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## **Construction of a phytodepuration treatment plant for wastewater reuse and distribution system**

Occupied Palestinian Territories – Gaza Strip – Governorate of Rafah – Al-Mawasi district

**PROJECT CODE: 11473/OVERSEAS**

# **VOLUME 3 TECHNICAL SPECIFICATIONS**

## **Bill of Quantity (BoQ)**

## General Requirements:

- The contractor should rehabilitate a clay road for the trucks and the cars
- The contractor should submit three accredited laboratories to select one or more options by the supervision
- The contractor should examine samples of all materials requested by the supervising engineer without claiming a price difference in approved laboratory
- The contractor should bring a steel box with a lock for the concrete samples, and testing cubes, also the testes must be done by a lab technician
- The contractor should bring Caravan consist of two offices, air condition, bathroom, office boy, and small kitchen with all its furniture and include the Stationery and printer in additional to close place for the samples
- The contractor should provide electricity line and internet line in the office of the site in additional to generator
- The contractor should print two copies of the drawings on A1 and three copies on A3
- The contractor must bring and approve the samples before one week of the using
- The contractor should pay a salary for one supervising engineer for seven months while signing the contract for the organization, and the organization will pay him month by month, the salary equal  $500 \text{ €} * 7\text{months} = 3500 \text{ €}$
- The contractor should prepare and print the administrative forms: work examination form, working permission form, daily report form, samples approval form, drawings approval form ... etc. regarding the instruction of the engineer.
- The contractor should prepare action plan, schedule time, and safety plan to have the approval
- Provide safety and security factors for all the workers inside the site, Warning tapes, and Warning signs
- The contractor must return everything as it was when he finishes the activity.
- The contractor should perform the experimental pumping at the end of the project, and guarantee the system work related to the implementation

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>B1 - PIPES FOR WATER NETWORKS</b>					
*	<b>Note:</b>				
	- The Contractor shall when pricing this Bill take into consideration to include and allow for costs or expenses of all requirements stipulated in the section entitled "General and Preambles" preceding this Bill.				
	- The exact lengths of the required pipes, the exact number of the required valves and the exact quantities of manholes will be determined according to the approved shop drawings.				
	- Price should account for cost of all associated works including trench excavation and all earthworks including all kinds of soil and rock excavation, asphalt cutting, spreading surplus soil, backfilling by using approved material , magnatic tracer warning tape, hydrostatic test, cleaning and disinfection of pipeline.				
	- Pipe, fittings, valves and other water main accessories shall be loaded, transported, unloaded, stored, handled, and installed by methods and in a manner that will insure their final installation in a sound and undamaged condition conforming in all respects to specified requirements.				
	- The price of fixing pipes should include the cost of thrust blocks (with or without reinforcement as specified in the drawings) and any reinforced concrete casing needs with its plywood and all type of bends, caps and likes needed to complete the jobs as described in Specifications and as shown in Drawings and directed by the Engineer.				
	- All fittings must be made from HDPE material and the valves must be compatible with the HDPE pipes and fittings.				
	- The price should include the cost of pipes welding, connections and all needed materials for installation.				
	- All fittings and valves are to be installed complete with bolts, nut washers rubber joints and flanges for pipes. Include for painting exposed metal work with external bituminous paint as directed by the Engineer after installation. Include all excavation, bedding, and backfilling.				
	- The installation of pipes, valves, and fittings shall include the connection between new pipe and any existing one, the cutting of any new and /or existing pipe, workmanship for installing tees, couplings, dismantling of any existing valve or fitting, transport of dismantled valves or fittings, temporarily shutting off supplies, excavation, backfilling and dewatering of existing pipes all as specifications, drawings and directed by the Engineer.				
	- Supply and install valves complete including but not limited to the following: valves, fittings, fixed, jack and concrete supports, complete all as described in the Specifications and as shown on the Drawings and as directed by the Engineer.				
	- All the works should be done by coordination with the consultant, Submission of shop drawing to be approved by the Consultant before starting any work activity, Making trial pits for identifying existing services, connecting existing water pipelines if required.				
	- Cut and restore existing asphalt at carriage way where crossed by pipes or chambers, including the provision of new base course and asphalt mix to the original profile but not less than 20cm thick for base coarse and 6cm thick for asphalt mix, compaction complete to original profile and disposal of surplus material as directed by the Engineer and specifications				
	- All the works should include repair any damage of any service at full satisfaction of relevant Service Authority, Restoring the existing surface to original status and approval of the Engineer, Testing, flushing and disinfections of the new pipeline.				
	- All Network pipes should be purple in color and according to Environmental quality Authority.				

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
	<p>- <u>The price of pipes should include the cost of trench excavation to any depth and not less than 1.2m from existing ground level, backfilling and compaction, pipe bedding with clean sand and disposal of surplus material (if applicable), thrust concrete blocks, all bends needs, welding, caps, etc. The price of pipes also should include hydrostatic test, cleaning and disinfection of pipeline and all required works to complete the job as specifications and directed by the Engineer.</u></p>				
	- <b>For all HDPE Pipes and its fittings must be PN 16</b>				
	- <b>For all Valves and its fittings must be PN 16</b>				
1.1	Supply and Install HDPE pipes diameter 225mm PN 16" (minimum wall thickness is 20.5mm). The price of pipes should include the cost of trench excavation (Width of trench is equal at least diameter of pipe and 30cm from each edge of pipe) to any depth and not less than 1.2m from existing ground level, backfilling in layers (25cm max. each layer & compaction test 100%) , pipe bedding with clean sand (15cm under pipe and 30cm over pipe) and disposal of surplus material (if applicable), Magnetic tracer warning tape, thrust concrete blocks with its plywood, all necessary bends, tees, reducers, caps, etc. as per drawings and specifications.	MR	1700		-
1.2	Ditto but for HDPE pipes diameter 160mm PN 16" (minimum wall thickness is 14.6mm)	MR	400		-
1.3	Ditto but for UPVC pipes diameter 110mm PN 16" (minimum wall thickness is 10mm)	MR	1600		-
1.4	Supply and Install connection for each land parcel: The connections will be from different diameter of HDPE pipes such as 225mm, 160mm and 110mm. The works include HDPE pipes (50mm diameter and around 10m length) below ground including saddles body which should be fabricated from copper alloy or plastic (Polypropylene, high-grade copolymer) with copper alloy Ferrule cock, end caps, flanged adapter, all connections to ferric tapping saddles and any existing service pipe, pipe laying, jointing and testing complete, excavation, backfilling and compaction. The price includes also water meter, gate valve, check valve and all needed works as specifications, drawings and directed by the Engineer.	SET	40		-
1.5	Supply and install flanged gate valve 6" PN 16. The item includes all the required pipes, two flange couplings with the same size and all the required fittings, accessories, bolts and nut washer's. The price also should include the connection for proposed pipe or existing pipe, as well as include the cost of all tests, cleaning and disinfection needed and all required works to complete the job as per specifications and as directed by the Engineer. (GV)	SET	1		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
1.6	Supply and install Air Release and Vacuum Release Valve, 80 mm, PN 16 bar for water - type ARI or equivalent, with the 80 diameter Arca bronze gate valve or equivalent and all the required fittings, accessories and pipes. the price include all reducers, Tees (all flanges with three branches), bolts and nut washer's. The price also should include the gate valve. The price also should include the connection for proposed pipe or existing pipe, as well as include the cost of all tests, cleaning and disinfection needed and all required works to complete the job as per specifications and as directed by the Engineer. (ARV)	SET	1		-
1.7	Supply and install Wash Valve, 6". PN 16 bar for water - type HAKOHAV or equivalent, with the 80 diameter Arca bronze gate valve or equivalent and all the required fittings, accessories and pipes. the price include all Tees (all flanges with three branches) and bolts and nut washer's. The price also should include the connection for proposed pipe or existing pipe, as well as include the cost of all tests, cleaning and disinfection needed and all required works to complete the job as per specifications and as directed by the Engineer. (WV)	SET	1		-
<b>TOTAL OF BILL B1 (PIPES FOR WATER NETWORKS) - EUR €</b>					-
<b>B2- VALVE CHAMBER WORKS</b>					
2.1	Supply and install 120cm internal diameter precast circular reinforced concrete water manholes complete (for flanged gate valves size 6", air release valves and wash valves) with B300 cast in place reinforced concrete base, cast iron cover (25 tons capacity, diameter 60 cm), frame, rings, <u>gravel 3/4"</u> , <u>steel jack support</u> and special joint required to fix the Water 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 bitumen coating, and backfilling in layers 25 cm maximum by using approved material with watering, and compaction the price includes repairing the damage of the existing asphalt layers, base course layers, curb stone, side walks tiles to the original condition as described in Specifications and as shown in Drawings and directed by the Engineer. (MH)	NO	3		-
<b>TOTAL OF BILL B2 ( VALVE CHAMBER WORKS) - EUR €</b>					-

<b>SUMMARY OF BOQ CARRIER LINES</b>	
<b>DESCRIPTION</b>	<b>TOTAL AMOUNT (EUR €)</b>
<b>TOTAL OF BILL B1 (PIPES FOR WATER NETWORKS)</b>	-
<b>TOTAL OF BILL B2 ( VALVE CHAMBER WORKS)</b>	-
<b>GRAND TOTAL FOR BILL 1 + 2</b>	-
<b>GRAND TOTAL FOR BILL 1 + 2 "IN WORDS"</b>	

