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Resilient nations.*

ITB 2012-001

**PACKAGE 4A - CONSTRUCTION OF SEWAGE PUMPING
STATION IN KHANYOUNIS**

Bill of Quantity

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
1	Bill No. 1 <u>Earth Works:-</u>				
1-1	Excavation in sandy soil or any other soils for the wet pit and sedimentation manhole, including backfilling with selected or imported sand material (sand are available near the site) around footings and walls for wet pit & sedimentation tank to design levels on layers not more than 25cm thick each with compaction. The compaction tests should exceed 97%. The price also includes transportation of surplus material to approved dump area according to engineer's instructions, and includes using shutter bracing to the excavation sides.	L.S	1		
Total of Bill no. (1)					

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
2	Bill No. 2 <u>Civil Works:-</u>				
	The work includes the supplying of all the required materials (workmanship, steel reinforcement, formwork & tie rods (Batant) & sleeves, concrete, binding wire, nails, spacers... etc.) Shoring, shuttering, safety measures, testing, construction joints, water stop 24cm wide, openings, polythene sheets beneath the blinding concrete, etc..) - All the following items shall be executed according to drawings, specifications and according to the engineer's instructions.				
a	All tests costs to be included in the unit rate items, without any extra paid money.				
b	All substructure items to be painted with hot bituminous 70/25 paint as directed by the supervision Engineers & the manufacture instructions.				
c	Supply & paint at least two coats of epoxy (Nitocote ET 550) for the internal walls, slabs, and floors of wet pit & sedimentation tank as per manufacturers instructions, drawings, specifications & the engineer's instructions.				
d	NOTE:-After fishing epoxy paint Test for water tightness is required for 3 days before starting backfilling around wet pit and sedimentation tank, the structure will be accepted if there is no leakage occurred				
e	All internal surfaces of concrete to be Fair Face.				
f	All fixation of framework is by using tie rod (Batent), and treatment of holes satisfactorily with approved materials.				
g	Contractor must use new ply wood and to paint the ply wood with approved oil				
h	All openings should be deducted from the measures for payment.				
i	all above ground concrete element must be fair face surfaces.				
2-1	Supply & cast ready mix plain concrete B 200 for blinding beds 10cm thick for wet pit as per drawings, specifications & the engineer's instructions.	m3	2.5		
2-2	Supply and cast ready mix reinforced concrete B 300 with additives (Super Plasticizer), the required reinforcement steel for the reinforced wet pit foundation as per drawings, specifications & the engineer's instructions.	m3	10		
2-3	Ditto but reinforced F.F. concrete for the walls of wet pit including sleeves and required anchorage as per drawings, specifications and engineer's instructions.	m3	40		
2-4	Ditto but for the reinforced columns, roof slabs, mid landing & beams for the wet pit as per drawings, specifications & the engineer's instructions.	m3	7		
2-5	Supply & place B250 concrete casting for benching of wet pit and for the pump foundation as shown in the drawings & the engineer's instructions.	m3	5		

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
2-6	<p>Supply and casting (3.0 * 3.5) m reinforced concrete B300 for Sedimentation Tank structure as per specifications and drawings complete with 25 cm reinforced concrete base, 25cm reinforced concrete slab, 25 cm interior and exterior wall thickness , (opening ,sleeves), internal coating, benching , stainless steel ladders, PVC water stop 24 cm and special joint required to fix the pipe to the structure . The item also includes excavation, supporting the trench sides, and backfilling using clean sand with watering, and compaction with max layer thickness 25 cm after approval of the engineer. The work also includes coating the inside walls and slab with two coats of Nitocoat ET 401 from FOSROC or equivalent and the external surfaces with two coats of hot bitumen. Locations are as shown on in drawings and depths not of more than 4.5m The work also includes Supply and casting plain concrete B200 under foundation .</p>	unit	1		
Total of Bill no. (2)					

