316L S.S bolts Sets, As per engineer approval and instructions.	No	4		
5.14	Supply, install a diaphragm pressure gauge liquid filled dial (0-10 bar) 100mm diameter for wastewater usage, Wika type or equivalent, As per engineer approval and instructions.	No	6		
5.15	Supply, Install and Weld stainless steel pipes, grade 316 L Schedule 10S with DN 14" ( 350 mm), to connect between discharge pipe of the first pump (west side of the wet pit), the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, supports (jacks) S.S 316 L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	LM	20		
5.16	Supply and install Stainless Steel 316L Elbow DN 14" (350mm), 90 degree, Schedule 10S, the work includes supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No	2		
5.17	Ditto But 45 Degree.	No	3		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.18	Supply and install a complete gate valve DN 14", PN 16, for wastewater usage, Raphael, AVK type or equivalent, the work includes supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No	1		
5.19	Supply and install an electro-magnetic flanged flow meter DN 14" for sewage use, Siemens, ABB type or equivalent the works include supply and install all required associated fittings and accessories, cables, connections, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., needed for proper installation and operation of the flowmeter as per manufacturer recommendation all according to the specifications, drawings and the engineer instructions.	No	1		
5.20	Supply and install a complete flanged dresser with ears and S.S 316L tie rods DN 14", with min. PN 16 bar, the works include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No	1		
5.21	Supply and install Cement-lined Flanged steel Tee DN 20"/20"/14", Schedule 10S, the works includes excavation, backfilling, compaction, watering, clean sand, tape etc, the work includes include supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts, nuts and washers ...etc., all according to the specifications, drawings and the engineer instructions.	No	1		
5.22	Supply and install Cement line Flanged Steel Elbow DN 14" (350mm), 90 degree, Schedule 10S, the works includes excavation, backfilling, compaction, watering, clean sand, tape etc, the work includes supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No	2		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.23	Supply and install UPVC Pipes DN 14" (355mm), PN12, the works includes excavation up to 2.5 m, backfilling, compaction, watering, supplying clean sand, tape etc, the work includes supply and install all required associated fittings, rubbers ,,etc., all according to the specifications, drawings and the engineer instructions.	LM	66		
5.24	Supply and install D.I Socket Flanged DN 14", the works includes excavation, backfilling, compaction, watering, clean sand, tape. etc, the work includes supply and install all required associated fittings and accessories, e.g. gaskets, flanges, stainless steel 316L bolts sets etc., all according to the specifications, drawings and the engineer instructions.	No	6		
5.25	Ditto But DN 20".	No	2		
5.26	Supply and install pressure switch Danfoss for high & low pressure on the main header connected to PLC panel, the switch shall be manually adjustable (0-10 bars) (low & high pressure) with all needed cables and connections.	No	2		
5.27	Dismantling, Repair, Maintain& Reinstall the discharge pipe of S.S 316L of 14" diameter, the work includes replacement the damaged parts of the pipe (similar material) and replacement of all clamps (tying) to be S.S 316L clamps qty. 5 for each discharge pipe, the work includes cleaning, civil, mechanical works and parts for popper dismantling, reinstallation and operation of the discharge pipe.	No	4		
5.28	Ditto But Cement Lined Steel pipes, but the work includes correcting the length of the discharge pipe and replacement of reducer.	No	1		



## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
	<b>Elec Works for Wafiya</b>				
	<p>* In general The works include supply and install the associated materials e.g. conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network, all are included in the unit price.</p> <p>* Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. The shop drawings shall include detailed lists of all electrical materials specifications (manufacturer, ratings and model numbers).</p> <p>* The contractor should provide the required onsite training courses for Operator staff to be familiar with the project components and it should cover the operation, maintenance and monitoring for the PLC system.</p> <p>* All the electrical works shall be carried out according to specifications ,standards, drawings, and the instructions of the engineer.</p> <p>* The contractor should remove and/or dismantle, the existing materials and components and all damaged or malfunctioned parts and materials and transfer them to locations or sites approved by the Engineer.</p> <p>* The works include dismantle of existing interlock tiles and others and re-install it without any damages as per the existing to complete the job.</p> <p>*All required modifications of the attached drawings shall be the responsibility of the contractor.</p>				
5.29	Supply, install and connect, MCC switch board as specified and shown on drawings, The panel sizes should be 210 cm height, (60+80) cm width, 50 cm depth. 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 for internal connections , extract fans with thermostats for cabinets , cabinet heaters, panel lighting door with micro switch for each , indication lamps for control pump, 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 door. as per drawings, specifications and engineer's instructions.	No.	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.30	Supply and install surge arrestor protection at the incoming feeder 3- phase 40KA including connection to the ground with flexible 16 mm <sup>2</sup> 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).	No.	1		
5.31	Supply and install Current transformer (400/5A).	No	3		
5.32	Supply and install Molded Case Circuit Breaker MCCB 3X400A.Type EATON NZMN3-400A , I <sub>sc</sub> =50KA, or equivalent).	No.	1		
5.33	Supply and install Miniature Circuit Breaker MCB 1X25A,(Type is EATON MOELLER FAZ-C25/1 or equivalent).	No	1		
5.34	Ditto but 1x16A,(Type is MOELLER FAZ-C16/1 or equivalent).	No	1		
5.35	Ditto but 1x10A,(Type is MOELLER FAZ-C10/1 or equivalent).	No	3		
5.36	Ditto but, Residual current circuit breaker RCD 4x40A/0.03A , (Type is MOELLER EATON RCD 40/4/0.03A or equivalent).	No	1		
5.37	Supplying and erecting over-load, current limiting switch, with over load and short circuit releases, PKZM adjustable 4-6A. (Type is MOELLER EATON or equivalent).	No	2		
5.38	Supply and install Digital Voltmeter with selector (Type is ENTES or equivalent).	Set	1		
5.39	Supply and install Digital Ampere Meter with protection (Type is ENTES or equivalent).	Set	3		
5.40	Supplying and erecting electrical digital hour counter 3.5 digits, supply voltage 24V dc and/or 230V ac, panel mounting.	No	1		
5.41	Supply, install 3 color indicating lamps, including push button with protection LTL fuse3x36/6A.	Set	1		
5.42	Supply and install Isolating transformer 380/220V,24V of 1000VA capacity.	No	1		
5.43	Supply and install 3-phase (By-pass) contactor. Three poles, 380V, 210 KW rate, with 2 auxiliary contacts,220V coil, AC3 category . (Type is MOELLER DILM or equivalent).	No	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.44	Supply, install, program and test 3-phase solid state reduced voltage starter for 210 KW pump, fully featured digital microprocessor based, complete with all required control, as per drawings, specifications and engineer's instructions Type is SOLCON RVS-DN 390A or equivalent.	No	1		
5.45	Supply and install Phase failure, loss of phase, under voltage, and phase sequence relay adjustable type, with LTL fuse3x36/6A and all necessary accessories .(Type is MOELLER or equivalent).	No	1		
5.46	Supplying and erecting 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.	No	5		
5.47	Supply, install electrical control 24 hour timer 24v or 220v, (Type is Hagar or equivalent).	No	1		
5.48	Supply, install electrical control relay 24v or 220v, (Type is Finder or equivalent).	No	5		
5.49	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		
5.50	Supplying and erecting toggle switch 10A, 24V dc and/or 230V ac, (1,0,2)	No	1		
5.51	Supplying and erecting N.C. and N.O. push button switch 10A, 24V dc and/or 230V ac.	No	3		
5.52	Supplying and erecting micro-switches connected to NVRs on the check valves including relays, 24V dc and/or 230V ac.	No	1		
5.53	Supplying and erecting external emergency push button.	No	1		
5.54	Supplying and erecting electrical bell with flashing rotary lamp , 24V dc and or 220V ac, IP55 category, for out side use (external)	No	1		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.55	Supply, install and commission Programmable logic controller PLC . (Type is DELTA or equivalent).The price includes PLC, CPU, Card modules (32 input, 32 output points) - (Digital & analog ), computer software and interface, with sufficient updated RAM, and two memory packs, logic memory of 16 kilo byte size (and PLC connection with laptops). The unit shall be as per drawings, specifications, and engineer's instructions and the new version manufactured at the time of tendering. The work includes programming the PLC to operate the pumps as (duty/standby) as per the engineer instruction for the operation purpos, as specified according to the sequence to operate the pumps equal times, including 10" HMI touch screen and all other necessary power and control circuits with all extra relays and/or switches, timers, PKZM, push buttons, manual changeovers, signal lamps, MCB's of FAZ type , and on line UPS of 1000VA, 50-60min batteries @ full load, sine wave output, wires, cables, terminals, all as according to attached drawings, specifications and engineer's instructions.	LS	1		
5.56	Only Supply electrical float switches inside the sewage wet pit, IP 65 category, with N.O. and N.C. 10A contacts points, supply voltage 24V dc and/or 230V ac, according to specifications and engineer's instructions type Flygt or equivalent. The price includes pedestal mounted weather proof junction box out side the wet well. All float switches should be protected by 4" PVC 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.	No.	3		