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>B1-MECHANICAL WORKS FOR BOOSTER SITE</b>					
*	<b><u>Note:</u></b>				
	- The Contractor shall when pricing this Bill take into consideration, include and allow for costs or expenses of all requirements stipulated in the section entitled "General and Preambles" preceding this Bill.				
	- The exact lengths of the required pipes, the exact number of the required valves and the exact quantities of concrete will be determined during the implementation of the Works.				
	- The price of under ground pipes should include the cost of all bends needs, reducers, concentric steel reducer, flexible joint, welding, flanges, tees, blank flanges, trench excavation to any depth and all earthworks including all kinds of soil and rock excavation, spreading surplus soil, backfilling, compaction, pipe bedding with sand and disposal of surplus material, metallic tracer tape for HDPE pipes, Warning Tape for metal pipes, hydrostatic test, cleaning and disinfection of pipeline and all as specifications and directed by the Engineer.				
	- The price of over ground pipes should include the cost of all bends needs, reducers, concentric steel reducer, flexible joint, glide, supports, welding, flanges, tees, blank flanges, jack, concrete supports, hydrostatic test, cleaning and disinfection of pipeline and all as specifications and directed by the Engineer.				
	- Pipe, fittings, valves, hydrants, and other watermain accessories shall be loaded, transported, unloaded, stored, handled, and installed by methods and in a manner that will insure their final installation in a sound and undamaged condition conforming in all respects to specified requirements.				
	- The price of fixing pipes should include the cost of welding, thrust blocks and all fittings needed to complete the jobs as described in Specifications and as shown in Drawings and directed by the Engineer.				
	- All fittings and valves are to be installed complete with jack support, bolts, nut washers rubber joints, welding . Include for painting exposed metal work with bituminous paint or epoxy paint as directed by the Engineer after installation. Include all excavation, bedding, and backfilling.				
	- The installation of pipes, valves, and fittings shall include the connection between new pipe and any existing one, the cutting of any new and /or existing pipe, workmanship for installing tees, couplings, dismantling of any existing valve or fitting, transport of dismantled valves or fittings, temporarily shutting off supplies, excavation, backfilling and de-watering of existing pipes all as specifications, drawings and directed by the Engineer.				
	- Supply and install valves complete including but not limited to the following: valves, fittings, fixed, jack and concrete supports, complete all as described in the Specifications and as shown on the Drawings and as directed by the Engineer.				
	- The price of pipes should include the cost of all bends needs, reducers, flexible joint (if needed), welding, flanges, blank flanges, Dismantling Joints, Flange coupling, dressers, straight coupling, The price of pipes also should include the cost of pipes tees (all Flanges with three branches with Flange-Sockets or Flange- Couplings for all connections - IF needed), hydrostatic test, cleaning and disinfection of pipeline and all required works to complete the job as specifications and directed by the Engineer.				
	<u>The price of pipes should include the cost of trench excavation to any depth and not less than 1.2m from existing ground level, backfilling and compaction, pipe bedding with clean sand and disposal of surplus material (if applicable), thrust concrete blocks, support concrete block, all welded bends, all welded tees, all welded reducers and connections, all flanged bends, all flanged tees, all flanged reducers, open flanged, blank flanged, straight coupling, caps, etc. The price of pipes also should include the cost of pipes tees (all Flanges with three branches with Flange-Sockets or Flange- Couplings for all connections ), hydrostatic test, microbiological test, cleaning and disinfection of pipeline and all required works to complete the job as specifications and directed by the Engineer.</u>				
	- <b>For all HDPE Pipes and its fittings must be PN 16</b>				
	- <b>For all Valves and its fittings must be PN 16</b>				

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>B1-A: NON-BURIED PIPES</b>					
A.1	Supply and install above ground steel pipes 12" dia., shedule 40 including the required elbows, reducers, tee's and all notes above as described in the Specifications and as shown on the Drawings and directed by the Engineer.	MR	15		-
A.2	Ditto, but steel pipes 8" dia., shedule 40.	MR	8		-
<b>TOTAL OF BILL B1 - A ( NON-BURIED PIPES)</b>					-
<b>B1-B: BURIED PIPES</b>					
B.1	Supply and install underground steel pipes 18" dia., shedule 40 including the required elbows, Bell Mouth, Mesh and all notes above as described in the Specifications and as shown on the Drawings and directed by the Engineer.	MR	20		-
<b>TOTAL OF BILL B1 - B ( BURIED PIPES)</b>					-
<b>B1-C: VALVES, FITTINGS AND MANHOLES</b>					
C.1	Supply and install 18" gate valve manual with gear mechanisim and includes one flange couplings and one open flanged as shown on the Drawings and all notes aboves as described in the Specifications or directed by the Engineer. (V1)	NO	2		-
C.2	Ditto, but 12" gate valve and includes two flange couplings. (V2)	NO	1		-
C.3	Ditto, but 8" gate valve and includes two flange couplings. (V4)	NO	2		-
C.4	Supply and install 8" Check Valve as shown on the Drawings and all notes aboves as described in the Specifications or directed by the Engineer. (C1)	NO	3		-
C.5	Supply and instal Automatic air release valve 50mm with ball valve, steel piping 50mm dia., with all fittings, valves and connection to drain point. (A1)	NO	2		-
C.6	Supply and install pressure gage 50mm dia. With faout 1/2" all fittings, pipes and connection to complete the job. (G1)	NO	4		-
C.7	Supply and install pressure switch 12mm dia. with all valve, fittings and connection to complete the job. (S1)	NO	4		-
C.8	Supply and install Flanged flexible joint 8" dia. with all fittings and connection to complete the job. (FJ )	NO	2		-



No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
C.9	Supply, install and cast in site rectangular or circular manhole (size should be match with the instrument, fittings, etc that minimum 60cm moving distance must be available all around the instrument and fittings for maintenance) reinforced concrete class B350 that includes wall, footing , slab, roof slab, Φ 200cm, cast iron cover (25 tons capacity, diameter 60 cm), frame, rings, gravel 3/4", steel jack support and special joint required to fix the Water pipes to the manhole. The item also includes excavation in any type of soil to any depth, plain concrete, two external bitumen coating, backfilling in layers 20 cm maximum using suitable material with watering, and compaction, shuttering, reinforcement, inside cast-iron steps each step 30 cm maximum where necessary, grouting around pipes and all required works to complete the job as specified in drawings and directed by the Engineer. (MH1)	UNIT	2		-
<b>TOTAL OF BILL B1 - C ( VALVES, FITTINGS AND MANHOLES)</b>					-
<b>B1-D: BOOSTER PUMPING STATION</b>					
D.1	Supply, test and install submersible wet sewage pump 6" of flow (Q)= 65 m3/hr., operating Head( H) =35 M, with efficiency not less than 55% Motor : 3 phase , Rated voltage 230 V , 50 Hz , 15 KW, Rated Speed : 2915 rpm, Flygt type or approved equivalent ,the two pumps will be operating in alternate turns using PLC. The price of this item should cover the following: - The pump shall be equipped with discharge connection 6" to the ground, exist rails, thermal & liquid protection system sensors, and marine type electric cable of sufficient length to connect to Electrical main board, one set of spare parts as specified by the manufacturer and frame, all in accordance with enclosed relevant technical specifications, hydraulic performance curves and the engineer's instructions. The works should include all associated supporting, electrical and mechanical connection necessary accessories (flanges, steel base, stainless steel bolts, gaskets, chains, stainless steel wires grade 316, washers, sleeves, ...etc.) and	Unit	2		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
D.2	Supply, test and install submersible wet sewage pump 4" of flow (Q)= 25 m3/hr, operating Head( H) =20 M, ,Made in cast iron and stainless steel with mechanical seal and open impeller with abrasion-resistant rubber coating.. The price of this item should cover the following: - The pump shall be equipped with discharge connection 4" to the ground, exsit rails, thermal & liquid protection system sensors, and marine type electric cable of sufficient length to connect to Electrical main board, one set of spare parts as specified by the manufacturer and frame, all in accordance with enclosed relevant technical specifications, hydraulic performance curves and the engineer's instructions. The works should include 4" gate valve, 4" check valve' flexible joint and pressure switch , micro switch and all associated supporting, electrical and mechanical connection necessary accessories (flanges, steel base, stainless steel bolts, gaskets, chains, stainless steel wires grade 316, washers, sleeves, ...etc.) and items shown on the drawings. All electrical protection controllers should be supplied and installed in accordance with the manufacturer recommendation such as (humidity detector, stator over heating protection, bearing temperature sensor, float switch). The works, installations and prices should include for all fittings , accessories and installations, electrical installations with cables and power panel ,including builders work installations with all associated reinforced concrete plinths specified by the manufacturer's installation manual. (PM2)	Unit	1		-
D.2	Supply, install and fix corrugated steel sheet with its purlins at booster pump shed. The works includes supply and installation of purlins steel box section 100x50x4mm @ 1.0m (total length around 45m) and corrugated steel sheet 0.70mm thick (area around 50m2), Painting, Bolts, welding, washers and all required works needed to complete the job. The price also includes the drainage system.	LUMP SUM	1		-
D.3	Supply and install electrical monorail hoist 2.0 ton capacity or according to supplied pump weight (which is larger) complete with "I" beam (IPE 330x160x49.1kg/m), the base, the hook, the chain, the stopper, the fixing rods, steel base plate, anchorage bolts, stiffeners, painting and all necessary parts required for proper installation and operation, all as described in the Specifications and as shown on the Drawings and directed by the Engineer.	LUMP SUM	1		-
<b>TOTAL OF BILL B1 -D ( BOOSTER PUMPING STATION)</b>					-
<b>B2-CIVIL WORKS FOR BOOSTER SITE</b>					
<b>B2.A: EARTH WORKS</b>					
*	<b><u>Notes:</u></b>				
	- <i>Prices for 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 or his representative.</i>				
	- <i>Quantities of Excavation shall be measured according to the elements' dimensions mentioned in the drawings</i>				
	- <i>Back-filling item should be in layers (25cm max. each &amp; compaction test 98%). Prices shall includes supply, wetted, compacted, transporting, tested and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.</i>				