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
3	Bill No. 3 <u>Miscellaneous Works:-</u>				
3-1	Supply & install galvanized shakerd steel plate cover 3 mm (two leaves) open able with hinges (120x90cm) including G.S. angle frames, and suitable lock for the wet pit & sedimentation tank with approved epoxy paint suitable for sewage with all needed fitting for fixation to the concrete as shown in the drawings, specifications and according to the manufacturer's instructions and the engineer's instructions.	no.	5		
3-2	Ditto but 120X120 cm	no.	1		
3-3	Supply & install stainless steel ladder 60cm width C-C consist of 2" S.S pipe (2.77mm th.) and 3/4" S.S pipes (2.11 mm th.) every 30 cm, include fixation to walls by S.S plate every 90 cm min. with all needed fitting, welding, half spherical end cap & the needed accessories to complete the job as shown in the drawings, specifications and the engineer's instructions.	m	12		
3-4	Supply & install steel ventilation pipes 6" dia. 5/32" thickness with epoxy paint including all the fittings, elbows, jointing, fixed to the wall, & the needed accessories to complete the job as shown in the drawings, specifications and the engineer's instructions.	m	4		
3-4	ditto but ventilation pipes 4"	m	2		
3-5	Supply and install stainless steel basket (1.0*1.0*1.4) m as shown on the Drawings , complete with the frame, hinges , stanless steel chain,as indicated in the specifications and drawings the price include fixing and suspending the basket by stainless steel angular 75*75*7.5 mm .	no.	1		
3-6	Supply and install Galvaniazed steel mesh fence size 50X50X3 mm. The item includes supply and install oven-painted three pronged steel angles (Type ST-37) each 3 m with length 3 meter steel beams , and 8 rows of razor wires to be fixed on angles by using 1 mm galvanized tie wire in addition two diagonal from the same wire in the panel and the price includes construction of leeve gate 4*4 m from steel mesh ,and the frame and support from galvanized steel pipes 2 " , and the price include reinforced concrete class B 250 of concrete beam 40x30 cm in the bottom of the steel fence with 3Y12 steel reinforcement for the top and the bottom of the beam . All works must be implemented according to the specification , drawings and engineers instructions.	LM	40		
Total of Bill no. (3)					

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
4	Bill No. 4 <u>Mechanical Installations: -</u>				
a	Qualified and specialized contractor should perform All the following works without any extra money to be paid to contractor. The contractor shall submit complete and detailed method of statement for all relevant mechanical and electrical installations of the pump for engineer's approval prior to the work commencement. The engineer prior to the installation should approve all materials and components.				
b	It is the contractor's responsibility to check all required works and associated mechanical and electrical components for safe connections of the pump, which will be his complete own responsibility.				
c	The contractor shall perform all standard testing, commissioning, programming and parameters settings; all in accordance with pump manufacturer's recommendations.				
d	By the end of the work the contractor shall submit to the engineer a complete set of as built shop drawing stating all settings and operating schemes & as per contract's requirements.				
e	All fixations to be with chemical capsules & s. steel bolts or s. steel expandable plugs, and under Engineer instruction.				
f	all the materials must be suitable to be used for sewage works.				
g	It is the contractor's responsibility to supply clean water for initial testing & operation the system.				
4-1	Supply, install, connect, test and operate submersible non clog centrifugal pump [Flygt {NP 3153.181 HT curve no (53-455-00-4550)}], or approved equivalent by the engineer], 65m ³ /hr discharge at 18m head, Impeller (N) type, 100mm flanged outlet, 1460RPM, discharge connection. Equipped with built in electric cable 15m min. length and cable holder. S.S chain, base and outlet size 100mm, upper guide holders & guides pipe Ø2" (S.S 2.77 mm th.). All electrical protection controllers should be supplied and installed in accordance with the manufacturer recommendation such as (FLS10, thermal contact, stator over heating protection, bearing temperature sensor, float switch). Certified motor characteristics, shop test performance curves, spare parts regular (as recommended by manufacturer) and maintenance catalogues.	no.	2		
4-2	Supply and test a submersible sewage pump for maintenance. Flygt or approved equivalent, "S" type installation, capacity 7L/sec. at 10 m head, 1-phase-230 V, 1.5kW, 25m cable, level regulator Flygt ENM10 (Pear shape) heavy duty, control float. With coupling and flexible canvas 2" piping 25m long, water in oil sensor. The price include stainless steel chain, Spare parts and maintenance catalogues.	no.	1		

