

REPUBLIC OF YEMEN
MINISTRY OF WATER AND ENVIRONMENT
LOCAL WATER AND SANITATION CORPORATION ADEN (LWSCA)

**CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY
DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF
YEMEN.**

ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT

**CONSTRUCTION OF MAIN SEWAGE PUMPING STATION
(PHASE 1, PART 1)**

IMPLEMENTED BY:

UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES (UNHCR)

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THE GOVERNMENT OF REPUBLIC OF YEMEN
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Bill of Quantities

Prepared by
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ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT

CONSTRUCTION OF MAIN SEWAGE PUMPING STATION (PHASE 1, PART 1)

BILL OF QUANTITIES

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PREAMBLE TO BILL OF QUANTITIES

PREAMBLE

1. Introduction

1.1 The Bill of Quantities includes this Preamble, the General and Preliminaries Schedule, Work items, Grand Summary and Schedule of rates.

1.2 The quantities set out in the Bill of Quantities are the estimated quantities of the work and they are not to be taken as the actual and correct quantities of the Works to be executed by the Contractor in fulfillment of his obligations under the Contract.

1.3 The Permanent Works shall be measured net notwithstanding any general or local custom except where otherwise specifically described or prescribed in the Contract.

1.4 The rates and prices in the Bill of Quantities shall, except where otherwise provided in the Contract, cover all the Contractor's obligations under the Contract and all matters and things necessary for the proper execution, testing, commissioning, and maintenance of the Works (Rates shall be deemed to include for supply/install/fix/lay/apply ... etc).

1.5 The rates for each item must allow for complying in all respects with the requirements as stated above and include for all the following:

- (a) Labour and all costs in connection.
- (b) Materials and goods including all costs in connection.
- (c) Fixing material and goods in their final position including hoisting to any height or lowering at any depth.
- (d) Provision of plant, equipment, and tools and all costs in connection.
- (e) Temporary works if not measured separately.
- (f) Working at any depth or height, including dewatering and shoring.
- (g) Establishment charges, overheads, and profits.

1.6 The rates and prices shall include all tax components, custom duties, and any other related governmental fees.

The payment currency will 100%) in US Dollars-

1.7 Except where otherwise detailed in the Bill of Quantities or specified, labour, including the supervision thereof, materials, constructional Plant, Temporary Works, accommodation and site facilities, transport to and from site and in and about the Works and other things of every kind required for the execution and maintenance of the Works shall not be measured and the cost thereof shall be deemed to be included in the rates and prices in the Bill of Quantities.

1.8 The total quantity included in the final measurement of each item shall be measured to the nearest integer relative to that item, or to one decimal place if so indicated in the Bill of Quantities.

1.9 The following abbreviations are used in the Bill of Quantities:

m ²	Square meter	km	kilometer
m ³	Cubic meter	%	per cent
No.	Number	diam	diameter
hr	Hour	t	Tonne
diam	Diameter	l	Litre
kg	Kilogramme	GMS	galvanized mild steel
Prov.Sum	Provisional Sum	AC	Asbestos cement
mm	Millimeter	DI	Ductile iron
L.m	Meter	DN	Nominal Diameter of
uPVC	Unplasticised		pipe (mm)
	polyvinyl chloride	PN	Nominal pressure
P&I	Process and Instrumentation	OD	Outer Diameter
Sum	Lump Sum	ID	Inner Diameter
L.V.	Low Voltage	HDPE	High Density Polyethylene
RTU	Remote Terminal Unit		
SCADA	Supervisory Control and Data Acquisition		
UPS	Uninterruptible Power Supply		
VHF	Very High Frequency		
I/O	Input/Output		
HVAC	Heating, Ventilation and Air Conditioning		
OHL	Overhead Line		

1.10 Bill of quantities shall not be used for procuring the materials. It is the responsibility of the Contractor to verify prior to placing orders that the ordered material quantities are sufficient to carry out the whole of the Works proposed under the Contract. An extension of time or other compensation shall not be granted by the Employer to the Contractor due to shortages of required materials.

2. Provisional Quantities

Items in the Bill of Quantities marked “PROVISIONAL QUANTITY” shall only be executed if they are subject of a written instruction from the Engineer. The rates set out for such items shall be used for the valuation of Works so ordered by the Engineer in writing whether the quantities shown are used wholly or in part. The quantities set out in the Bill of Quantities are the estimated quantities subject to re-measurement.

3. Provisional Sums

“Provisional Sum” means a sum included in the Contract and so designated in the Bill of Quantities for the execution of work or the supply of goods, materials, or services, or for contingencies, which sum may be used, in whole or in part, or not at all, at the direction of the Engineer, who shall consult with the Employer prior to the issue of an instruction to this expenditure. The Contract Price shall include only such sums in respect of the work, supply reinstatement or other services to which such Provisional Sums relate as the Engineer shall approve or determine in accordance with the Bill of Quantities items.

The item Contractor's overhead and profit shall be filled by tenderer as an amount forming percentage of total provisional sum and will be paid as percentage of actual work done.

4. Schedule of rates/Dayworks

The daywork shall be used in accordance with the requirement.

4.1 Labour

No payment shall be made in respect of wages of the Contractor’s site management, supervisory and administrative staff, the costs in respect of which shall deemed to be included in the rates given by the Contractor. Gangers or charge-hands working with their gangs shall not be counted as site management, supervisory or administrative staff.

The rates shall be deemed to cover:

- (a) All statutory charges in accordance with government regulations and all other charges and costs in respect of or incidental to the employment of the said labour on a daywork basis, except only the cost of materials and constructional plant.
- (b) The costs in respect of portable hand tools such as picks, shovels, barrows, trowels, ladders, handsaws, buckets, trestles, hammers, chisels and all items of a like nature, which for the purpose of work executed on a daywork basis shall not be considered as constructional plant.
- (c) All Profits and overheads.

4.2 Materials

The “Net cost of materials” means the net cost of such materials delivered by the supplier to store or stockpile on the site. The cost of taking the materials from the store or stockpile on the site to the place where they are used shall be included in the percentage addition allowed in the Bill.

The “Percentage addition” shall cover the Contractor’s costs in taking delivery and supplying to actual place of work or stockpile, storage, overheads, profit and all other charges and costs in respect of or incidental to the procurement and handling of such materials.

4.3 Constructional Work

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4.4 Any items not covered in the Dayworks Bill, the rates will be fixed based on similar works in the Bill.

5. Fixing and Building in

unless expressly itemized separately in the Bill of Quantities, no separate measurement shall be made in respect of items, whether specified or not, requiring: mortar; building in a fixing to blockwork, concrete, metalwork or timber; painting and protective treatments, welding; drilling; bolting inclusive of bolts, nuts and washers; screws, nails and plugs; jointing and joint materials; shuttering; boxing out and filling thereof; grouting; packing; bedding; insulation between different metals, making good; conduits and fittings; cutting; waste; labour; materials; temporary Works; construction; plant; storing; handling; and all incidental work to the items concerned and their surroundings.

6. General Requirements - Chapter (1)

No separate payment shall be made for complying with the requirements of Chapter 1 of the specifications. Unless expressly itemized in the Bill of Quantities all the requirements of Chapter (1) of the specifications shall be deemed to be included in the rates and prices of the Bill of Quantities.

7. Sewerage Network and Force Mains

7.1 Gravity Sewers from uPVC and VC Pipelines

Supply and Installation Works

This item is measured in linear meters for the supplied and installed quantity of pipes including, fittings and flexible joints according to the specified materials, diameters and pipe depths as shown in the Bills of Quantities. The supply of material shall match the construction programme, approved shop drawings and only the quantity agreed and accepted by the Engineer will be considered for payment during the interim payment. Installed pipelines shall be measured by linear meters from the internal face of the subsequent manholes, inspection chambers, etc. The pipes depth shall be measured from the surface levels of the roads to the invert of the pipes in case of the pipes to be laid under roads. If the pipes will be laid outside the roads, the depth will be measured from the ground level to the invert level of the pipes.

The rate for supply and installation of pipelines shall include the following works as specified:

- Testing as per Manufacturer's instructions, packing and dispatching.
- Supply to site stores in an acceptable working conditions.
- Submittal of all relevant certificates as per the Contract provisions.
- Removing pavement, masonry, blocks and all types of obstructions.

- Coordination and taking all necessary actions concerning existing utilities (e.g. temporary / permanent diversions, support and replacement / rerouting of existing utilities as directed by the Engineer). Replacement / rerouting of existing utilities shall be made after the approval and full supervision of relevant authorities.
- Excavation of trench to the required depth and width in all types of soil not including rock.
- Leveling, protection of trenches and keeping the sides of excavation true by struts and sheeting.
- Laying and joining pipes for the gravity pipelines including cutting, joints, and short pieces, complete with the proper type of bedding.
- Testing of pipelines before backfilling.
- Backfilling using suitable excavated materials from trenches or any suitable material in the project site.
- Disposing the surplus excavated materials and the unsuitable excavated materials off the project site.
- Breaking out, temporary and permanent reinstatement of all surfaces including reinstatement of paved roads.
- Re-testing of pipelines after complete backfilling as per Specifications.
- Pipeline cleaning.

7.2 Trial Holes

This Item is measured cubic meter; rate shall include the following works.

- Excavation to required depths in any type of soil including rock.
- Re-filling and reinstatement of trial holes immediately after carrying out the required information.

7.3 Services and Other Crossings

Crossing existing services and any temporary measures required to deal with such services shall not be measured for payment, and the cost thereof shall be included in rates entered for other items in the Bill of Quantities. Works should be made after prior approval of Employer and should be completed within 24 hours.

Permanent diversion or replacement of existing services shall, if carried out by the Contractor, be measured on a day work basis. Pursuant to the Preamble to the Day work Schedule such day work shall be classified as 'ordinary day work'.

Prior to implementation the Contractor should submit plans and method statement to Employer and Engineer for approval. It is the Contractor responsibility to invite of relevant services authorities to be presented during implementation.

7.4 Manholes

This item is measured in number; rate shall include the following works as specified for the types and depths according to drawings, specifications and Bill of Quantities:

- Excavation to required depths in any type of soil not including rock.
- Construction of reinforced or plain concrete foundation including supply, cutting and fix steel reinforcement and forming benching with plain concrete.
- Supply and paint three layers of coating as specified to the external walls of manholes adjacent to the backfilling.
- Supply and paint internally two layers of coating.
- Construction of bottom benching and side slopes as per drawings
- Supply and installation of reinforced concrete manholes cast in situ and all necessary works as shown on detailed drawings.
- Supply and install of steps as per detailed drawings.
- Supply and install connection of short piece of pipes outside of manhole with length 1.5 items the diameter of pipe (not grater than 600 mm) to avoid deferential settlement.
- Supply and installation of ductile iron cover and frames of heavy duty type.
- Testing of manholes/collection chambers, backfilling and compaction.
- Backfilling using suitable excavated material or any suitable material from the project site, compaction and restoration of ground surface to its original conditions.
- Disposing of the surplus excavated material and unsuitable excavated materials off the project site.

7.5 Manholes Drop Pipings

The item shall be measured by number and shall include all supply, installation and testing works for additional piping to be mounted for specified manholes to construct manhole drop piping in concrete encasement with all necessary piping, fittings, excavation works, encasement, testing, backfilling, disposal of surplus material and unsuitable excavated materials off the project site.

7.6 HDPE Force Main Pipelines

7.6.1 Supply and Installation of Pipes

The pipes shall be measured in linear meters for only the supplied and installed quantity of pipes including fittings.

The rate shall include for the following:

- Supply and transportation of pipes and fittings to site
- Excavation and disposal of surplus material in all materials not including rock, to the maximum bottom width of trench permitted under the specification for ranges of depth measured to the invert of the pipe.
- Earth work supports or shoring of trenches wherever necessary.
- Location, crossing and reinstatement of hedges, walls, fences, and underground services.
- The provision and laying of bedding material.
- Laying and jointing pipes and fittings.
- The provision and placing of suitable material for backfilling of pipe trench.
- Breaking out, temporary and permanent reinstatement of all surfaces including reinstatement of paved roads.
- Testing of the pipeline.
- Welding of pipes.
- Supply and installation of marker tape and marker posts.

7.6.2 Valve Chambers on Force Main

Valve chambers shall be measured by number, as indicated in BOQ complete and shall include earth works (in all types of soil not including rock), concreting, benching, steps, cover slabs, chamber covers and frames, surface boxes, extension rods, support brackets as per specifications and standard details drawings.

The rate shall also include all necessary works including excavation, provision, laying, jointing, testing, cleaning, anchor blocks, backfilling, protection, disposal of surplus and unsuitable materials off site, etc. The rate shall also cover the redesign of valve chambers and/or thrust blocks to accommodate space restrictions, changes in ground conditions, supplied fittings dimensions, etc. All water for cleaning and testing of chambers shall be provided by the Contractor and no separate payment will be made for provision and disposal of water.

7.6.3 Valve Chambers Fittings

Supply and installation of Ductile Iron valves and fittings inside all valve chambers. Measurement shall be by number supplied according to type and size as specified. The rates shall include all necessary works as supply, laying, erection, jointing, testing, all necessary associated pipes & pieces, puddle pieces, etc.

