The *OPEC Fund for International Development* (*OFID*)

UNITED NATIONS DEVELOPMENT PROGRAMME

Programme of Assistance to the Palestinian People

Construction of new small scale desalination Units for education sector in the Gaza Strip

Lot#2 North area

1-AL-Alazhar Uni. Scientific Colleges.
2- AL-Alazhar Uni. Colleges of Literature.
3-Al Esraa Uni.
4-UCAS Uni.

ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US$)		AMOUNT (US$)	
				Local Material	Coordination Material	Local Material	Coordination Material
	General Notes:						
	The price shall include but not limited to the following: 1-Complete detailed shop drawings should be delivered to the Engineer with approved software used to design the units 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 relevan 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 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 students and workers in schools and universities. All relevant costs including machinery and transportation 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. 3-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. 4-All dismantled material must be transferred to places as specified by the supervisor Engineer * unit prices shall include *1- all –direct and indirect works and expenses required for the completion of Earth works* *2- the removal of any buried structure not to be includes Cleaning the site and demolishing and removal of any existing structures. Debris material shall be disposed off to a location approved by the engineer or his representative.* *3- workmanship needed, all according to drawings, specifications, conditions and directed instructions by the Engineer.* *4- insurance document to cover all site equipment , laborers,personal health parts* *5- All safety measurement ,signs and protections around the site for existing utilities structures and building* *6- Safety precaution to protect neighbor utilities and persons* *7- All required tests that should be accommedated by an approved lab.* *8- leveling and backfilling with imported clean sand (Safia) to make up level to the design level* *9- Back-filling item should be in layers (25cm max. each & compaction test 98%). include supply, water, compaction, transportation, testing and any needed workmanship and material, all according to drawings, specifications, and as directed by the Engineer.* *10- The contractor will expect that more than one contractor will be carrying out works at the same time, the Contractor is presumed to make all necessary coordination and facilitate accessibility to and other work-related issues*						

ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US$)		AMOUNT (US$)	
				Local Material	Coordination Material	Local Material	Coordination Material
Bill No. (1) -Mechanical Works							
	Unit rate of items shall include:						
	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. All pipes and fittings ,pumps components in contact with brackish water should be made of CPVC PN16 for low pressure and stainless steel 316 for high pressure It is the contractor full responsibility to check and inspect the proposed sites as identified here below and to quote for all works, repairs, installations, and all necessary material requirements for the items work. 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 / standards and code of practices . • Supply and place in service each component of the RO Systems and connection requirements to the proposed discharges of the desalinated water • Test and commission in accordance to relevant standards • The Contractor shall submit “as built” drawings after the completion of the work. The contractor will submit all chemical and biological tests for the permeate intake and saline waters , training of eight technicians in the commissioning period for 7 hours daily for one week, 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. • 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 The unit rate includes Supply , install and operate 6" diameter 250m3/hr wall mounted extract fan with louver and all needed material ,cables, pipes, boxes...etc. The work includes supply and install control unit with all required Timer 24,Relays, selector switch, Circuit breakers and all protection devices inside the RO panel to operate automatic to complete the work as per the engineer instructions. Type-Venta or equivalent The unit rate includes supply and install power and control cables from Main distribution board to the RO sub distribution board with all needed PVC conduits, ducts and trays, internal LED lighting (LED lighting fixture 14W with driver ,230 V ,1100 lumens, Type is GAASH # 5Z00538 or equivalent) switches (one way switch, 220v, 13A ,Type is GEWISS CHORUS or equivalent) sockets (3-pin,flushmounting , 220V-16A inside water proof Box , Type is GEWISS CHORUS or equivalent) with wiring . Also the price includes supply and install complete control panel including all needed circuit breakers, control relays, timers, complete PLC unit, contactors, overloads, adjustable under voltage relay, protection devices, Siren, digital multimeter, indication lamps, and all needed fittings and materials to complete the job.						

ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US$)		AMOUNT (US$)	
				Local Material	Coordination Material	Local Material	Coordination Material
1.01	Design, Supply, install, test and commission modular skid mounted water RO desalination unit built inside isolated container of 3x2.4x2.6 m size with all associated mechanical and electrical installations including any builder's works requirements, the container will be made of 2mm galvanized steel sheet, all walls shall be covered with 16mm wooden pannels covered with soft wood finishing, the door is 2x2.2 m with key,,the container shall be painted from outside with three layers one of primary coating and two layers of Hamer paint, the ceiling will be isolated with glasswool of 6cm thickness and will be finished with false ceiling type Armostrong, and the container will be layed on a B200 concrete slab of 10 cm thick and according to the dimensions of the container with 15cm from all side. The unit shall be capable to produce 1.25 M3/hour of desalinated water of TDS not more than 100ppm.Charcteristics of raw water TDS 6000 ppm the price includs supply and install low pressure switch European made range (0-7)bar High pressure switch (8-20)bar. *The unit shall be supplied as the following Pretreatment equipment and materials which include the following: . Automatic FRP multimedia filtration MMF controlled by actuator valve size 10" x 35" including quartz sand and antheracite, with required pressure gauges before and after the MMF .Grundfos SS304 (Case, impeller and shaft) Feed pump with all required valves pressure gauges…ect, . size 20", 5-micron cartridge filter with required valves , pressure gauge before and after the CF…ect , . antiscalant dosing system 1L/h at 10 bar with 250 Liter PE tank filled with antiscalent material, manual mixer and level switch control, . SMBS dosing system 1L/h at 10 bar with 250 Liter PE tank filled with SMBS, manual mixer and level switch control (All required pipes and fittings ,pumps components that have to be made by UPVC PN16 for low pressure and stainless steel 316 for high pressure side contact with brackish water or the brine) • Range of instrumentation required for pretreatment 1- feed water pressure transmitter 2- low pressure switch European made range(0-7)bar, High pressure switch (8-32)bar. 3- all electrical and mechanical protection for the feed pump. 4- flow meter for raw water 5- Feed water PH meter 6- Feed water conductivity meter	No.	4				

ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US$)		AMOUNT (US$)	
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1.01	Main treatment Unit (RO) . Grundfos SS316 (Case, impeller and shaft) high pressure pump with all required valves pressure gauges…ect, of RO membrane to produce 75% recovery rate of size 40" X 4" FRP pressure vessels 450PSI, CIP System including 250 Liter PE Tank with manual mixer , SS316 high pressure pipes • Range of instrumentation required for pretreatment 1- Pressure transmitters 2- flow meter for permeate water 3- flow meter for reject water 4- SS304 regulated valve for reject/feed flow control 5- online PH meter at permeate flow 6- online Conductivity meter at permeate flow 7- automatic valve for flushing membranes during every plant shut down Post treatment . Costic soda dosing system 2L/h at 10 bar with 250 Liter PE tank, manual mixer and level switch control, Sodium hypochloride dosing system 2L/h at 10 bar with 250 Liter PE tank, manual mixer and level switch control ,UPVC PN16 pipes, fithing and all needed material for connection with water supply sestem REMINERALIZATION SECTION . Lime stone filter FRP Tank size 16" X 50" with all required piping system and calcite . Carbon Filter FRP Tank size 16" X 50" with manual head filled with suitable Carbon, to be installed after the Sodium Hypochlorite Dosing Pump to remove chlorine from water before drinking. Raw water supply: it is the contractor's responsibility to connect the unit to the allocated water supply by the clients. The contractor shall include in the price all the required fittings, valves, pipes,meter and workmanship to carry on the works to the engineer's approval. The instrumentation controls . Feed water conductivity meter . Feed water pH meter . Permeate conductivity meter . Permeate PH . Operation timer Safety Shut down for : . Dry running of each dosing pump . Permeate high conductivity . Feed water high conductivity . Feed min. pressure . Permeate max. pressure . Membrane inlet max pressure . Inlet water minimum pressure . Overload of each pump . Wrong dosings . Wrong pH						

ITEM No	DESCRIPTION	UNIT	QTY.	RATE (US$)		AMOUNT (US$)	
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1.02	Supply and fix water storage stainless steel 304 tank 1.0 m3 capacity with locks, vent pipe and washout complete with lockable cover. automatic float valve, overflow pipe (1"diam) and drip tray,**8** EGMATOR tabs, with all connections to stainless steel 304, 2.0 m3 tank and stop valves 1" , PN16 for low pressure with all accessories as specification and drawings.	**Set.**	**4**				
1.03	Supply and fix water storage stainless steel 304 tank 2.0 m3 capacity with locks, vent and washout ,complete with lockable cover with automatic float valve, overflow pipe (1"diam) and drip tray,with all connections to **RO** Systems and stop valves 1" with all accessories as specification and drawings	**N0.**	**4**				
1.04	Supply and install Fire extinguisher (Powder 3kg) No.=1 Supply and install Fire extinguisher (CO2 6kg).) No.=1	Set.	**4**				
1.05	Supply spare parts set for each RO unit including: 1-kit shaft seal mmf feed pump 2-kit shaft seal hp pressure pump 3-kit shaft seal cip pump 4-magnetic level pvdf magnetic rid 5-dosing pump maintenance kit 6-pressure vessel complete end cap 450 psi end port 7-limestone filling calcite.	Set.	**4**				
	Total of Mechanical Works - US$						
	Summary						
	Total of Mechanical Works - US$						
	Total of Desalination Plant Works - US$						

Contractor's Company Name

Contractor Representitative Name

Contractor Representitative Signature

Stamp

Date