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Rehabilitation and Consolidation
of the Gaza Industrial Estate (RCGIE)



Funded By: European Union

Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Bill No. (1) - Civil works in Desalination plant					
	<p>General Notes: The price shall include but not limited to teh following: 1- Complete detailed shop drawings should be delivered to the Engineer to take his approval prior to commencement of work. Samples of all materials shall also be delivered to the Engineer to take the approval, 2-Contractor shall take into consideration that all – direct and indirect works and their relevant expenses required for proper implementation of the project including temporary facilities, fencing, securing utilities (water, wastewater, telephone and electricity systems) as well as making access to project implementation location such that the industrial area is running safely without disturbance. The contractor will be accountable for all necessary equipment, materials and activities to assure the safety of people within the desalination plant building and vicinity, where an approved safety plan will be prerequisite to initiating activities along with installing all required components and materials necessary for safety of workers, project team as well as people at the desalination plant. All relevant costs are deemed to be included in the unit price in addition to the required re-instatement works needed to bring the original facilities to its original status before addition of temporary works.</p> <p>3-The contractor will expect that more than one contractor will be carrying out works in the desalination plant at the same time, the Contractor is presumed to make all necessary coordination and facilitate accessibility to and other work-related issues</p> <p>4-All works and installations listed here below should be carried out, tested and commissioned by specialized responsible skilled labors in full coordination with supervisor Engineer, all in accordance with drawings, specifications and relevant standards, and the instruction of the Engineer. The Engineer has the right to reject any component of the work not complying with the specifications and the terms of the contract.</p> <p>5-All existing Material dismantled must be transferred to places as specified by the supervisor Engineer</p>				
1	DEMOLISHING & EARTHWORKS				
*	<p>Notes: <i>Contractor shall take into consideration that all – direct and indirect works and expenses required for the completion of Earth works items' Prices. Excavation item shall include the removal of any buried structure not to be part of the proposed construction, including transport of excavated, surplus material and buried structure (not to be part of the proposed construction) to a location approved by the engineer or his representative outside the site, workmanship and any where else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer. the following will be in the items prices but not limited to:</i></p> <p>Contractor shall take into consideration that all – direct and indirect works and their relevant expenses required for proper implementation of the project including temporary facilities, fencing, securing utilities (water, wastewater, telephone and electricity systems) as well as making access to project implementation location such that the industrial area is running safely without disturbance. The contractor will be accountable for all necessary equipment, materials and activities to assure the safety of people within the Transformer Rooms buildings and vicinity, where an approved safety plan will be prerequisite to initiating activities along with installing all required components and materials necessary for safety of workers, project team as well as people at the desalination plant. All relevant costs are deemed to be included in the unit price in addition to the required re-instatement works needed to bring the original facilities to its original status before addition of temporary works.</p>				



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	<p>1. Shore up the sides of excavation and take all precautions to keep the adjacent buildings and existing infrastructure utilities (sewage, water, electricity, telecommunication and pavement works) safe. And repair any damage that may occur in the site.</p> <p>2. The cadastral survey and leveling of existing status at grids not exceeding 5 m in both directions. And the contractor should get Approval of Bench mark and leveling network before excavation works.</p> <p>3. Safety precautions to protect neighbor utilities and persons.</p> <p>4. All required Tests should be accommodated by an approved lab.</p> <p>5. Laying out the buildings coordinates to be carried out by professional surveyor using total station device.</p> <p>6. Price includes leveling and backfilling from imported clean sand (Safia) to make up level around buildings up to the top of external ground beams levels.</p> <p>7. All the above mentioned and following specifications is part of the contractor obligations.</p> <p>8. Quantities of Excavation shall be measured according to the elements' dimensions mentioned in the drawings</p> <p>9. The Price for excavation includes Cleaning the site and demolishing and removal of any existing structures. Debris material shall be disposed off to approved site as directed by the Engineer.</p> <p>10. Back-filling item should be in layers (25cm max. each & compaction test 98%). Prices shall include supply, water, compaction, transporting, testing and any needed workmanship and material, all according to drawings, specifications, conditions and as directed by the Engineer.</p> <p>11. The contractor will expect that more than one contractor will be carrying out works in the desalination plant at the same time, the Contractor is presumed to make all necessary coordination and facilitate accessibility to and other work-related issues</p> <p>12. All works and installations listed here below should be carried out, tested and commissioned by specialized responsible skilled labors in full coordination with supervisor Engineer, all in accordance with drawings, specifications and relevant standards, and the instruction of the Engineer. The Engineer has the right to reject any component of the work not complying with the specifications and the terms of the contract.</p> <p>13. Cleaning the site and removing all debris, surplus unwanted materials and rubbles to approved dump site.</p> <p>14. All existing Material dismantled must be transferred to places as specified by the supervisor Engineer</p>				
1.1	Demolish and remove safely ceramic wall tiles from the existing building, keeping and protecting the existing ceramic floor tiles from damage. The price shall also include remove & clean all cement mortar materials on walls, and removing of all defected materials inside and outside desalination plant building which is not limited to tiles. All resulted materials are to be transported and delivered to places as specified by the supervisor Engineer.	L.S	1		
Total OF PAGE 1 OF DEMOLISHING & EARTHWORKS - US\$					



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ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
1.2	Dismantle safely course aggregates, bituminous membrane layer, floor tiles and any other materials covering the roof of the building. The price shall include transporting what has been removed to a an approved site as specified by supervisor engineer. The work includes dismantle and reinstall existing water tanks to complete the works including all required fitting, pipes, any other materials and workmanship to complete the work as per Engineer's Instructions.	L.S	1		
1.3	Remove carefully side-walk tiles surrounding the building and transport to a proper place as specified by the supervisor engineer. The price shall include Excavation and the removal of any obstacles including trees, cleaning the site and removal of all debris and rubble to an approved dump site according to the specifications & the supervisor Engineer's instructions.	M ²	200		
1.4	Remove the existing internal plaster of some walls in the management area of the building as specified by the supervisor engineer. The price shall include cleaning and removal of all resulted materials to an approved dump site by supervisor engineer. All works According to the specifications & the supervisor Engineer's instructions.	M ²	30		
1.5	Demolish and remove safely block walls. Works shall include cutting and removal sills and lintels which included in the wall, transporting the debris to an approved dump site according to specifications and supervisor Engineer instructions.	M ²	30		
1.6	Dismantle carefully steel shelves in the Generator's room and handing them according to the supervisor engineer's instructions.	L.S	1		
Total OF PAGE 2 OF DEMOLISHING & EARTHWORKS - US\$					
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ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
2	CONCRETE WORKS				
	General Notes:				
*	<p>Notes: Prices for all concrete items shall include shuttering, steel reinforcement, testing for steel reinforcement and concrete, supply and placing of concrete, Mix Design, vibrating, curing, striking, polyethylene sheet (for any concrete in contact with the soil), painting with approved type hot bitumen (one coat of primer & min. 2-coats of hot bitumen) underground concrete for external surfaces, workmanship, all ducts, sleeves, concrete surface shall be finished with mechanical steel trowel . to obtain smooth fair surface. all according to drawings, specifications, and s directed by the Engineer. the following will be in the items prices but not limited to:</p> <ol style="list-style-type: none"> 1. All wooden form works and shuttering shall be new wooden forms painted by special oil and shall be in any form, shape and size . Works include allowing for and making grooves and sleeves and using Tie Rods (Batant) for concrete walls; removal of form works, and cleaning of all exposed tie wires and rods. and filling the cavities with special approved maeruals. Steel forms must be used in shuttering the external decorations if needed. 2. Fuel or burned oil is not accepted to be used for painting the wooden forms before use the form. 3. Supplying, Casting, vibrating and curing concrete as per specifications. 4. Supplying and using Approved additives and admixtures. 5. Incurred costs on New Concrete Job Mix Designs, Sampling , testing and providing test results certificates, storing and saving of samples. 6. Painting of exposed surfaces of underground reinforced concrete elements with one coat of approved primer and minimum two coats of hot bituminous paint (75/25), the strokes of each layer to be opposite to each other. 7. Preliminary installations for Electrical, plumbing and floor drainage in floor slabs including final floor slab. 8. Compaction and testing under the foundation, ground beams, and ground slabs, the compaction should not be less than 98% of MDD. 9.The Price for any concrete contact with soil includes laid polythene sheet with 200 micron thickness. 10. Supply, fabricate and fix reinforcement steel (fy= 410 N/mm2) for all the structural elements according to drawings and engineer's instructions for any grade, size and length as detailed in the drawings, storing on site including cutting, bending and fixing in position and providing all tying wires, spacers, shop drawings, testing and bar bending schedules. All works according to specifications , drawings and supervisor engineer instructions 				
2.1	Supply and cast ready mix reinforced concrete B(250) kg/cm2 for foundation, foundation for desalination plant container, ground beams and any other reinforced concret item needs maintenance works as per specifications , drawings and supervisor Engineer instructions.	M ³	15		
Total OF CONCRETE WORKS - US\$					



