

# **The International Committee of the Red Cross**

## **WATER & HABITAT DEPARTMENT**

**Hamam Al Alil / WTP / Rehabilitation**

**Hamam Al Alil / Nainawa District / Nainawa Governorate**

01 - March - 2017

**Hamam Al Alil / WTP / Rehabilitation**  
**Hamam Al Alil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
<b>A</b>	<b>SYSTEM 1</b>				
<b>A.0</b>	<b>Site Preparation</b>				
A.0.1	Provide all the required skilled labors, equipment (shovel, trucks, etc..) and tools for cleaning the whole area of the plant, the work includes removing the structures, pipes and electric devices demolish the operator room and pump house. Backfilling with layers of approved material/tested sub-base mix up to appropriate levels according to the site work requirements. The layers thick should not be more than 20 cm, compacting the layers after adding water with vibrator rollers compactor (Min.15 Tons) to reach to the compaction percentage not less than %95 from the maximum density. The work includes leveling to appropriate level (+15cm to -15cm) with laying a crushed stone layer of 10 cm with compaction for the plant area, (cleaning of the surfaces of the site includes before and after the completion of the project) according to the ICRC engineer instruction.	L.S	1		0
<b>Total</b>					<b>0</b>
<b>A.1</b>	<b>Rehabilitation the Intake Steel Structure &amp; Cleaning the River Intake Area Installing Cran, Cage and Installing L.L pumps</b>				
A.1.1	Rehabilitation the Intake Steel Structure, Installing Crane and : - Providing all required materials, equipment, tools and labors for modifying & rehabilitation the intake structure, the work includes dismantling the existing vertical (overhead) I beam shed for increasing the high and installing overhead crane of five tons capacity with slide railway for installing and pulling (installing & maintenance) the low lift pumps with suitable (legth & size) chain on the top of the overhead structure using I beam size 4"x2" and iron angle sections size 3" & 4" to be welded to the intake for supporting the piles & shed, the wok includes treating all the parts of intake with prime anti-corrosion paint and three layers oil paint, construction Iron vertical ladder, slide cage for protecting the pumps.	L.S	1		0
A.1.2	<b>Cleaning the Suction Area and Leveling the Road:-</b> Providing tools, skilled labors, excavator, machines for cleaning, removing reeds, sludge, stone and rubbish in order to open the stream o f the river and levelling the suction area using excavator and shovel for grading & carpeting with sub-base the road between the WTP and intake structure according to the site and instructions of ICRC engineer with all other requirements to complete the work properly.	L.S	1		0
A.1.3	<b>Submersible Pumps:-</b> Providing the required equipments, labors and tools for installing and operating brand new two Submersible/dry type Electrical Motor Pumps, complete sets (1 duty + 1 standby, Pump, Electrical Motor and control panel 75 kW with circuit breaker 250Amp). The set components & technical specification, which will be provide by ICRC are: - 380 V, 50 Hz, and Pump of Q = 400 M3/hr & H = 30 m, 75 kW, RPM=1450. The work also includes supplying carbon steel pipes 12" dia. and 8mm thickness with two gate valves 10" size and two check valves with the same daim. and making a header of carbon steel pipe 14" to connect the two lines of the pumps. connecting the pump with the header by using 8" carbon steel pipe. electrical installation according to the site and instructions of ICRC engineer with all other requirements to complete the work properly.	NO	2		0
<b>Total</b>					<b>0</b>