The rate shall include the submittal of Shop Drawings to the Engineer for approval before works commencement for the following (as a minimum requirement):

- Valve chambers including all internal fittings, valves, ... etc.
- Complete dimensions of the chambers and each piece (fittings, valves, ... etc.).
- All structural details and calculation sheets.
- Any details essential for the execution of works or requested by the Engineer.

Pipes, fittings and valves specified for supply by the Contractor shall be delivered to the place of work and the rate shall cover for this and the supply of all necessary joints and jointing materials. The rate shall also include for linings, coatings, sleeveings and all other protection.

8. Structural and Building Works

8.1 The Site and Reinstatement

No separate payment shall be made for complying with the requirements of the specification regarding the site and reinstatement works with the exception of the items included in the Bill of Quantities.

8.2 Earthworks

Earthworks as specified shall be measured in cubic meter in the categories of excavation, and shall be as follows:

8.2.1 Excavation

- All excavation shall be measured geometrically and net, according to drawings and shall be deemed for re-use and removing surplus and disposal of unsuitable excavated material as specified.
- The volume measured as the product of the horizontal area of the base of permanent work (excluding blinding) to be constructed and the mean depth below finished ground level or measured as the volume to be occupied by permanent work below ground level, whichever is the greater.
- The Contractor shall take into consideration that he might need special excavation techniques and additional safety precautions at locations of deep excavation for pump station or mechanical coarse screen (6.0 – 10.0 m depth).
- The Contractor shall take into consideration that he might need additional width for workspace for deep excavation (6.0 – 10.0 m) depending on his excavation techniques.

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Rates are to include for:

- Site leveling as the difference between finished ground level and original ground level (the latter being agreed prior to commencement of earth Works).
- Increase in bulk or shrinkage.
- Excavation in loose or hard sand, gravel and soil.
- Upholding sides of excavation with timber, steel sheeting or any other means.
- Working space where required.
- Temporary soil heaps and multiple handling as required.
- Leveling or grading and compacting the bottoms of all excavations to receive concrete and other permanent works.
- Excess excavation as specified resulting from removing more than the net dimensions of the foundation shown on the drawings and/or as specified or described in this method of measurement.
- Backfilling using selected excavated material, removing surplus and disposal of unsuitable excavated material to heaps.
- In trench for pipelines, etc. as described elsewhere in this preamble.

8.2.2 Excavation in rock, which shall be measured in sole category measurement by volume from the level at which rock is encountered, unless otherwise is mentioned including rock in Bill of Quantity.

8.2.3 Backfilling

Backfilling shall be with imported clean suitable material as stated when backfilling rate is shown in Bills of Quantities, backfilling shall be measured as equal to the volume to be filled. The given quantities and the stated thickness shall be the finished thickness after compaction and penetration.

Rates are to include for:

- Compaction in layers as specified.
- Any loss in volume due to shrinkage or compaction, and for any additional materials required due to penetration of filling materials into the ground or any settlement or compaction of the original ground levels under the weight of materials or due to methods of compaction or traffic required for construction.
- Temporary spoil heaps and multiple handling as required.
- All labour including hand-packing and temporary retaining boards where required.

8.2.4 No separate payment shall be made of making records of ground levels and topography; providing and ,maintaining proper markers and profile rails; supporting excavations; making good slips, falls and excess excavations for working space or any other reason;

trimming surfaces of excavations for structures and embankments; making allowance for settlement or heave; selection of material for backfill against permanent Works; compaction trails; compacting with hand held equipment; compaction and control of moisture content; testing; preparation and restoration of borrow pits including removing and disposal of unsuitable surface and other material; scarification; location marking and shaping of disposal heaps and embankments; keeping the Works and excavations dry; blasting in excavation or quarry, storage of explosives; haul; placing materials by hand; preparing plans of earthwork operation; stockpiling and double handling resulting from use of excavated material for fill; trench for pipes and cables within a structure; supplying samples for testing by the Engineer; interruptions and delays while carrying out tests.

8.3 Concrete and Reinforcement

8.3.1 Concrete shall be measured by volume as the product of the horizontal area of the base of the permanent work and the mean depth with no deduction for space occupied by any item fully embedded in or any recess, chase or fixture having a cross sectional area of less than 0.25 square metres or width equal to or less than 100 mm. The rate shall include for formed chamfers to all exposed edges.

The superficial area by which work may be measured shall be the net area of the permanent work with no deductions for openings less than 0.25 square metres or of width equal to or less than 100 mm.

Each specified class of concrete shall be measured individually. Where concrete finish is not formed by shuttering the rates or placing of concrete shall include for finishing surface to type U1, finishing concrete to Types U2 and U3 shall be measured separately.

Formwork shall be included in the concrete unit rates. All formwork are to include for working in narrow widths and small quantities, for setting up, strutting and supporting at any height together with any necessary coating with shutter oil, casing, props, stays, struts, wedges, blots, all overlaps and passings at angles, intersections, raking and circular and notching around all obstacles, striking and removing, cleaning, preparing for re-use and removal from site when no longer required.

Formwork to designed joints or for jointing and cutting waterstops is not measured separately

Formwork for various types of finishes are to include in addition to the requirements of the previous clauses for forming respective finishes to the concrete faces in accordance with the specification.

8.3.2 Reinforcement shall be measured by tone for all diameters as shown on the drawings and placed in the Permanent Work. The mass of reinforcement shall be calculated using the appropriate mass per meter run value from Table (2) of BS 4449. Reinforcement drawings

will be issued for all permanent work.

Steel wire fabric reinforcement shall be measured by area for each mass of fabric with no allowance for laps. Rates shall include for chair and spacers to provide cover to reinforcement and separation between bars, binding wire and other items required for supporting and securing the reinforcement in its correct position together with the preparation of bar bending schedules based on the reinforcement drawings provided by the Engineer.

8.3.3 No separate payment shall be made for expansion and construction joints including shuttering, joint filler, primer, joint sealant, sealing strip membrane, waterbar, painting, slip membranes, lap and dowel bars where specified, and any other items shown on the Drawings.

8.3.4 No separate payment shall be made for supply and testing of concrete ingredients; storage of materials; determination of mix proportion; making and testing of trial mixes; supplying samples of water, cement, aggregates and concrete for testing by the Engineer; cube modules; slump cones; control mixing of concrete; transporting, placing and compacting concrete; recesses; moulds for transporting and fixing precast work: precautions for concrete in unfavorable weather; preparation of surfaces; curing; ascertaining requirements for reinforcement, bending, cutting and fixing reinforcement or working requirements for reinforcement, bending, cutting and fixing reinforcement or working space for erection and handling of back and soffit shuttering, protection of concrete surfaces as specified.

8.4 Waterproofing

Waterproof to the structures below ground level shall be type 1 bituminous coatings.

Waterproof membranes to the roof, floors and reservoirs shall be measured in square meter. The rate shall include for all preparation, priming and application of the membrane together with its testing and the various overlying. The rate shall also include for extending the membrane up parapets and up-stands together with the application of a solar protective coating where required. Cement screed protective layers shall be measured in square meter in separate item.

When no separate item exists in the Bill of Quantities for complying with the requirements of membranes manufacturers the cost of complying with such requirements shall be deemed to be included in the rates.

8.5 Buildings and Superstructures

The Tenderer shall apply a rate or price against each item in the Bill of Quantities, and these rates will be used to determine the cost of any variation arising during the progress of

the Works.

The items in the Bill of Quantities shall be measured as follows:

- 8.5.1** Blockwork, by area in square metres for each thickness of blockwork with no deduction for openings of less than 0.025 sq.m. No measurement shall be made for any other work involved in blockwork.
- 8.5.2** Rendering and painting, by area in sq.m.
- 8.5.3** Windows, doors and Louvres, by number inclusive of frames, fixtures, stops, beadings, glazing, installation, painting, iron mongery etc. complete.
- 8.5.4** Drain pipes for roof drainage by length with no separate measurement for zinc flashing and fixing.
- 8.5.5** Gargoyles for roof drainage shall be measured by number.
- 8.5.6** Water supply and drainage pipes by length in metres for each diameter, inclusive of all fittings, valves, insulation etc. complete.

8.6 Painting

All painting shall be measured by area in square metres including any area less than 0.01 m². The rate shall include for all preparation, priming, application, touching up, testing and all other items required to complete the Works as detailed below:

- Painting either internally or externally with (1) primer coat & (2) coats of paint.
- Deliver to the site paint materials in sealed cans properly labelled as to its quality.
- All cleaning and preparatory works to the surface to be painted and rubbing down between coats.
- Providing sample reference areas for the Engineer's approval before commencement.
- All materials and tools required such as thinners, solvents, brushes and all other services.
- All Scaffolding and working platform

8.7 Rendering and Plastering

Rendering and plastering shall be measured as the net area in square meters covered at the specified thickness and no allowance will be made for bulking of materials or waste. No deduction from the measurement will be made in respect of any opening of feature causing a reduction in the plastered area of less than 0.025 m². Skirting shall be measured net by Length in meter

Rates for rendering and plastering are to include for:

- Well wetting of solid surface to be plastered or rendered.
- Raking out joints of brickworks walls, hacking surfaces of concrete to form a key.
- Reinforcement, beading and all other necessary items and accessories required for corners, junctions and intersections
- Rough coat (tartasha) with cement sand mortar mix (A) for surfaces to be rendered or plastered, prime coat and finishing coat as indicated on drawings and Specifications.
- Working in narrow widths and all labours including arises, short lengths, angles, ends, making good around pipes, conduits, pipe brackets or the like, making good up to door and window frames and skirting, working around buried pipes, cables conduits or the like.
- Making samples of each type of rendering and plastering and repeating where required to get the Engineer's approval to texture and colour.
- Plaster stopper where required.
- Scaffolding and working platform.

8.8 Tiling and Floor Coverings

Tiling works shall be measured in square meters, to the net area covered with tiles laid as specified with no deductions for any area that, with the Engineer's approval, is not tiled if it does not exceed 0.025 m². Skirting shall be measured net by Length in meter

Rates are to include for:

- Supplying and laying of tiles and floor coverings.
- Supply and application of mortar as specified.
- Bedding, jointing, grouting, cleaning and pointing as specified.
- All cuttings, narrow widths, rounded edges, short lengths, angles end and junctions.
- Cutting and fitting around pipes, conduits, trunking, pipe brackets and up to window and door frames or the like.
- Surface finishing and cleaning.
- The required curing of tiles with water before being laid as specified.
- Laying level or slopes as specified and shown on the drawings.
- Screeding below tiles as per Specification.

8.9 Ceramic Tiles for Walls and Floors

Ceramic tiles for walls and floors shall be measured as the net area covered by tiles in square meter, with no deduction for openings or areas not tiled that do not exceed 0.025 m².

Rates are to include for:

- Supply and laying tiles according to Specification.
- Preparing surfaces to be tiled, supply and application of sand/cement mortar mix (A) for floor tiling and special adhesive material for wall tiling.
- Pointing of joints with white cement.
- Leveling and pointing of fixtures and covers such as floor traps and pipes.
- Supply and fixing special pieces for ends and corners as specified and instructed by the Engineer.

8.10 Carpentry and Joinery

Doors with frame units shall be measured on a numerical basis according to the door schedule and the guiding detailed sections on drawings.

Rates are to include for:

- All materials required to complete the finish and perfect operation to the Engineer's approval.
- Painting one coat of approved primer on the back of frames before fixing.
- Fixing frames with galvanized cramps and dowels.
- Architraves, cover fillets and door stops.
- Supply and fixing all ironmongery and submitting samples to the Engineer for approval before fixing.
- Lipped edges of flush doors.
- Supply and fixing of glazing with beads or putty as specified.
- Painting, veneer polishing and finishing according to Specifications.

8.11 Aluminum Windows and Doors

Windows and doors units shall be measured on a numerical basis according to schedules and with the required sections shown on drawings, and as instructed by the Engineer.

Rates are to include for:

- Supply and fixing sub frames and aluminum frames.
- Supply members of windows and doors with sections shown on drawings and fixing these members together in their positions.
- All required ironmongery and submitting samples of ironmongery to the Engineer for approval before fixing.
- Supply and fix the reinforcing galvanized steel sections where required and as

specified.

- Solar glazing to external openings and plain glazing to internal openings each 6mm thickness with required beads

8.12 Plumbing and Fire Protection Works

8.12.1 Plumbing Works Inside Buildings

Plumbing and sanitary works shall be measured as set forth in the Bill of Quantities.

The installation of sanitary fixtures shall be measured by numbers.

Rates for Plumbing and Sanitary works are to include for:

- Supplying, fixing and testing fixtures, pipes, fittings and valves complete with all accessories.
- Connections to services and wastes with all materials, fittings and sealants required.
- Wall mounting and connecting the electric heaters to hot and cold water pipes, and electric power.
- Rate for pipework shall include cutting, joining, sealants, special pieces and all other fittings on pipes - except valves - including isolation tape wrapping to concealed pipes.
- Painting with primer and finishing coats to all exposed pipes as instructed by the Engineer.
- Hot and cold water pipes thermal insulation.

8.12.2 Plumbing Works Outside Buildings

• Pipes

Pipes for water and drainage and rain stacks shall be measured by linear meters according to drawings. (valves and fittings are measured separately).