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3	MASONRY WORKS				
	General Notes:				
	<i>The price for Block works shall include 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/cm² for hollow block and 60 kg/cm² for solid block. This item will include cement mortars, reinforced concrete infill (B250) between columns & block walls (10-20 cm wide) with 1Ø8mm/40cm horizontally and 2Ø8mm vertically according to drawings, pipes encasement, and bituminous paper between block work and drop beams & all requirements needed to finish the works according to the drawings, specification and to the Engineer instructions. the price shall include curing and Providing samples for approval and all the required tests.</i>				
	2- Providing samples for approval and all the required tests. Note: Measurement calculations will be in (Engineering Measurements).				
3.1	Supply and build hollow cement block 40x20x20cm for internal and external walls and building's parapet.	M ²	10		
3.2	Ditto but 40x20x 15 cm.	M ²	10		
3.3	Ditto but 40x20x 12 cm.	M ²	10		
3.4	Supply and build glass blocks 20x20x10cm matching to existing block. the price includes removing the old glass blocks. Price will also include white cement ,reinforcement steel, reinforced concrete edges adhesive materials, polish, and any required materials to complete the work according to specification and engineer's instructions.	No.	40		
Total OF MASONRY WORKS - US\$					



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4	CARPENTARY WORKS				
	General Notes:				
	The price shall include but not limited to supplying carpentry works from good and approved type of wood grade "A" including frame cover mold, architrave. The price include 2 layers of putty, prime painting by undercoat and at least two coats of oil paint, 15cm stainless steel Grade 316, 1mm thick from both sides , hard ware lock type Wally switch or equivalent and heavy duty approved door handle, brass, hinges, latches from approved type, door stopper and all other fitting according to specification and drawing . Site visit is necessary to identify the needed preparation works and relevant necessary materials for reinstatement and maintenance items. All parts that are needed for replacement are to be included in unit price. The price shall include removing the damaged wood works and handing it according to the Engineer's instructions. The width of frame taking into account the thickness of plaster or ceramic on both sides. as per detailed drawings. The price shall include maintenance works for floor and wall including materials and workmanship.				
4.1	Maintenance and reinstallation of wooden doors overall size 90 x 220 x 4.5cm thickness including doors frames, The price shall include dismantling and refixing the doors and replacing all handles, switchches, and hinges with new approved ones. The maintenance shall include all accessories, materials such as but not limited to door stoppers to finish the works as per specifications and the supervisor engineer instructions. The price includeremoval of existing paint, prime painting by undercoat and two coats of color oil paint approved type, using putty where needed, smoothing the door to complete the works to the satisfaction of the engineer.	No.	4		
4.2	Ditto but for Door with 80 x 220 x 4.5 cm clear dimension	No.	2		
4.3	Supply, fix & paint flushed wooden door leaves with overall size 90 x 220 x 4.5cm with 3 cm Zan wood from 3 sides as per detailed drawings including oil paint. with all needed accessories for the door, materials and workmanship. The price shall include painting the door frame as per Engineer's instructions. For paint,	No.	1		
Total OF CARPENTARY WORKS - US\$					



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ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
5	ALUMINUM AND METAL WORKS				
	General Notes:				
	<p>All works must be according to drawings, specification and Engineer instructions.</p> <p>All works must be according to drawings, specification and engineer instructions. Rates shall include but not limited to:</p> <ol style="list-style-type: none"> 1. Submitting samples for approval of: material, ironmongery, accerories, color, and method of fixation. 2.All metal works include the fixation for frames and leaves and all required accessories according to the engineer's instructions. 3. Price of Galvanized Steel works includes supplying, workmanship, oil painting (base coat & min. 2-coats of oil painting), fixation (all galvanized steel frames should be filled with the fine aggregate rich mortar concrete), hinges, , handles and all ironmongary needed to complete the works. 4.Price of doors or windows (Galvanized steel or others) include supplying, workmanship, painting, oil painting, fixation. lock type is Wally or equivalent, handles, latches (horizontal and vertical) and/or all ironmingary necessary parts, latches, stoppers to complete the works. 5. Painting after smoothing and filling all the voids with putty, primer coat, undercoat and two oil coats and in case of galvanized steel the primer should be poly zinc. 6. The price shall include removing the damaged aluminum and steel works according to Engineer's instructions. 7.The price includes supplying Aluminum windows section 7000 matching the existing ones, with min. wall thick 1.5mm (to be approved by the Engineer)as frame, glass 4 mm thick, ironmongery , accessories and hard ware as per specification and drawings. All maintenance works include all needed accessories and reinstatement materials and works. 				
5.1	Maintenance and refixing for Aluminum door 80×220cm. This item includes supplying and replacing all the accessories including but not limited to switches, handles and door stoppers as needed according to supervisor Engineer instructions.	No.	1		
5.2	Ditto but 100×220 cm.	No.	3		
5.3	Ditto but 120×220cm.	No.	1		
5.4	Maintenance and refixing for Aluminum windows. This item includes supplying and replacing all windows' damaged glass to match the existing glass, maintenance for fly screens and replacing ironmongary, screen, and all the accessories if needed according to UNDP specifications and Engineer's instructions.	M ²	20		
5.5	Painting for steel screens (steel Gratings). The item includes maintenance works if needed, removal of old paint, supplying and painting with one coat of primer, undercoat and at least two coats of oil paint. The price shall also include dismantling the steel screens and reinstalling them and cleaning and maintaining the trench.	L.M	55		
5.6	Supply and install Galvanized steel louvered door double sheet (2-mm) and supply & fix G.S frame according to wall thickness, ironmongery, for service building. The price shall include supplying and painting with two coats of oil paint in addition to the primer coat according to Engineer's Inastructions.	M ²	22		
TOTAL OF PAGE 1 - ALUMINUM AND METAL WORKS					