**Hamam Al Alil / WTP / Rehabilitation**  
**Hamam Al Alil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
<b>A.2</b>	<b>Water Treatment Plant Works</b>				
A.2.1	<b>Rehabilitation the existing concrete settling tank:-</b> Providing materials and manpower & rehabilitation the existing concrete settling tank (6.5 x 5 x 3.2 m depth), the work includes cleaning, replacing damaged parts, repairing skimmer, sludge discharge pit repair the control sluice valves with its shaft, galvanized bolts and nuts, wall spiders , repair the drain valve, cleaning the drain pits & pipes, painting with oil paint all metal parts handrail, walkways three layers, installing new flash mixer motor and repair the gear box, all requirement works according on the site and instructions of ICRC engineer to make the works properly.	NO	2		0
A.2.2	<b>Rehabilitation the existing intermediate concrete water tank:-</b> Providing materials and manpower & rehabilitation the existing intermediate concrete water tank the work includes cleaning the tank, treating the cracks, maintenance or installing (if needed) the exiting valves completing missing parts as requested, repairing the existing manhole, steel gates, ladder , painting three layers with oil paint all metal parts handrail, walkways, ladders valves and gates with all requirement works according on the site and instructions of ICRC engineer to make the works properly.	L.S	1		0
A.2.3	<b>Installing Multi-Media Filtration Unit:-</b> Providing, installing testing complete Multi-Media Filtration Unit (Automatic & Manual Operation) assembling and commissioning which, consist from:- A- Unit Total production Capacity 100 M3/hour, ( 2.3 x 6) m. Body thickness 10 mm & Dome thickness 12 mm and Nozzle base 16 mm thickness, Manufactured from Carbon Steel (ST-37) with all Valves, , Pressure gage, Feeder pumps, Plumbing and Electrical works. B- Media Materials for each unit must consist from five different layers/filter materials (Gravel, Sand and Anthracite). The Media materials (Anthracite, Silica Sand & Gravel) should be tested according to technical required specification. C- The work includes connection with the old filters with all requirements to make the work properly according to the ICRC engineer instruction.	NO	2		0

**Hamam Al Ail / WTP / Rehabilitation**  
**Hamam Al Ail / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
A.2.4	<p><b>Repairing (rehabilitation work) of the Existing 100 m3/hr. Multi-Media Filters ( 2.3x6 m): -</b></p> <p>i. Provide the required labors, equipment and tools for emptying the existing filters from the old filter media and support layers (Sand &amp; Gravel), clay and all other collected materials internally &amp; externally. The work includes surface pretreatment by cleaning, scrub the interior faces very well, sand blasting and preparing the internal &amp; external faces for painting.</p> <p>ii. Provide the required labors, equipment and tools for replacing the Nozzles and repairing Mirror/Base by scarping the fractures as V shape then fill it by the solder, treating the cracks in the internal walls of the filters prior to painting. Complete work to repair/replace the pipes with it's nozzles, manholes and maintaining the inside &amp; outside components. The work includes anti rust, food grade Epoxy paint (RAL 5015) of 150 Micron thick for internal faces and acrylic based oily paint for outside.</p> <p>iii. Provide the required labors, equipment and tools for testing all electric &amp; mechanical valves the wok includes replacing the destroyed valves.</p> <p>iv. Provide and placing tested sand filter and support layers (gravel) materials for changing and replacing the old filter media &amp; gravel layers. The supplied filter &amp; gravel layers must be quality certificate according to Iraqi Technical Specification for filter material No. 1555 (Effective size (D10) &gt; 0.6 &amp; Uniformity Coefficient (D60/D10) &lt; 1.5). The thickness layers, particle range size and arrangements are according to the manual of the filter manufacture and ICRC Engineer</p>	NO	2		0
A.2.5	<p><b>Installing New Air Blower: -</b> Providing, installing and operating new air blower complete work, Moline type: MGM Root Pump, the air blower motor power (15) kW, (2900) rpm, Q=440 m3 / hr., 05 the work includes (3) ph. (380) Volt, (50) Hz. replacing the non-return and safety valves if needed, new circuit breaker with the starter connecting with main board and with all necessary works to make the work properly under ICRC engineer instruction.</p>	NO	2		0
A.2.6	<p><b>Installation of Booster Horizontal (High lift) water pump sets:-</b> Providing, installing and testing brand new Booster horizontal water pump sets (new feed/HL Pumps ) (Split Case, Electrical Motor, Star delta starter, Base plate, High quality flexible Coupling and Guard). The sets should be of Turkish Origin such as (The same installed one or Standard/Mass or equivalent), approved by ICRC Engineer. Electrical cables of suitable size for required length (from the pump and to the closer main electrical panel). The Star delta in addition to the technical specification conditions should consist from phase sequence, low - high voltage protection, main circuit breaker, contactors, overload relay, timer, chromium push bars and painted metal board including all necessary fittings required. The set components &amp; technical specification are as below:-</p> <p>Water Pumps for boosting treated water (turbidity &lt; 10 NTU &amp; Chlorine Content up to 5 ppm). Electrical motor 400 VAC Y/D, 50 Hz, Insulation Class F, Enclosure IP55, RPM &lt;1500, 132kW, rated power of Motor not less than 10% more than Pump shaft's max power. The Pump of Q=400 m3 / hr. &amp; H= 60 m., RPM &lt; 1500, Material of construction for CASING should be Ductile Cast Iron GGG-50. IMPELLER - Bronze 88.10.2. SHAFT &amp; SLEEVES - Stainless Steel 1.4122 &amp; 1.4301. GLAND/SEAL END PLATE - Bronze 88.10.2. CASING WEARING - Bronze RG7. BEARING HOUSE - Cast Iron GG-25. WET BOLTING - Stainless Steel 1.4301 FLANGES of suitable size &amp; shape for Suction Side PN 10 and for Discharge/Delivery Side PN 10.</p>	NO	2		0

