

PETRA GATE

Volume 1 – Conditions of Contract – “Re-measured Contract”

Volume 2 – Specification

Volume 3 – Bills of Quantities & Preambles

Volume 4 – Drawings

November 2012

PETRA GATE

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**DIVISION 2
SITE WORK**

(To be read in conjunction with Section 2 of the General Specifications)

PETRA GATE
DIVISION 2 - SITEWORK

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>02050 - Demolition and Alteration Works</u>				
	Demolishing to existing slabs and walls(block or concrete),finish...etc,including removal of surplus material to an approved dumping place, complete to the Engineer's approval				
A	Exisitng guest room	1	L.S.		
B	Exisitng kiosks	1	L.S.		
C	Existing walls	1	L.S.		
D	Exisitng Tiling	1	L.S.		
E	Exisitng Gate	1	L.S.		
	<u>02100 - Excavation & Earthwork</u>				
	Excavation in any kind of soil, rock ... etc., starting at natural ground level to reduced level (to bottom of hardcore) including removal of surplus material from site to an approved dumping area complete as shown on drawings and as per specifications				
F	Excavation to reduced level	386	m3		
	Excavation in any kind of soil, rock ... etc., starting at reduced level to bottom of foundation blinding level including removal of surplus material from site to an approved dumping area, complete as shown on drawings and as per specifications				
G	To foundations and ground beams	224	m3		
	<u>FILLING/BACKFILLING</u>				
	Fill with imported fill material subject to the Engineer's approval, including compaction in layers, complete as shown on drawings and as per specifications				
H	Around and above foundations	164	m3		
Carried To Collection				JD	

PETRA GATE
DIVISION 2 - SITEWORK

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<p>Fill with imported hardcore material, subject to the Engineer's approval, including compaction, complete as shown on drawings and per specifications</p>				
A	<p>150mm thick beds (after compaction) under slab on grade</p>	945	m2		
	<p>Supply and lay in position natural gravel color to match the natural earth on site, size subjected to Engineer's approval</p>				
B	<p>100mm thick layer Ref. GR-01</p>	89	m2		
Carried To Collection				JD	

PETRA GATE
DIVISION 2 - SITEWORK

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>COLLECTION</u>				
	From Page 2/1				
	From Page 2/2				
	DIVISION 2 - SITE WORKS CARRIED TO SUMMARY			JD	

DIVISION 3
CONCRETE WORKS

(To be read in conjunction with Section 3 of the General Specifications)

PETRA GATE
DIVISION 3 - CONCRETE WORKS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>SUBSTRUCTURE</u>				
	<u>03200 - Concrete Reinforcement</u>				
	Deformed high yield steel bar reinforcement of characteristic strength FY=414N/mm ² , including bending, hooks, tying wires, distance blocks and spacers, complete as shown on drawings and as per specifications				
A	Various diameters	9558	Kg		
	<u>03100 - Concrete Formwork</u>				
	<u>03300 - Cast-In-Place Concrete</u>				
	<u>03370 - Concrete Curing</u>				
	Plain concrete (C15), 15 N/mm ² at 28 days compressive strength with ordinary Portland cement including all necessary formwork complete as shown on drawings and as per specifications				
B	Blinding, 100mm thick, under footings	10	m ²		
	Reinforced concrete (C30), 30N/mm ² at 28 days compressive strength with ordinary Portland cement including all necessary formwork complete as shown on drawings and as per specifications				
C	Isolated footings	1	m ³		
D	Strip footings	18	m ³		
E	Column necks	1	m ³		
F	Grade beams	7	m ³		
G	Walls below grade, 300mm thick	5	m ³		
H	Walls below grade, 550mm thick	29	m ³		
I	Slab on grade, 100mm thick	100	m ³		
Carried To Collection				JD	