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
5.57	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 (controller), IP 68, Type is Pulsar ultra5 or equivalent. The price includes supply and install all required connectors, sensor, flanges, make the suitable opening in the wet pit, metallic and non-metallic supports, electrical bell (horn) 12VDC connected to Ultrasonic, control and power cables from ultrasonic level meter to the control panel and PLC, with all required civil works and materials, 3 no. of control relays, circuit breakers, LTL, with all needed materials and workmanship as per specifications and engineer instructions.	No.	1		
	<b>Cables &amp; Pipes</b>				
5.58	Supply, laying and termination of synergy type, copper conductors, XLPE insulation type, N2XY (4X185) mm <sup>2</sup> of superior type or equivalent, (For mains, pumps connections)	L.M.	50		
5.59	Ditto, but control cable 12X1.5 mm <sup>2</sup> XLPE Copper. for switchboard and sensors (control).	L.M.	50		
5.60	Ditto, but control cable 3X2.5 mm <sup>2</sup> .	L.M.	60		
5.61	Supplying and erecting 6 " UPVC pipes, including 100cm digging and back filling clean sand, and a warning tape 6" diameter UPVC pipe and reinstate the pavement as per the existing works all as per engineer instruction and specification.	L.M.	100		
5.62	Ditto but 3" diameter pipe for control	L.M.	80		
5.63	Supplying and install concrete manhole 80 cm dia, up to 2 m depth the price includes excavation, removing the paving materials, backfill with clean sand, erect steps, supply and install 25 ton iron top cover 80cm diameter all as per engineer instruction and specification.	No	1		

**Bill of Quantities**

<b>Item</b>	<b>Description</b>	<b>Unit</b>	<b>QTY</b>	<b>Unit Price (US\$)</b>	<b>Total Price (US\$)</b>
5.64	Supplying and erecting local isolated On/Off switch 3X400 A rating, Isc=50KA with external hand, the switch shall be lockable type and to be installed close to the associated pump inside weather proof enclosure fiber glass suitable size after the shop drawing approval of IP-65 protection including also emergency stop. Type Eaton, Hager or equivalent. The price includes fixing the panels on galvanized plate and profiles as per drawing and engineer instructions. (Optional Item).	No	1		
<b>Total of Bill No. 5</b>					

## Bill of Quantities

Item	Description	Unit	QTY	Unit Price (US\$)	Total Price (US\$)
<b>BILL 6: PLC control system for the infiltration basins in Al Fukhary area</b>					
	Supply, install and commission PLC panel board factory assembled wired and tested in accordance with international standards, including 2mm Galvanized steel frame with anti-static paint including bus bars, terminal blocks and all necessary civil works (e.g. foundations , cable trenches and handing over clean), tested and in operating conditions.				
6.1	Supply and install Programmable logic controller device( PLC) Type is Delta or equivalent, the item include cards 128 I/O points, computer software and interface, with sufficient updated RAM, two memory Flash 16 giga bite per each with complete program and software and logic memory of 16 kilo byte size, also the item include the last version HMI 10" touchable. The item includes programming the PLC to operate the basins valves with 6 Actuators (3-duty/3-standby to be changed per 48 hours), according to the sequence which require to operate the basins at equal times, also the item include all necessary extra relays for each inputs and outputs required and thr required switches, timers, PKZM, H-0-1 switch, push buttons, manual changeovers, signal lamps, MCB's of FAZ type , isolating control transformers and on line UPS of 1500VA, 50-60min, sine wave output, the item include all internal cables and wires and conductors, all according , specifications and engineer's instructions.	LS	1		
6.2	Supply, lay and terminate of XLPE cupper cable, ( 12x1.5 ) mm2	LM	900		
6.3	Ditto, but control cable 3X1,5 mm2 for float switch	LM	150		
6.4	Supply and erect an electrical float switch inside the basin , IP 68 category, with N.O. and N.C. 10A contacts points, supply voltage 24V type is FLYGT the floating valve will be install in UPVC pipe with dia 4" fixed in concrete foundation	No.	6		
<b>Total of Bill No. 6</b>					

Bill of Quantities

**Rehabilitation of Pumping Stations No.08 , 03 and 02 in Khan Younis**

<b><u>BILL 1: Pumping station PS8</u></b>	_____	USD
<b><u>BILL 2 : Service Building and yard Works PS8</u></b>	_____	USD
<b><u>BILL 3 stormwater Works PS8</u></b>	_____	USD
<b><u>BILL 4 Electrical Works PS8</u></b>	_____	USD
<b><u>BILL 5 Mechanical and elec. works for Al-Wafiya and Hesbit Al samak PS</u></b>	_____	USD
<b><u>BILL 6 PLC control system for the infiltration basins in Al Fukhary area</u></b>	_____	USD
<b><u>Grand Total :</u></b>	_____	USD

In Words:-----

Name of contractor :-----

Signature :-----

Stamp :-----

Date :-----