**Hamam Al Aiil / WTP / Rehabilitation**  
**Hamam Al Aiil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
A.2.7	<b>Filters Reinforcement Concrete Base:</b> - Paving the treated/leveled surface by casting reinforcement concrete (1:1.5:3) mix by using sulphate resistance cement and deformed steel bar of 16 mm dia. & 15x15 cm C/C of double layers of 30 cm minimum thick of the concrete layer of smooth & level surface to place the filters schemes in straight and equal level line and for required places. The work includes making suitable size of RC supports/bases for the Settling four Filters components should have its own individual drain line. Expansion joints every 6 m in each direction with filling by proper material and using thick nylon layer under the concrete layer to protect the moisture content. With all requirement works under ICRC engineer instruction.	M3	33.6		0
A.2.8	<b>Aluminum sulphate system:-</b> Install, test and operate the powder Aluminum sulphate system of 1,000 L/h capacity. The work includes all the fittings needed, collecting PVC tank 1,000 L with mixer, PVC pipes 1" dia. to connect the system with settling tank, electrical connection (between the system, main board and dosing pump) the laying of pipes & cables should be cover by tray cables with all necessary works as ICRC engineer instruction.	NO	2		0
A.2.9	Supplying and installing Chlorine Powder dosing system, (piston diaphragm dosing pump) Aldos brand or equivalent quality, 27 l/h capacity, 50Hz, 220-240V, motor capacity 0.55 kW. Works include connection of PVC pipes, dosing tank agitator, suction pulsation dumper, suction lines, loading and controlling valves, injection unit with measuring pipes, starter, cables with plugs for power connections, spare parts (gaskets, plastic valves, inner valve parts for stainless steel and plastic versions). Including fixing dosing 500 litre tank on a suitable platform of concrete, testing and operating.	NO	1		0
A.2.10	<b>Carbon Steel Pipes:-</b> Supplying and fixing carbon steel pipes of 8" dai. And 8mm thickness to connect the filters unit with the existing settling tanks, storage tank of the old project, the work includes the works of excavation and backfilling of the pipes outside the site of the filters unit with depth not less than 60cm, the price should cover all the fittings needed to complete the work properly.	M.L	60		0
A.2.11	Providing and installing Gate Valves DI 350 mm & PN 10, for the Suction side of the high lift & low lift pumps and feeding pumps. The work includes dismantling the old valve and all required modifications and fittings to install the new valve.	NO	4		0
A.2.12	<b>Check Valve:</b> Supplying and installing new brand cast iron check valve DN 6", PN 16, working temperature (-10 to + 110), should be stainlesssteel, wedge should be ductile iron+rubber coated,casket EPDM- NBR (Ethylenepropene, Nitrile, Fluorine (Viton)), western orgin, type or best available in the local market, flange type, with all bolts and nuts. The work includes providing any fittings required or any pipe modification and paint all with Jotun paint. All connections needed & all accessories as to instructions of ICRC engineer and site request	NO	6		0