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
	- Suitable Clean Sand should be used for back-filling in layers (25cm max. each & compaction test 98%), selected from the approval excavated soil or imported. Prices shall includes supply, wetted, compacted, transporting, tested and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
A.1	Bulk Excavation of any soil according to the elements' dimensions mentioned in the drawings with all required works	M3	200		-
A.2	Backfill at areas as shown on the drawing by imported and approved Kurkar material with all required works. This item includes maintain the levels of the building as shown in the drawings, specifications and directed by the Engineer, using Kurkar material (25cm max. each layer & compaction test 98%) according to Engineer instructions and specifications.	M3	100		-
<b>TOTAL OF BILL B2 - A (EARTH WORKS)</b>					-
<b>B2.B: CONCRETE WORKS</b>					
*	<b><u>Notes:</u></b>				
	- Prices for all concrete items shall include shuttering, steel reinforcement, testing for steel reinforcement and concrete, supply and placing of concrete, Mixe Design, vibrating, curring, striking, polyethylene sheet (for any concrete contact with the soil), painting for hot bitumen (one coat of primer & min. 2-coats of hot bitumen) underground concrete for external surfaces, workmanship, all ducts, sleeves, opening areas and the concrete surface shall be finished with mechanical steel trowel and the price shall include steel trowelling with smooth face (fair face)and any where else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
	- The Contractor shall use tie bolts 8mm in the wall shuttering and other elements can use galvanized steel tied wire (if approved)				
*	<b><u>CONCRETE (B - 200) :</u></b>				
B.1	Plain concrete B 200, 10cm thick below foundation of septic tank and booster pump shed with all required works	M3	5		-
*	<b><u>CONCRETE (B - 300) :</u></b>				
B.2	Supply and cast reinforced concrete for isolated footings of booster pump shed with all required works	M3	4		-
B.3	Ditto for nick columns and columns of booster pump shed with all required works	M3	4		-
B.4	Ditto for ground beams of booster pump shed with all required works	M3	5		-
B.5	Ditto for beams of booster pump shed with all required works	M3	5		-
B.6	Ditto for slab on grade 20cm thick (reinforcement 1T12@20cm at two directions top & bottom) of booster pump shed with all required works	M3	8		-
B.7	Ditto for pump foundation of booster pump shed with all required works	M3	13		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
B.8	Ditto but for Septic Tank foundation, walls and slab with all required works. The price includes painting at minimum 2-coats of Nitocoat ET 401 painting from FOSROC (Thixotropic pitch extended epoxy resin) or equivalent for wetted surfaces, water stop sheets, water testing for chambers, workmanship and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.	M3	65		-
<b>TOTAL OF BILL B2 - B (CONCRETE WORKS)</b>					-
<b>B2.C: METAL WORKS</b>					
	* <b>Notes:</b>				
	- All the following items shall be completed according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
	Price of Stainless Steel ( <u>Grade 316 specially for sewage</u> ) Handrails, Ladders, Covers & Grating include supplying, workmanship, fixation (should be filled with the fine aggregate rich mortar concrete), hinges, handles and all necessary parts needed to complete the works				
C.1	Stainless Steel Ladder for Septic Tank including above notes with all required works	MR	7		-
C.2	Stainless Steel Cover size 1.2x1.2m for Septic Tank including protection safety grating and all above notes with all required works	NO	4		-
<b>TOTAL OF BILL B2 - C (METAL WORKS)</b>					-
<b>B2.D: TILING WORKS</b>					
	* <b>Notes:</b>				
	- Prices of Tiles works shall include supply of all materials, testing, mortar, 5cm sand under or back the tiles, workmanship, opening areas and all materials & tools and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
D.1	Supply and install Colored Interlocking Tiles 8cm thick (B-450) for the main road or likes, size and shape as directed by the engineer or his representative. Prices shall includes supply 20cm base coarse layer, 5cm clean sand under Interlocking, testing, workmanship and the works includes supply and install concrete at the ends and edges of tiles and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.	M2	200		-
<b>TOTAL OF BILL B2 - D (TILING WORKS)</b>					-

SUMMARY OF BOQ BOOSTER SITE	
DESCRIPTION	TOTAL AMOUNT (EUR €)
<b>MECHANICAL WORKS FOR BOOSTER SITE</b>	
TOTAL OF BILL B1 - A ( NON-BURIED PIPES)	-
TOTAL OF BILL B1 - B ( BURIED PIPES)	-
TOTAL OF BILL B1 - C ( VALVES, FITTINGS AND MANHOLES)	-
TOTAL OF BILL B1 -D ( BOOSTER PUMPING STATION )	-
<b>CIVIL WORKS FOR BOOSTER SITE</b>	
TOTAL OF BILL B2 - A ( EARTH WORKS)	-
TOTAL OF BILL B2 - B ( CONCRETE WORKS)	-
TOTAL OF BILL B2 - C ( METAL WORKS)	-
TOTAL OF BILL B2 -D ( TILING WORKS )	-
GRAND TOTAL FOR BILL 1 + 2	-
GRAND TOTAL FOR BILL 1 + 2 "IN WORDS"	

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>B1 - EARTH WORKS</b>					
	* <u>Notes:</u>				
	- Prices for 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 or his representative.				
	- Quantities of Excavation shall be measured according to the elements' dimensions mentioned in the drawings.				
	- Back-filling item should be in layers (25cm max. each & compaction test 98%). Prices shall includes supply, wetted, compacted, transporting, tested and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
	- Suitable Kurkar should be used for back-filling in layers (25cm max. each & compaction test 98%), selected from the approval excavated soil or imported. Prices shall includes supply, wetted, compacted, transporting, tested and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
1.1	Bulk Excavation of any soil according to the elements' dimensions mentioned in the drawings with all required works.	M3	30		-
1.2	Backfill at areas as shown on the drawing by imported and approved Kurkar material with all required works. This item includes maintain the levels of the building as shown in the drawings, specifications and directed by the Engineer, using Kurkar material (25cm max. each layer & compaction test 98% ) according to Engineer instructions and specifications.	M3	20		-
<b>TOTAL OF BILL B1 (EARTH WORKS)</b>					-
<b>B2 - CONCRETE WORKS</b>					
	* <u>Notes:</u>				
	- Prices for all concrete items shall include shuttering, steel reinforcement, testing for steel reinforcement and concrete, supply and placing of concrete, Mixe Design, vibrating, curring, striking, polyethylene sheet (for any concrete contact with the soil), painting for hot bitumen (one coat of primer & min. 2-coats of hot bitumen) underground concrete for external surfaces, workmanship, all ducts, sleeves, opening areas and the concrete surface shall be finished with mechanical steel trowel and the price shall include steel trowelling with smooth face (fair face)and any where else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
	- The Contractor shull use tie bolts 8mm in the wall shuttering and other elements can use galvanized steel tied wire (if approved)				
	* <u>CONCRETE (B - 200) :</u>				
2.1	Plain concrete B 200, 10cm thick below foundations (or base slab) , concrete pipes supports, anchor blocks, benching, slopes or likes with all required works.	M3	2		-
2.2	Ditto but for sills, lintels, coping, posts, parapets, concrete wall for steps of stairs of building and the likes works with all required works.	M3	3		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
2.3	Supply and cast light weight concrete (foam concrete B-200) on the roof slab of building with thickness of 3-10 cm to the direction of the drainage The price shall include supply, workmanship and making good with all required works.	M2	40		-
2.4	Ditto but for ground slab (10cm - under tiles or without tiles) for electrical building including reinforcement (1T8mm @ 20cm in both directions), leveling, compaction of sub-grade with all required works.	M3	4		-
<b>* <u>CONCRETE (B - 300) :</u></b>					
2.5	Ditto for Foundations of building with all required works.	M3	3		-
2.6	Ditto for Nick columns and columns for building with all required works.	M3	3		-
2.7	Ditto for Ground beams of building with all required works.	M3	6		-
2.8	Ditto for electrical wall trenches of building with all required works.	M3	1		-
2.9	Ditto for external steps of building with all required works.	M3	2		-
2.10	Ditto but for Slabs 25cm thick for building. Price includes concrete, reinforcement, hollow Blocks (40x25x17), drainage, electrical, mechanical ducts & wormanship with all required works.	M2	40		-
<b>TOTAL OF BILL B2 (CONCRETE WORKS)</b>					-
<b>B3- BLOCK, PLASTERING &amp; PAINTING WORKS</b>					
<b>* <u>Notes:</u></b>					
- Prices of block works shall include supply of all materials, testing, mortar, scaffolds, placing of approval blocks, workmanship, all ducts, sleeves, opening areas, fiber board, protection concrete (B-200) around sleeves and pipes (for electrical, sanitary & mechanical), tools and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.					
- Prices of plastering works shall include supply of all materials, galvanized angles (for exposed edges), galvanized mesh (between block wall and concrete), mixing, scaffolds, curing, workmanship & tools and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.					
- Prices of painting works for walls & ceilings shall include supply of all materials, scaffolds, workmanship & tools and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.					
3.1	Supply and build concrete hollow blocks for walls (size 40x20x20cm) with all required works, according to specifications and engineer's instructions. The item includes the reinforced concrete posts between block and columns.	M2	70		-
3.2	Ditto, but concrete hollow blocks size 40x20x10cm with all required works.	M2	10		-
3.3	Internal Plastering two faces for internal walls, partitions and likes, min. thick 20mm with all required works.	M2	80		-
3.4	Internal Plastering two faces for ceilings min. thick 15mm with all required works.	M2	40		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
3.5	Supply and make external plastering of three layers with min. thickness of 20mm. The first layer is rough nail rendering (mix 1:1 cement to sand), the second is 5mm thick mortar (mix 1:2 cement to sand) and the third is 13 mm undercoat (mix 1:3:0.25 cement to sand to lime) with all required works. For existing walls, the work includes cleaning and repairing the reinforcement corrosion, repairing of cracks, filling of holes, etc.	M2	90		-
3.6	Supply and make Ecos (Italian finish) layer with all required works and according to specifications and engineer instructions.	M2	90		-
3.7	Supply and paint internal painting for walls with 1 coat of undercoat primer (Pendrol), two coats of putty and min. two coats of (Supercryle) with all required works. The work includes repairing of wall cracks and removing the existing paint for existing walls.	M2	80		-
3.8	Supply and paint internal painting for ceiling with 1 coat of undercoat primer (Pendrol), two coats of putty and min. 2 coats of (polyceed) paint with all required works. The work includes repairing of wall cracks and removing the existing paint for existing walls.	M2	40		-
<b>TOTAL OF BILL B3 (BLOCK, PLASTERING &amp; PAINTING WORKS)</b>					-
<b>B4 - TILING &amp; MARBLE WORKS</b>					
*	<b><u>Notes:</u></b>				
	- <i>Prices of Tiles &amp; Marble works shall include supply of all materials, testing, mortar, 5cm sand under tiles or marble or back the tiles or marble (wall), skirting, workmanship, opening areas and all materials &amp; tools and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.</i>				
	- <i>Black Basalt mixed with white marble chips, size 4mm, shall be used in the precast terrazzo tiles, free from cracks, holes and pits, homogeneous in the approval color.</i>				
	- <i>Only European Type of good quality imported glazed ceramic tiles (floor &amp; walls) shall be used.</i>				
	- <i>Only Grade A for local marble shall be used, free from cracks, holes and pits, homogeneous in the approval color.</i>				
4.1	Terrazzo floor tiles size 25x25x2.5cm., terrazzo skirting of same kind and color of the floor tiles size 25x7x1cm thick with all required works.	M2	40		-
4.2	Non-slipping white ceramic floor tiles size 20x20x0.8 cm. with all required works.	M2	3		-
4.3	Glazed white wall ceramic size 20x20x0.6 cm. with all required works.	M2	20		-
4.4	Local marble (Grade A) 3cm thick for window sills, doors, external steps and likes with all required works.	M2	7		-
4.5	Marble (Black Tiger Granite) 2cm thick for the kitchenatefor cupboards 5060 wide & 100cm height, the works including the top surface with round edges, vertical dividers and internal horizontal shelves, back of cupboards, floor skirting 10cm height (local marble - Grade A) and making the needed opening for basins , <u>lower/bottom with fiber sheet and top with glass 4mm thick aluminum cabinets</u> , all according to drawings, specifications, conditions and as directed by the Engineer or his representative.	MR	2		-