PETRA GATE
DIVISION 3 - CONCRETE WORKS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>SUPERSTRUCTURE</u>				
	<u>03200 - Concrete Reinforcement</u>				
	Deformed high yield steel bar reinforcement of characteristic strength FY=414N/mm ² , including bending, hooks, tying wires, distance blocks and spacers, complete as shown on drawings and as per specifications				
A	Various diameters	6137	Kg		
	<u>03100 - Concrete Formwork</u>				
	<u>03300 - Cast-In-Place Concrete</u>				
	<u>03370 - Concrete Curing</u>				
	Reinforced concrete (C30), 30N/mm ² at 28 days compressive strength with ordinary Portland cement including all necessary formwork complete as shown on drawings and as per specifications				
B	Walls, 300mm thick	22	m ³		
C	Walls, 550mm thick	55	m ³		
D	Flat slabs, 300mm thick	10	m ³		
E	Flat slabs, 250mm thick	9	m ³		
F	Columns	1	m ³		
G	Parapet	1	m ³		
	Light weight foam concrete screed, dry density 450Kg/m³, including all necessary wire mesh around drains, fixings, fittings and accessories, complete as shown on drawings and as per specifications				
H	To roof, 50mm "minimum" thickness	25	m ²		
	Trowelled smooth cement and sand levelling screed including triangular fillet all necessary fixings, fittings and accessories, complete as shown on drawings and as per specifications				
I	To roofs, 20mm thick, screed protection layer	25	m ²		
Carried To Collection				JD	

PETRA GATE
DIVISION 3 - CONCRETE WORKS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>COLLECTION</u>				
	From Page 3/1				
	From Page 3/2				
	DIVISION 3 - CONCRETE WORKS CARRIED TO SUMMARY			JD	

DIVISION 4
MASONRY

(To be read in conjunction with Section 5 of the General Specifications)

PETRA GATE
DIVISION 4 - MASONRY

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>04450 - Natural Stone Work</u>				
A	Brushed "Jerusalem" stone cladding, using semi wet mechanical fixing method, including, galvanized steel hooks, steel mesh, backing concrete, cutting, pointing, fixings, fittings, accessories , special pieces to jams and angles and all related necessary works, complete as per Specification and Drawings <u>Externally</u> Size 550mm high, 50mm thick, to elevations, ref. ST-1	318	m2		
B	<u>Internally</u> Size 550mm high, 50mm thick, to elevations, ref. ST-1	45	m2		
c	Brushed "Jerusalem" Stone Sills , including cutting, mortar bed, fixings, fittings, accessories, pointing, and all related necessary works, complete as per Specification and Drawings 250 mm wide, 30mm thick	17	m		
D	500 mm wide, 50mm thick	3	m		
E	Brushed "Jerusalem" Stone Lintels , including cutting, mortar bed, fixings, fittings, accessories, pointing, and all related necessary works, complete as per Specification and Drawings 250 mm wide, 30mm thick	17	m		
F	500 mm wide, 50mm thick Brushed "Jerusalem" stone coping, including cutting, mortar bed, fixings, fittings, Specification and Drawings accessories, pointing, and all related necessary works, complete as per Specification and Drawings	3	m		
G	750 mm wide, 50mm thick sloped	15	m		
H	1180 mm wide, 50mm thick sloped	44	m		
I	Restoration of stone including providing additional stone pieces were required, cleaning and sand blasting. To existng western retaining wall	1	L.S		
DIVISION 4 - MASONRY CARRIED TO SUMMARY				JD	

DIVISION 5
METAL WORKS

(To be read in conjunction with Section 10 of the General Specifications)