**Hamam Al Aiil / WTP / Rehabilitation**  
**Hamam Al Aiil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
A.2.13	<p><b>Operation Room (3.8x4x2.8 m) with Sanitation Unit (2x2x2.8 m):-</b></p> <p>1) Excavating for foundation (60 width x 90 deep) cm &amp; back-filling with clear and well compacted soil 10m<sup>3</sup></p> <p>2) Providing materials and casting (1:2:4) reinforcement concrete for foundations in thickness of 30 cm over compacted 10cm layer of crushed stones 4 m<sup>3</sup>.</p> <p>3) Providing materials and building a wall of (40) cm thickness under DPC with solid concrete blocks (15x20x40) cm or stone &amp; cement mortar (1:3) 5 m<sup>3</sup>.</p> <p>4) Providing materials and building a wall of (20) cm thickness over DPC with concrete blocks (20x20x40) cm &amp; cement mortar (1:3) 12m<sup>3</sup></p> <p>5) Providing materials and casting reinforced concrete for lintels, slabs, beams and columns using (1:2:4) ratio 7 m<sup>3</sup>.</p> <p>6) Supply materials and plaster with cement mortar (1:3), three layers (minimum of 20 mm thick). Use aluminium straight edge of 80 cm. The work includes emulsion paint with 2 layers minimum and writing health hygiene education messages 100m<sup>2</sup>.</p> <p>7) Providing materials and casting reinforced concrete by BRC for floor and aprons using (1:2:4) ratio 30 m<sup>2</sup>.</p> <p>8) Providing materials &amp; installing (2.0x1.0) m. steel door made of metal sheet (1.25 mm thick), primer &amp; two layers of oil paint and latch lock 1no.</p> <p>9) Providing materials &amp; installing (1.5x1.2) m. steel window including painting &amp; glass.</p> <p>10) Building a sanitation unit, the work includes providing and installing W.C oriental type with gully trap, sewerage PVC pipe system with pit (cesspool &amp; small septic tank, Ceramic wash basin, Ceramic tiles paving for the internal wall surfaces, Cylindrical PE water tank of one meter cubic with all pipelines connection and fittings. All above mentioned are includes the work &amp; materials requirements to complete the work properly. 1 unit</p>	L.S	1		0
A.2.14	<p><b>Main Control Panel:</b> - Assembling and commissioning the existing control panel for all the electrical connections of the feeding filter pumps, alum mixer, chlorine mixer, and the mixer motors of the sedimentation tanks, the price includes all the cables needed and the installation of the followings: - One main circuit breaker for incoming supply with full protection, three ammeter, current transformer, volt meter with selector switch, indicating lamps, phase failure protection. One MCB for each electrical motor (1 x Main distribution board of MCCBs. 2 x (132kW Y-Δ control panel). 3x95mm<sup>2</sup> + 70mm<sup>2</sup> (50 meter length). (From MDB after transformer up to the station). Booster pump board cable from distribution board 3x70mm<sup>2</sup> + 16mm<sup>2</sup> (20 meter length). Y-Δ control panel cable 3x25mm<sup>2</sup> + 16mm<sup>2</sup> (20 meter length).(from each control board to the pump)) . One starter for each motor with thermal overload. Indicating lamps for motors and filters with lamp tester. Relays and level sensors required for the process operation and protection. Three phase socket outlet on the side of the board. All push buttons, selector switches etc. Electrical components suitable for 380 V, 3 phase, 50 Hz, outdoors. The work also includes providing and installing all required fittings, electrical cables and all other requirements. The work includes all required cables (color coded and numbered cabling), fittings, accessories making complete anti lighting system by using copper bars/wire of 50 mm with all connections to the plant from inside &amp; outside, electrical connection the new equipment with the existing power supply source in the area and all other necessary works to put all the plant equipment in full operation capacity.</p>	NO	1		0