Rates are to include for:

- Excavation, disposal of surplus materials, backfilling, dewatering if necessary.
- Complete construction including bedding, pipes supply and laying, testing and necessary works for pipe installation as shown on drawings.

• Inspection Chambers

Inspection chambers shall be measured by numbers according to drawings.

Rates are to include for:

- Excavation and required backfilling.
- Complete construction as shown in drawings.
- Painting all internal and external surfaces by appropriate number and type of coating layers as specified.
- Supply and fixing double seal cast iron covers with frames
- Benching works and slopes within the chambers
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8.12.3 Fire Fighting Works

The fire protection works shall be measured as follows:

- Fire hydrant includes hose cabinet with 30 ms hose with all accessories complete per lump sum.
- For CO₂ fire extinguisher automatic open system the installation shall be measured by lump sum and shall include supply and install cylinders, all cylinders accessories (check valve, etc.) and pipe distribution system and nozzles in case of using pipes distribution system and nozzles.
- For chemical powder multi-purpose fire extinguisher the installation shall be measured by the number of cylinders.

Rates for fire protection works are to include for:

- Supplying, fixing and testing pipes, fittings, cylinders and all accessories for CO₂ fire extinguisher system and dry chemical powder fire extinguisher system.

8.13 Steel, or aluminum ladders shall be measured by weight in kilogram. Different rises shall be measured separately. The rate shall include supply of material, fixing and painting or galvanizing as specified.

8.14 Open type metal flooring and metal plate decking shall be measured by weight in kilogram and shall include all supporting structure, framing, edging and toe plates, fixing, clips,... etc.

8.15 Hand railing shall be measured by weight in kilogram including all fittings and foot wall fixings, chains or removable sections. No separate payment will be made for complying with the requirements of the Specification.

8.16 Steel Doors

Steel doors shall be measured by the number of each type listed.

Rates are to include for:

- Supply of materials.
- All ironmongery to doors and submitting samples for approval.
- Fabrication, welding, machining and painting or galvanizing where specified.
- All labouring, cleats and like.
- Hoisting and fixing in position at any height.

8.17 Steel Structure

Steel structure shall be measured by item according to the bill items. Earth work and concrete foundation must be measured as in earth and concrete works.

9. Road Works

9.1 General

1. General directions and descriptions of items of works given elsewhere in the Tender Documents are not generally repeated in the Bill of Quantities. References must be made to the Drawings, Specification and Conditions of Contract for this information.
2. The items of work given in the Bill of Quantities shall comply with the relevant sections of the Specification and with the Instructions of the Engineer.
3. In the Preliminaries Bill the Tendered shall insert a lump sum or rate to each item which he considers has a financial value. Where the Tendered considers that an item has no financial value he shall insert "nil". Lump sums shall not be inserted covering more than one item.
4. Quantities of work and materials in the Bill of Quantities are estimated only and are not to be considered as limiting or extending the amount of work to be done and material to be supplied by the Contractor. The Contractor shall not use the quantities as an ordering schedule.
5. Unit rates shall be written both in words and figures in the space specified in the Bill of Quantities.
6. The unit rate inserted by the Tendered in the Bill of Quantities for any item of work shall apply completed work confirming to the Contract Documents convening all expenses of labor, material and equipment required for executing that item of work as well as covering the share of that item for the other general expenses to be incurred by the Contractor during the execution of the works. These general expenses shall include but are not restricted to the following, unless entered as a separate pay item in the Bill of Quantities.
 - Preparation and submission of bids including the Site inspection.
 - Employment and accommodation of the Contractor's staff - local and expatriate – including official holidays. Annual leave, sick leave, compensation, bonuses, insurances, ... etc.
 - Costs related to the Contractor's site, camp(s) including the provision of all utility facilities.
 - Provision of wastage of materials and for consumable materials.
 - Cost of laboratory testing, survey work and assistance to the Engineer as required in the Contract.
 - Cost of temporary works.

- Cost of work items for which there are no direct payments and which are considered in the Specification and other contract documents as subsidiary to other items in the Bill of Quantities.
- All other expenses the Contractor may encounter in the proper execution of the Contract.

7. Setting Out

No separate payment shall be made for setting out.

8 Temporary Traffic Diversion

No payment will be made for this work.

9.2 Earthworks

(i) **Clearing and Grubbing**

Clearing and grubbing shall be applied in fill areas only if required for stumps, roots and grasses as described in project specifications. The work pre-described under this section will not be paid for directly but will be considered subsidiary work pertaining to the several clauses of earthworks.

(ii) **Earthworks for Roads and Parking**

Earthworks for roads and parking construction shall include the required survey works, securing of bench-marks, excavation for subgrade and compaction in layers and watering, stock-piling and hauling or wasting of excavated material, well drainage of road-way during the course of construction operations, removal of surplus soil to outside of the site, grading of shoulders slopes in accordance with the plans, maintenance of subgrade surface until final acceptance of the works or until construction of the base course begins and all incidentals necessary to complete the works according to these specifications. The item shall be measured in cubic meters.

For borrow excavations it shall include the above mentioned works and additional payment shall be made for extra hauling distance.

9.3 Base Course

Base course shall include supply of all necessary materials, cleaning and correction of subgrade and construction of corresponding course including compaction to the specified thickness. The item of each layer shall be measured in square meters.

9.4 Prime Coat

Prime coat shall include supply of bitumen, preparing and leveling the base course, spraying the hot bitumen and keeping the layer clean. The item shall be measured in square meters.

9.5 Bituminous Wearing Course

Bituminous concrete pavement shall include supply and construction of corresponding course with the specified thickness including compaction. The item of each layer shall be measured in square meters.

9.6 Tack Coat

Tack coat shall include supply of bitumen and spraying the hot bitumen and keeping the layer clean. The item shall be measured in square meters.

9.7 Interlocking Tiles for Footpath

This item shall be measured in square meters, and shall include the requirements for all operation in connection with the furnished and placing of different coloured paving tiles 60 mm thick as specified by the Engineer. This item shall also include the formation and compaction of soil and the furnishing, laying and compacting of 100 mm sand laying course, labour, equipment, tools and incidentals necessary to complete the works.

9.8 Kerbs

Straight, curved and corner pre-cast or cast in-situ concrete kerb stones shall be measured in linear meters.

Works are deemed to include straight or curved pre-cast or cast in-situ concrete kerbs and shall include supply and laying of kerbs and concrete (Grade 25) for haunches and foundation as shown on the drawings, excavation to the required level, formworks, curing, backfilling, jointing material, labour, equipment, tools and shall include all material and formworks necessary to form the kerb stone to the shape as illustrated on the detailed drawings, the cement mortar for end joints, material, labour, equipment, tools, curing, and all other items necessary for proper completion.

10. Mechanical Work

Measurement of all items specified in the Mechanical Work chapter shall generally be in accordance with General and Particular Specification. The Contractor shall quote for any plant, equipment and services that he deems to be necessary to comply with the specifications and satisfactory working of the plant and equipment. The Contractor shall add prices for such items in all related Bills of the Bill of Quantities.

10.1 The prices inserted against each item in the Bill of Quantities shall be applicable and including the manufacture, painting, packing, dispatch to site and storage, complete with all various accessories as specified. Prices also shall include for erection, setting to Work, testing, commissioning and all plant requirements for these items, with all other obligations, until the final taking over of the Works.

- 10.2** The prices of material, equipment, apparatus and their spare parts shall include submission of inspection certificates.
- 10.3** The prices for pipes and connections within the sites of the project shall include lining, coating or painting and polyethylene sleeves for external protection according to specifications, constructing of supports and anchors where is necessary, excavation of trenches for the required depth and width in any kind of soil including rocks, in places where pipes laid underground level, testing, cleaning, refilling of trenches and restoration of ground surface to its original condition. The pipes shall be measured in linear meter.
- 10.4** No payment will be made for any supplies and equipment unless the required certificates are submitted.
- 10.5** The Contractor shall supply special tools and spares recommended for the maintenance and satisfactory working of the equipment supplied for period of 5 years. The list of special tools and spares proposed shall include unit rates and quantities and shall be submitted by the Contractor along with the Tender.
A metal label shall be attached to each piece of spare parts giving a suitable description for easy identification at site.
The spare parts shall be adequately protected and collectively packed in suitable containers and shall be complete with four copies of detail schedules.
- 10.6** The origin and quality of equipment supplied shall be considered in the technical evaluation of the tender.

11. Electrical Work, Instrumentation and Control

11.1 Electrical Work

11.1.1 Electrical switchgear/switchboard shall be measured by number. The rates shall include but not limited to Busbars, circuit breakers, starters, push buttons measuring instruments, instrument transformers, protective relays, Interlocks, ... etc. as per Specification and Drawings. The rates shall also deem to include internal wiring and connections, all anchor bolts, materials and all accessories to complete the installation.

11.1.2 Lighting panels shall be measured by number. The rates shall include but not limited to busbars, circuit breakers, signal lamps, ..etc. as per Specification and Drawings. The rates shall also include equipment mounting panels, internal wiring and connection and all materials and accessories to complete the installation.

- 11.1.3** Lighting units / luminaries shall be measured by number. The rates shall include control gear, capacitors, lamps, holders, internal wiring and connections, conduits, conduit fittings, junction boxes, wiring, boxes for wall and/or ceiling lighting outlets, lighting switches with outlets, suspension rods with ceiling plates, nuts and washers if required and all accessories to complete the installation.
- 11.1.4** Socket outlets shall be measured by number. The rates shall include switched socket itself, cover, wiring/cabling, conduits, conduit fittings, boxes for socket outlets, and all accessories to complete the installation.
- 11.1.5** Power cables shall be measured in meters. The rates shall include for all items necessary to allow the installation of the cables in different environments. This shall include but not be limited to excavation and backfilling of cable trenches, cable trays, ducts and draw pits, warning tapes, conduits, terminations, glands , sleeves, ... etc to complete the installation. In case of high voltage cables, the required cable termination kit shall also be included.
- 11.1.6** External lighting shall be measured by number. The rates shall include lighting poles, concrete base, fuse cut-outs, fuses, cables to light fittings, cable glands, lugs, terminations, luminaries, lamps, control gear, capacitors and all other accessories to complete the installation.
- 11.1.7** Telephone outlets shall be measured by number. The rates shall include telephone junction box, wiring from the junction box up to the respective telephone outlet, conduits, conduit fittings, boxes for telephone outlet, telephone sockets, interconnection, ...etc and all accessories to complete the installation.
- 11.1.8** Telephone cables shall be measured by sum. The rates shall include design, preparation of drawings and all necessary items to allow the installation of the cable in different environments. This shall include but not limited to excavation and backfilling of cable trenches, ducts, hand holes, conduits and conduit fittings, ... etc. and all accessories to complete the installation.
- 11.1.9** Exhaust fans shall be measured by number. The rates shall include wiring, conduits, conduit fittings, boxes for electrical outlet, switches and all accessories to complete the installation.
- 11.1.10** Air conditioning units shall be measured by number. The rates shall include evaporator, condenser, compressor, expansion valve, drain pipe, supports, connection to the nearest

drain point, wiring, conduits, conduit fittings, boxes for electrical outlet, suitably rated double pole switched fuse spur unit with neon indicator and all accessories to complete the installation.

11.1.11 Fire alarm system shall be measured by number. The rates shall include all heat detectors, smoke detectors, manual fire alarm stations, fire alarm bells, siren, end of line units, fire alarm control and display panel, ... etc associated cabling/wiring, conduits, conduit fittings, boxes for ceiling and/or wall outlets, ... etc and all accessories for complete installation.

11.1.12 Earthing system shall be measured by sum, the rates shall include design, preparation of drawings and all necessary items. This shall include but not limited to excavation, earthing pit, earthing rod, earthing conductor, required connection, ... etc. and all accessories to complete the installation.

11.1.13 The Contractor shall supply all the spare parts recommended for the maintenance and satisfactory working of the equipment supplied for a minimum period of two years. The list of the proposed spares shall include unit rates and quantities and shall be submitted by the Contractor along with the Tender.

12. Conditions in Respect of Interim Payments

1. The amounts due to the Contractor on account of the Contract Value are subject inter alia to deductions for repayments of advance and retentions in accordance with Clause in General Conditions of Contract.
2. Equipment shall be treated as materials delivered to the site for the period between such delivery and incorporation in the Permanent Works.
3. Pipes, fittings and valves shall be treated as materials delivered to the site for the period between such delivery and installation up to and including satisfactory execution of preliminary testing.
4. Payment in respect of the Conditions of Contract in Bill Nr "GP" item "1", payment shall be made on submission of the relevant bond or insurance policy documents as appropriate.
5. Breakdown of preliminaries items in Bill Nr "GP" for initial costs, running costs and final demobilization costs to be agreed with the Engineer/Employer.