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ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
5.7	Maintenance for the existing damaged multi lock doors 100x220cm 90x220cm, 80x220cm. The price includes supply, fix & and paint with approved oil paint for frames, closing holes if any, supply and replace steel sheets , supply and replace all locks with new approved ones and coating the door with new approved plastic (PVC) sheets to match the existing doors, all works as per Engineer instructions.	No.	4		
5.80	Supply and install cast iron cover (25 tons capacity,60*135cm three parts telecommunication manholes wording should be in English), frame, rings, internal coating, painting, cast iron steps and all required works to the manhole.	No.	2		
5.90	Supply and install cast iron cover (25 tons capacity,60cm opening for sewage manholes), frame, rings, internal coating, cast iron steps and all required works to the manhole.	No.	2		
TOTAL OF PAGE 2 - ALUMINUM AND METAL WORKS					
Total OF ALUMINUM AND METAL WORKS - US\$					



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6	<p>FINISHING WORKS</p> <p>A- Plaster works All works must be according to drawings, Technoical Specification and Engineer's 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- 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>4-Trimming of concrete chippings, removing the wires and etc. and cleaning of existing surfaces to be ready for plastering.</p> <p>5- Checking out all of the preliminary installation in ceilings and walls such as electrical, water supply and waste water pipes and repairing the damages if any.</p> <p>* For defected areas around the damages or with huge cracks extent of work will be identified with the supervision Engineer and rates will include all necessary removal of plastering , replastering , watering, disposal of debris and necessary preparation for painting works inclusive of all accessories needed for plastering along with the needed scaffolding.</p> <p>6- Curing with water for at least three days for each coat. This should be done prior to commencement of plastering and after obtaining a written approval from the supervision engineer.</p> <p>B- Tiles works All works must be according to drawings, specification and Engineer's instructions. Rates shall include :</p> <p>1. Samples for approval and all the required tests.</p> <p>2. Cleaning, mechanical polishing and pointing using grout.</p> <p>3.Insulation works under ceramic floor tiles for all wet areas and kitchens using primer coat, two hot bitumen coats (75/25)</p> <p>4. Plastic angle beads for ceramic wall tiles at the corners and top and sides of ceramic edges</p> <p>5. Local marble must be Grade (A) free cracks and clay flaws</p> <p>6. Measuring the stockpiled quantities of tiles and obtaining the engineer approval prior to shipment to the site</p> <p>7.Transporting and carefully handling the stored quantities to the site.</p> <p>8.Removal of damaged elements (tiles, stairs steps, damaged plaster, granite, local marbleetc. and any other required work to complete the job according to specifications.</p> <p>C- Painting works Painting and decorating to walls, ceilings and the like shall be measured net in squared meters, Rates for painting and decorating work shall include:</p> <p>1.Preparation of surface including puttying, sealing and priming,</p> <p>2. Any area or width,</p> <p>3. Any location, so works shall include scaffolding.</p> <p>4. Work in multi colors,</p> <p>5. Cutting in edges,</p> <p>6. Any taping and covering to protect areas and others.</p> <p>7.cleaning and polish for any place after paint. All painting materials should be approved by the Engineer, tested by approved local laboratory.</p> <p>Painting for External steel works shall be with Hummer paint Tambour type or equivalent.</p>				



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6.1	Supply & execute internal plastering 13mm thick to walls, soffits & columns including galvanized metal lath angles for columns, edges & chicken wire at the intersection of concrete & block works, pipes & cement rendering , Treatment of cracks including cleaning, rubbing, opening, filling with Sikaflex and painting (by approved internal paint(supercryle)) to match the existing. according to the engineer's instructions.	M ²	40		
6.2	Supply, install and fix 250 x 250 x 6mm glazed ceramic wall tiles, of European type grade A, 1.5m high for the plant and 3 m high for the kitchen and bathrooms (grade A) size 250 x 400 x 6mm thick according to specification, drawings and the Engineer's instructions. the cost also includes cement mortar bed, cleaning, pointing and polishing and any other works and materials to complete the work.	M ²	120		
6.3	Supply, install and fix 250 x 250 x 8mm unglazed ceramic floor tiles, of European type grade A, (grade A) according to specification, drawings and the supervisor engineer instructions. including cement mortar bed, cleaning, pointing and polishing. The price shall also include removing old floor tiles and delivering them to a proper place according to the supervisor engineer.	M ²	5		
6.4	Ditto but 400*400*8mm	M ²	30		
6.5	Supply and install granite Rosabetta type for staircase risers 2 cm thickness, and treads with 3 cm thickness rounded edge for internal and external steps with all required works and materials such as cement, skirting, polishing, etc.. To complete the works as per Engineer's instructions. (Measurements will be only for Horizontal projections).	M ²	20		
6.6	Supply and paint super bondrol prime coat and three coats of emulsion paints (Supercryl) for external walls, including all the required materials and scaffolding. The works include removing the old paint and plaster repairing, testing, Treatment of cracks including cleaning, rubbing, open, filling with sika flex, closing openings, repairing plaster, terolyne finish in the walls up to (20*20 cm) and cleaning the surface..	M ²	900		
6.7	Supply and Paint, slabs, internal soffits, sloping soffits, internal walls with one coat of Pendrole primer and at least two coat of External quality emulsion (Supercryle) or equal and the item includes maintenance works for plastering coats and scaffoldings approved as specification and drawings. The works include removing the old paint and plaster repairing, testing, scaffolding, Treatment of cracks including cleaning, rubbing, open, filling with sika flex, closing openings, repairing plaster, openings up to (20*20 cm) are included and will not be measured.	M ²	1800		
TOTAL OF PAGE 1 - FINISHING WORKS					



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6.8	Supply and Paint internal walls above wall tiles and floor level with one undercoat layer include two coats of putty primer and two coats of colored oil paint. The price shall include maintenance works for plastering coats and repairing existing cracks as per specification, drawings and the supervisor Engineer instructions. The price shall include removing the old paint and plaster repairing, testing, Treatment of cracks including cleaning surfaces, rubbing, open, filling with sikaflex, closing openings, repairing plaster, terolyne finish in the walls up to (20*20 cm) are also included.	M ²	200		
6.9	Painting works for mild steel stairs 50cm wide as specified by the engineer with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint (the color must be approved By the Engineer and as drawings and specifications).	L.M	10		
6.10	Painting works for mild steel balustrade 90cm high for staircase handrails as specified by the engineer with one coat of primer, one under coat and minimum two coats of oil paint, after scratching the old paint (the color must be approved By the engineer and Technical specifications).	L.M	25		
6.11	Maintinace &Painting works for steel door (external room) 110*270cm with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint. All must be done according to specifications and the Engineer's instructions.	No.	1		
6.12	Painting works for steel protection including the door for the external transformer beside the stairs. 250*270cm with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint. All must be done according to specifications and the engineer's instructions.	No.	1		
6.13	Painting for steel cover of the floor 45cm and 75cm wide. The item includes maintenance works if needed, scratching the old paint, painting with one coat of primer, undercoat and at least two coats of oil paint. The price shall also include dismantling the steel screens and reinstalling them and cleaning the trench.	M ²	25		
6.14	Supply and erect Granite type Tiger counter top 60cm wide for kitchen cupboard, including local marble shelves and vertical dividers, back of cupboard, floors and skirting .Vertical dividers and floor should be 3cm thick, but back and shelves 2cm, making opening for kitchen sink with size (60cm x40cm), and another suitable opening for gas pipe as per specification, and Engineer's instructions. The price includes dismantling the old counter top, including local marble shelves and vertical dividers, back of cupboard, floors and skirting.	L.M	3		
TOTAL OF PAGE 2 - FINISHING WORKS					
Total OF FINISHING WORKS - US\$					