**Hamam Al Alil / WTP / Rehabilitation**  
**Hamam Al Alil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
A.2.15	<p><b>Installing and testing step down existing transformer-</b>            Installing and testing step down existing transformer 1.0 mVA capacity 11/04 kVA (outdoor type) with all (conductive &amp; un-conductive) accessories            Work prices will include the followings:</p> <ul style="list-style-type: none"> <li>• Providing and installing H-pole with foundation &amp; transformer angle iron base</li> <li>• Connect and complete earthing system.</li> <li>• The electrical connections between the new transformer and with main electrical source should be arranged with Hamam Al Alil electricity directorate.</li> <li>• Operating and testing the new transformer</li> <li>• All materials should be approved by ICRC &amp; DoW supervisors before started the work. , with all required works to make the works properly.</li> <li>• Providing and installing cut-out fuse for the high tension as same or alternative type on the site</li> </ul>	L.S	1		0
<b>Total</b>					<b>0</b>
<b>G.Total System 1</b>					<b>0</b>
<b>B</b>	<b>SYSTEM 2 / Providing &amp; Instalation 100m3/h CU</b>				
<b>B.0</b>	<b>Site Pereparation &amp; Sub-mersible Pumps</b>				
B.0.1	<p><b>Site Preparation:-</b> Excavation in all types of soils for minimum 50 cm depth for the whole area of the plant area/CU (min.25x18 m), clearance of the project site and cleaning of the surfaces before and after the completion of the project.. Backfilling with layers of approved material/tested sub-base mix up to appropriate levels according to the site work requirements. The layers thick should not be more than 20 cm, compacting the layers after adding water with vibrator rollers compactor (Min.15 Tons) to reach to the compaction percentage not less than %95 from the maximum density. The work includes leveling to appropriate level (+15cm to -15cm) with laying a crushed stone layer of 10 cm with compaction for the plant area, the works includes open and re-building the external fence of entering the machines and new CU equipment.) removing, transporting the garbage &amp; debris to the area allocated by the Engineer.</p>	L.S	1		0
B.0.2	<p><b>Sub-mersible Pumps:-</b> Providing and installing two Submersible Pumps complete sets (1 duty + 1 standby, Pump, Electrical Motor and Starter) of best quality (Turkish brand/origin, original type, for e.g. Mass, Standard or equivalent) approved by ICRC Engineer. Voltage 3 phase 380 - 415 Volts/50 Hz, Class F, IP 68, Pump of flow rate Q = 125 M3/hr &amp; Discharge head/ H = 30 m, RPM=1450, MOTOR power 22kW Grey Iron materials for wetted parts, CP of Protection from short circuit, Single phase overload and under voltage, with (2) route switch with phase failure, Automatic transfer between pumps with the required according to the ICRC engineer instruction.</p>	NO	2		0
	The work also includes all plumbing works (fittings, different size and type of Valves, Foot valves & Screens of coarse opening 3 cm from coated Carbon Steel, Pipes..etc), electrical installation and all other requirements.				
<b>Total</b>					<b>0</b>
<b>B.1</b>	<b>Concrete Base, Shed Structure and Illumination System.</b>				

**Hamam Al Aiil / WTP / Rehabilitation**  
**Hamam Al Aiil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
B.1.1	<b>Reinforcement Concrete Base:-</b> Paving the treated/leveled surface by casting reinforcement concrete (1:1.5:3) mix by using sulphate resistance cement and deformed steel bar of 16 mm dia. & 15x15 cm C/C of double layers of 30 cm minimum thick of the concrete layer of smooth & level surface to place the CU schemes in straight and equal level line and for required places. The work includes making suitable size of RC supports/bases for the Settling Tanks, Filters, H.L.P, Water Tanks and etc. Each components should have its own individual drain line. Expansion joints every 3 m in each direction with filling by proper material and using thick nylon layer under the concrete layer to protect the moisture content.	M3	75		0
B.1.2	<b>Drain Channel &amp; Walkways:-</b> Casting plain concrete of (1:2:4) mix for walkways of one meter width & 15 cm thick on 10 cm thickness of well compacted crushed stone with joints each 2 m in the long direction. The walkways to have a slope of 0.5% towards the edges of the site.. The work includes making suitable drain system (trench-type of minimum width 0.5 & depth 0.6 m) around the plant in flowing direction and have capacity to carry twice the backwash flow rate of an individual filter tank. The minimum thickness of the wall & base is 15 cm with slope of 1% towards the collection pit. The price includes providing and installing Iron grids that is going to be fixed on Iron angles of 2"*2" as a cover of the drainage channel.	M.L	60		0
B.1.3	<b>Metallic Shed Structure:-</b> Building a suitable shed/shelter (Truss Bungle) to protect and fence part of the plant area. The work includes building a metallic structure from column iron 4" dia. with RC foundation of 1x1x0.3 m. with bolts for fixing (the space between each columns should not exceed 3 m) + beams from U channels of 3" plus bracing from angle iron 3" and corrugated galvanized sheet gauge 16 for covering the top/roof with access gates for all required places, painting all structure by anti-rust paint & 3 layers of oil paint. The connection will be done by means of proper bolts & nuts or by welding using steel plates...etc. The work includes supplying & installing G.I plates for covering the roof center & both end sides to drain rain water with vertical drain pipes and all other requirements to complete the work properly. The final dimension and shape should fit with the site requirements, equipment manufacture instructions and providing suitable access for future operation and maintenance. At least 150 cm of clearance above the highest equipment should be provided.	M2	80		0
B.1.4	<b>External Illumination:</b> - Providing, installing and operating lighting system (projectors 400 watt of sodium tv type with steel columns/poles 1.5" dia) with starters, cables, photo cells, switch boards and connecting them with power source.	NO	10		0
	<b>Total</b>				<b>0</b>
B.2	<b>Providing, Assembling, installing Compact Unit 100m3/hr. according to below Specification, Description and instructions of the CU Manufacture (Supplier's Manual).</b>				