BILL OF QUANTITIES

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

BILL NO. (1) : GENERAL AND PRELIMINARY :

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1.	The Contractor shall consider the cost related to all General Requirements as mentioned in <i>Chapter 1 General Requirements of Technical Specifications</i> of Tender Documents. All related cost will not be paid separately, unless they are separately mentioned herein under. It shall be included in the Contractor's overall price.				
1/1	Soil investigation at site: Cost for conducting soil investigations as specified in Clause 1.4, of Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
1/2	Water and electricity supply: Cost for supply of water and electricity as specified in Clause 1.21 & 1.22, of Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
1/3	Contractor's site facilities: Cost for supply and installation of site facilities as specified in Clause 1.26 of Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
1/4	Contract Sign Boards: Cost for supply and installation of sign boards as specified in Clause 1.39 of Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
1/5	Training during implementation and commissioning: Cost for training as specified in Clause 1.51 of Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
1/6	Office for employer /Engineer: Cost for providing Employer's Mobile Site Office as specified in Clause 1.77, Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
1/7	Cost for insurance of works, plant & machinery, materials, third party and workmen.	Sum	1	Included	Included
1/8	Setting out and Accuray: Cost for site survey, setting of works as specified in Clause 1.59.2, Chapter 1 General Requirements of Technical Specifications of Tender Documents.	Sum	1	Included	Included
	Important Note: <i>1.No prices are to be added in this page. If the contractor added any prices for the above items, they will be ignored and corrected as "Zero" in the evaluation. 2. Not all items to be considered for costing under chapter 1 General requirement of technical specifications have been listed in this bill. contractor should study the chapter 1 general requirements and adjust his rates accordingly.</i>				
CARRIED TO COLLECTION:					0.00
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 1/1					
TOTAL FOR BILL NO. (1) :					0.00
Carried to Grand Summary					0.00

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

2- SEWAGE NET WORK

BILL NO. (2-1) : SEWERAGE SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
	<u>PIPELINES</u> Supply and Install uPVC pipes class 4 according to ISO 4422. socket/spigot joints 10 bars, including trench excavation in all type of soil including rock, side support, dewatering if necessary and backfilling with selected excavated material, removal of surplus and disposal to heaps off site, required beddings, testing, and soil investigation, all in accordance with Specifications, Drawings and Engineer's Instructions.				
1	<u>DN 800 mm</u>				
1/1	Depth to invert from 4.51 to 5.50 m	L.m	0		
1/2	Depth to invert from 5.51 to 6.50 m	L.m	195		
2	<u>MANHOLES</u> Supply and install plain concrete manhole, including excavation works in backfilling with selected excavated material, removal of surplus and disposal to heaps off site, required insulation, access cover, steps and fittings, all in accordance with Specifications, Drawings and Engineer's Instructions .				
2/1	depth from 4.51 m to 5.50 m	No.	0		
2/2	depth from 5.51 m to 6.50 m	No.	3		
3	<u>FORCE-MAIN</u> Supply and Install HDPE pipes with diameter 630 mm according to ISO 4427/11667 & working pressure 10 Bar, including fittings, trench excavation works in soil including rock, side support, dewatering if necessary, backfilling with selected excavated material, removal of surplus and disposal to heaps off site, required beddings,with conection,all in accordance with Specifications, Drawings and Engineer's Instructions.				
3/1	Force-Main HDPE 630 mm diameter	L.m	520		
4	sphalted roads, re-enstatement in accordance with specifications and engineers insructions.	m ²	30		
CARRIED TO COLLECTION :					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. (2-1)/1					
TOTAL FOR BILL NO. (2-1) :					
Carried to Summary of Bills for SEWAGE NETWORK					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT

CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)

3-MAIN PUMP STATION - CIVIL WORKS

BILL NO. (3-1-1) : PUMP STATION BUILDING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Earthworks:</u>				
1\1	Excavation from ground level to required depth in all types of soil excluding rock, including dewatering, side slope removal of surplus and disposal to heaps off site.	m ³	1655		
1\2	Backfilling using suitable selected excavated material or imported material according to specification and as directed by the Engineer.	m ³	35		
1\3	Provisional item: Excavation from bottom level of pump structure to a depth of 1m in all types of soil excluding rock, including dewatering, side slope, removal of surplus and disposal to heaps off site. (<i>subject to outcome of soil investigation report</i>)	m ³	165		
1\4	Provisional item: Backfilling under pump station structure using suitable selected imported material according to specification and as directed by the Engineer. (<i>subject to outcome of soil investigation report</i>)	m ³	165		
1\5	Provisional Item: extra-over for excavation in rock of all types	m ³	5		
2	<u>Concrete Work:</u>				
2\1	Supply and place plain concrete (Grade 20), under the foundation.	m ³	20		
2\2	Supply and place plain concrete (Grade 20) for floor slopes of 150 mm average thickness towet and dry well, including benching in wet well.	m ³	30		
2\3	Supply and place foam concrete to roof slopes of 70 mm average thickness.	m ²	125		
2\4	Supply and place concrete screed (Grade 20) 50 mm thick over horizontal protection layers for <i>roof</i> .	m ²	150		
2\5	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement (<i>refer to drg</i>) and formwork for floors, The surface of exposed concrete will be fair face.	m ³	200		
2\6	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement, (<i>refer to drg</i>) and formwork for walls, beams. The surface of exposed concrete will be fair face.	m ³	470		
2\7	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement (<i>refer to drg</i>) and formwork for columns, slabs and parapet	m ³	65		
3	<u>Protection Works:</u>				
3\1	Supply and apply three coats of protective coating using bituminous latex emulsion to face of concrete and walls adjacent to backfilling.	m ²	470		
3\2	Roof ,floor and wall Water Proofing membrane complete in accordance with the drawings and specification.	m ²	660		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
3\3	Supply and fix 50 mm thick extruded polystyrene boards for thermal protection of roofs.	m ²	125		
3\4	Supply and fix flexible PVC water stop with minimum width of 230 mm, and 8 mm thick.	L.m	65		
3\5	Supply and place poly-sulphide joint sealer or similar in grooves 25 x 25 mm.	L.m	130		
4	<u>Masonry Works:</u>				
4\1	Supply and build solid cement bricks 200 mm thick with cement/sand mortar according to specification.	m ²	175		
4\2	Supply and build solid cement-bricks 100 mm thick with cement / sand mortar according to specification, to protect vertical isolation material.	m ²	470		
5	<u>Rendering and Cladding Works:</u>				
5\1	Supply and apply cement sand render to internal walls, ceilings and internal surface of roof parapet.	m ²	190		
5\2	Supply and apply Yemeni stone cladding for facades(<i>stone that is resist ant to local enviromental conditions.</i>) according to drawings and as directed by Engineer.	m ²	200		
5\3	Supply and apply Yemeni stone cladding (<i>stone that is resist ant to local enviromental conditions.</i>) for external plinths according to drawings and as directed by Engineer.	m ²	12		
6	<u>Painting Works:</u>				
6\1	Supply and apply three coats of plastic or oil paint for internal walls and ceilings..	m ²	155		
6\2	Epoxy paint and hardener power floated finish for pump room flooring according to drawings and specifications.	m ²	100		
6\3	Epoxy paint flooring and wall for wet well according to drawings and specifications.	m ²	260		
7	<u>Tiling Works:</u>				
7\2	Supply and lay 200 x 200 x 20 mm cement tiles for roofs including roof slopes and skirting.	m ²	125		
7\3	Supply and lay 6 mm thick. Ceramic wall tiles, and the colors and dimensions according to drawings.	m ²	60		
7\4	Supply and lay ceramic floor tiles 20 x 20 x 8 mm thick, anti-slip, high abrasion resistance.	m ²	80		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
8	<u>Door and Window Works:</u> Supply and install steel doors and frame complete with all required accessories:				
8\1	Door type (D1) with dimension 2.4 x 2.25 m	No.	1		
	Supply and install aluminum windows, complete with 6 mm glass ,completed with all required accessories.				
8\2	Window type (W1) with dimension 2.4 x 1.20 m	No.	4		
8\3	Window type (W2) with dimension 2.4 x 1.2 m	No.	7		
9	<u>Sanitary Installation:</u>				
9\1	Supply and install UPVC roof water drain of 100mm. Diameter complete with all accessories .	No.	1		
9\2	Supply and install galvanized steel rain stack of 100mm. Diam.with all accessories	L.m	5		
10	<u>Fire fighting works</u>				
10\1	Supply and erect 6 kg dry chemical powder multi-purpose fire extinguisher its location as drawings complete in accordance with to specification.	No.	2		
11	<u>Metal Works:</u>				
	Metal work shall be cut and assembled in accordance with relevant drawings and standard specifications.				
11\1	Supply, fix and paint external steel ladder with safety cage (mild steel of grade 37).	kgs	4000		
11\2	Supply, fix and paint steel work for well covers (mild steel of grade 37).	kgs	50		
11\3	Supply, fix and paint steel steps for wet well stair (mild steel of grade 37).	kgs	250		
11\4	Supply, fix and paint Aluminum alloy handrails.	L.m	16		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-1-1/1					
Page NO. 3-1-1/2					
Page NO. 3-1-1/3					
TOTAL FOR BILL NO. (3-1-1) :					
Carried to Summary of Bills for MAIN PUMP STATION -CIVIL WORKS.					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3-MAIN PUMP STATION - CIVIL WORKS

BILL NO. (3-1-2) :GENERATOR BUILDING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Earthworks:</u>				
1\1	Excavation from ground level to required depth in all types of soil excluding rock, including dewatering, side slope removal of surplus and disposal to heaps off site.	m ³	137		
1\2	Backfilling using suitable selected imported material according to specification and as directed by the Engineer.	m ³	108		
2	<u>Concrete Work:</u>				
2\1	Supply and place plain concrete (Grade 20).	m ³	3		
2\2	Supply and place plain concrete (Grade 20) 100 mm thick, for floor slabs.	m ²	60		
2\3	Supply and place foam concrete to roof slopes of 70 mm average thickness.	m ²	70		
2\4	Supply and place concrete screed (Grade 20) 50 mm thick over horizontal protection layers	m ²	65		
2\5	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) for floor slab with thick. 150 mm and formwork (<i>diam 10mm @ 15 cm both direction</i>).	m ²	60		
2\6	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement (refer to drg) and formwork for foundations.	m ³	18		
2\7	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) , and formwork for trenches.	m ³	2		
2\8	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for mechanical, electrical, plinths with all requirements to complete work.	m ³	3		
2\9	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for columns, beams and slabs.	m ³	40		
3	<u>Protection Works:</u>				
3\1	Supply and apply three coats of protective coating using bituminous latex emulsion to face of concrete and walls adjacent to backfilling.	m ²	120		
3\2	Roof, floor and wall Water Proofing membrane complete in accordance with the drawings and specification.	m ²	170		
3\3	Supply and fix 50 mm thick extruded polystyrene boards for thermal protection for roof.	m ²	70		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
4	<u>Masonry Works:</u>				
4\1	Supply and build solid cement bricks 200 mm thick with cement/sand mortar according to specification.	m ²	220		
5	<u>Rendering and Cladding Works:</u>				
5\1	Supply and apply cement sand render to internal walls, ceilings and internal surface of roof parapet.	m ²	265		
5\2	Supply and apply Yemeni stone cladding for facades(<i>stone that is resist ant to local enviromental conditions.</i>) according to drawings and as directed by Engineer	m ²	290		
5\3	Supply and apply Yemeni stone cladding(<i>stone that is resist ant to local enviromental conditions.</i>) for external plinths according to drawings and as directed by Engineer.	m ²	25		
5\4	Sand cement skirting 100 mm height according to drawings & specifications.	L.m	35		
6	<u>Painting Works:</u>				
6\1	Supply and apply three coats of plastic or oil paint for internal walls and ceilings.	m ²	265		
6\2	Epoxy paint and hardener power floated finish for generator room flooring according to drawings and specifications.	m ²	60		
7	<u>Tiling and Marble Works:</u>				
7\1	Supply and lay 200 x 200 x 20 mm cement tiles for roofs including roof slopes and skirting.	m ²	70		
8	<u>Door and Window Works:</u>				
	Supply and install aluminum doors and frame complete with all required accessories:				
8\1	Door type (D1) with dimension 1.0 x 2.2 m	No.	1		
	Supply and install aluminum windows, complete with 6 mm glass, completed with all required accessories.				
8\2	Window type (W1) with dimension 3.00 x1.20 m	No.	2		
8\3	Window type (L1) with dimensions 4.0 x 3.0 m	No.	1		
8\4	Window type (L2) with dimensions 3.0 x 3.2 m	No.	1		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
9	<u>Sanitary Installation:</u> Supply, fix and test, sanitary installations including all internal hot and cold water and wastewater connections, up to the nearest water riser or vertical soil stack or gully-trap outside. Internal water pipes are of polypropylene				
9\1	Supply and install UPVC roof water drain of 100mm. Diameter complete with all accessories .	No.	1		
9\2	Supply and install galvanized steel rain stack of 100mm. Diam. with all accessories	L.m	5		
10	<u>Fire fighting works</u>				
10\1	Supply and install co2 automatically open system complete with cylinders (9cylinders 45kg.weight each one), cylinders accessories, check valves, solenoid valve with pressure gauge connected with electric alarm system ,pipe distribution fire gas system with nozzles, fittings, valves and complete according to specification and drawings.	L.S.	1		
11	<u>Metal Works:</u>				
	Metal work (mild steel of grade 37) shall be cut and assembled in accordance with relevant drawings and standard specifications.				
11\1	Supply, fix and paint steel ladder.	Kgs	200		
11\2	Supply, fix and paint steel work for chequer plates of trench covers.	Kgs	100		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. (3-1-2)/1					
Page NO. (3-1-2)/2					
Page NO. (3-1-2)/3					
<u>TOTAL FOR BILL NO. (3-1-2) :</u>					
<u>Carried to Summary of Bills for MAIN PUMP STATION -CIVIL WORKS.</u>					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3-MAIN PUMP STATION - CIVIL WORKS