No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>TOTAL OF BILL B4 (TILING &amp; MARBLE WORKS)</b>					-
<b>B5 - METAL WORKS</b>					
*	<b><u>Notes:</u></b>				
	- All the following items shall be completed according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.				
	- Price of Galvanized Steel works include 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 necessary parts needed to complete the works.				
	- Price of doors or windows or other metal works (if needed), the works includes supplying, workmanship, fixation for lock type is UNION or European type of good quality complete and all necessary parts needed to complete the works.				
	- Price of colored Anodized Aluminum windows or doors (type secection 7000 or 4500 Grade A ) includes supplying, workmanship, fixation (frames should be filled with the fine aggregate rich mortar concrete), hinges, clear glass 6mm, lock type (for door) is approval European type of good quality, handles and all necessary parts needed to complete the works				
*	<b><u>Aluminum Works:</u></b>				-
5.1	Supply and install anodized colored Aluminum profile window W1 - 1.40x1.00, complete with two sliding leave complete, glazing, silicone sealant, ironmonger and hardware, all and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.	NO	3		-
5.2	Ditto but for W2 - 0.60x0.60 louver window with 6mm wire glass and steel protection with all required works.	NO	1		-
5.3	Supply and install anodized colored Aluminum profile door DA1 - 0.7x2.10, complete with one leave complete, clear glazing (at top half all is clear glass) , silicone sealant, ironmonger and hardware, all and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.	NO	1		-
*	<b><u>Metal Works:</u></b>				-
5.4	Supply and install of Multilock door size 1.00 x 2.30 one leaf (DS1). The scope of works includes joineries, accessories, 3 mm galvanized steel frame, MUL-T-LOCK switch , door stops, hydraulic closer, all and anywhere else, needed, all according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.	NO	1		-
5.5	Supply and install Galvanized Steel Door DS2 - 1.40x2.30 two leave with all required works.	NO	1		-
5.6	Supply and install Galvanized Steel Louver window W3 - 1.40x0.50 with all required works.	NO	1		-
5.7	Supply and install Galvanized Steel Grill for window protection with all required works.	M2	5		-
5.8	Supply and install Galvanized Steel Ladder with all required works.	MR	4		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
5.9	Supply and install galvanized steel grating panels (opening 30x30mm) at electrical trenches of electrical room. The scope of works includes accessories connections, supports and all needed work to completer the job as shown in drawings, specifications, above notes and instruction of engineer.	M2	3		-
TOTAL OF BILL B5 (METAL WORKS)					-
B6 - INSULATION WORKS					
*	Notes:				
- All the following items shall be completed according to drawings, specifications, conditions and directed instructions by the Engineer or his representative.					
6.1	Supply and install granular top surface 4mm thick bituminous sheet for roof water proofing. The price shall include supplying, installing, workmanship, prime coat, overlapping and water testing for the roof after completing the works and making good with all required works	M2	50		-
TOTAL OF BILL B6 (INSULATION WORKS)					-
B7 - HVAC WORKS					
*	Notes:				
- The Contractor shall when pricing this Bill take into consideration, include and allow for costs or expenses of all requirements stipulated in the section entitled “General and Preambles” preceding this Bill.					
- The exact lengths of the required pipes, the exact number of the required valves and the exact quantities of concrete will be determined during the implementation of the Works.					
- Price should include all excavation, backfilling, supporting of trenches and all associated works.					
B7.1 - PLUMBING WORKS					
7.1.1	Supply and install white vitreous china hanged wash basin "Vitra Type" or equal product size 40x56cm complete with all necessary fittings, towel rail 45cm, china soap holder, mirror and china shelves, support Egmatour) type water mixer or equivalent, chrome traps, tap and drainage to the nearest manhole, rate to include water pipes from tank to the unit.	NO	1		-
7.1.2	Supply and install white vitreous china western type toilet "Vitra Type" or equal with flush cistern of 2 gal. capacity, seat mounted, and hard seat covers, rate to include waste pipes and drainage to the nearest manhole and all associated water pipes, china paper holder, all other required fittings as required.	NO	1		-
7.1.3	Supply and install white vitreous china hanged shower "Vitra Type" or equal product size 80x80cm complete with all necessary fittings, china soap holder, (hamat) type water mixer or equivalent, chrome traps, tap and drainage to the nearest manhole, rate to include water pipes from tank to the unit.	NO	1		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
7.1.4	Supply and install one bowel stainless steel kitchen sink 50x85 cm complete with chrome plated hot and cold water mixer, workmanship and all necessary fixing, accessories, waste pipes and drainage to the nearest manhole with all required works.	NO	1		-
7.1.5	Supply and install UPVC floor Trap size 15x15cm, rate to include double cover chrome plated one grated and other is solid with all accessories, fittings and connecting to the nearest manhole.	NO	2		-
7.1.6	Supply and install UPVC floor Cleanout size 15x15cm, rate to include double cover chrome plated one grated and other is solid with all accessories, fittings and connecting to the nearest manhole.	NO	2		-
7.1.7	Supply and install UPVC floor Drain size 15x15cm, rate to include double cover chrome plated one grated and other is solid with all accessories, fittings and connecting to the nearest manhole.	NO	2		-
7.1.8	Supply and install 1" dia. Galvanized steel water supply pipe from roof tanks to each services for WC & Kitchen, the works including all fittings, bends, test, valves needed, installation and all required works to complete the job.	Unit	1		-
7.1.9	Supply and install plastic water storage tank 1.0 M <sup>3</sup> capacity complete with lockable cover, float valve 1/2" dia., cleaning opening with plug 3/4" dia., overflow pipe 3/4" dia., steel base and the connection with the feeding and distribution lines, all according to Drawings, Specifications and instructions of the Engineer.	NO	1		-
7.1.10	Supply and install water Box complete (Rozabeta) with poeethene pipe with Φ16 mm, gates, fittings, allaccessories, marble frame, two leaves of aluminum door and all needed works to complete the job as shown in drawing and specification and engineer insructor.	NO	1		-
7.1.11	Supply and install 3" PVC pipe drainage pipes for roof of building including all necessary bends and connections and making good with all required works	MR	8		-
7.1.12	Supply and install UPVC Pipes 110mm Dia. for venelation pipe (SN4) including cap ventelation, fixation, concrete casing for pipes and all needed work to complete the job.	MR	8		-
7.1.13	Supply and install UPVC Pipes 110mm Dia. (SN4) including fittings, fixation, concrete casing for pipes and all needed work to complete the job.	MR	10		-
7.1.14	Ditto, but for UPVC Pipes 50mm Dia.	MR	5		-
7.1.15	Supply and install DN160-mm diameter gravity Rigid PVC-U sewer pipes SN8 and lay in all kinds of soil including excavation to the required depth, supporting the trench sides, bedding with clean sand, backfilling and compaction (compaction layers at max. thicknes of layer is 25cm). Unwanted soil to be removed outside the site. The price includes all necessary works, supplying and installing warning tape with copper wires, gaskets, connection to manholes and others to complete the work as specified in the specification, drawings and to the satisfaction of the Engineer. Excavation up to any depth as specified.	MR	20		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
7.1.16	Supply and install pre-cast circular manhole of 80cm diameter reinforced concrete class B300 sewage manholes as per specifications and drawings complete with 15 cm reinforced concrete base, 25cm reinforced concrete slab, plain concrete, cast iron cover (25 tons capacity and 60cm opening), frame, rings, internal coating, benching, cast iron steps and special joint required to fix the pipe to the manhole. The item also includes excavation, supporting the trench sides and backfilling using clean sand with watering and compaction (compaction layers at max. thickness of layer is 25cm). The work also includes coating the inside walls and slab with two coats of special sewer epoxy and the external surfaces with two coats of hot bitumen. Pipe opening at manhole base shall be factory made without drilling manhole walls at site. Locations are as shown on in drawings and Depth up to any depth as specified.	UNIT	2		-
<b>TOTAL OF BILL B7.1 (PLUMBING WORKS)</b>					-
<b>B7.2 - FIRE FITTING SYSTEM</b>					
7.2.1	Supply and install Manual (CO2 Gas) wall mounted Fire extinguisher (6kg) with all accessories, fittings and all required works to complete the job..	NO	2		-
7.2.2	Ditto but for Manual (Dry Powder) Fire extinguisher (6kg).	NO	2		-
<b>TOTAL OF BILL B7.2 (FIRE FITTING SYSTEM)</b>					-
<b>TOTAL OF BILL B7 (HVAC WORKS)</b>					-
<b><u>B8- CUSTOM MADE FURNISHING WORKS (OPTIONAL)</u></b>					
*	<b><u>Notes:</u></b>				
	- The Contractor shall when pricing this Bill take into consideration, include and allow for costs or expenses of all requirements stipulated in the section entitled "General and Preambles" preceding this Bill.				
	- Specs of used several types of wood, glass, accessories, metal, coating, paint, ... etc.				
	- Condition of submitting samples for approval				
	- Condition of delivery of same items with the same approved colour				
	- All the joinery items will be manufactured in accordance to the needed specifications in approved joinery factory.				
	- Price of works includes supplying, workmanship, painting, fixation, hinges, handles and all necessary parts needed to complete the works.				
8.1	Supply local made Single Bed size (1.0x2.0 m) made of 17 mm sandwich wood with beech veneer and bed Mattress with wooden pallet and 1 pillow with all needed accessories and parts to complete work according to the tender documents and engineer instructions.	Set	1		-