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7	<p>PLUMBING WORKS</p> <p>1- All the plumbing units should be from the best quality and has trade mark. 2- Submitting shop drawing for water supply and waste water networks for approval prior to commencement of the work. 3- Submitting samples for all required material with catalogue indicating its specifications. 4- All required tests , pressure for water net work , hydraulic test for sewage lines</p> <p>5- Cleaning and disinfecting all water pipes. 6- Insulation of all galvanized water pipes and wrapping it with bitumen's sheets and protect pipes located under tiles with cement mortar. In addition to the insulation materials against heat loss for hot water pipes. 7- All hot and cold water pipes for the points of fixtures to the nearest distribution board. 8- All plumbing works (wash basin, kitchen sink, gully traps, etc...) include the connection to the nearest trap, WC to the nearest vertical sewage header in the typical floors and WC in the GF to the nearest manhole and include all accessories including PVC S and caps for all the ends of pipes at parapet. 9- All external inspection elbows should covered by galvanized steel plate with thick 2mm .</p> <p>(1) Price shall include:</p> <ol style="list-style-type: none"> 1. Shop drawings, 2. Cutting and forming all chases, recesses, holes, and the like, 3. Pipe sleeves, 4. Building of concrete and/or brick ducts in floors, walls ...etc., 5. Excavation, forming of trenches for services, concreting, bedding and back filling and ramming after laying, 6. Fixing brackets, clips, holder bats, hangers, and the like, 7. Temporary and final fixing, 8. Nails, screws, bolts, nuts, washers, holes, plugs, sleeves and the like, 9. Building in or cutting and pinning, 10. Testing and drawings, 11. Painting, 12. All work of other trades in connection with plumbing work including all making good. <p>(2) Rates for building of manholes and pits shall include excavation, concrete, benching, plastering, backfilling and cover as per Drawings and Specifications,</p> <p>(3) Rates for sanitary fittings, isolated taps and gullies shall also include for:</p> <ol style="list-style-type: none"> 1. All pipe work in connection therewith and connections thereto including connection to the nearest manhole or gully and to the cold water storage tank. <p>(4) Rates for pipe work including pipes within frames to shading sheds and shall include:</p> <ol style="list-style-type: none"> 1. Joints in the running length, 2. Nipples, connections, sockets, ferrules, couplings, back nuts, unions, and the like, 3. Bends, elbows, tees, reducers, access doors, cleaning eyes, blank caps, stop valves, and the like, 4. Welded joints and connections including grinding, 5. Lagging and wrapping, 6. Excavation, bedding and backfilling. 				