PETRA GATE
DIVISION 5 METAL WORKS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>05500 - Micellaneous Metal Fabrications</u>				
	Supply and install steel grill to the external elevation including all necessary fixings, fittings accessories, treatment and powder coating, complete as shown on drawings and as per specifications				
A	Size 900mm x 1650 mm high	1	No.		
	Supply and install steel stair, comprising steel tube fixed in ground, steel wedges, steel plates, powder coated color to the selection of Engineer, steel screws, welding, fixing and fittings, polished prefabricated concrete steps complete as shown on drawings				
B	Including two steps (4500 mm length*470 mm width) and (2850 mm length*650 mm width)	1	No.		
	Floor mounted metal railing comprising of perforated stainless steel mesh cladding on steel tubes design to be approved by Engineer on , including all necessary fixings, fittings, accessories, treatment and painting, complete as per Specification and Drawings				
C	Variable height, for entrance and exit seperation	66	m		
	Provide and install powder coated steel gate including metal tubes, door lock, electrical automatic door closer, all necessary fixings, finishes and fittings complete as per specification and drawings.				
D	Ref. D01, Over all size (4900mm*variable height), double leaf hinged portal size (4100mm*variable height)	1	No.		
DIVISION 5 - METAL WORKS CARRIED TO SUMMARY				JD	

DIVISION 7
THERMAL AND MOISTURE PROTECTION
(To be read in conjunction with Section 9 of the General Specifications)

PETRA GATE
DIVISION 7 - THERMAL & MOISTURE PROTECTION

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>07535 - Modified bitumen roofing membrane</u>				
	Approved 4mm thick torch applied waterproofing membrane sheet, including all necessary primer coats, preparation works, fixings, overlapping, complete as shown on drawings and as per specifications				
A	To roofs, applied horizontally	34	m2		
B	To roofs, applied vertically, 200mm high	16	m		
	<u>07120 - Fluid Applied Water proofing</u>				
	Two layers 3mm thick hot applied bitumen including all necessary, fixings, fittings, protection board and accessories, complete as per Specification and Drawings				
C	To footing, horizontally	30	m2		
D	To footing, vertically	37	m2		
E	To column neck	2	m2		
F	To walls below grade	136	m2		
G	To ground beams	6	m2		
	Elastomeric high build cold applied rubberized bitumen waterproofing membrane including, preparation works, all necessary, fixings, fittings, and accessories, complete as per Specification and Drawings				
H	To wet area, horizontally	25	m2		
I	To wet area, vertically, 100 mm high	15	m		
	<u>07600 - Sheet Metal Flashing and Trim</u>				
J	Brushed stainless steel metal flashing	16	m		
DIVISION 7 - THERMAL AND MOISTURE PROTECTION CARRIED TO SUMMARY				JD	

**DIVISION 8
DOORS AND WINDOWS**

*(To be read in conjunction with Section 10 & 12 of the General
Specifications)*

PETRA GATE
DIVISION 8 - DOORS AND WINDOWS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<p><u>08520 - Aluminum Windows, Doors and louvers</u></p> <p><u>NOTE: ALL ALUMINUM SHALL BE POWDER COATED</u></p> <p><u>Aluminum Louvers</u></p> <p>Aluminum louvers system comprising square shaped aluminum tubes 40mm*40mm fixed via aluminum holders, including trims, mastic sealant, fixings, fittings and accessories, complete as shown on drawings and as per specifications</p>				
A	<p>Vertical louvers, to elevations, ref. L01 and L02</p>	130	m		
	<p><u>Aluminum Sheet Cladding</u></p> <p>Powder coated aluminum sheets metal wall cladding including all necessary fixings, fittings, and accessories complete as shown on drawings and as per specification</p>				
B	<p>Internally to column behind curtain wall</p>	2	m2		
	<p><u>Aluminum Windows</u></p> <p>Design Supply and install double glazed powder coated aluminum windows, comprising 6mm thick tempered clear internal glass pane, 12 mm thick cavity and 6 mm thick tempered tinted external glass pane, including all necessary frames, trims, mastic, sealant, flashing, weather stripping, hardware, complete as shown on drawings and as per specifications</p>				
	<p><u>Fixed Windows</u></p>				
C	<p>Ref. W03, size 350 mm*600 mm high</p>	6	No.		
Carried To Collection				JD	