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
8.2	Supply standard Disk size (160x80x75 cm) made of sandwich wood with beech veneer and top face covered by Formica sheet, with fixed three drawers and fixed cabinet with leave with Stainless steel Handles, with all needed accessories and parts to complete work according to the tender documents and engineer instructions.	Set	1		-
8.3	Supply Swivel Chair, revolving with five wheels and adjustable up and down size (W43xD54xH79 cm), The back & base of the chair upholstered with approved quality Fabric and 7cm foam "industrial sponge" thickness, the chair with low back. Color determined by Beneficiary and client.	Set	1		-
8.4	Supply Wooden cabinet size 195X80X40 made of sandwich wood with beech veneer 17mm includes 2 doors + 3 shelves coated inside and outside and shelves with a layer of melamine, beech color, The rear cover of almuiznit, with all accessories and Parts to complete work according to the tender documents and engineer instructions	Set	1		-
8.5	Supply and installation of Coffee table, made up of MDF wood coated veneer beech wood, the Price include glass thickness of 6 mm (82x40 cm), as well as the price includes all needed fittings and accessories and all necessary, painting and finishing work.	Set	1		-
8.6	Supply and installation and commission 32`` LED TV SAMSUNG type or equivalent type, including complete unit of satellite receiver system the price include the dish (80cm), receiver (starsat type - Made in Korea) or equivalent type, the price include all cables and accessories to To run the system Without problems. TV table is also included made up of MDF wood coated veneer beech wood, the price includes all needed fittings and accessories and all necessary, painting and finishing work.	Set	1		-
8.7	Supply plastic chairs	NO	6		-
8.8	Supply non frost refrigerator 16 cubic feet	Set	1		-
<b>TOTAL OF BILL B8 (CUSTOM MADE FURNISHING WORKS)</b>					<b>-</b>

SUMMARY OF BOQ SERVICE BUILDING	
DESCRIPTION	TOTAL AMOUNT (EUR €)
TOTAL OF BILL B1 (EARTH WORKS)	-
TOTAL OF BILL B2 (CONCRETE WORKS)	-
TOTAL OF BILL B3 (BLOCK, PLASTERING & PAINTING WORKS)	-
TOTAL OF BILL B4 (TILING & MARBLE WORKS)	-
TOTAL OF BILL B5 (METAL WORKS)	-
TOTAL OF BILL B6 (INSULATION WORKS)	-
TOTAL OF BILL B7 (HVAC WORKS)	-
TOTAL OF BILL B8 (CUSTOM MADE FURNISHING WORKS)	-
GRAND TOTAL FOR BILL 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8	-
GRAND TOTAL FOR BILL 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 "IN WORDS"	

No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>ELECTRICAL WORKS</b>					
-	Notes:				
-	<i>The items in general shall also include conduits, connection boxes, controls, wires, connectors, clamps, bolts, and connecting the cables to switchboards and common electric network are included in the unit price.</i>				
-	<i>1. Contractor shall submit shop drawings for all electrical works to be approved by the Engineer before executing the work. The shop drawings shall include detailed lists of all electrical materials specifications (manufacturer, ratings and model numbers).</i>				
-	<i>2. All the electrical works shall be carried out according to Standards, drawings, specifications and supervisor engineer instructions.</i>				
-	<i>3. All required modifications of the attached drawings shall be the responsibility of the contractor</i>				
-	<i>4. The contractor shall be stick with the specified materials. No variations will be accepted with out prior approval of the Engineer</i>				
-	<i>5. As-built drawings shall be submitted after handing over the work.</i>				
<b>1</b>	<b><u>Lightings Fittings</u></b>				
1.1	Supply and install new LED lighting fixture 5000 lm at least, 50Watt max dust proof, IP20 (min) type Matix or equivalent. complete with PVC conduits, J. boxes, wiring and all necessary accessories. All wirings and connections are included in the unit price.	No.	3		-
1.2	Supply and install new LED lighting fixture 750 lm at least, water proof, IP54 (min) type Ensto, Gawiss or equivalent. complete with PVC conduits, J. boxes, wiring and all necessary accessories. All wirings and connections are included in the unit price.	No.	6		-
1.3	Supply, install, connect and test 8" Extractor fan with movable louvers, 250cfm, complete with PVC conduits, J. boxes, wiring, and all necessary accessories. (Type is VENTA or equivalent).	No.	1		-
1.4	Supply, install, test and connect an external LED lighting fixture IP65(min) with at least 20000 lm max. power 200 Watt type Matix or equivalent. complete with PVC conduits, J. boxes, wiring and all necessary accessories.	No	2		-
1.5	Rechargeable LED Industrial Emergency Lights Torch 400 lm (min), with battery for at least 3 hours, 2 brightness levels, min. built-in 8000mAh lead-acid battery.	No	2		-
1.6	Supply and install, test and operate air conditioning system of 18000 PTU inverter type with all required cabling, compressors and other accessories. The works include AC output socket (32A) with isolating switch and lamp complete with cables, conduits, and connections. Type is Electra platinum inverter or approved equivalent.	No	1		-
<b>2</b>	<b><u>Switches and Sockets</u></b>				-
2.1	Supply, install connect and test single pole one way switch, 220v, 13A, complete with PVC conduits, J. boxes, wiring, cover and all necessary accessories. (Type is GEWISS or equivalent).	No.	4		-
2.2	Supply, install connect and, testing double socket outlet 16A, 220v, 2p+E for flush or surface mounting, complete with PVC conduits, J. boxes, wiring, and all necessary accessories. (Type is GEWISS or equivalent).	No.	5		-

No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
2.3	Ditto, but water proof type.	No.	2		-
2.4	Supply, install connect and, testing switched socket outlet 230V, 20A, with pilot lamp, flush type for water heater (Type is GEWISS or equivalent).	No.	1		-
2.5	Supply, install connect and, testing three phase socket outlet 5X16A, 380v, 3p+N+E, IP65 surface mounting, complete with PVC conduits, J. boxes, wiring, and 5 pole plug and all necessary accessories. (Type is NESCO or equivalent).	No.	1		-
2.6	Ditto but 3X16A, 220 V including 3 pole plug.	No.	1		-
<b>3</b>	<b><u>MDB</u></b>				-
3.1	Supply, install and commission main distribution panel board (MDB) as specified as shown on drawings, factory assembled wired and tested in accordance with international standards, including 2mm Galv. steel frame with anti static paint including bus bars, neutral bus bar and earthing terminal and all necessary civil works for foundations, cable trenches and handing over clean, tested and in operating conditions. The MDB includes metering, changeover and all other circuit breakers and control circuits as here below. Unless otherwise stated, all components shall be of Moeller type or approved equivalent The work includes but not limited to the following supply and installation works :	LS	1		-
3.2	Complete metering panel for 3X100A license. The panel shall include main MCCB, Energy meters, current transformers and all required metering circuit protection as shown in the drawings and shall be approved by the Electricity local company- GEDCO	LS	1		-
3.3	All control circuits including timers, relays, thermistors etc all as per drawings etc.	LS	1		-
3.4	All bus bar, circuit breakers, fuse switches, panel lighting, control transformers, wires and cable connections and all other needed accessories to complete the job all as per attached drawings and Engineer instructions.	LS	1		-
3.5	Panel Mounted Energy meters with Modbus 485 Type socomic or equivalent for measuring (3-phase Current , Voltage, power, Total KWH, P.F, and frequency).	No.	1		-
3.6	Panel ventilation system including Extract fans for the MDB and MCC boards, thermistor relay, temperature sensors (30-70 OC), 16A contactor, MCB 1X10A.	LS	1		-
3.7	4-pole complete circuit of surge protection of short circuit rating 4X50KA type SPBT-12/4 DT together with LTL160/100A	LS	1		-
3.8	Ditto but 2-pole surge protection, model SPBT-12/2	LS	1		-