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7.1	Supply and fix white glazed fire clay sink 40x60cm (HARSA) or equivalent, complete with waste fitting, trap, plug and chain, chromium water mixer (ECA type or equivalent ,jack, wall mounted type), glazed fire clay soap holder. the work includes water supply pipes 16mm (Golany) to the nearest distribution box (DB) and the drainage line 2" to the nearest new floor trap with stainless steel cover 15x15 cm (Nevally Type or equivalent).	No.	1		
7.2	Supply and fix water mixer (ECA ,jack, wall mounted type or equivalent) according to the specifications, drawings and the Engineer's instructions.	No.	1		
7.3	Supply and fix white glazed fireclay European W.C. suite (Vitra type - grade A), or equivalent complete with heavy duty cover, 9 liter plastic double action flushing cistern , and fixed chromium plated tap 1/2" ECA type or equivalent, including all water supply pipes 16mm(Golany) to the nearest dist. box (DB), flushing hose sprayer, angle valves, UPVC drainage pipe connecting to the nearest manhole or sewage header as per specifications , drawings and Engineer's instructions.	No.	2		
Total OF PLUMBING WORKS - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
8	ROOFING WORKS				
	<p>(1) Rates for foam concrete/ cement and mortar work shall include:</p> <ol style="list-style-type: none"> 1. Supply and storage of cement. 2. Supply and storage of aggregates and water, 3. Mixing, 4. Hacking concrete, applying cement slurry or raking out joints of block work to form key, 5. Application to any surface, 6. Finish to surface, 7. Finish to falls and cross falls, 8. Forming bays including joints, 9. Finish to edges, 10. Making good around steel sections, pipes, tubes, bars, brackets, outlets, and the like, 11. Ends intersections, ramps, and the like, on fillets. <p>(2) Rates for waterproofing shall include for:</p> <ol style="list-style-type: none"> 1. Preparation of surface, 2. Any area or width, 3. Cutting in edges. 4. Over laps, priming and treatment at the corners and floor drains. 5. Testing for the roof with water 6. Dressing over parapets and stub columns including forming groove to receive edge of plasticized bitumen membrane and sealing with elastic sealer. 7. Removal of damaged elements (damaged insulation sheets, damaged foam concrete, cleaning the surface and any other required work to complete the job according to specifications and Engineer's instructions. <p>(3) Rates for roof sheets shall include for:</p> <ol style="list-style-type: none"> 1. Side and end laps, Fittings including bolts, hook bolts, screws and washers, 2. Sheets of any width or length. 				
8.1	Supply and cast foam concrete with fine aggregates for roof screening of average thickness 7 cm dressing into rain water outlets to form water proofing seal for the building according to the engineer's instructions. Note: Measurement will be for the horizontal projection	M ²	600		
8.2	Supply and lay one layer of plasticized bitumen roofing membrane with chipping 4 mm thick, including priming concrete surface prior to laying, dressing into rain water outlets to form water proofing seal and cover the angle fillets. The rate include verticals parts skirting as per specification. The price shall include overlapping 10cm between sheets, upstands up to 15cm, dressing into storm water traps, etc. Note: Measurement will be for the horizontal projection. The work includes inspected for leakage of water not less than 48 hours.	M ²	600		
Total OF ROOFING WORKS - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
9	EXTERNAL WORKS				
9.1	Supply ,spreading ,leveling , damping and compacting 15cm base coarse material including removing trees, leveling, compacting to 100% of MDD, testing of subgrade, removing trees or any other obstruction items available in the proposed area of the side-walk beside the building and removing all arising debris from the site according to drawing specifications and Engineer's instructions.	M ²	400		
9.2	Supply and Execute Colored Interlock 6 cm thick(B450). size and shape as directed by the engineer or his representative. The work include spray and leveling of 5cm clean sand and making concrete B250 closing 15 cm wide * 30 cm height(4Ø10).as per specifications and engineer's instructions. This item includes removing existing sand under the side walk tiles according to specifications, drawings and supervisor Engineer's instructions.	M ²	400		
9.3	Supply & lay pre-cast concrete curbstones B300 for sidewalks (15x30x80 cm) including all necessary excavations, filling with dune sand & compaction to 98% of MDD and compacted Basecourse layer (30x15 cm), B250 plain concrete foundation (27x12cm) under the curb and (12x21cm) behind, spreading 2 cm mortar under the curb, filling joints between curbs with cement mortar and painting with one prime coat and two finishing coats of approved brand name painting material ,expansion joint every 12 mr with selotex board and filling 3cm with sika flex ,all according to drawingsTechnical specifications, and Engineer's instructions.	LM	150		
9.4	Supply and install Stainless steel ladder with min. length 5.0 meter all according to Drawings, Specifications and instructions of the Engineer. The price should include painting with two coats and base coat, all according to Drawings, Specifications and instructions of the Engineer. The price should include dismantle existing old one	No.	2		
9.5	Supply and install for existing manhole, 60cm cast iron cover (25 tons capacity), frame, ring. The item also includes inside cast iron steps each step 30 cm maximum and safety measures. All according to Drawings, Specifications and Engineer's instructions.	No.	7		
9.6	Ditto. But rectangular frame of 3 units each one has dimension 45x65 cm	No.	7		
9.7	Supply and install 60 cm internal diameter pre-cast circular reinforced concrete sewage manholes up to 130 cm depth, width of wall not less than7 cm, complete with 40 cm cast iron cover (8 tons capacity)	No.	8		
9.8	Supply and install cast iron rings (25 tons capacity,60cm opening manholes), all required works to the sewage manholes.	No.	10		
9.9	Supply and install Manual (CO2 Gas) wall mounted Fire extinguisher or hanging on the ceiling (6kg) and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.	No.	4		
9.10	Ditto but for Manual (Dry Powder) Fire extinguisher (6kg).	No.	4		
Total OF EXTERNAL WORKS - US\$					
Total of Bill No. (1) - Civil works in Desalination plant - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Bill No. (2) -Mechanical Works					
	<p>Full maintenance for all components start with entrance of row water to discharge clean water including but not limited pipes, valves, fittings, motors, pretreatment system, blowers, pumps, chemical treatment unit ,dosing pumps, external tank final filter above that external tank. The works include supply and replacement all damaged or defected parts or components and all necessary equipment for operation efficiently of the plant according to the engineer's instructions.</p> <p>The price shall include Supply, Install and commission Skid Mounted 40m3/hour Brackish Water RO Desalination Plant and connect,commision,test of permeate quality and synchronize with to the existing system</p> <p>It is the contractor full responsibility to check and inspect the proposed site as identified here below and to quote for all works, repairs, installations, and its associates with all material requirements. The contractor shall arrange for all required equipment, tools, and utilities (water, electricity, and tanks...etc.) to carry out the job in accordance with relevant clauses of standards and code of practices .</p> <p>The contractor shall arrange for all required safety measures, signs, and protections around the sites. The contractor should make valid insurance document to cover all site equipment and labors.</p> <p>The contractor should include in the price inspection visit/s for the manufacturing factory and carry on the tests for the unit before delivery to Gaza, the cost will cover all travelling costs including accomodation, visas, transportation and other logistics for three persons. And if traveling is impossible, there should be a third party inspector but witnessed by one UNDP engineer to certify the tests.</p> <p>The contractor have to submit detailed schedule for commissioning the rehabilitated desalination plant for seven days/24 hours and for each electrical and mechanical component of the plant and certified by the engineer. The contractor will submit all chemical and biological tests for the permeate and saline waters and the price includes training of three technicians in the commissioning period for 7 hours daily and 7 days, all under the approval and monitoring of the engineer. • Prior to any work commencement the contractor shall submit detailed design , detailed shop drawings, action plan, material specifications ,itemized priced breakdown of all elements and work methodology for the Engineer's approval, as per relevant clauses of the Conditions of Contract</p> <ul style="list-style-type: none"> • The Contractor shall submit "as built" drawings after the completion of the work • Any other material, accessories and/or fitting, not expressly mentioned but required for the successful installation of the RO plant components , shall be specified and supplied by the contractor, and must be included in the original price of the tender 				



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
10.1	Supply and install modular ,factory assembled, tested , piped and wired 40m3/hour skid mounted brackish water desalination plant for max TDS of raw water less than 4500 ppm producing water with TDS not more than 200ppm and PH 7 -8 all in accordance with detailed process schematic diagram .The plant should be comprising but not limited to, raw water tank FEED pump, fully controlled Multimedia filtration made of rubber lined FRP vessels and externally epoxy painted with automatic backwashing and air blowers ,FRP cartridge filtration vessel, antiscalent and acid HCL 33% dosing system each of 500 liters PP tank with level controls, two stage FRP,PN20 high pressure vessels and 46 No. ,8" diameter RO membranes 99.7% salt rejection, VFD controlled high pressure pump pump, lime stone filter ,product water tank , Product water booster pump, stainless steel grade 316 high pressure piping, PN16 CPVC piping for low pressure side, pipes, valves, gauges, electromechanical Siemens digital flow meters for raw product and brine water flows, Caustic soda dosing system and sodium hypochlorite dosing system, Digital EC, PH , PLC controlled electrical power and control switch board. The prices should include for all civil structures and concrete including all associated electromechanical installations . the price also include connecting the new plant with the existing system and synchronizing the operation of the plant as one unit including all required materials and workmanship to complete the work.	Set	1		



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Total of Page 1 - Mechanical Works - US\$					
Rehabilitation of the existing brackish water desalination unit in the GIE					
	<p>Complete rehabilitation and operation of the GIE RO desalination unit. The unit shall be capable to produce more than 40m³/hr. of desalinated water of TDS not more than 200 ppm. Characteristics of raw water TDS less than 4500 ppm and recovery rate must be(70- 80)%.</p> <ul style="list-style-type: none"> • It is the contractor's full responsibility to carry out all works and installations with all materials and equipment requirements , and upon approval of the Engineer. • Transfer all the required material and equipment to the working site • Arrange all equipment and labor required to carry out all installations. Construct the plant shed and building with all associated civil works, electrical and mechanical installations. • Supply and place in service each component of the RO Systems.. • Test and commission in accordance to relevant standards • The Contractor shall submit "as built" drawings after the completion of the work. • Any other material, accessories and/or fitting, not expressly mentioned but required for the successful installation of the RO plant components, shall be supplied and installed by the contractor. <p>All pipes and fittings ,pumps components in contact with brackish water should be made of CPVC PN10 for low pressure and stainless steel 316 for high pressure side</p>				
10.2	Complete maintenance and rehabilitation of the existing membranes and pressure vessels necessary to remove all debris more than 5 Micrometers dia. to operate optimally for the existing RO plant. The works include but not limited to: replacement of all bolts and nuts with a Stainless Steel 316L, Gaskets(EPDM), filter base and all related accessories . the price also includes supply and installation of 1"dia air release valves ARI type or equivalent with all required accessories and supply and replacement of all 2" cartridge filter with new membranes of (Tory, Hydraunitics ,Filmetic) made with flow of 15 M3/min according to engineers instruction.	LS	1		
10.3	Supply of cartridge filter 2" dia and 40" length with less than 5Microns mesh size (Tory, Hydraunitics ,Filmetic) made with flux of 15m ³ /min for each 10"	No.	30		
10.4	Supply and install all Pneumatic Valve Actuator to replace all the existing ones (Bray type or equivalent) to control opening and closing of all feed pipes for multimedia Filters and sand filters. The replaced valves should be connected to the main control panel and should operate automatically. the price includes; replacement of all related bolts and nuts with Duplex SS316L and EPDM gaskets and all required fittings to complete the work. the price should include complete maintenance of the control panel for the valves and related accessories to complete the works to the satisfaction of the engineer.				
a	4" diameter Pneumatic Valve Actuator	No.	6		
b	Ditto but 3" dia.	No.	4		
c	Ditto but 2" dia	No.	4		
10.5	Supply and install Butterfly Valves to replace the old ones Bray or equivalent PN12. price should include stainless steel 316L bolts, nuts, washers and EPDM gaskets and all required fittings to complete the work according to the engineer's approval.				
a	Butter fly valve 6", PN12	No.	1		
b	Butter fly valve 4", PN12	No.	9		
c	Butter fly valve 3", PN12	No.	8		
d	Butter fly valve 2", PN12	No.	2		