PETRA GATE
DIVISION 8 - DOORS AND WINDOWS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>08920 - Structurally Glazed Curtain Walls</u>				
	Design, supply and instal double glazed extruded aluminum curtain walls, comprising of 6mm thick clear tempered glass inner pane, 12 mm thick cavity and 6mm thick tempered tinted outer pane, including all necessary frames, trims, mastic sealant, flashing, caulking, glazing , weather stripping and hardware, complete as shown on drawings and as per specifications				
A	Ref. W01 including hinged aluminum framed double	11	m2		
B	Ref. W02	18	m2		
C	Ref. W04 including sliding double glazed aluminum door	20	m2		
Carried To Collection				JD	

PETRA GATE
DIVISION 8 - DOORS AND WINDOWS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>COLLECTION</u>				
	From Page 8/1				
	From Page 8/2				
	DIVISION 8 - DOORS AND WINDOWS CARRIED TO SUMMARY			JD	

DIVISION 9
FINISHES

(To be read in conjunction with Sections 7, 8 and 13 of the General Specifications)

PETRA GATE
DIVISION 9 - FINISHES

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>09220 -Portland Cement Plaster</u>				
	Cement and sand plastering to concrete surfaces including background preparation and accessories, complete as specified				
	<u>Three- Coats internal plaster</u>				
A	To soffits	29	m2		
	Colored stucco, including all necessary casing stop, angle beads and wire mesh, complete as shown on drawings and as per specifications				
B	To external elevations, ref. PL-1	10	m2		
	<u>09315 - Porcelain Tiles</u>				
	First class imported porcelain floor tiles,on and including cement and sand mortar bed, sand fill materials, cutting, fittings, trims, accessories, grouting and cleaning, complete as shown on drawings and as per specifications				
C	To floors, size 600 mm * 600 mm	26	m2		
	<u>09610 - Stone Flooring</u>				
	Combination stone floor tiles comprizing of beige "Ajloun" bush hammered stone on sand bed Ref. TST01 size 100mm *200 mm *50mm thick and brown local stone with rough texture Ref. TST02 size 100mm *200 mm *50mm on and including cement and sand mortar bed, sand fill material, cutting, grouting and cleaning, complete as shown on drawings and as per specifications				
D	To external yard	945	m2		
	Beige "Ajloun" bush hammered stone flooring ,on and including cement and sand mortar bed, sand fill material, cutting, grouting and cleaning, complete as shown on drawings and as per specifications				
E	Size 100 mm* 200mm * 30mm thick to roof	25	m2		
	<u>09900 - Painting</u>				
	Emulsion paint including preparation works and under coats,complete as show non drawings and as per specifications				
	<u>Internally</u>				
C	To plastered soffits	29	m2		
DIVISION 9 - FINISHES CARRIED TO SUMMARY				JD	

DIVISION 15
MECHANICAL WORKS

*(To be read in conjunction with the Technical Specification for Building,
Volume 2, Mechanical Services 1996)*

PETRA GATE
DIVISION 15 - MECHANICAL WORKS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	<u>MECHANICAL WORKS</u>				
	<u>Section (1) - HVAC System</u>				
	Split Units				
A	Ref. SU-1	2	No.		
B	Refrigerant pipes for pipework running in shafts, embedded in walls.	10	MR		
	Condensate drain pipes for pipework running in shafts, embedded in walls, under tiles and slabs				
C	Diam. 32 mm (1.5")	20	MR		
Carried To Collection				JD	

<u>Section (2) - Plumbing System</u>					
<u>Domestic Water System</u>					
PPR pipes for cold and Hot water supply for pipe runs in walls and underground, with insulation					
A	Diam. 15 mm (1/2")	5	MR		
B	Diam. 40 mm (1 1/2")	90	MR		
Isolating valves					
C	Diam. 16 mm (1/2")	2	No.		
D	Diam. 40 mm (1 1/2")	1	No.		
Electrical Water Heater					
E	1. Ref. (EWH-1)	1	No.		
<u>Above Ground Drainage</u>					
Above ground Soil, Waste Overflow, Venting and rain water UPVC pipes and fittings					
A	Diam. 110 mm (4")	6	MR		
Rain water drain outlets					
B	Ref. RW0-1	1	No.		
Floor Drains					
C	Ref. FD-1	1	No.		
UPVC Drainage Pipes And Fittings for Below Ground Installations					
D	Diam 80mm	8	MR		
	Diam 50 mm	4	MR		
Sanitary Fixtures					
E	Sink	1	No.		
<u>Section (3) - Fire Fighting System</u>					
A	Fire Extinguishers Ref. FE-1	1	No.		
Carried To Collection				JD	