BILL NO. (3-1-3) :TRANSFORMER BUILDING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Earthworks:</u>				
1\1	Excavation from ground level to required depth in all types of soil excluding rock, including dewatering, side slope removal of surplus and disposal to heaps off site.	m ³	140		
1\2	Backfilling using suitable selected excavated material or imported material according to specification and as directed by the Engineer.	m ³	115		
2	<u>Concrete Work:</u>				
2\1	Supply and place plain concrete (Grade 20)	m ³	3		
2\2	Supply and place plain concrete (Grade 20) 100 mm thick, for floor slabs.	m ²	55		
2\3	Supply and place foam concrete to roof slopes of 70 mm average thickness.	m ²	75		
2\4	Supply and place concrete screed (Grade 20); 50 mm thick over horizontal protection layers	m ²	55		
2\5	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) for floor slab with thick. 150 mm and formwork (diam 10mm @15 cm both direction).	m ²	55		
2\6	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for foundations.	m ³	14		
2\7	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for columns, beams and slabs.	m ³	28		
2\8	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg)and formwork for trenches	m ³	17		
2\9	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for mechanical, electrical, plinths with all requirements to complete the work	m ³	1		
3	<u>Protection Works:</u>				
3\1	Supply and apply three coats of protective coating using bituminous latex emulsion to face of concrete adjacent to backfilling.	m ²	120		
3\2	Floor and wall Water Proofing membrane complete in accordance with the drawings and specification.	m ²	130		
3\3	Supply and fix 50 mm thick extruded polystyrene boards for thermal protection of roofs.	m ²	75		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
4	<u>Masonry Works:</u>				
4\1	Supply and build solid cement bricks 200 mm thick with cement/sand mortar according to specification.	m ²	120		
5	<u>Rendering and Cladding Works:</u>				
5\1	Supply and apply cement sand render to internal walls, ceilings and internal surface of roof parapet.	m ²	225		
5\2	Supply and apply Yemeni stone cladding for facades(stone that is resist ant to local enviromental conditions.) according to drawings and as directed by Engineer	m ²	175		
5\3	Supply and apply Yemeni stone cladding(stone that is resist ant to local enviromental conditions.) for external plinths according to drawings and as directed by Engineer.	m ²	20		
6	<u>Painting Works:</u>				
6\1	Supply and apply three coats of plastic or oil paint for internal walls and ceilings.	m ²	225		
6\2	Epoxy paint and hardener power floated finish for transformer room flooring and trenches according to drawings and specifications.	m ²	75		
7	<u>Tiling and Marble Works:</u>				
7\1	Supply and lay 200 x 200 x 20 mm cement tiles for roofs including roof slopes and skirting.	m ²	75		
8	<u>Door and Window Works:</u>				
	Supply and install steel doors and frame complete with all required accessories:				
8\1	Door type (D1) with dimension 2.0 X3.20 m	No.	1		
8\2	Door type (D2) with dimension 2.0 X3.20 m	No.	1		
	Supply and install aluminum windows, complete with 6 mm glass, completed with all required accessories.				
8\3	Window type (W1) with dimension .60X1.20 m	No.	6		
8\4	Window type (W2) with dimension .60 X.80 m	No.	4		
8\5	Window type (W3) with dimension .60 X.40 m	No.	2		
9	<u>Sanitary Installation:</u>				
9\1	Supply and install UPVC roof water drain of 100mm. Diameter complete with all accessories .	No.	1		
9\2	Supply and install galvanized steel rain stack of 100mm. Diam. with all accessories	L.m	5		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
10	<u>Fire fighting works</u>				
10\1	Supply and install co2 automatically open system complete with cylinders (6cylinders 45kg.weight each one), cylinders accessories, check valves, solenoid valve with pressure gauge connected with electric alarm system ,pipe distribution fire gas system with nozzles, fittings, valves and complete according to specification and drawings.	L.S.	1		
11	<u>Metal Works:</u>				
	Metal work (mild steel of grade 37) shall be cut and assembled in accordance with relevant drawings and standard specifications.				
11\1	Supply, fix and paint steel ladder.	Kgs	160		
11\2	Supply, fix and paint steel chequer plates for trenches covers.	Kgs	260		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-1-3/1					
Page NO. 3-1-3/2					
Page NO. 3-1-3/3					
TOTAL FOR BILL NO. (3-1-3) :					
<u>Carried to Summary of Bills for MAIN PUMP STATION -CIVIL WORKS.</u>					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3-MAIN PUMP STATION - CIVIL WORKS

BILL NO. (3-1-4) :MECHANICAL COARSE SCREEN

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Earthworks:</u>				
1\1	Excavation from ground level to required depth in all types of soil excluding rock, including dewatering, side slope removal of surplus and disposal to heaps off site.	m ³	720		
1\2	Backfilling using suitable selected excavated material or imported material according to specification and as directed by the Engineer.	m ³	5		
1\3	Provisional item: Excavation from bottom level of pump structure to a depth of 1m in all types of soil excluding rock, including dewatering, side slope, removal of surplus and disposal to heaps off site. (<i>subject to outcome of soil investigation report</i>)	m ³	70		
1\4	Provisional item: Backfilling under pump station structure using suitable selected imported material according to specification and as directed by the Engineer. (<i>subject to outcome of soil investigation report</i>)	m ³	70		
1\5	Provisional Item: extra-over for excavation in rock of all types	m ³	5		
2	<u>Concrete Work:</u>				
2\1	Supply and place plain concrete (Grade 20)	m ³	15		
2\2	Supply and place plain concrete (Grade 20) for floor slopes of 150 mm average thickness.	m ²	40		
2\3	Supply and place concrete screed (Grade 20) 50 mm thick over horizontal protection layers	m ²	70		
2\4	Supply and place reinforced concrete (Grade 35),rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for floors.The surface of exposed concrete will be fare face.	m ³	65		
2\5	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for walls. The surface of exposed concrete will be fare face.	m ³	310		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
3	<u>Protection Works:</u>				
3\1	Floor and wall Water Proofing membrane complete in accordance with the drawings and specification.	m ²	415		
3\2	Supply and fix flexible PVC water stop with minimum width of 230 mm, and 8 mm thick.	L.m	35		
3\3	Supply and place poly-sulphide joint sealer or similar in grooves 25 x 25 mm.	L.m	65		
3\4	Supply and apply with anti acid material for internal faces and floor according to specification.	m ²	490		
4	<u>Masonry Works:</u>				
4\1	Supply and build solid cement-bricks 100 mm thick with cement / sand mortar according to specification, to protect vertical isolation material.	m ³	345		
5	<u>Metal Works:</u>				
	Metal work shall be cut and assembled in accordance with relevant drawings and standard specifications.				
5\1	Supply, fix and paint steel work cover for opening (mild steel of grade 37).	Kgs	250		
5\2	Supply, fix and paint Aluminum alloy handrails.	Kgs	280		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-1-4/1					
Page NO. 3-1-4/2					
<u>TOTAL FOR BILL NO. (3-1-4) :</u>					
<u>Carried to Summary of Bills for MAIN PUMP STATION -CIVIL WORKS.</u>					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3-MAIN PUMP STATION - CIVIL WORKS

BILL NO. (3-1-5) :MAIN FUEL TANK

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Earthworks:</u>				
1\1	Excavation from ground level to required depth in all types of soil excluding rock, including dewatering, side slope removal of surplus and disposal to heaps off site.	m ³	40		
1\2	Backfilling using suitable selected excavated material or imported material according to specification and as directed by the Engineer.	m ³	3		
2	<u>Concrete Work:</u>				
2\1	Supply and place plain concrete (Grade 20)	m ³	8.5		
2\2	Supply and place plain concrete (Grade 20) for floor slopes of 150 mm average thickness.	m ²	22		
2\3	Supply and place concrete screed (Grade 20) 50 mm thick over horizontal protection layers	m ²	28		
2\4	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for floors.The surface of exposed concrete will be fare face	m ³	9		
2\5	Supply and place reinforced concrete (Grade 35), rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) and formwork for walls.The surface of exposed concrete will be fare face	m ³	6		
3	<u>Protection Works:</u>				
3\1	Supply and apply three coats of protective coating using bituminous latex emulsion to face of concrete adjacent to backfilling.	m ²	21		
3\2	Floor and wall Water Proofing membrane complete in accordance with the drawings and specification.	m ²	46		
4	<u>Masonry Works:</u>				
4\1	Supply and build solid cement-bricks 100 mm thick with cement / sand mortar according to specification, to protect vertical isolation material.	m ²	21		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
5	<u>Valve chambers (civil works)</u> Construct R.C valve chamber, works include, excavation in all types of soil, and backfill with selected excavated material, removal of surplus and disposal to heaps off site, dewatering, side support to excavations, required access cover, ladder steps and fittings, beddings, benching, anchor blocks, insulation, testing in accordance with Specifications, Drawings and Engineer's Instructions.(note: dimensions of chambers vary)				
5/1	Flow meter valve chamber, in accordance to with specifications , drawings and engineers instructions.	No.	1		
5/2	Outlet valve chamber, in accordance to with specifications , drawings and engineers instructions.	No.	1		
5/3	600X600 inspection chamber, in accordance to with specifications , drawings and engineers instructions.	No.	1		
5/4	900X600 inspection chamber, in accordance to with specifications , drawings and engineers instructions.	No.	1		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-1-5/1					
Page NO. 3-1-5/2					
TOTAL FOR BILL NO. (3-1-5) :					
Carried to Summary of Bills for MAIN PUMP STATION -CIVIL WORKS.					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.
ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)
3-MAIN PUMP STATION - CIVIL WORKS
BILL NO (3-1-6) : GUARD ROOM

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Earthworks:</u>				
1\1	Excavation from ground level to required depth in all types of soil excluding rock, including side slope removal of surplus and disposal to heaps off site.	m ³	40		
1\2	Backfilling using suitable selected imported material according to specification and as directed by the Engineer.	m ³	25		
2	<u>Concrete Work:</u>				
2\1	Supply and place plain concrete (Grade 20)	m ³	1		
2\2	Supply and place plain concrete (Grade 20) 100 mm thick, for floor slabs.	m ²	20		
2\3	Supply and place Foam concrete to roof slopes of 70 mm laver. thick.	m ²	30		
2\4	Protective screed, 50mm thick over horizontal waterproofing layers.	m ²	20		
2\5	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield reinforcement refer to drg, and formwork for foundations.	m ³	7		
2\6	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield steel reinforcement,(refer to drg) for floor slab with thick. 150 mm and formwork (diam 10mm @ 15 cm both direction).	m ²	20		
2\7	Supply and place reinforced concrete (Grade 35) rate include fusion epoxy coated high yield reinforcement refer to drg, and formwork for columns, beams and slabs	m ³	10		
3	<u>Protection Works:</u>				
3\1	Supply and apply three coats of protective coating using bituminous latex emulsion to face of concrete and walls adjacent to backfilling.	m ²	90		
3\2	Roof & floor Water Proofing membrane complete in accordance with the drawings and specification.	m ²	55		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
3\3	Supply and fix 50 mm thick extruded polystyrene boards for thermal protection of roofs.	m ²	30		
4	<u>Masonry Works:</u>				
4\1	Supply and build solid cement bricks 200 mm thick with cement / sand mortar according to specification.	m ²	42		
4\2	Ditto item No. (4\1), but for walls 100 mm thick.	m ²	10		
5	<u>Rendering and Cladding Works:</u>				
5\1	Supply and apply cement sand render to internal walls, ceilings and internal surface of roof parapet.	m ²	70		
5\2	Supply and apply Yemeni stone cladding for facades(stone that is resistant to local environmental conditions.) according to drawings and as directed by Engineer	m ²	65		
5\3	Supply and apply Yemeni stone cladding(stone that is resistant to local environmental conditions.) for external plinths according to drawings and as directed by Engineer.	m ²	15		
5\4	Sand cement skirting 100 mm height according to drawings & specifications.	L.m	12		
6	<u>Painting Works:</u>				
6\1	Supply and apply three coats of plastic paint for internal walls and ceilings.	m ²	70		
7	<u>Tiling Works:</u>				
7\1	Supply and lay anti slip ceramic floor tiles 8 mm thick. The colors and dimensions will be according to drawings.	m ²	17		
7\2	Supply and lay 200 x 200 x 20 mm cement tiles for roofs including roof slopes and skirting.	m ²	30		
7\3	Supply and lay 6 mm thick. Ceramic wall tiles, and the colors and dimensions according to drawings.	m ²	20		
7\4	Stair cover 20mm risers & 40mm threads in mosaic tiles, including skirting all according to drawings & specifications..	L.m	3		
8	<u>Door and Window Works:</u>				
	Supply and install Aluminum doors complete with required accessories:				
8\1	Aluminum door type D3 (0.90 x 2.20 m)	No.	1		
	Supply and install wooden doors fixed on softwood sub-frame (musky 2" thick.) completed with required accessories.				
8\2	Wooden door type D4 (0.80 x 2.20 m)	No.	2		
	Supply and install aluminum windows, complete with 6 mm glass and completed with required accessories.				
8\3	Window type (W1) with dimension(1.50X1.20)m	No.	3		
8\4	Window type (W2) with dimension (0.75X0.75) m	No.	2		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
9	<u>Sanitary Installation:</u>				
	Supply, fix and test, sanitary installations including all internal hot and cold water and wastewater connections, up to the nearest water riser or vertical soil stack or gully-trap outside. The internal water pipes are of polypropylene .				
9\1	Wash down European water closets complete with flushing cistern and plastic seat.	No.	1		
9\2	Wash basin with mixer, bottle trap, complete with all accessories	No.	1		
9\3	Stainless steel sink with mixer valve complete with all accessories	No.	1		
9\4	Electrical heater 1000 watt, 30 liter capacity.	No.	1		
9\5	Construction of inspection chamber(60cm x 60cm) including trench excavation works in all types of soil, side supports, dewatering if necessary and backfilling with selected excavated material, removal of surplus and disposal to heaps off site, required bedding, testing, and soil investigation, all in accordance with Specifications, Drawings and Engineer's Instructions.	No.	1		
9\6	Supply and fix and test enameled gulley-trap complete with the grating and other fittings and pipes for feeding with wastewater and connection to the nearest inspection chamber.	No.	1		
9\7	Supply and fix floor drain made of uPVC., including grating cover of enameled cast iron and brass fitting for connection.	No.	1		
9\8	Supply and install UPVC roof water drain of 100mm. Diameter complete with all accessories.	No.	1		
9\9	Supply and install galvanized steel rain stack of 100mm. Diam.with all accessories	L.m	10		
9\10	Supply and install polypropylene waste water drainage pipes of size 50mm,75mm,110mm and 150mm diameters complete with all accessories, according to drawings, technical specifications and engineer instructions.	L.s	1		
9\11	Supply and install polypropylene cold and hot water supply pipes of size 13mm,20mm, and 25mm diameters complete with all accessories, according to drawings, technical specifications and engineer instructions.	Ls	1		
10	<u>Fire fighting works</u>				
10\1	Supply and erect 6 kg dry chemical powder multi-purpose fire extinguisher its location as drawings complete according to specification.	No.	1		
11	<u>Metal Works:</u>				
	Metal work (mild steel of grade 37) shall be cut and assembled in accordance with relevant drawings and standard specifications.				
11\1	Supply, fix and paint steel ladder .	Kg	84		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 2-1-3/1					
Page NO. 2-1-3/2					
Page NO. 2-1-3/3					
TOTAL FOR BILL NO. (2-1-3) :					
Carried to Summary of Bills for SEWAGE TREATMENT PLANT -CIVIL WORKS.					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