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Total of Page 2 - Mechanical Works - US\$					
10.6	supply and install non-return valve PN16 Keystone type or equivalent. Price includes stainless steel 316 bolts, nuts and washers with EPDM gaskets to complete the works according to the engineer's instruction.				
a	Non-return valve 4"	No.	2		
b	Non-return valve 2"	No.	1		
10.7	Supply and install non-return valve made of CPVC PN16 and nominal pressure 16 and of 2" dia FIP, Asahi or equivalent. Price includes stainless steel 316 bolts, nuts and washers and EPDM gaskets and all required fittings to complete the work.	No.	4		
10.8	complete rehabilitation and maintenance of the 2 Multimedia Filters to produce 60m ³ /hr. and 3 bar with turbidity less than 1 NTU. The price includes replacement of all lower and upper caps and replacement of Anode. The prices also include cleaning of glass openings from inside the filters from fungi and cleaning the filters and painting the base with two layers (apply and paint with Hammer Type paint Tambour or equivalent with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint (the color must be approved by the engineer). the price also includes replacement of the pressure gauge and air release valve (ARI) 1" dia. and maintenance of the upper opening of the filter in accordance with the engineer's instruction and approval.	L.S	1		
10.9	Supply, install and commission Thin film composite spiral wound membranes for brackish water (DOW/Filmtec; Koch Membrane Systems, Toray or Hydranautics) with High Rejection rate not less than 99.7% and Recovery percentage not less than 80%. the membrane dia is 8" and length is 40" supplied inside FRP, PN25 high pressure vessels 8" dia. the contractor should provide and install and test the Head interlock and Piping connections with all required accessories for brackish water, permeate and brine waters. The works should be according to the approval of the engineer. all fittings and accessories used should be of stainless steel 316. The existing feed pump flow is 40m ³ /hr. and head of 18 bar. The feed water quality is: 1. TDS ≤ 4500 mg/l Permeate water specifications: 1. TDS ≤ 200 mg/l 2. Cl. = 80-100 mg/l 3. Hardness = 50-70 mg/l	No.	42		
10.10	provide, install and commission complete dosing system for HCl acid that operates automatically by connection to the existing PLC control panel. The dosing will be on the brackish water line and the dose will automatically calibrated to be in accordance with readings of the PH meter. the proposed system consists of two dosing pumps Prominent type with polyethylene 500 liters tank and 25 cm high fiberglass base. the system should include a level control switch and will give an alarm for shortage of acid and eventually will stop the plan in the acid is depleted. the tank should be completely filled with HCl acid. the works include all mechanical connections, fittings, pressure hoses and electrical protections and accessories. the dosing pump's capacity is 0-2 liters/hour at rated pressure of 10 bar and specifications: Dosing head: PLEXI/PVC, Diaphragm: PTFE/EPDM, PVC Valves, motor Voltage/Frequency: 230V/50Hz, Input Signal: On/Off, Output Signal (on terminals/Plug): Operation/Pump failure, Level Switch: Process on/Off according to media level.	L.S	1		



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Total of Page 3 - Mechanical Works - US\$					
10.11	Ditto, but for Antiscalent and PLC control. The pump capacity should be 0-1 liter/hour @16 bar with one dosing pump only.	L.S	1		
10.12	Ditto, but for Caustic Soda and PLC control. The pump capacity should be 0-2 liter/hour @16 bar With one dosing pump only.	L.S	1		
10.13	Ditto, but for Sodium Hypochlorite 12.5% concentration and PLC control. The pump capacity should be 0-2 liter/hour @16 bar. The injection of the pump should be on the permeate line with a residual chlorine of 1% with one dosing pump only.	L.S	1		
10.14	supply and install Automatic air release valve ARI type or equivalent 1" dia PN25 to be installed on the high pressure line according to the engineer's instructions.	No.	2		
10.15	supply and install Automatic air release valve ARI type or equivalent 1" dia PN10 to be installed on the low pressure line according to the engineer's instructions.	No.	5		
10.16	Supply and install Turbidity measurement instrument TU Hefer3000C or equivalent. The works include connection with the PLC and all required accessories in accordance with the drawings and engineer instructions	No.	1		
10.17	Ditto but for EC measurement.	No.	1		
10.18	Ditto but for PH measurement.	No.	1		
10.19	Ditto but for residual Chlorine measurement.	No.	1		
10.20	complete rehabilitation and maintenance for metal works and installations inside and outside the plant. The works include cleaning of all the tanks, sand blasting and with supply and paint with Hummer Type paint Tambour or equivalent with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint (the color must be approved By the engineer and specifications). The price should include replacement of damaged parts that cannot be fixed. the price also includes replacement of bolts, nuts and EPDM gaskets according to the best engineering practice and engineer's instructions.	L.S	1		
10.21	Dismantle, supply and install UPVC pipes PN16 including all fittings such as elbows, tees, dressers, flanges, bolts, nuts, and rubber gaskets according to the engineer's instructions.				
a	for 6" UPVC pipes	LM	20		
b	for 4" UPVC pipes	LM	20		
c	for 3" UPVC pipes	LM	20		
d	for 2" UPVC pipes	LM	20		
e	for 1" UPVC pipes	LM	20		
10.22	Dismantle, supply and install flexible joint Armflex or equivalent EPDM PN16 including all fittings such as elbows, tees, dressers, flanges, bolts, nuts, and rubber gaskets according to the engineer's instructions.				
a	100 mm dia	No.	4		
b	80mm dia	No.	3		
10.23	Complete electrical and mechanical rehabilitation for CIP pump Ingersoll Dresser pump (30m3/hr. @2.5 bar). The works should include supply and instal all required spare parts after the approval of the engineer for each stage and part.	L.S	1		