COLLECTION

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**DIVISION 15 - MECHANICAL WORKS
CARRIED TO SUMMARY**

JD

DIVISION 16
ELECTRICAL WORKS

*(To be read in conjunction with the Technical Specification for Building,
Volume 2, Electrical Services 1996)*

PETRA GATE
DIVISION 16 - ELECTRICAL WORKS

Item	Description	Quantity	Unit	Rate	Amount
				JD	JD
	ELECTRICAL WORKS Detailed Package <u>Section (1) - Electrical installations</u>				
A.	<u>Multicore Armoured Cables</u> 600/1000V copper XLPE/SWA/PVC for the following:				
	1) 4X10 + 1X10 mm2	120	M.R.		
B.	<u>Isolating Switch</u>				
	1) 20A, TPN, IP-65	1	No.		
	2) 20A, SPN, IP-65	2	No.		
C.	<u>Wiring Accessories</u>				
	1) 13A, Single Phase, One Gang Socket Outlet, Switched Type, IP-20	1	No.		
	2) 13A, Single Phase, Double Gang Socket Outlet, Switched Type, IP-20	3	No.		
	3) Power point for ticketing system	3	No.		
	4) Spur Outlet	1	No.		
	5) Power Point for Camera	3	No.		
	6) Spur Outlet for Electrical Water Heater	1	No.		
	7) Double Pole Switch with Indication Lamp	1	No.		
	8) Electrical Installation for motorized Arm Gate	L.S.	L.S.		
	9) Internal Lighting point	8	No.		
	10) External Lighting point	50	No.		
DIVISION 16 - ELECTRICAL WORKS				JD	
CARRIED TO SUMMARY					

A.	<p><u>Section (2) - Lighting System</u></p> <p>A. Internal lighting</p> <p>1) F1</p> <p>2) F2</p> <p>3) F2E</p> <p>B. External lighting</p> <p>1) F3</p> <p>2) F4</p> <p>3) F5</p> <p>4) F6</p> <p>5) F7</p> <p><u>Section (3) - Electrical Distribution System</u></p> <p><u>Secondary Distribution Boards</u></p> <p>Finger safe fully shrouded bus bar system to BS EN 60529/IEC 529</p> <p>1) DLP-GATE</p>	<p>4</p> <p>3</p> <p>1</p> <p>2</p> <p>11</p> <p>5</p> <p>2</p> <p>30</p> <p>1</p>	<p>No.</p> <p>No.</p> <p>No.</p> <p>No.</p> <p>No.</p> <p>No.</p> <p>M.R.</p> <p>No.</p>		
	<p>DIVISION 16 - ELECTRICAL WORKS CARRIED TO SUMMARY</p>		<p>JD</p>		

Section (4) - Low Current Systems					
B.	<u>Telephone System</u>				
	1) Telephone outlet for desk type telephone set, RJ-45 (cat.6)	2	No.		
	2) Telephone outlet for wall mounted telephone set, RJ-45 (cat.6)	1	No.		
C.	<u>Data System</u>				
	1) Data outlet, RJ-45 (cat.6)	2	No.		
	2) Data cable point, RJ-45 (cat.6) (For Ticketing System)	3	No.		
	3) Intermediate Distribution Frame, Ref. IDF	1	No.		
	4) 6 strands fiber optic cable, armoured, single mode type for connection with Petra Visistor Center including 50 mm PVC pipe and manhole each 30 mr	200	MR		
D.	<u>CCTV SYSTEM (EMPTY CONDUIT ONLY)</u>				
	1)Wall mounted camera point connected to the police station (180 mr away) including 100mm PVC pipe and manhole each 30 mr	3	No.		
E.	<u>Fire Detection & Alarm System</u>				
	1) Fire alarm control panel including batteries, autodialer,etc.	1	No.		
	2) Manual call point.	1	No.		
	3) Indoor Siren.	1	No.		
	4) Smoke Detector.	2	No.		
	5) Control module	1	No.		
	6)Communication cable in 25 mm PVC conduit for connection with FACP at Visitor Center including maholes each 30 m	L.S	L.S		
DIVISION 16 - ELECTRICAL WORKS CARRIED TO SUMMARY				JD	