SUM (3-1) SUMMARY OF BILLS FOR MAIN PUMP STATION - CIVIL WORKS

BILL NO.	DESCRIPTION	TOTAL PRICE US \$.
3-1-1	PUMPING STATION	
3-1-2	GENERATOR BUILDING	
3-1-3	TRANSFORMER AND SWITCHBOARD BUILDING	
3-1-4	MECHANICAL COARSE SCREEN	
3-1-5	MAIN FUEL TANK	
3-1-6	GUARD ROOM	
TOTAL OF BILLS		

Carried to Total Summary of Main Pump Station

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3-MAIN PUMP STATION -MECHANICAL WORK

BILL NO. (3-2) :MECHANICAL EQUIPMENT

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
	Supply, erection, testing and delivery in good working condition according to technical specification and drawings of the following equipment with all ancillaries:				
1	1- Screen Chamber Equipment				
1\1	Mechanically raked bar screen of 1 m width complete with all accessories.	No.	2		
1\2	Screening container.	No.	4		
1\3	Screens control panel complete with all accessories.	L.S.	1		
2	Main Pumping Units :				
2\1	Vertical pumping unit to be erected in dry well of 170 lit/sec discharge at 13 m total head when working in parallel with another unit at speed not exceed 1500 r.p.m with working range (10~15) m. The unit shall be complete with suction bend electric motor, starter and all accessories.	No.	3		
	Pipe works, Valves and Gates:				
3	Screens Chamber :				
3\1	Slide gate for size 2250x1000 mm. complete with gearbox, pillar and hand wheel .	No.	4		
3\2	Flexible coupling 800 mm diam.	No.	2		
3\3	Double spigot puddle pipe piece 800 mm diam. Length 1 m.	No.	2		
3\4	Penstock for opening 800 mm diam. Complete with gearbox, pillar and hand wheel.	No.	1		
	Pump Station				
4	For Wet Wells:				
4\1	Flexible coupling 800 mm diam.	No.	1		
4\2	Double spigot puddle pipe piece 800 mm diam.	No.	1		
5	For Pumps' Suction Branches:				
5\1	Manually operated sluice valve 500 mm diam.	No.	3		
5\2	Dismantling piece 500 mm diam.	No.	3		
5\3	Double flanged puddle pipe piece 500 mm diam. length 1 m.	No.	3		
5\4	Flanged eccentric reducer 500 mm / pump suction diam.	No.	3		
5\5	Double Flanged 45° flare bend 500 mm diam.	No.	3		
CARRIED TO COLLECTION					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
6	For Pumps' Delivery Branches:				
6\1	Electrically and manually operated sluice valve 400 mm diam.	No.	3		
6\2	Non return valve 400 mm diam.	No.	3		
6\3	Dismantling piece 400 mm diam.	No.	3		
6\4	Double flanged pipe piece 400 mm diam (different lengths).	No.	6		
6\5	90 degree Duck foot bend 400 mm diam.	No.	3		
6\6	Flanged concentric reducer 400 mm/pump delivery diam.	No.	3		
6\7	Flanged and spigot puddle pipe piece 400 mm diam. Length 2 m	No.	3		
6\8	Flanged 90 ⁰ bend 400 mm diam.	No.	3		
6\9	Rocker pipe piece 500 mm diam.	No.	3		
7	For Common Delivery Pipeline:				
7\1	All socket tee 600/400 mm diam.	No.	2		
7\2	All flanged tee 600/400 mm diam.	No.	1		
7\3	Double spigot pipe piece 600 mm diam. .	No.	2		
7\4	Blind Flange 600 mm diam.	No.	1		
8	Flow Meter Chamber:				
8\1	Double spigot puddle pipe piece 600 mm diam. Length 1 m.	No.	1		
8\2	Socket & flanged pipe puddle piece 600mm diam.	No.	1		
8\3	Flange adaptor 600 mm diam.	No.	1		
8\4	Rocker pipe piece 600 mm diam.	No.	3		
9	Delivery Valves Chamber :				
9\1	flanged and socket pipe piece 600 mm diam.	No.	1		
9\2	Flanged and spigot puddle pipe piece 600 mm diam. Length 1 m.	No.	1		
9\3	Non return valve 600 mm diam.	No.	1		
9\4	Dismantling piece 600 mm diam.	No.	1		
9\5	Manually operated sluice valve 600 mm diam.	No.	1		
10	Interconnecting Pipes :				
10\1	D.I. Pipes with socket and spigot 600 mm diam. With all accessories.	L.m	36		
10\2	D.I. Pipes with socket and spigot 800 mm diam. With all accessories.	L.m	24		
CARRIED TO COLLECTION					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
11	Electric Power Generating Equipment				
11\1	Electric power generating unit of 400 KW capacity, 3 phase, 380 V, 50 Hz. Comprising. - Diesel engine complete with its accessories. - Alternator, self excited. - Steel base-plate complete with anti vibrators, bolts and nuts. - Voltage regulator complete with adjusting rheostat. - Speed governor. - Water cooling system. - Inlet air system. - Starting system. - Exhaust system. - Battery charger. Control board for the generating unit complete with all accessories.	No.	1		
11\2	Main fuel storage tank of 3 m ³ capacity complete with all accessories.	No.	1		
11\3	Electric fuel transfer pump of 1.5 L/S discharge at 6 m total head complete with all accessories.	No.	1		
11\4	Manual Fuel Transfer Pump of capacity 0.5 lit/stroke.	No.	1		
11\5	Daily fuel tank of 800 liters capacity, complete with all accessories and protective steel hood.	No.	1		
11\6	Necessary fuel pipes, fittings, valves, meters and all accessories.	L.S	1		
	Subsidiary Equipment:				
12	Dewatering Pumping Units:				
12\1	Submersible dewatering pumping unit of 10 lit/sec discharge at 15 m total head complete with all accessories to be erected in dry well of pump station.	No.	2		
13	Water Sealing System :				
13\1	Water sealing system complete with all accessories.	No.	2		
14	Lifting Equipment:				
14\1	Electrically operated overhead traveling crane complete with longitudinal beams, cross girders, rails, hoist and swiveling hook of 3 tons capacity for the pump station.	No.	1		
14\2	Electrically operated overhead traveling crane of 3 tons capacity complete with all accessories for the generator building.	No.	1		
14\3	Jip crane complete with all accessories of capacity 1 ton to be installed in the screen chamber.	No.	1		
CARRIED TO COLLECTION					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
15	Odor Control System.				
15\1	Supply and installation, Complete odor control system dry type according to specifications.	L.S.	1		
16	Lifting Stations				
	Submersible pumping unit to be erected in wet well including motor and accessories complete with lifting chain, guide rail and fixing material				
16\1	<u>Lifting Station No (1)</u>				
16/1/1	Capacity 28 l/sec. against 6.5 m	No.			
16/1/2	Gate for pipe 300 mm with spindle	No.			
16/1/3	Puddle Flange Piece 100 mm Dia	No.			
16/1/4	Non Return Valve 100 mm Dia	No.			
16/1/5	Flanged gate Valve 100 mm Dia	No.			
16/1/6	All Flanged Tee 100/100	No.			
16/1/7	Flanged dismantling piece 100 mm	No.			
16/1/8	Flanged Tee 150/100	No.			
16/1/9	Flanged bend 100 mm	No.			
16/1/1	Flanged reducer 150/100 mm	No.			
16/2	<u>Lifting Station No (2)</u>				
16/2/1	Capacity 40 l/sec against head 8 m	No.			
16/2/2	Gate for pipe 400 mm with spindle	No.			
-	Puddle Flanged pipe 150 mm	No.			
16/2/4	Non Return Valve 150 mm Dia	No.			
16/2/5	Flanged gate Valve 150 mm Dia	No.			
16/2/6	All Flanged Tee 150/150	No.			
16/2/7	Flanged dismantling piece 150 mm	No.			
16/2/8	Flanged Tee 200/150	No.			
16/2/9	Flanged bend 150 mm	No.			
16/2/1	Flanged reducer 200/150	No.			
	Spare Parts:				
	a Screening Equipment				
17	Mechanical Screens:				
17\1	Rack pins sufficient to replace all pins for one unit.				
17\2	Motor and gear box.	Set	1		
17\3	Wipe blade				
18	For Main Pumping Units:				
18\1	Pump shaft complete with protecting sleeves.	No.	2		
18\2	Impeller.	No.	2		
18\3	Set of bearings for pump.	Set	2		
18\4	Set of soft packing.	Set	4		
18\5	Set of bearings for motor.	Set	4		
18\6	Set of renewable wearing rings.	Set	4		
18\7	Set of all gaskets and oil seals.	Set	2		
CARRIED TO COLLECTION					

ITEM NO.	DESCRIPTION	UNIT	50	UNIT US \$.	TOTAL US \$.
19	For Secondary Pumping Units:				
19/1	Submersible pumping unit complete with all accessories for lifting No-(1)				
19/2	Submersible pumping unit complete with all accessories for lifting No-(2)				
20	For Dewatering Pumping Units:				
20/1	Submersible dewatering pumping unit complete with all accessories.	No.	2		
	For Electric Stand by Generator:				
21	For Diesel Engines:				
21\1	Set of fuel filter elements.	Set.	4		
21\2	Set of oil filter elements.	Set.	4		
21\3	Set of all types of gasket.	Set.	1		
21\4	Set of driving belts.	Set.	1		
	For Electric Fuel:				
22	Transfer Pumping Unit :				
22\1	One pump complete with motor.	No.	1		
23	Tools				
23\1	Complete set of drop forged spanners and special tools required for dismantling or adjusting purposes, must be supplied and suitably mounted on rack of an approved pattern and must be mentioned in detail in the tender .	set	2		
CARRIED TO COLLECTION					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-2/1					
Page NO. 3-2/2					
Page NO. 3-2/3					
Page NO. 3-2/4					
Page NO. 3-2/5					
TOTAL FOR BILL NO. (3-2) :					
Carried to Total Summary of Main Pump Station					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3-MAIN PUMP STATION - ELECTRICAL WORKS