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
4-3	Supply and install a pump base for the future third pump as in item No. 4-1 include upper guide holders & guides Ø2" pipe (S.S 2.77 mm th.)	no.	1		
4-4	Supply and install 8" gate valve (Raphael, Hakohav or equivalent) of working pressure 16 bars with flanges, bolts, gaskets, hand wheel and all fittings needed for proper installation and operation as indicated in the drawings, specifications and according to the manufacturer & engineer's instructions.	no.	1		
4-5	Ditto but gate valve of 4" diameter,	No.	2		
4-6	Ditto but gate valve of 2" diameter,	No.	2		
4-7	Supply & install combination air valve, from ARI "Saar D-020" 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 in the drawings, specifications and according to the manufacturer & engineer's instructions.	No.	2		
4-8	Supply & install swing type check valve ARI (NR-040), or equivalent. 100mm diameter, PN16, hinged with lever, limit switch IP65 & cables to main panel, removable cover, flanges, bolts, gaskets and all required accessories, as indicated in the drawings, specifications and according to the manufacturer & engineer's instructions.	No.	2		
4-9	Supply and install oil pressure gauge 4" rated (0-16)kg/cm2 with 1/2" valve, all needed fittings, tees, elbows, welding & piping as indicated in the drawings, specifications and according to the manufacturer & engineer's instructions.	No.	2		
4-10	Supply & install HDPE channel sluice gate 600X600mm opening (rectangular){ TBS (PKS), or equivalent }, stainless steel 316 with EPDM sealant & associated operating gear, fittings, suitable for wastewater . as indicated in the drawings, specifications and according to the manufacturer & engineer's instructions.	No.	1		
4-11	Supply and install DN 8" diameter (PN16) complete flange dresser with ears and tie rods, flanges, bolts and gaskets as indicated in the drawings, specifications and according to the manufacturer & engineer's instructions.	No.	1		
4-12	Ditto, but DN 4" diameter.	No.	2		
4-13	Supply and install DN 4" diameter, 45 degree steel long radius bend with internal alumina lined (concrete mortar) and external epoxy paint completed with all necessary jointing assembly or any needed fitting and completely welding with main discharge pipe and proper installation of the bend in its place all as indicated in specifications, drawing. and engineer instructions	No.	2		
4-14	Ditto, DN 4" diameter but with blind flange.	No.	1		
4-15	Ditto, DN 4" diameter, but 90 degree with all needed fitting flanges, bolts, gaskets....etc .	No.	2		
4-16	Ditto, DN 4" diameter, 90 degree but with blind flange.	No.	1		

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
4-17	Ditto, but DN 8" diameter 90 degree with thrust block.	No.	1		
4-18	Ditto, DN 8" diameter but 45 degree with thrust block.	no.	3		
4-19	Supply and install DN 4" diameter, 4" X 2" diameter, steel TEE with internal alumina lined (concrete mortar) and external epoxy paint completed with all necessary jointing assembly or any needed fitting for proper installation of the TEE in its place all as indicated in drawing, specifications and engineer instructions	no.	4		
4-20	Supply and install Blind flange DN 8" with all needed fittings and accessories (flanges, bolts, gaskets, welding, sleeves Etc) as indicated in drawing, specifications and engineer instructions.	No.	1		
4-21	Supply and install steel DN 4" diameter pipe 3/16 inch thickness, internal alumina lined (concrete mortar) and externally coated with (epoxy) to connect the base of the pump with manifold, including S.S Fixation to the concrete wall every 1 m . The work includes cutting, welding, steel flanges, S.S Bolts, anchorage in concrete, special rubber around pipe to reduce vibrations between pipes and concrete sleeves and all other fittings as per drawing, specifications and Engineer instructions.	M	18		
4-22	Ditto, DN 4" diameter for discharge pipe above ground level include jacks support 3" diameter , flanges, bolts, gaskets and needed fitting as per drawing, specification and engineer instructions.	M	7		
4-23	Supply & install 8" diameter manifold steel pipe 3/16" epoxy external coating and internal alumina (concrete mortar), above ground level for the pressure line (force main) including flanges , gaskets, bolts, and connect with the (3) 4" pipes also includes concrete supports & connecting to 200mm UPVC line under ground with appropriate fittings the price include excavation and backfilling with clean sand for underground part. all the works as per drawing, specifications and Engineer instructions	m	20		
4-24	Supply and install 2" diameters 5/32" thickness by-pass system, consisting of steel piping epoxy external coating and internal alumina and connect to the 8" manifold, with one 2" gate valve(PN16) and one dresser with retaining bolts, elbows, tees, flanges, blind flanges and fixation to walls all with 3 outlets at the pumps level in the wet pit, as per drawing, specifications and Engineer instructions.	L.S	1		
4-25	Supply and install 2" diameters 5/32" thickness washing system, consisting of steel piping epoxy external coating and internal alumina and connect to the 4" manifold, with one gate valve(PN16) DN 2" diameter, and one dresser flange with retaining bolts, one elbows 90 degree, one tee and one blind flange all works shall be as per drawing, specifications and Engineer instructions.	L.S	1		