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Total of Page 4 - Mechanical Works - US\$					
10.24	Rehabilitation and maintenance of the air compressors unit system(2 compressors, compressed air tank and pipes). The works include supply and replacement of all damaged parts, mechanical and electrical accessories, pressure gauges, pressure valves, sensors, safety valves, air relief valves with sand blasting , and paint with Hummer Type paint Tambour or equivalent with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint (the color must be approved By the engineer and as drawings and specifications).	L.S	1		
10.25	Complete electrical and mechanical rehabilitation for the 2 high pressure pumps Floway type (40m3/hr. and 18 bars). The works include dismantling the pumps, workshop inspection, supply and replacement of all damaged parts in the motor and pump after engineer's approval for the materials. the works also include cleaning, sand blasting, supply and paint with Hummer Type paint Tambour or equivalent with one coat of primer, one undercoat and minimum two coats of oil paint, after scratching the old paint (the color must be approved By the engineer and as drawings and specifications) and replacement of EPDM gaskets, bolts, nuts for both in and out lines.	L.S	1		
10.26	Ditto but for the low pressure 2 pumps	L.S	1		
10.27	Dismantle all pressure gauges and replace with new ones Gordon type or equivalent all required accessories for 0-10 bar range	No.	2		
10.28	Ditto but for 0-16 bar range	No.	2		
10.29	Ditto but for 0-25 bar range	No.	1		
10.30	Complete electrical and mechanical rehabilitation for the Decarbonator unit with cleaning and painting. The price should also include supply of 5 sets of timing belts, Goodyear type.	L.S	1		
10.31	Complete maintenance and rehabilitation for all water pipes(permeate and reject) with diameters 1.5",1" and 3/4" for the RO unit made of Duplex SS316L including supply replacement of pipes, all types of fittings, bolts, EPDM gaskets and all related flanges.	L.S	1		
10.32	Maintenance and rehabilitation of the 4" manifold for the high pressure pumps including supply replacement of the damaged pipes, fittings, EPDM gaskets and flanges.	L.S	1		
10.33	Rehabilitation, cleaning and complete disinfection of permeate water tank. The price will include works including evacuation of the tank from all contents,maintenance of internal walls and slab, removal of existing grouts and supply and apply new grout of approved type, supply and cleaning of disinfectant, and leakage inspection according to the engineer's instruction to complete work.	L.S	1		
10.34	Supply and install Fire extinguisher (Powder 3kg) No.=5 Supply and install Fire extinguisher (CO2 6kg.) No.=5	L.S	1		
Total of Page 5 - Mechanical Works - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
10.35	Supply Laboratory instruments and testing kits type Endress and Houzer or approved equivalent All Laboratory instruments and testing kits must be according to technical specifications and Engineer's instructions	L.S	1		
10.36	Supply, install and lay 160mm diameter UPVC pipe for discharge brine water of desalination plant to main sewage pump station(minimum wall thickness 4.7 mm) gravity UPVC sewer pipes in all kinds of soil with watertight and flexible joints sealed with approved gasket rubber ring. The price includes dewatering, excavation in any type of soil to the required depth, safety measures, and backfilling in layers 25 cm maximum using suitable material with watering & compaction. It also includes levelling for roads after backfilling, cart away the surplus soil to site, and Depth Up to 1.5 m. The price includes Cut existing asphalt and restore it to its previous state at carriage way orwalk side where crossed by pipes or chambers, including the provision of asphalt mix 1/2" to the original profile but 6cm thick for asphalt mix, include supply and place 25 cm of base course	LM	70		
10.37	Supply and install 100cm internal diameter pre-cast circular reinforced concrete sewage manholes B300 complete with 60cm cast iron cover (25 tons capacity), frame, rings, and special joint required to fix the sewer pipes to the manhole. The item also includes B300 benching, shuttering, inside cast iron steps each step 30 cm maximum and safety measures, excavation in any type of soil to any depth, plain concrete, two external hot bitumen coating, and backfilling in layers 25 cm maximum using suitable material with watering, compaction, and Depth more than 4.0 m	No.	4		
Total of Page 6 - Mechanical Works - US\$					
Total of Mechanical Works - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Bill No. (3) -Electrical Works					
	<p>General:</p> <p>The price shall include but not limited to the following:</p> <ul style="list-style-type: none"> *The contractor must visit the site before tender pricing . *The exact quantities that be executed , will be determined during implementation . *The price of the items in general shall include conduits, connection boxes, controls, wires, connectors, clamps, bolts, cable trays, pvc ducts and connecting the cables to switchboards. *Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. * The price should include commissioning works for the PLC, SCADA systems and operating all the new and the existing equipment's to complete the job according to the specifications. *The price in the following items also include removal of any damaged Mechanical or Electrical materials according to engineer instructions * As-built drawings for all works (existing and new works) shall be submitted after handing over the work. *All the electrical works shall be executed according to IEEE Standards, specifications and supervisor Engineer instructions. 				
11.1	<p>Supply, install, connect and test Programmable logic controller PLC in the existing control panel .</p> <p>The price also include all I/O cards with 480 I/O , connecting to computer and Ethernet with all needed Ethernet cards , removing carefully the old existing PLCs , make the required cabling and wiring works to connect the new PLC , and then connect the PLC with computer and programing the computer to operate all the plant successfully</p> <p>The price includes Programing the PLC for all existing and proposed inputs and outputs to operate the plant according to engineer instructions .</p> <p>The price includes submitting of two copies of open source software and Procures with the technical data from PLC Manufacturer, with detailed software simulator program to operate the Desalination plant. with connecting the existing fiber optic system.</p> <p>also supply spare parts (CPU ,Network card , memory ,hand held programmer and all original interface connections)</p> <p>Type is Siemens , Allen Bradly , or equivalent</p> <p>All work must be the international standard and according to the Engineer instructions.</p> <p>The contractor should provide the required onsite training courses 15 hours for at least 5 persons from PADICO staff to be familiar with the project components.</p> <p>The training should cover the operation, maintenance and monitoring for the PLC system.</p>	L.S	1		
11.2	<p>Supply ,install , and connect , 12" touch screen for monitoring and controlling , to be Compatible with PLC and from the same type , and install it on external door of the control panel ,and connect it with PLC , with all needed interfase cables and accessories , and program it to monitor all the Operating activities , and control with all I/O the program and all operations, the screen also consist of all feature for monitoring and controller</p> <p>The screen must include simulation page to preview all the station components and connections with all measurement readings .and connect it with the existing fiber optic system , and Ethernet</p> <p>the work also include supplying the newest ver of the open software .</p> <p>All works must be according to Engineer's instructions</p>	L.S	1		
Total of Page 1 - Electrical Works - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