No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>4</b>	<b><u>Motor Control Center (MCC)</u></b>				-
4.1	Supply, install and commission MCC panel board as specified and as shown on drawings, factory assembled wired and tested in accordance with international standards, including 2mm Galv. steel frame with anti static paint including feeder , neutral bus bar and grounding terminal and all necessary civil works for foundations, cable trenches and handing over clean, tested and in operating conditions. (Type is MOELLER or equivalent). The panel shall drive two Pumps of 20 Hp, one running and one standby. The work include supply and installation of all required power and control circuits for auto / manual operation including all monitoring and protections in accordance with specifications, drawings and Engineer instructions The contractor has to modify the components ratings to comply with the pumping system ratings were necessary. The works includes but not limited to the following supply and installations:	Set	1		-
4.2	Molded Case Circuit Breakers 3X80 A of 50 KA short circuits type Moeller, model NZMN1- M80	No.	2		-
4.3	Fully featured Variable speed frequency driver of 20KW rating or the suitable one for 20 hp Pump engaged with Modbus communication module. The driver shall be US or European made and shall be engaged with panel mounted monitoring screen. the VFD shall include integrated line filters, chock coil and all required recommended modules necessary for smooth and safe operation . Type is Grundfos, Danfoss, Schneider, ABB or approved equivalent.	No	2		-
4.4	Complete set of Instrumentation and measuring devices including signal lamps, digital ammeters, hour meters, current transformers.	set	2		-
4.5	All other circuit breaker shown in attached MDB& MCC drawings and including also power and control circuits and pump protections , heat detection with all required Relays, PKZM, signal lamps, Control transformers, 10 A- toggle switches, emergency PB ...etc) all as per attached drawing and all components shall be of Moeller type unless otherwise specified.	set	1		-
<b>5</b>	<b><u>PLC Cabinet</u></b>				-

No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
5.1	Supply, install and commission PLC panel board as specified and as shown on drawings, factory assembled wired and tested in accordance with international standards, including 2mm Galv. steel frame with anti static paint including bus bars, terminal blocks and all necessary civil works for foundations , cable trenches and handing over clean, tested and in operating conditions. .the works includes supply and installation of the PLC of hot swap modular type with internal sufficient registers and high speed counters with all required units and modules needed for complete control and monitoring and future SCADA system all as per drawings, and engineer instruction The Programmable logic controller includes hand programmer, computer software and interface, with sufficient updated RAM, and two memory packs, logic memory of 16 kilo byte size. The unit shall be as per drawings, specifications, and engineer's instructions and the new version manufactured at the time of tendering. The work includes programming the PLC as specified by the engineer and according to the sequence to operate the pumps equal times, including all necessary extra relays and/or switches, timers, PKZM, push buttons, manual changeovers, signal lamps, MCB's of FAZ type The PLC system consists but not limited to the supply and installations of the following components				-
5.1.1	panel board as described above	L.S	1		-
5.1.2	Supply, install and operate CPU unit of Type Siemens model : SIMATIC S7-1200 CPU 1215C,COMPACT CPU, DC/DC/RELAY, 2PROFINET PORT,ONBOARD I/O: 14 DI 24V DC;10 DO RELAY 2A, 2 AI 0-10V DC,2 AO 0-20MA DC,POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY: 100 KB.	No.	1		-
5.1.3	Ditto, but 4-channel Analog input module, 24 VDC, SIMATIC S7-1200, ANALOG INPUT, 4 AI, +/-10V, +/-5V, +/-2.5V, OR 0-20mA/4-20 mA 12 BIT + SIGN BIT (13 BIT ADC).	No.	1		-
5.1.4	Ditto, but 4-chanel Analog output module, 24 VDC, 4 AO, +/-10V, 14 BIT RESOLUTION, OR 0 - 20 MA/4 - 20 MA, 13 BIT RESOLUTION.	No.	1		-
5.1.5	Ditto but Communication serial port of RS- 485 Modbus protocol. 6ES7241-1CH30-0XB0.	No.	1		-
5.1.6	Ditto but addressable collector and repeater of 4 signals of RS-485 Modbus protocol	No.	1		-
5.1.7	Built in HMI with keyboard and panel mounted, 7" screen of KTP700 including PROFINET connection with the PLC to display images, text and graphs according to real-time conditions and historical values all as per Engineer instructions	No.	1		-
5.1.8	All communication cables and profinet connections as per drawings and Engineer instruction	Set	1		-
5.1.9	SIMATIC Step 7 Basic V14 SP1	Package	1		-
5.1.10	Program Memory back of 4Mega for the PLC finished program	No.	1		-
5.1.11	Program Memory back of 4 Mega for the HMI finished program	No.	1		-

No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
5.1.12	Programming the PLC for complete monitoring and control of the two sets of pumps (1 pump on duty and one standby) the program shall control the speed of the pumps according to the variation of the pressure. The program shall also monitor all data in the VFD of each pump and all control and monitoring signals and data. It shall also be accessible through the PLC monitoring screen and future messages and SCADA System. The pumps pressure should be set by the user to 2, 2.5, 3, 3.5, 4, 4.5, etc. with a step of 0.5 bar up to the maximum bar level.	Set	1		-
5.1.13	Supply and install Temperature sensitive relays, of EMT-6 type for motor heat detection with all required circuit breakers and relays as per drawings	Set	2		-
5.1.14	Supplying and erecting electrical bell with flashing rotary lamp, 24V dc and or c, IP55 category, for outside use (external). Including all wiring requirements.	No.	1		-
5.1.15	Supply and install Gel battery -DG12VDC-40A/h type RITAR or substantially equivalent with all required cables, terminals, circuit breakers, LTL and all necessary accessories to complete the work.	No.	2		-
5.1.16	Supply and install and connect power supply 220V input- 24 VDC output 5A automatic battery charger (Maximum and minimum of the charger output voltage must be within the permissible range of the PLC input power supply, the charger must be built in with necessary protection such as (overload and short circuit, lightning, rectifier fail output, High temp ....etc.) type DATAKOM or equivalent.	No.	1		-
5.1.17	Complete control circuit including power supply 24 V, 10 A, On line pure sinusoidal UPS of 230V, 1 KVA, 30 min , manual Transfer Switches , circuit breakers , fuses ...etc all as per attached drawings.	Set	1		-
5.1.18	<b><u>Sub-Distribution Boards (DB-E)</u></b> Supply, install sub-distribution board DB-E consists of lockable board frames as per specifications including 2m Galv. steel sheets with anti-static paint, bus bars for incoming cables, neutral and earthing terminal with all necessary accessories and material to hand over clean and tested and in operating conditions. (Type is MOELLER or equivalent). the panel includes all circuit breakers and accessories shown in the attached drawings.	LS	1		-
<b><u>6</u></b>	<b><u>Cables and conduits</u></b>				-
6.1	Supply, laying under ground PVC piping system for the underground electrical network as per drawings, specifications and Engineer instructions. The work includes all electrical junction manholes with cast iron covers, excavation, laying pipes, warning tapes, backfilling, connection boxes of IP 65 where required and all required cable and wires lugs and joints and cable extensions for the existing building cables. All flexible conduits shall be of industrial type. As per drawings and engineer instructions.	L.S	1		-
6.2	Supply, laying and termination of XLPE insulated PVC sheathed cable, 0.6/1kV Copper cable, (3X25+16) mm2 of Synergy type or equivalent, For connecting the main Supply and the Generator to the MDB.	L.M	120		-
6.3	Ditto but single core XLPE 1X70 mm2 for grounding system	LM	40		-
6.4	Ditto but XLPE 4X10 mm2 Cu connected between the MCC and the pump	LM	100		-