BILL No. (3-3): ELECTRICAL, MEASURING AND CONTROL EQUIPMENT

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	Supply, erection, testing and delivery in good working condition according to technical specification and drawings for the following: <u>Transformer and Ring Main Unit :</u>				
1\1	Transformer, 500 KVA, 11/400-230 KV, 50 Hz complete with all accessories.	No.	1		
1\2	Ring main unit 11KV.	No.	1		
2	<u>Motor Control Center.</u>				
2\1	Motor control center at pump station.	No.	1		
3	<u>M.T. and L.T. Power Cables:</u> Supply, lay and connection of the following cables including excavation and backfilling of trenches in any kind of soil including rocks, uPVC conduits concrete encased at road crossings, warning tapes, cable glands, sealing boxes, terminations, cable trays indoor and outdoor wherever required and all accessories required to complete the work.				
3\1	<u>M.T. Cables :</u>				
	M.T cables from the ring main unit up to transformer in accordance to electrical power authority requirements	L.m	15		
3\2	<u>L.T. Cables (CU/XLPE/SWA/PVC):</u>				
3\2\1	2 (4 x 240) mm ² +120 mm ² E	L.m	100		
3\2\2	2 (3 x 200 + 120) mm ² + E	L.m	100		
3\2\3	(4 x 16) mm ² +16 mm ²	L.m	70		
3\2\4	(4 x 10) mm ² +10 mm ²	L.m	30		
3\2\5	(4 x 6) mm ² +6 mm ²	L.m	50		
3\2\6	(4 x 4) mm ²	L.m	25		
3\2\7	(4 x 4) mm ² +4 mm ²	L.m	100		
3\2\8	(3 x 4) mm ²	L.m	20		
3\2\9	(4 x 2.5) mm ² +4 mm ²	L.m	80		
3\2\10	(3 x 2.5) mm ² +4 mm ²	L.m	50		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
4	<u>Earthing System:</u> Supply, erection, testing and delivery in good working condition of an efficient earthing system according to technical specifications and to the following basis:				
4\1	Common earthing system for the ring main unit, transformer, generator, telephone, measuring and control equipment, motor control center, lighting boards, metallic parts of installations and fuel tank.	L.S.	1		
5	Local control push button station beside the pumps at pump room connected 70 MCC.	No.	3		
6	<u>Telephone Network:</u>				
6\1	Telephone Terminal Cabinet (TTC) of 10 pairs capacity.	No.	1		
6\2	Electronic, private automatic branch exchange EPABX 4/12, with a main distribution frame (MDF) and battery.	No.	1		
6\3	Supply, lay and connection of Jilly filled telephone cables with copper conductors inside uPVC conduits 4" diameter, including excavation and backfilling in any kind of soil including rocks, installation of the required telephone hand-holes, warning tape and all accessories.	L.S.	1		
7	<u>Measuring and Control Equipment:</u>				
7\1	Electromagnetic flow meter on the common suction pipeline DN 600 with measuring range (0-600) lit/sec. complete with metering tube, electrodes, indicators, transmitter, converter/amplifier units and all accessories.	No.	1		
7\2	Ultrasonic level measuring and control system complete with supporting brackets and all accessories to indicate level inside the wet well and to control start/stop of the pumping units according to the level inside the wet well and for dry running protection.	No.	1		
7\3	Pressure gauge of Burdon tube type on the suction pipelines of pumps (0-1) bar complete with isolating cock and drain tap.	No.	3		
7\4	Pressure gauge of Burdon tube type on the delivery pipelines of pumps (0-5) bar complete with isolating cock and drain tap.	No.	3		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
7\5	Supply, lay and connection of the necessary instrumentation and signal cables according to manufacturer recommendations including uPVC conduits, concrete encased with 10 cm thick at road crossings, excavation and backfilling of trenches in any kind of soil including rocks. The price shall also include junction boxes, supports and all accessories.	L.S.	1		
8	<u>Spare parts:</u>				
8\1	Molded case circuit breaker 1000 A., 50 KA	No.	2		
8\2	Molded case circuit breaker 300 A., 36 KA	No.	2		
8\3	Molded case circuit breaker 50 A., 25 KA	No.	1		
8\4	Molded case circuit breaker 40 A., 25 KA	No.	1		
8\5	Molded case circuit breaker 32 A., 25 KA	No.	1		
8\6	Phase sequence and phase failure relay	No.	1		
8\7	Overvoltage relay	No.	1		
8\8	Under voltage relay	No.	1		
8\9	Motor protection relay including all protection functions as shown on drawing.	Set	1		
8\10	Hours run meter	No.	1		
8\11	Signal lamp with cover	No.	10		
8\12	Push buttons	No.	10		
8\13	L.T. current transformer 1000 / 5 A	No.	1		
8\14	Ammeter	No.	3		
8\15	Voltmeter (0-500) volt	No.	1		
9	<u>Measuring and Control Equipment:</u>				
9\1	All replaceable materials as recommended by the manufacturer necessary for 5 years operation.	L.S.	1		
10	<u>Power Supply to Lifting Stations:</u>				
10\1	Supply and erect connection to existing electric source including cables, Isolators, Posts and necessary parts according to Local Authority of electricity regulations.	L.S.			
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-3 /1					
Page NO. 3-3 /2					
Page NO. 3-3 /3					
TOTAL FOR BILL NO. (3-3) :					
Carried to Total Summary of Bills for MAIN PUMP STATION					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3 - MAIN PUMP STATION - LIGHTING, HVAC AND FIRE ALARM SYSTEM

BILL NO. (3- 4- 1) : PUMP STATION BUILDING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Lighting and HVAC works :</u>				
1\1	Supply and erection of complete lighting board according to specifications and drawings.	No.	1		
	Supply and erection of the following according to specifications and drawings complete with 1-core wires of copper conductors, PVC insulated inside heavy duty seamless galvanized steel conduits surface run of appropriate diameters, conduit fittings, galvanized steel boxes with appropriate dimensions, junction boxes with insulated terminal strips, double suspension enameled steel rods for luminaires, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1\2	Industrial luminaire with high utilization factor (IP-54) complete with 1 x 32 watt led lamps, reflector of pure anodized aluminum, prismatic diffuser held by spring loaded end plates and all accessories suspended to ceiling.	No.	7		
1\3	Heavy duty industrial luminaire (IP-54), wall mounted complete with 125 watt sodium lamp, integral control gear, high purity aluminum reflector, prismatically patterned borosilicate glass diffuser, protection grid of galvanized steel, white enameled and all accessories.	No.	19		
1\4	Emergency luminaire (IP-44) complete with 2x18 watt fluorescent lamps, reflector, battery, charger, changeover sensor and a switch to check the battery, prismatic glass diffuser and all accessories for 3-hours working.	No.	2		
1\5	Exit sign luminaire (IP 44) complete with 8 watt fluorescent lamp, reflector, battery, charger, opal diffuser and all a accessories for three hours working incase of mains failure	No.	2		
1\6	Industrial single phase switched socket 220 V, 25 A, 2-pin type complete with earthing contact and cover.	No.	4		
1\7	Industrial three phase switched socket 380 V, 25 A, 4-pin type complete and plug (IP-54) .	No.	1		
1\8	Single pole lighting switch 15 Amp.	No.	1		
1\9	Double pole lighting switch 15 Amp.,	No.	1		
1\10	Double pole lighting switch 15 Amp weather proof type.	No.	2		
1\11	Supply and erection of rigid PVC telephone terminal cabinet complete with removable cover, screws and terminal strips.	No.	1		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1\12	Supply and erection of equipment and copper wires (2 x 0.6 mm) inside PVC conduits embedded inside walls up to telephone terminal cabinet required for making telephone outlet complete with socket and all necessary equipment.	No.	1		
1\13	Telephone wall mounted type.	No.	1		
1\14	Supply and erection of aluminum fresh air louver with mesh screen 0.8 m x 0.8 m	No.	3		
	<u>FIRE ALARM SYSTEM :</u>				
	Supply and erection of the following according to specifications and drawings complete with MICC cable insulated inside rigid , heavy duty seamless galvanized steel conduits of appropriate diameters, conduit fittings, junction boxes with insulated terminal strips, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1\15	fire alarm zone indicating panel	No.	1		
1\16	Automatic smoke detector.	No.	3		
1\17	Manual fire alarm station.	No.	1		
1\18	Fire alarm bell.	No.	1		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-4-1/1					
Page NO. 3-4-1/2					
<u>TOTAL FOR BILL NO. (3-4-1) :</u>					
Carried to Summary of Bills for Main Pump Station - Lighting, HVAC and Fire Alarm System					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3 - MAIN PUMP STATION - LIGHTING, HVAC AND FIRE ALARM SYSTEM

BILL NO. (3- 4- 2) : GENERATOR BUILDING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Lighting and HVAC works :</u>				
1\1	Supply and erection of complete lighting board according to specifications and drawings.	No.	1		
	Supply and erection of the following according to specifications and drawings complete with 1-core wires of copper conductors, PVC insulated inside heavy duty seamless galvanized steel conduits surface run of appropriate diameters, conduit fittings, galvanized steel boxes with appropriate dimensions, junction boxes with insulated terminal strips, double suspension enameled steel rods for luminaires, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1\2	High bay industrial discharge luminaire (IP 54) complete with 250 watt sodium lamp, integral control gear, high purity aluminum reflector and all accessories including mounting ring and catenary suspension.	No.	6		
1\3	Heavy duty industrial luminaire (IP-54), wall mounted complete with 125 watt sodium lamp, integral control gear, high purity aluminum reflector, prismatic glass diffuser, protection grid of galvanized steel, white enameled and all accessories.	No.	9		
1\4	Emergency luminaire (IP 44) complete with 2 x 18 watt fluorescent lamps, reflector, battery charger, change-over sensor and a switch to check the battery, prismatic glass diffuser and all accessories for 3-hours working.	No.	3		
1\5	Industrial single phase switched socket 220V, 25A, 2-pin type complete with earthing contact.	No.	4		
1\6	Industrial three phase socket 380 volt, 25 Amp., 2-pin type complete with earthing contact.	No.	1		
1\7	Single-pole lighting switch 15 Amp weather proof type.	No.	1		
1\8	Double-pole lighting switch 15 Amp.	No.	2		
1\9	Supply and erection of fresh air aluminum louver with washable filter 4 m x 3 m	No.	1		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
2	<p><u>FIRE ALARM SYSTEM :</u></p> <p>Supply and erection of the following according to specifications and drawings complete with MICC cable insulated inside rigid , heavy duty seamless galvanized steel conduits of appropriate diameters, conduit fittings, junction boxes with insulated terminal strips, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:</p>				
2\1	fire alarm zone indicating panel	No.	1		
2\2	Automatic smoke detector.	No.	1		
2\3	Automatic heat detector.	No.	1		
2\4	Manual fire alarm station.	No.	1		
2\5	Fire alarm bell.	No.	1		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-4-2/1					
Page NO. 3-4-2/2					
<u>TOTAL FOR BILL NO. (3-4-2) :</u>					
Carried to Summary of Bills for Main Pump Station - Lighting, HVAC and Fire Alarm System					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3 - MAIN PUMP STATION - LIGHTING, HVAC AND FIRE ALARM SYSTEM

BILL NO. (3- 4- 3) :TRANSFORMER BUILDING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Lighting and HVAC works :</u>				
1\1	Supply and erection of complete lighting board according to specifications and drawings.	No.	1		
	Supply and erection of the following according to specifications and drawings complete with 1-core wires of copper conductors, PVC insulated inside heavy duty seamless galvanized steel conduits surface run of appropriate diameters, conduit fittings, galvanized steel boxes with appropriate dimensions, junction boxes with insulated terminal strips, double suspension enameled steel rods for luminaires, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1\2	Industrial luminaire with high utilization factor (IP-54) complete with 2 x 32 watt led lamps, starters, ballasts, capacitors, reflector of pure anodized aluminum, prismatic diffuser held by spring loaded end plates and all accessories suspended to ceiling.	No.	2		
1\3	Ditto as item (1\2) but with 1x32 watt	No.	2		
1\4	Heavy duty industrial luminaire (IP-54), wall mounted complete with 125 watt sodium lamp, integral control gear, high purity aluminum reflector, prismatically patterned borosilicate glass diffuser, protection grid of galvanized steel, white enameled and all accessories.	No.	6		
1\5	Industrial single phase switched socket 220 V, 25 A, 2-pin type complete with earthing contact and cover.	No.	3		
1\6	Single pole lighting switch 15 Amp.	No.	1		
1\7	Double pole lighting switch 15 Amp.,	No.	1		
1\8	Supply and erection of axial exhaust fan with a capacity of 2500 c.f.m., complete with electric motor, gravity damper, operating switch, thermostat and timer, interconnecting wire and all accessories.	No.	1		
1\9	Supply and erection of an air conditioning unit, window type with a capacity of 24000 BTU/hr complete with casing, sealed compressor unit, air cooled condenser, evaporator, cooled and recirculated air sections with silent running fans, filter section, control switch and all accessories.	No.	2		
	<u>FIRE ALARM SYSTEM :</u>				
	Supply and erection of the following according to specifications and drawings complete with MICC cable insulated inside rigid , heavy duty seamless galvanized steel conduits of appropriate diameters, conduit fittings, junction boxes with insulated terminal strips, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1\10	fire alarm zone indicating panel	No.	1		
1\11	Automatic smoke detector.	No.	2		
1\12	Automatic heat detector.	No.	2		
1\13	Manual fire alarm station.	No.	2		
1\14	Fire alarm bell.	No.	2		
CARRIED TO COLLECTION:					