11.3	<p>Design, Supply, Install and Commission of SCADA System on computer device with required monitores to allow the operator to locally and remotly monitor, control and operate the Desalination plant from the HMI on the PC. Price includes submission of 3 copies of open source softwares , all needed data, power cables, communication cards and devices to connect the PLC to computer. Price also includes sply two laptops (HP ,core i7 ,8GB ram ,1Terra HD) , all needed devices with SEM card device for remotely control to the system.</p> <p>The price shall include all the works needed for all materials and works to remote connection to SCADA system for maintenance purposes, also include connection of the new desalination plant where it will be controlled by the SCADA system with all needed interface connections.</p> <p>All works according to specifications and engineer instructions.</p> <p>The contractor should provide the required onsite training courses 15 hours for at least 5 persons from PADICO staff to be familiar with the project components.</p> <p>The training should cover the operation, maintenance and monitoring for the SCADA system.</p>	L.S	1		
11.4	Supply and install ,UPS system 1500 VA , type is Expert or equivalent , the price also include two gel battery 100Ahr (type is Trojan or equivalent) , with Hager MTS 40 A , cable to connect control panel with UPS.	unit	1		
11.5	<p>Test all the existing control and power cables and replace any damage cable with new one ,the work also include labeling and numbering of all existing and new cables from both terminal sides , and all circuit breakers and control devices, As-built drawings for all electrical connections , panels ,mechanical works. reconnect all cable on PLC and electrical panels to operate the plant automatically and manually , the work also include rehabilitation of all distribution boards with all interconnections and change all damaged indicator lambs, push buttons , switches ,fuses and circuit breakers with control devices.</p> <p>The price includes supply and replacments of 4 zones fire control panel with programming and operation to the hole existing fire system including covering two VHD for high pressure pump and reconnect with PLC, and SCADA system.</p> <p>The price , also includes two multiranger devices and the two VFD devices for</p> <p>Dismantel all mech/Elec measurement devices and tranporte them to the proposed location by the engineer.</p>	L.S	1		
11.6	Supply and install 4" Digital water flow meter , (4-20 mA) , the price includes all needed materials and workmanship for propper installation to the existing piping system with all electrical connections to the PLC & SCADA. Type is ABB , Siemens	No.	1		
11.7	Supply and install 4" Digital water pressure meter , (4-20 mA) , the price includes all needed materials and workmanship for propper installation to the existing piping system with all electrical connections to the PLC & SCADA. Type is ABB , Siemens	No.	1		
11.8	Supply, install, program and test 3-phase solid state reduced voltage starter for 50kw pump, fully featured digital microprocessor based, the price includes all needed materials and workmanship for propper installation to the existing dirtribution board completely with all required controls connections to the PLC & SCADA. Type is SOLCON RVS-DN 145 or equivalent.	No.	1		
11.9	Supply , install ,and connect Transducers to sense the the water level in tank , the sensor must be compatible with the existing multiranger , the price includes all needed materials and workmanship for propper installation to the existing piping system with all electrical connections to the PLC & SCADA.	No.	1		
11.10	Supply , install ,and connect Transducers to sense the the water pressure in tank , the sensor must be compatible with the existing multiranger , the price includes all needed materials and workmanship for propper installation to the existing piping system with all electrical connections to the PLC & SCADA.	No.	1		
Total of Page 2 - Electrical Works - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
11.11	Supply and install connect water proof electrical float switch with two contacts , the price includes all needed materials and workmanship for propper installation to the existing piping system with all electrical connections to control panel and the PLC .	No.	3		
11.12	Supply , Install and connect MCCB 3*60/80/100A , 25KA , The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation	No.	3		
11.13	Supply and Install contactor 60A ,4 poles ,with all needed electrical protection. The price includes dismantel and remove old one. including all needed materials and workmanship for propper installation	No.	3		
11.14	Supply and Install Plastic external handel with Locking suitable for Siemens MCCB's Device . type is Siemens 745240a00 , and remove the old one .including all needed materials and workmanship for propper installation.	No.	10		
11.15	Supply and Install control relay 24 DC volt or 220 AC volt , The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation.	No.	3		
11.16	Supply and install fluorescent lamp 60cm or 120cm , 36/18W , The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation.	No.	15		
11.17	Supply and install one way , one pole switch with all needed wires , covers , box , and removing the old one .The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation.	No.	5		
11.18	Supply and install water proof socket/switch cover , type is GEWISS. The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation.	No.	5		
11.19	Supply and install water proof lighting globe with all needed lamps , The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation.	No.	5		
11.20	Supply and install smoke detector, the detector shall be twin-chamber with latching electronic circuitry, with all needed fire cables two wires, pvc pipes and boxes to complete the works.(Type is TELEFIRE or equivalent).	No.	5		
11.21	Supply and install heat detector, the detector shall be twin-chamber with latching electronic circuitry, with all needed fire cables two wires, pvc pipes and boxes to complete the works.(Type is TELEFIRE or equivalent).	No.	1		
11.22	Supply, install break glass cal point as per drawings the unit shall be standard type for interior use with key operated test facility, with plastic coated glass. .(Type is TELEFIRE or equivalent).	No.	2		
Total of Page 3 - Electrical Works - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
11.23	Supply, install 95 db electronic horn ultra sound for indoor and outdoor used. (Type is TELEFIRE or equivalent).	No.	1		
11.24	Supply and install residual current circuit breaker 4X40/0.03A. (Type is MOELLER FI-40/4/003-A or equivalent).	No.	1		
11.25	Supply, install External photocell (KAJA type) , and removing the old one	No.	1		
11.26	Supply , and install square LED Light projector (Flood Light) 100 watt , 4000 k , 10000 lumen, Type is Gaash or Nesco.The price includes dismantel and remove old one.including all needed materials and workmanship for propper installation.	No.	10		
11.27	Supply , install , connect 3*50+25 mm2 XLPE cupper power cable .from MDB to new plant , in the existing cable tray . The price includes all needed materials and workmanship for propper installation.	L.M	40		
11.28	Ditto, but 5x16 mm2 XLPE cupper power cable .	L.M	30		
11.29	ditto but 5x4 mm2 .	L.M	30		
11.30	Ditto, but 5x1.5.	L.M	30		
11.31	Ditto, but control cable 8x1.5 mm2.	L.M	30		
11.32	Ditto, but 12x1.5mm2 control cable	L.M	30		
11.33	Supply , install , and operate Split unit Air condition 18000BTU ,inverter type , heat and cooling , complete with all needed pipes, electrical cables , accessories external and internal parts , Type is Electra or equivalent.	No.	3		
11.34	Supply, install, connect, and test the electrical works for the following items as per specifications, and engineer's instructions. The price of the following items includes, all necessary junction boxes, wires, clamps, bolts, connectors, minerom pvc pipes, pvc ducts 6x12 cm for main ducts and 6x4 cm for sub ducts, 6" PVC Pipes for extractor fans, clamps, bolts, connectors, (wires 3x2.5mm2 for power sockets & 3x1.5mm2 for Lighting, cable 3x4mm2 for electric heaters) and connecting all cables and wires to switch boards.				
11.35	6" 250 CFM Extractor fan with movable aluminum louvers, and all required materials to complete the work (Type is VENTA or equivalent).	No.	1		
11.36	Ditto but 10" Extractor fan	No.	1		
11.37	Ditto but 20" Extractor fan	No.	1		
11.38	Ditto but 24" Extractor fan	No.	1		
Total of Page 4 - Electrical Works - US\$					
Total of Electrical Works - US\$					



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Desalination Plant					
ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US\$)	AMOUNT (US\$)
Summary					
1	Total of Civil works in Desalination plant - US\$				0.00
2	Total of Mechanical Works - US\$				0.00
3	Total of Electrical Works - US\$				0.00
Total of Desalination Plant Works - US\$					0.00

NET TOTAL SUM (in words):

SIGNED AND SEALED :

AUTHORIZED :

TITLE :

SIGNATURE :

DATE :