No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
6.5	Ditto, but control cable 12X2.5 mm <sup>2</sup> for control signals terminal in DS1, DS2	L.M	120		-
6.6	Ditto, but 3X1.5 mm <sup>2</sup> between the MCC and the pump disconnection boxes for Emergency signals	L.M	120		-
6.7	Ditto but Data Shielded Cable of 3X1.5 mm <sup>2</sup> for 4-20 mA analogue for the pressure transmitters	LM	90		-
6.8	Ditto but communication cable for RS-485 or RS-232 Modbus protocol communication signal	LM	40		-
6.9	Ditto, but XLPE cable 3X2.5 mm <sup>2</sup> for the connection between the MDB and DB-E.	L.M	40		-
6.10	Supply, install and commission a complete grounding system for the service building including all required galvanized 35x3 mm steel sheet, cables, earthing pits, electrodes according to attached drawings, specification and engineers instructions that the earthing resistance shall be tested in front of the engineer and shall not exceed 2 ohm. the earthing wire shall be connected to the equipotential bass bar at the MDB& MCC panel.	LS	1		-
6.11	Supplying and erecting complete lightning protection system, Type is ABB PULSAR 45 or equivalent including air terminal, copper conductors connected from the pulsar to the grounding Electrodes, PVC chairs, inspection boxes, earthing pits with cast iron cover, connectors, clamps to obtain resistance less than 3 Ohm for three separate earthing system. The contractor should prove, measure the total grounding system resistance not more than 2 Ohms, all according to specifications, drawings and engineer's instructions.	L.S.	1		-
<b>7</b>	<b><u>Booster pumps</u></b>				-
7.1	Supplying and erecting weather proof fiber enclosure of lockable type of 40X60X25 cm of IP-65 Hager type or equivalent on galvanized beams or on walls adjacent to the pumps according to drawings and Engineer approval. the box include two local service On/Off switch of Type PN- 3X64A rating each with external handles and associated emergency stop Type K. Moeller, Hager or equivalent. All power and control cables, glands and connections are included	No.	2		-
7.2	Supply and install micro-switch IP 65 with N.O and N.C 10A contacts type is ABB, Moeller or substantially equivalent, connected to NRVs on the check valves the price includes all required cable, conduit, ducts, to connect the micro-switch to the pump disconnect switch panels as per the engineer instructions.	No.	2		-
7.3	Supply, install and program pressure transmitter connected to pump control panel through the disconnect switch panels, consist of (pressure sensor and digital display as per the following specifications: Pressure sensor stainless steel, pressure rang adjustable (0-16 bars)), power supply 16-32 VDC, output 4-20mA, IP 67. KOBOLD type or equivalent, The work include supply and install all required connectors, stainless steel ball valve, opening and welding the main pipe, control and power cables (cross section at least 1mm <sup>2</sup> shielded cable), ducts, excavation and backfilling, supports, and all necessary materials and accessories to complete the work as per the supervisor instructions. The price include a galvanized steel housing box with lockable door and key.	No.	1		-

No	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
7.4	Supply, install and program high pressure switch 0-16 Bar of Danfoss RT Type	No.	1		-
7.5	Supply, install and program low pressure switch 0-6 Bar of Danfoss RT Type	No.	1		-
7.6	Complete all required connections of power and control cables including the connection of data cables. All control cables shall be installed inside industrial conduits of 20-25 cm diameter. The price includes all civil works are included in the price for both	LS	1		-
7.7	<b>FIRE ALARM SYSTEM:</b> Supply, install and commissioning addressable fire alarm system as per drawings including fire resist PVC pipes, pull boxes special wires which includes :				-
7.8	Fire alarm control panel complete with batteries and all necessary accessories.( 2 ZONES, Type is TELEFIRE or equivalent).	No.	1		-
7.9	Supply, install and commission ionization smoke detector, the detectors shall be twin-chamber with latching electronic circuitry, two wire connection.(Type is TELEFIRE or equivalent). The work includes all wiring	No.	3		-
7.10	ditto, but heat detector.	No.	1		-
7.11	Supply, install break glass call point as per drawings the unit shall be standard type for interior use with key operated test facility, with plastic coated glass.	No.	3		-
7.12	Supply, install 95 db electronic horn ultra sound for indoor and outdoor used. (Type is TELEFIRE or equivalent).	No.	2		-
8	<b><u>Spare Parts</u></b>				-
	Supply to the store the following:				-
8.1	Fully featured Variable speed frequency driver of 20KW rating or the suitable one for 20 hp Pump engaged with Modbus communication module. The driver shall be US or European made and shall be engaged with panel mounted monitoring screen. the VFD shall include integrated line filters, chock coil and all required recommended modules necessary for smooth and safe operation . Type is Grundfos, Danfoss, Schneider, ABB or approved equivalent	No	1		-
2.9	<b><u>Miscellaneous</u></b>				
9.1	Air blowers control system: the control should run three 4KW air blowers as follows, two air blowers can run at the same time and one is standby. The control will run a certain air blowers for a period of time then the other will take its place. The operator shall be able to control the max run period of an air blower. The control shall also have a switch selector to run, and stop the operation of all air blowers. The control strategy should be handled to the engineer for review and approval. The item include all parts, cables, connections, establishments, etc. to run the system as per the engineer instructions and specifications.	LS	1		-
<b>TOTAL OF BILL ( ELECTRICAL WORKS)</b>					-

SUMMARY OF BOQ ELECTRICAL WORKS	
DESCRIPTION	TOTAL AMOUNT (US\$)
GRAND TOTAL FOR ELECTRICAL WORKS	-
GRAND TOTAL FOR ELECTRICAL WORKS "IN WORDS"	

No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
<b>SECTION NO.01: EXCAVATION and EARTH WORKS</b>					
	* <b>Notes:</b> The Prices for all earthworks works (items) shall include the following:				
	- <i>Submit shop drawings for all works and get the approval of the engineer before commencement of the works.</i>				
	- <i>Demolition of any existing structure based on the Engineer instructions.</i>				
	- <i>Stockpiling selected excavated material near the site based on the Engineer instructions to re-use it later in backfilling works, and the surplus shall be transferred out of the site according to the instructions of the engineer from the project site</i>				
	- <i>All Works must be executed according to drawings, specifications and engineer instructions</i>				
	- <i>Cut and restore the existing roads or the surrounding fence of the adjacent sand filter for PEC DAR and Oxfam (if needed) according to the engineer instructions</i>				
No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
1.1	Clearing and Grubbing Remove & Clear the site from rubbish, trees, shrubs, debris, concrete, boundary walls and fences .... etc. to be ready to starting the excavation work and cart away the excavated material from the site to any location approved by the engineer.	L.S.	1		-
1.2	Excavation from ground level up to required designed level for all elements of the project (purification ponds, aeration lagoon, septic tanks ....etc.) and the price shall include compacting the soil surfaces to get at least (98% MDD) under structural elements only and the price include reshaping the side slopes of the aeration lagoon as shown in the drawings.	L.S.	1		-
	For structural elements Backfilling, compact excavated selected clean sand and fill in layers 20 cm thick in all places requiring backfilling to make up levels according to the drawings, (95% MDD) as per specifications, drawings and engineer instructions. This is not including the fills in the purification ponds.	L.S.	1		
	For the purification ponds Filter media Supply and laying of suitable natural gravel (size is not less than 30 mm), the thickness of the layer will be according to the attached drawings, including the burden of protection of draining pipes. All the work will be implemented according to the specifications and the instructions of the supervision engineer.	M3	2050		

	<p>For the purification ponds</p> <p>Filter media</p> <p>laying of suitable layer of excavated selected clean sand, the thickness of the sand layer will be according to the attached drawings, and instructions of the supervision engineer. Minimum permeability = 8 m/d and fill in one layer as per specifications, drawings and engineers instructions. The contractor shall perform testing for permeability coefficient for three samples and get the approval from the engineer before commencement of the works.</p>	M3	3444		
	<p>For the purification ponds</p> <p>Filter media</p> <p>Supply and install a separating filter layer, composed of a double layer of protective net (insect-net or dust-net) to protect the collection pipes. This layer will be placed immediately above the gravel layer and below the clean sand layer.</p>	M2	4305		
	<p>For the purification ponds</p> <p>Vegetation Soil Layer</p> <p>Supply and laying of suitable layer of loose vegetation soil to cover the filter bed placed above the influent perforated pipes, carried out without compaction such as to be finished, completed and leveled, measured as a result, including the burden of the eventual recharge and subsequent watering. The thickness of the vegetation sand layer will be according to the attached drawings. All works will be performed according to the specifications and instructions of the supervision engineer.</p>	M3	1077		
	<p>For the purification ponds</p> <p>Vegetation Soil Layer</p> <p>Supply Alfalfa seeds with the following specifications: Free of weevils and impurities, germination rate not less than 97%, purity percentage of 95%, the production year is not more than 12 months. The work will be implemented according to the specifications and the instructions of the supervision engineer.</p>	M2	4305		
<b>TOTAL OF BILL B1 (EXCAVATION &amp; EARTH WORKS)</b>					-



<b>B2 - CONCRETE WORKS</b>					
	* <b>Notes:</b>				
	- Submit shop drawings for all concrete works and get the approval of the engineer before commencement of the works.				
	- All material must be approved before starting the works.				
	- All concrete to be used in the project, must be from ready mix concrete.				
	- Approved additives and admixtures				
	- Factory of Ready mix concrete must be approved from pertinent authorities.				
	- Supplying, Casting, vibrating and curing all elements of concrete as shown in the documents.				
	- All form works, shuttering in any form (wood or steel), shape, decoration, fabrication, arches. Making chamfered and curved edges , making good grooves and sleeves , surface finishing				
	- Painting all exposed surfaces of underground reinforced concrete elements with at least one primer coat & two coats of hot bituminous paint (75/25), the strokes of each layer to be opposite to each other				
	- The Contractor shall use Galvanized tie Rods "BATANT" 8mm in the wall shuttering.				
	- Supplying reinforcement steel of grade 60 (4200kg/cm <sup>2</sup> ), size and length as detailed in the drawings, storing on the site including cutting, bending and fixing in position and providing all tying wires, spacers , testing and bar bending schedules				
	- All materials needed to execute the works completely for example but not limited to : (all concrete types , Vibrators , steel with all diameters & size , shuttering , pipes & fittings for mechanical installation , polythene sheet 200 micron, workmanship , polystyrene 2cm for joints , bitumen , testing material...etc.).				
	- Finishing all horizontal surfaces of concrete (slabs, Slab on Grade, Etc.) The concrete surfaces shall be finished mechanically with (helicopter) to give smooth surfaces.				
	- All elements of concrete must obtain compressive strength not less than 115% from type of concrete after 28 days (for example B300 must give 345kg/cm <sup>2</sup> ), and if the concrete not reaches to the required strength, the following steps must be applied: a- check the design, if safe and the compressive concrete value equal or more than the value that denoted in the B.O.Q will be accepted but, b- will make discount at least 20% of the price of the item.				
	- All works must be according to drawings, specifications, and the engineer instructions.				
	- The contractor shall provide a job mix from an approved laboratory and get the approval from the engineer.				
No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
2.1	Supply and cast plain concrete B200, 10cm thick below foundations of Retaining Walls, calm tanks, septic tanks, boundary wall and other elements.	M3	91		-
2.2	For the purification ponds & Aeration lagoon (base only), supply and cast a reinforced concrete slab on grade of at least 10 cm thickness of B250 concrete (ø8mm/20cm mesh in both directions). The slab will be underlined by polyethylene sheet (Naylon of 0.2 mm thickness). The work includes a semicircular drainage channel and Expansion Joints as shown in the drawings.	M3	454		-