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill No. A - wet pit & sedimentation tank				
4-26	Supply and install electrical chain hoist with push trolley, with I-beam (300x125x10.5)mm IPN300 including painting with sufficient length for loading & unloading on trucks, from recommended type YALE with protection IP66 minimum, or approved equivalent with all materials and all needed accessories to complete the job as follows:- With load 1000kg {16 (fpm) lift speed, three phase (1 hp motor)}, to service a height of 10 meters for the pumps include hand geared trolley and control panel for hoist with cables 5*6 mm2 with circuit breakers 3*25 Amp as per drawing instructions.	Lump Sum	1		
4-27	Supply and casting reinforcement concrete B300 concrete box for the electrical board 2.10*1.8*0.50 m for the MDB size, reinforcement steel 5T 12mm/ m , the thick for the wall 15 cm the work include the painted galvanized two steel leeves,thickness 2mm, lockable and the work include all accessories and all necessary works according to instructions of the Engineer.	unit	1		
4-28	Supply and cast in site Square manhole 1.20*1.20 m internal dimension with reinforced concrete class B300 sewage manholes as per specifications and drawings complete with 25 cm reinforced concrete base, 20cm reinforced concrete slab, wall thickness 15 cm, (with layers steel reinforcement 7 Y 12 mm/m in horizontal and vertical direction for walls , roof slab, base), cast iron cover (25 tons capacity and 60cm opening), frame, rings, internal coating, benching, cast iron steps and special joint required to fix the pipe to the manhole also for the preparation of installing sluice gate. The item also includes excavation, supporting the trench sides and backfilling using clean sand with watering, and compaction after approval of the engineer. The work also includes coating the external surfaces with two coats of hot bitumen. Pipe opening at manhole base shall be factory made without drilling manhole walls at site. Locations & depths are as shown on in drawings.	no.	1		
4-29	Supply and install circular 1.2 m diameter reinforced concrete class B300 sewage manholes as per specifications and drawings complete with 25 cm reinforced concrete base, 25cm reinforced concrete slab, cast iron cover (25 tons capacity and 60cm opening), frame, rings, internal coating, benching, cast iron steps and special joint required to fix the pipe to the manhole. The item also includes excavation, supporting the trench sides and backfilling using clean sand with watering, and compaction after approval of the engineer. The work also includes coating the external surfaces with two coats of hot bitumen. Pipe opening at manhole base shall be factory made without drilling manhole walls at site. Locations & depths are as shown on in drawings.	no.	1		
Total of Bill no. (4)					

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
	Bill B: Electrical Works				
	<u>Main Distribution Board</u>				
1	Supply ,Installand Commissioning and Testing main Distribution Board (M.D.B) of Size (180cm length, 120cm width ,25cm depth , made of hot dipgalvanized steel 2mm thicknessfactory assembled and tested in accordance with international standards.The works , include frames painting with antistatic paint, busbars,foundation trenches,sleeves, safety shatter for top services of the pannel to hand over clean tested and in operating conditions .	NO	1		
2	Supply and Install M.C.CB 4pole (4x63Amp)/63,with all nessecary wiring ,connections and all accessories .	NO	1		
3	. Supply and Install LTL((3x100/63Amp) with External hand all nessecary wiring ,connections and all accessories .	NO	1		
4	Supply and Install CTs (3x50/5)Amp .	NO	2		
5	Supply and Install 3PH,KWHM(3X5A)With all nessecery wiring and connections.	NO	1		
6	Supply and Install 3PH,KVAR(3X5A)With all nessecery wiring and connections.	NO	1		
7	Supply and Install Ammeters (0-100A) with all nessecery wiring and connections.	NO	2		
8	Supply And Install Voltmeter (0-500V) with all nessecery wiring and connections.	NO	2		
9	Supply And Install voltage selector switch seven steps with all wiring and connections.	NO	2		
10	Supply and Install 4 poles(4x63A) MANUAL Transfer switch with NO and NCcontacts , and all necessary relays andTimers with their contacts , Eletrical and Mechanical interlock	Set	1		
11	Supply and Install power factor correction unit with control unit , Static Capacitors 10 KVR with quick discharge resistors, M.C.C.B. , Contactors with all needed wires an accessories	NO	1		
12	Supplying and erecting 3 Phase ,PKZM protective circuit breaker-adjustable 4-6A. with auxiliary contact	NO	2		
13	Ditto but 13-20A	NO	2		
14	Supply and Install indication lamps lower power consumption ,Red ,Yellow and Green colured with Three stages Pushbutton	NO	6		
15	Supply and installExtract Fan 10cm diam with thermostat and switches	NO	2		
16	Supply And Install Voltmeter (0-500V) with all nessecery wiring and connections.	NO	2		
17	Supply And Install voltage selector switch with all wiring and connections.	NO	2		
18	Supply And Install Transformer(250 VA)400/24Vac with all necessary wiresand connections including Circuit breakers for protections .	NO	1		
19	Supply And Install m.c.b(1x6A)@10KAbreaking Capacity	NO	5		