**Hamam Al Aiil / WTP / Rehabilitation**  
**Hamam Al Aiil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
	Provide all the required skill labors, equipment and tools for erecting, installing, testing and operating complete set Pre-fabricated Compact/Package Unit CU Water Treatment Plant WTP of overall production capacities/continuous flow rate (output capacity) not less than 100 Cu.M/hr for river raw water treating (turbidity ranging between 10 to 750). The unit consist from Clarifying Tank with all internal components, Intermediate Storage Tank, Alum Dosing, Pressure Filters (Quartz Sand & Gravel Media, should provide/or completed by the Contractor), Chemical Sterilization with powder chlorine device, Intermediate Pumps to pump the water through filters, the motor of the pumps are of 1450 RPM, three phase and 50 Hz. The price also includes all required Cables, Pipes with fittings, Accessories and all other requirments (such as repairing, repainting by food grade Epoxy...etc) which are not included/provided by the manufacture for connection, testing and full operation. The all most Compact Unit CU Components Description, Technical Specification and Work requirments are as below:-				
B.2.1	<b>Coagulation Unit:</b> - Providing assembling and complete installation which, consist from: - A- Two Dosing Pumps (1 Duty x 1 Standby) of Automatic Metering Pump, Capacity of each is around 100 Liter/hr. B- B - Two Solution Tanks (1 Duty x 1 Standby) of Polyethylene. C- C- Two Solution Tank Mixers (Vertical shaft, Stainless Steel, SS 304, 1 Duty x 1 Standby) of low speed mixer type.	L.S	1		0
B.2.2	<b>100m3 Settling Tank:-</b> Providing , assembling and complete installation which, consist from :- A- Tank manufactured from Carbon Steel ST 37 of minimum 6 mm thickness of surface protection by Thermal Arc Spray Coating and Epoxy Paint. 100m3 capacity B- High Mixing Part of two Mixer of high speed (2 Duty, one in each tank), Vertical shaft type manufactured from stainless steel (SS 304) f. C- Flocculater Part of two Mixer of low speed (2 Duty one in each tank) manufactured from stainless steel (SS 304). D- Lamella (Settling) of Length around 5 m. E- Collecting Part. The work includes complete set of Inlet & Outlet Valves, Ladder, walkways, Piping and Fittings.	NO	1		0
B.2.3	<b>Accumulation Tank (Intermediate Tank):-</b> Providing, assembling installing and complete installation of the accumulation tank not less than 75 m3 manufactured from pressed steel/carbon steel with all drain, overflow, inlet, outflow and ladder installation with all other requirements.	NO	1		0
B.2.4	<b>Multi-Media Filtration Unit:-</b> (Automatic & Manual Operation):- providing, assembling, installing and horizontal which consist from:- A- Units (2) of Total production Capacity 100 M3/hour. Body thickness 10 mm & Dome thickness 12 mm and Nozzle 16 mm thickness, Manufactured from Carbon Steel (ST-37) with all Valves, Feeder pumps, Plumbing and Electrical works. B- Media Materials for each unit must consist from five different layers/filter materials (Gravel, Sand and Anthracite). The Media materials (Anthracite, Silica Sand & Gravel) should be tested according to technical required specification.with all valves (manuals & electrical valves).	Unit	1		0