2.3	For aeration lagoon (Side wall), ramp, and slabs between ponds, supply and cast a reinforced concrete slab on grade of at least 15 cm thickness of B250 concrete (φ10mm/20cm mesh in both directions) The work includes expansion joints as shown in the drawings.	M2	193		-
2.4	Supply and cast B250 reinforced concrete for stairs, boundary walls, main gates columns (30*20cm), the four distribution manholes and foundations of septic tanks & clam tank. The reinforcement is according to drawings.	M3	305		-
2.5	Supply and cast fair face reinforced concrete B300 for foundations and walls of retaining walls and septic tanks walls. The price shall include isolation works for the inside face for all concrete element with a minimum of one primer coat & two coats of hot bituminous paint (75/25).	M3	436		-
<b>TOTAL OF BILL B2 (CONCRETE WORKS)</b>					-
<b>B3- METAL WORKS</b>					
No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
3.1	Supply and install cast iron cover engraved (Wastewater) by English & Arabic letters for manhole openings and calm tank opening (25 tons capacity and 60cm opening), including square frame rings and internal painting. All must be according to Specifications & the Engineer instructions.	No.	17		-
3.2	Supply & install fence made of wire mesh of size 50x50x3mm HOT-DIP Galvanized double twisted, the price includes 2.3m height galvanized steel profile 80x40x2mm each 3m, galvanized straining wires, stiffeners, barbed wires, supports profiles at corners and each four panel, painting for profiles...etc. as per drawing, specifications and the engineer instructions.	LM	352		-
3.3	Supply, fix and paint double leaves galvanized steel gate size 400 cm wide x 210 cm high (made of wire mesh of size 50x50x3mm HOT-DIP Galvanized double twisted which includes galvanized steel pipes sections, galvanized straining wires, stiffeners, painting, frame, hinge, hardware locked, ironmongery &...etc. to complete the works. ,..etc. as per drawing, specifications and the engineer instructions.	No.	2		-
3.4	Supply and install handrail around the septic tanks for protection purpose with railing pipe (50mm for top horizontal pipe and vertical pipes and 38mm for middle horizontal pipe) and 3mm thick. The handrail height is 90 cm and the distances between vertical pipes are 90cm. The price includes the steel pipes and fixing plates, painting with one coat primer, under coat and two coats of hummer finish oil paint. Fixing handrails and all necessary works needed shall be according to specifications and approved according to the Engineer instructions.	LM	310		-
<b>TOTAL OF BILL B3 (METAL WORKS)</b>					-

<b>B4 - MECHANICAL WORKS</b>					
	* <b>Notes:</b>				
<b>No.</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QTY.</b>	<b>RATE (EUR €)</b>	<b>AMOUNT (EUR €)</b>
4.1	Supply, install, PVC pipes for outlet drain with watertight and flexible joints sealed with approved gasket rubber ring including laying in any soil, connection with manhole and concrete Benching, safety measures and testing. The price includes laying excavated sand from the site around, top and bottom of the pipe. The selected material will be used for backfilling the rest of the trench in layers not exceeding 25cm (for each layer) with compaction not less than 95 %, up to the design levels of the roads, leveling the roads after backfilling, take away the surplus soil as specified and instructed by the engineer. The price shall include different required fitting e.g., elbows, scam baffles,... as shown in the drawings and the engineer instructions.				
4.1.1	Supply and install PVC DN400 pipe - SN 8, as shown in the drawings.	L.m.	25		-
4.1.2	Supply and install PVC DN250 pipe - SN 8, as shown in the drawings.	L.m.	25		-
4.1.3	Supply and install PVC DN200 pipe - SN 8, as shown in the drawings.	L.m.	200		-
4.1.4	Supply and install PVC DN160 pipe - SN 8, as shown in the drawings.	L.m.	150		-
4.1.5	Supply and install PVC DN125 pipe - SN 8, as shown in the drawings.	L.m.	15		-
4.1.6	Supply and install PVC DN80 pipe - SN 8, as shown in the drawings.	L.m.	45		-
4.1.7	Transport and install perforated PVC DN80 pipe, as shown in the drawings.	L.m.	2000		-
4.2	Supply and install 200 mm diameter pressure HDPE pipe for inlet pipe from the 8" part of Y-T connection to the calm tank. The price includes all necessary elbows according to the drawings and specifications and engineer instructions.	L.m.	55		-
4.3	Supply and install 125 mm diameter HDPE pipe for inlet pipe. The price includes all necessary elbows according to the drawings and specifications and engineer instructions.	L.m.	150		-
4.4	Supply, install and cast in place Circular reinforced concrete manholes (B300) and cast iron steps @30cm spacing, built-in collector inlet and outlet pipes. The price includes two external bitumen coating, shuttering, shoring, safety measures, formwork, excavation in any type of soil, backfilling with selected material in layers 20cm thick each and compaction 95% MDD. The price includes also supplying and casting 10cm plain concrete B200 under the bottom of the manhole and plain concrete for benching. All are as per drawings, specifications, and the engineer instructions.				-

4.4.1	Diameter of 150 cm and Depth up to 1.50m.	No.	3		-
4.4.2	Diameter of 150 cm and Depth of 3.65m.	No.	2		-
4.4.3	Diameter of 100 cm and Depth up to 1.50m.	No.	9		-
4.5	Supply and install 200 mm diameter globe valve (HAKOHAV kind) in the main influent line, soft sealed, and all fittings needed for proper installation and operation as indicated in the drawings, specifications, and according to the manufacturer and supervision engineer's instructions. The work according to the drawings and specifications and engineer instructions.	No.	1		-
4.6	Supply and install 250mm diameter Ball float valve with all other requirements to complete the work according to the drawings and specifications and engineer instructions.	No.	2		-
4.6.1	Supply and install 200mm diameter Ball float valve for the influent pipe with all other requirements to complete the work according to the drawings and specifications and engineer instructions.	No.	1		-
4.7	<b>For septic tanks</b> Supply and Install 200mm circular cast grey iron sluice gate for 200mm pipe SINYAVER or ZET or equivalent, and stainless steel non-rising long stem complete with all requirements for installation and operation according to the drawings and specifications and engineer instructions.	No.	4		-
4.8	Supply and install 8" gate valve manual with gear mechanism and includes one flange couplings and one open flanged as shown on the Drawings and all notes above as described in the Specifications or directed by the Engineer	No.	2		-
4.9	Supply and install Flow Meter 8"ARAD or Equivalent and includes two flange couplings. As shown on the Drawings and described in the Specifications or directed by the Engineer.	No.	1		-
4.10	Install the aeration system as shown in the drawings and as the engineer instructions including (supply and install for main pipe DN100, air left pipes DN65, concrete blocks 40*40*20cm, and pipes supply ¾") and (transport and install the Blowers). The price shall include the pipe fixation and any needed modification to get the best operation according to the engineer instructions.	L.S.	1		-
<b>TOTAL OF BILL B4 (MECHANICAL WORKS)</b>					-

B5 - EXTERNAL WORKS					
No.	DESCRIPTION	UNIT	QTY.	RATE (EUR €)	AMOUNT (EUR €)
5.1	Clean, excavate, cut and fill (as needed) by approved material and grade from natural ground level to the bottom of base coarse layer design level of the roads and cart-away disposal of excavated material as per drawings, specifications and engineer's instructions. (The price includes watering, compaction not less than 98% & CBR not less than 10%).	M2	1452		-
5.2	Supplying, laying, compacting 8 cm thick colored inter locking tiles; size & shape the price shall include Supplying and laying two layers of basecourse 10 cm each layer as shown in the drawing and according specifications & the engineer's instructions.	M2	1452		-
5.3	Supplying and installing two steel banners, the first one is 4*3 m with 4 mm minimum thickness, and high 3 m to be fixed in the main street with 10*10 cm legs , and the second one inside the site 2*1.5 m, in additional to marble banner 1*0.8 m at the end of the project regarding to the instruction of the engineer.	L.S.	1		-
TOTAL OF BILL B5 (EXTERNAL WORKS)					-

SUMMARY OF BOQ	
DESCRIPTION	TOTAL AMOUNT (EUR €)
TOTAL OF BILL B1 (EXCAVATION & EARTH WORKS)	-
TOTAL OF BILL B2 (CONCRETE WORKS)	-
TOTAL OF BILL B3 (METALWORKS)	-
TOTAL OF BILL B4 (MECHANICAL WORKS)	-
TOTAL OF BILL B5 (EXTERNAL WORKS)	-
GRAND TOTAL FOR BILL 1 + 2 + 3 + 4 + 5	-
GRAND TOTAL FOR BILL 1 + 2 + 3 + 4 + 5 "IN WORDS"	

SUMMARY OF BOQ	
DESCRIPTION	TOTAL AMOUNT (EUR €)
TOTAL OF CARRIER LINE	-
TOTAL OF BOOSTER SITE	-
TOTAL OF SERVICE BUILDING	-
TOTAL OF ELECTRICAL WORKS	-
TOTAL OF WW TREATMENT PLANT	-
GRAND TOTAL	-
GRAND TOTAL "IN WORDS"	