COLLECTION OF BILL	TOTAL PRICE US \$.
Page NO. 3-4-3/1	
Page NO. 3-4-3/2	
TOTAL FOR BILL NO. (3-4-3) :	
Carried to Summary of Bills Main Pump Station - Lighting, HVAC and Fire Alarm System	

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT

CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)

3 - MAIN PUMP STATION - LIGHTING, HVAC AND FIRE ALARM SYSTEM

BILL NO. (3- 4- 4) : SITE LIGHTING

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Lighting works :</u> Supply and erection of the following according to specifications and drawings, the price for lighting pole shall include the concrete base:				
1\1	Light pole 4 meters height complete with one flood light projectors (IP54) complete with 250 watt metal halide lamp, ignitor gear, reflectors, reversible mounting bracket with graduated scale and all accessories.	No.	5		
1\2	Spherical lighting with of seamless diffuser bowl made of vandal-restamt,high density polyethylene opal with and ultra violet stabilized complete with 125 watt sodium lamp, ballast, copalitor, anti-corrosion metal base plate and all accessories(IP54) corrosion.	No.	5		
1\3	Supply, lay and connection of (4 x 10) mm ² +10mm ² CU/XLPE/SWA/PVC cable including excavation and backfilling in any kind of soil, the price shall include uP.V.C. pipes, concrete encased with 10 cm thick around the pipes at road crossings.	L.m	80		
1\4	Supply, erection and testing of earthing system for poles, and units.	L.S	1		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					TOTAL PRICE US \$.
Page NO. 3-4-4/1					
<u>TOTAL FOR BILL NO. (3-4-4) :</u>					
Carried to Summary of Bills Main Pump Station - Lighting, HVAC and Fire Alarm System					

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

3 - MAIN PUMP STATION - LIGHTING, HVAC AND FIRE ALARM SYSTEM

BILL NO. (3- 4- 5) :GUARD ROOM

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	<u>Lighting and HVAC works :</u>				
1\1	Supply and erection of complete lighting board according to specifications and drawings.	No.	1		
	Supply and erection of the following according to specifications and drawings complete with 1-core wires of copper conductors, PVC insulated inside heavy duty seamless galvanized steel conduits surface run of appropriate diameters, conduit fittings, galvanized steel boxes with appropriate dimensions, junction boxes with insulated terminal strips, double suspension enameled steel rods for luminaires, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1\2	Industrial luminaire with high utilization factor (IP-54) complete with 2 x 32 watt led lamps, starters, ballasts, capacitors, reflector of pure anodized aluminum, prismatic diffuser held by spring loaded end plates and all accessories suspended to ceiling.	No.	2		
1\3	Ditto but circular opal glass with stain finish, surface mounted luminaire (IP54) complete with 100 watt incandesscent lamp, reflector, lamp holder , and all accessories, fixed to ceiling.	No.	2		
1/4	32, Amp. Switched fuse spur unit, complete with pilot lamp (control air conditions and water heater)	No.	2		
1/5	Heavy duty industrial luminaire (IP-54), wall mounted complete with 125 watt sodium lamp, integral control gear, high purity aluminum reflector, prismatically patterned borosilicate glass diffuser, protection grid of galvanized steel, white enameled and all accessories.	No.	2		
1/6	Industrial single phase switched socket 220 V, 25 A, 2-pin type complete with earthing contact and cover.	No.	5		
1/7	Desk telephone outlet with socket	No.	1		
1/8	Single pole lighting switch 15 Amp.	No.	1		
1/9	Double pole lighting switch 15 Amp.,	No.	2		
1/10	Supply and erection of axial exhaust fan with a capacity of 2500 c.f.m., complete with electric motor, gravity damper, operating switch, thermostat and timer, interconnecting wire and all accessories.	No.	2		
1/11	Supply and erection of an air conditioning unit, window type with a capacity of 24000 BTU/hr complete with casing, sealed compressor unit, air cooled condenser, evaporator, cooled and recirculated air sections with silent running fans, filter section, control switch and all accessories.	No.	1		
CARRIED TO COLLECTION:					

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
	<u>FIRE ALARM SYSTEM :</u>				
	Supply and erection of the following according to specifications and drawings complete with MICC cable insulated inside rigid , heavy duty seamless galvanized steel conduits of appropriate diameters, conduit fittings, junction boxes with insulated terminal strips, if required, with ceiling plates, nuts, washers and all necessary accessories to complete the work:				
1/12	fire alarm zone indicating panel	No.	1		
1/13	Automatic smoke detector.	No.	1		
1/14	Automatic heat detector.	No.	1		
1.15	Manual fire alarm station.	No.	1		
1/16	Fire alarm bell.	No.	1		
1/17	End of line unit incorporating self resetting switch	No.	1		
CARRIED TO COLLECTION:					
Page NO. 3-4-5/1					
Page NO. 3-4-5/2					
TOTAL FOR BILL NO. (3-4-5):					
Carried to Summary of Bills Main Pump Station - Lighting, HVAC and Fire Alarm System					

**CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST
ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

SUMMARY OF BILLS FOR

SUM (3-4) MAIN PUMP STATION - LIGHTING, HVAC AND FIRE ALARM SYSTEM

BILL NO.	DESCRIPTION	TOTAL PRICE US \$.
3-4-1	PUMP STATION BUILDING	
3-4-2	GENERATOR BUILDING	
3-4-3	TRANSFORMER BUILDING	
3-4-4	SITE LIGHTING	
3-4-5	GUARD ROOM	
TOTAL OF BILLS		

Carried to Total Summary of Main Pump Station

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT

CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)

3-MAIN PUMP STATION

BILL NO. (3-5) :SITE WORK

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	ROAD WORKS:				
1\1	Excavate in all kinds of soils except rocks, and use suitable materials for embankment and dispose unsuitable materials to waste	m ³	450		
1./2	Supply, spread and compact aggregate sub grade 20 cm compacted thickness as specified in specifications and drawings	m ²	140		
1\3	Supply, spread and compact aggregate base course 20 cm compacted thickness as specified in specifications and drawings	m ²	1,000		
1\4	Supply and distribute bituminous prime coat (MC-0) with rate of application 1.5 kg / m ² for asphaltic roads	m ²	300		
1\5	Supply, spread and compact bituminous wearing course 5 cm compacted thickness as specified in specifications and drawings	m ²	300		
1\6	Supply and lay precast concrete curbs 30*15*50 cm for footpath including 10 cm concrete bed and 2 cm cement mortar for edge of asphaltic roads as specified in specifications and drawings	L.m	145		
1/7	Supply and lay precast interlocking tiles, thickness not less than 6cm laid on 10cm thick sand layer, covering all surfaces of the compound excluding built up areas and road. Interlocking tile type, shape , size and colors shall be as provided in specifications and drawings.	m ²	660		
2	BOUNDARY WALL				
2/1	Execute fence as shown in drawing including earth works, concrete works, masonry works, gate works and other works to complete boundary wall. Material of steel gate to be suitable for sewage and resist the weather condition and as specified in technical specification, drawings and as directed by engineer	m	118		
CARRIED TO COLLECTION:					
COLLECTION OF BILL					PRICE US \$.
Page NO. 3-5\1					
TOTAL FOR BILL NO. (3-5) :					

Carried to Total Summary of Main Pump Station

**CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND
HOST COMMUNITIES IN REPUBLIC OF YEMEN.**

**ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)**

SUM 3. SUMMARY OF BILLS FOR MAIN PUMP STATION

BILL NO.	DESCRIPTION	TOTAL PRICE US \$.
(3-1)	CIVIL WORKS	
(3-2)	MECHANICAL EQUIPMENT	
(3-3)	ELECTRICAL, MEASURING AND CONTROL EQUIPMENT	
(3-4)	LIGHTING, HVAC AND FIRE ALARM SYSTEM	
(3-5)	SITE WORK	
TOTAL OF BILLS		

Carried to Grand Summary

CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND HOST COMMUNITIES IN REPUBLIC OF YEMEN.

ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT

PHASE I, PART I: CONSTRUCTION OF MAIN SEWAGE PUMP STATION & FORCE MAIN.

BILL NO (3.7) GRAND SUMMARY

Bill No.	Description	Total Price (as per BOQ)US \$
1	GENERAL AND PRELIMINARY	
2	SEWAGE NET WORK	
3	MAIN PUMP STATION	
GRAND TOTAL OF THE PROJECT.		

Grand Total in Words:

تحميل بند قطع الاسفلت على بنود المواسير أذ

تحميل بند قطع الاسفلت على بنود المواسير أذ

GRAND TOTAL OF THE PROJECT	
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**CRITICAL INFRASTRUCTURE DEVELOPMENT FOR INTERNALLY DISPLACED PERSONS AND
HOST COMMUNITIES IN REPUBLIC OF YEMEN.
ADEN WATER AND SANITATION UTILITIES DEVELOPMENT PROJECT
CONSTRUCTION OF MAIN SEWAGE PUMP STATION (PHASE 1 PART 1)
SCHEDULE OF RATES /DAY WORK**

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT PRICE US \$.	TOTAL PRICE US \$.
1	(I) Labor for Work Executed on a Day works Basis (Provisional) :				
1\1	Unskilled labor	hr	1		
1\2	Heavy plant operators	hr	1		
1\3	Formwork carpenters	hr	1		
1\4	Steel fixers	hr	1		
1\5	Concretors	hr	1		
1\6	Pipe layers	hr	1		
1\7	Masons	hr	1		
1\8	Electricians	hr	1		
1\9	Plumbers	hr	1		
1\10	Carpenters	hr	1		
1\11	Driver of trucks up to 3 T	hr	1		
1\12	Fitters	hr	1		
1\13	Drivers of trucks over 3 T	hr	1		
1\14	Mechanics	hr	1		
1\15	Mates	hr	1		
1\16	Junior headman or Charge hand	hr	1		
1\17	Surveying and setting out assistant	hr	1		
1\18	Senior headman or foreman	hr	1		
1\19	Junior Engineer	hr	1		
1\20	Welder	hr	1		
1\21	Watchman (8 hours per shift)	shift	1		
2	(II) Cost of Constructional Plant for Works Executed on Day works basis (Provisional):				
	Bulldozers (with or without rippers):				
2\1	Blade capacity not less than 4.0 cu.m	hr	1		
	Excavator (with or without hammer):				
2\2	Hydraulic back action – plant weight up to 10t	hr	1		
2\3	Hydraulic back action – plant weight up to 20t	hr	1		
2\4	Hydraulic back action – plant weight up to 30t	hr	1		
2\5	JCB type combined loader and backhoe	hr	1		
2\6	Extra for excavator using a percussion breaker	hr	1		
	Wheel Loader:				
2\7	Bucket capacity not less than 1 cu.m	hr	1		
2\8	Bucket capacity not less than 1.7 cu.m	hr	1		
2\9	Bucket capacity not less than 3.3 cu.m	hr	1		

ITEM NO.	DESCRIPTION	UNIT		UNIT PRICE US \$.	TOTAL PRICE US \$.
	Motor Grader:				
2\10	Front blades size not less than 3.66 x 0.61 m	hr	1		
3	Cranes Including All Slings, Chains, Grab, Skips, etc Complete:				
3\1	10 tone capacity	hr	1		
3\2	20 tone capacity	hr	1		
3\3	30 tone capacity	hr	1		
4	Dump Trucks:				
4\1	Less than 10 cu.m capacity	hr	1		
4\2	Greater than 10 cu.m capacity	hr	1		
5	Generators:				
5\1	250 KVA	hr	1		
5\2	125 KVA	hr	1		
5\3	50 KVA	hr	1		
5\4	25 KVA	hr	1		
5\5	Mobile lighting unit with 2.5 KVA generator and mast up to 7.5m	hr	1		
5\6	7.5KVA with lighting tower	hr	1		
6	Lorries, Vans, . . etc.:				
6\1	Pick up vehicle, weight up to 2t	hr	1		
6\2	7 tone flat bed truck	hr	1		
6\3	Rigid or articulated truck-vehicle weight up to 15t	hr	1		
7	Compressor (with tools)				
7\1	350 cu.ft per min at 100 psi	hr	1		
7\2	600 cu.ft per min at 100 psi	hr	1		
8	Concrete Mixer				
8\1	0.25 cu.m capacity	hr	1		
8\2	0.50 cu.m capacity	hr	1		
8\3	1.0 cu.m capacity	hr	1		
8\4	Truck mounted concrete mixer (capacity up to 6 cu.m)	hr	1		
9	Dumpers:				
9\1	0.5 cu.m capacity	hr	1		

ITEM NO.	DESCRIPTION	UNIT		UNIT PRICE US \$.	TOTAL PRICE US \$.
10	Compactors:				
10\1	120 kg vibrating plate	hr	1		
10\2	950 kg double roller vibrator	hr	1		
11	Concrete Equipment:				
11\1	Vibrating poker	hr	1		
12	<u>Welding and cutting sets</u>				
12\1	Oxy - acetylene	hr	1		
12\2	Electric arc (diesel powered)	hr	1		
13	<u>Provisional Items</u>				
13/1	Extra-over for excavation in rock of all types for buildings.	m ³	1		
13/2	Cost for maintain without removing of the excavation shuttering, if needed and directed by the Engineer. The cost will be based on the area of the supported sides.	m ²	1		