**Hamam Al Aiil / WTP / Rehabilitation**  
**Hamam Al Aiil / Nainawa District / Nainawa Governorate**

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B.2.5	<b>Installing New Air Blower:</b> - Providing, installing and operating new air blower complete work, Moline type: MGM Root Pump, the air blower motor power (15) kW, (2900) rpm Q=440 m3/h, the work includes (3) ph. (380) Volt, (50) Hz. replacing the non-return and safety valves if needed, new circuit breaker with the starter connecting with main board and with all necessary works to make the work properly under ICRC engineer instruction.	NO	1		0
B.2.6	<b>Installation of Booster Horizontal (High lift) water pump sets:-</b> Providing, installing and testing brand new Booster horizontal water pump sets (new feed/HL Pumps ) (Split Case, Electrical Motor, Star delta starter, Base plate, High quality flexible Coupling and Guard). The sets should be of Turkish Origin such as (The same installed one or Standard/Mass or equivalent), approved by ICRC Engineer. Electrical cables of suitable size for required length (from the pump and to the closer main electrical panel). The Star delta in addition to the technical specification conditions should consist from phase sequence, low - high voltage protection, main circuit breaker, contactors, overload relay, timer, chromium push bars and painted metal board including all necessary fittings required. The set components & technical specification are as below:- Water Pumps for boosting treated water (turbidity < 10 NTU & Chlorine Content up to 5 ppm). Electrical motor 400 VAC Y/D, 50 Hz, Insulation Class F, Enclosure IP55, RPM <1500, rated power of Motor not less than 10% more than Pump shaft's max power. The Pump of Q=100 m3 / hr. & H= 60 m., RPM < 1500,37kW Material of construction for CASING should be Ductile Cast Iron GGG-50. IMPELLER - Bronze 88.10.2. SHAFT & SLEEVES - Stainless Steel 1.4122 & 1.4301. GLAND/SEAL END PLATE - Bronze 88.10.2. CASING WEARING - Bronze RG7. BEARING HOUSE - Cast Iron GG-25. WET BOLTING - Stainless Steel 1.4301 FLANGES of suitable size & shape for Suction Side PN 10 and for Discharge/Delivery Side PN 10.	NO	2		0
B.2.7	Supplying and installing Chlorine Powder dosing system, (piston diaphragm dosing pump) Aldos brand or equivalent quality, 27 l/h capacity, 50Hz, 220-240V, motor capacity 0.55 kW. Works include connection of PVC pipes, dosing tank agitator, suction pulsation dumper, suction lines, loading and controlling valves, injection unit with measuring pipes, starter, cables with plugs for power connections, spare parts (gaskets, plastic valves, inner valve parts for stainless steel and plastic versions). Including fixing dosing 500 litre tank on a suitable platform of concrete, testing and operating.	Unit	1		0
B.2.8	<b>Cables:</b> Supplying and fixing cable size (4x50)mm to connect main circuit 600Amp with the circuit 400Amp of the suction pumps to the starters of the low lift pumps and the straters of the feeding filters pumps, the laying of the cable should be according to the ICRC eng. Instructions.	M.L	100		0