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
20	Supply And Install m.c.b(2x10A) @10KA breaking Capacity	NO	5		
21	Supplying and erecting 3-phase Low Voltage Molded case circuit breaker (MCCB), 3*32 A	NO	2		
22	Ditto but (MCB), 3*25 A	NO	3		
23	Ditto but (MCB), 3*16 A	NO	2		
24	Supply And Install m.c.b(3x25A) @10KA breaking Capacity	NO	1		
25	Supply And Install surge arrester with LTL(4x80A) With Wires and cables.	Set	1		
26	Supply and install 24volt relay, finder type with auxiliray contacts .	NO	12		
27	supply and install 3 phase,380V,7.50 KW contactor for pumps, with 2 auxiliary contacts,220V coil, AC3 category. Type K. Moller	NO	2		
28	Supply and Install steps relay 220 Volt,16A with all wires and connections	NO	1		
29	Supply and start stop pushbutton	NO	2		
30	Supply and 3 position selector switch	NO	2		
31	Supply and Install 220V ,Horn for high level Alarm.	NO	1		
32	Supply and Install underVolt relay,phasesloss relay and rotation relay with all necessary wires and connections.	NO	2		
33	Supply and Install elecrical digital counter 3.5 digit readout Gressline type with all necessary wires and connections .	NO	2		
34	Supplying and erecting Megatronic, pulsar,or equivalent approved ultrasonic water level indication and control device,(4relay,4-20mA) output with all associated materials,fitting.sensors and connection, materials and works for pump station	NO	1		
35	Supply and install 8 inputs /16 outputs PLC with proگرامing unit and all needed wirings and connections,to operate the controll of the system for the sewage pump.	ITEM	1		
36	Supply and Install 3phase ,25Amp with controlpush button station unit for hoist including (5x4mmSq Cable) From M.C.C to hoist Circuit breaker box.	NO	1		
37	Supply and Install EMT6/24VDC with all connections and cables	NO	2		
38	Supply and Install Pump minicase with all connections and cables	NO	2		
39	Cables Trenches Excavate in soil with different levels cables Trenchs ,40cm width ,80cm depth from F.F.L for laying upvc pipes inside trenches ,the work	MR	100		
40	Manholes Supply and Install 80cm diam manhole with 8ton cover as per drawings and Engineer Instructions.	NO	2		

ITEM NO.	DESCRIPTION	Unit	Qty.	Unit Rate US\$	AMOUNT US\$
41	PIPES Supply and Install 4 inch Upvc Pipe,SN8 inside cable trenches and backfilling with clean sand include warning tape anf 8mm rope inside the pipes .	MR	100		
42	Cables Supply and Install XLPE Cable (4x16)mmSQ From LV pillar to M.D.B With all necessary connections and pipes .	LM	130		
43	Supply and Install shilded control cable Cable From microswitches to Control unit With all necessary connections,relays and pipes .ThePrices includes Microswitches for NR Valves.	MR	50		
44	Supply and Install control cable (24x2.5) mmSQ Cable From PLC Control Panel To Pump motors With all necessary connections and pipes	MR	50		
45	External Lighting Fixtures Supply and Install wooden lighting Pole 10 meter length with 250W M.H Luminaire ,chock coil , condenser , ballast , arms , control box with 1x16 A m.c.b, Terminal connections ,Base Concrete Foundation and 5x6mmsq cable inside 3 Inch flexible conduit .The work include excvation in the soil ,80cm depth in the ground and backfilling with clean sand .	NO	1		
Total of Bill B: Electrical works					

GENERAL SUMMARY

Bill No. A - wet pit & sedementation tank		
Total of Bill No. (1) {Earth Works}	\$	
Total of Bill No. (2) {Concrete Works}	\$	
Total of Bill No. (3) {Miscellaneous Works}	\$	
Total of Bill No. (4) {Mechanical Works}	\$	
Total of Bill (A) of wet pit & sedementation tank Works	\$	
Bill B: Electrical Works		
Total of Bill B: Electrical works	\$	
GRAND TOTAL	\$	

GRAND TOTAL IN WORDS:-

(_____ \$)

NAME of CONTRACTOR:- _____

SIGNATURE of CONTRACTOR:- _____

STAMP:- _____

CONTRACTOR ADDRESS:- _____

PHONE NO. :- _____

MOBILE NO. :- _____

FAX NO. :- _____