**Hamam Al Aiil / WTP / Rehabilitation**  
**Hamam Al Aiil / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
B.2.9	<b>Main Control Panel:</b> - Providing, installing testing control panel for all the electrical connections of the feeding filter pumps, alum mixer, chlorine mixer, and the mixer motors of the sedimentation tanks, the price includes all the cables needed and the installation of the followings: - One main circuit breaker for incoming supply with full protection, three ammeter, current transformer, volt meter with selector switch, indicating lamps, phase failure protection. One MCB for each electrical motor. One starter for each motor with thermal overload. Indicating lamps for motors and filters with lamp tester. Relays and level sensors required for the process operation and protection. Three phase socket outlet on the side of the board. All push buttons, selector switches..etc. Electrical components suitable for 380 V, 3 phase, 50 Hz, outdoors. The work also includes providing and installing all required fittings, electrical cables and all other requirements.	Unit	1		0
B.2.10	Cables;- Supplying and fixing cable size (4x50)mm to connect main circuit 600Amp with the circuit 400Amp of the suction pumps to the starters of the low lift pumps and the starters of the feeding filters pumps, the laying of the cable should be according to the ICRC eng. Instructions.	M.L	60		0
B.2.11	<b>Carbon steel pipes:-</b> Supplying and fixing carbon steel pipes of 10" dia. And 8mm thickness to connect the compact unit with the intake, L.L pumps, filters, the agriculture area transmission pipeline and existing storage tank of the old project, the work includes the works of excavation and backfilling of the pipes outside the site of the compact unit with depth not less than 60cm, the price should cover all the fittings needed to complete the work.	M.L	350		0
B.2.12	Providing and installing Gate Valves DI 350 mm & PN 10, for the Suction side of the high lift & low lift pumps and feeding pumps. The work includes dismantling the old valve and all required modifications and fittings to install the new valve.	NO	4		0
B.2.13	<b>Check Valve:</b> Supplying and installing new brand cast iron check valve DN 6", PN 16, working temperature (-10 to + 110), handwheel type, stem should be stainlesssteel, wedge should be ductile iron+rubber coated,casket EPDM- NBR (Ethylenepropene, Nitrile, Fluorine (Viton)), western origin, type or best available in the local market, flange type, with all bolts and nuts. The work includes providing any fittings required or any pipe modification and paint all with Jotun paint. All connections needed & all accessories as to instructions of ICRC engineer and site request	NO	6		0
<b>Total</b>					<b>0</b>
<b>G.Total System 2</b>					<b>0</b>
<b>C</b>	<b>General Works</b>				
C.1	Plastic Emulsion Painting: Supplying materials and painting the inside of building with three layers of plastic emulsion painting (suitable & approved type and colour, eg SanDECO/Petek, Fillo Turkish Type). The work should be done under instruction of ICRC Engineer.	M2	600		0
C.2	Supplying, installing & testing florescent lamp best quality (36)Watt, wall mounting using screws (6)mm. wire size (2x1.5) mm2 single core through a plastic conduit with suitable operating switch.	NO.	20		0
C.3	Supply and installing new metal covered rain proof light (100)W, inside and out side the rooms by necessary cables (2x2.5)mm2 accessing, with switches, including testing to complete the work properly	NO.	10		0

**Hamam Al Ail / WTP / Rehabilitation**  
**Hamam Al Ail / Nainawa District / Nainawa Governorate**

Item	Description	Unit	Qty	Unit Price (USD)	Total Price (USD)
C.4	Supplying & installing Industrial Exhaust fan Best quality with 40x40) cm fan dimensions using (2x2.5) mm <sup>2</sup> inise of the pupms rooms wire single core through a plastic conduit and painted metal expanded wire mesh cover.	NO.	3		0
C.5	Supplying, installing & testing AC-Unit 2400 BTU/h wall types single fuse with cabling in side walls of the hall the work includes electricity connection and cabling with all accessoriness according to ICRC engineer instructions.	NO.	2		0
C.6	Providing all necessary materials, tools for removing the existing damaged Doors & Windows and installing New Doors & Windows with frame according to sections 1100+1200+1300 of I.G.T.S, details, and instructions of ICRC Eng.	NO.	2		0
C.7	Provide the required materials for installing the doors by new PVC doors of 0.9 x2.1 m by using sections of super profile (reinforced by steel channel sections of min. 1 mm thick, Turkish made (such as ESENPEN/SALL, SARAR GROUPS), quality comply with European standards, profile width not less than (70) mm, outer wall thickness min. (3) mm), including handles, glass, steel frame for fixing the doors...etc. according to ICRC Engineer instructions and details.	NO.	1		0
C.8	Windows: - Provide the required materials for repairing the existing windows the work includes re-installing broken glass thickness min. (4) mm, completing missing parts handles, steel frame, oil painting ...etc. according to ICRC Engineer instructions and details.	M2	4		0
C.9	Water Boiler Heater: - Provide, install and operate a complete set of accepted quality Water Heater 180 L storage tank capacity American Type, consisting from Min. with double heat exchangers not less than 2000 W, thermostat automatic with all other required accessories & works, connections, fittings, mounting set and skilled team for installation. All the work should be done in line with the manual manufacture instructions and ICRC Engineer recommendation.	NO.	1		0
C.10	Supplying & installing switch plug (13) Amp Crabtree (MK) brand new using (2x2.5) mm <sup>2</sup> wire single core through a plastic conduit including earth wire	NO.	5		0
	<b>Total</b>				<b>0</b>
	<b>Grand Total</b>				<b>0</b>
	<b>Duration</b>				<b>days</b>