COLLECTION

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**DIVISION 16 - Electrical WORKS
CARRIED TO SUMMARY**

JD

SUMMARY

PETRA GATE

SUMMARY

Div. No.	Description	Quantity	Unit	Rate	Amount
				JD	JD
2	SITWORK				
3	CONCRETE				
4	MASONRY				
5	METAL WORKS				
7	THERMAL AND MOISTURE PROTECTION				
9	FINISHES				
15	MECHANICAL WORKS				
16	ELECTRICAL WORKS				
TOTAL CARRIED TO GENERAL SUMMARY				JD	

Petra Gate
Amman-Jordan

Bill of Quantity
Preambles & Method of Measurements

November 2012

BILL OF QUANTITIES

MECHANICAL INSTALLATIONS

PREAMBLES

The Bills of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications, Appendices and Drawings. The documents are to be taken as mutually explanatory and inter-related to one another.

Unless otherwise mentioned, all quantities of works shall be measured "Net" in accordance to the drawings or/as ordered by the engineer, and generally, according to method of payment mentioned in the tender documents.

The Unit Price and the rates inserted in the Bills of Quantities respectively shall be comprehensive and shall include for complying in all respects with the requirements of the Technical Specifications, drawings and all other related tender documents. This shall cover all the obligations under the contract and all matters deemed necessary for the proper construction, completion and remedy of defects in the works. No claims for additional payment will be allowed for any error, misunderstanding or failure to acquaint with all necessary information of the work.

The unit prices inserted in the Bill of Quantity shall be of fixed rates. The contractor shall not be entitled for new rates should the quantities be altered during the construction and execution of the works.

In the Bills of Quantities, a unit price or rate shall be inserted against its respective item with quantities only. The value of any item left unpriced shall be deemed to be to be included in the total cost of the BOQ.
Bead

All measurements of the executed works called for in the Contract shall be based on the unit price stated in the Bills of Quantities and made according to the specifications. Any work done by the Contractor, but not called for in the Contract or not requested in writing by the Engineer, shall not be included in the measurement.

The unit rate of the materials and equipment shall be based on the Specification, all components as required and specified under each item concerned in the Specifications, Technical Data and Notes on Contract Drawings, and all other Contract documents

The Bills of quantities are classified under headings and sections with the same reference numbers and titles as the specifications.

Each section referred to in the Bills of quantities shall be read in conjunction with the respective section and with all other related sections of specifications.

The Bills of Quantities, Specifications, Schedule of Equipment and Drawings and all other Contract documents are complementary to each other.

It is the responsibility of the Contractor to check the locations and quantities of the materials and equipment to be executed in accordance with the contract drawings.

Any discrepancy between the Drawings and Specifications and Bill of Quantities shall be brought to the notice of the engineer in writing for his decision as to which is the correct interpretation before the commencement of the work. In General, Drawings shall take preference over those stated in the Specifications.

In the case of discrepancy in quantities of works performed by the contractor and those shown on the drawings, and should such discrepancy be acceptable to the employer, then the quantities agreed by the Engineer shall be taken into account in the measurement of quantities.

The contract is a Remeasured Contract. The Contractor shall be responsible for all the works deemed necessary to complete the scope of work. For this purpose the Bill of Quantities shall be used for guidance only and all works shall be carried out as shown on drawings, and covered in the Specifications. All materials quantities shall be lbe remeasured on site after execution, and payment be made be made in accordance to the executed worksy.

Bill Of Quantities are not intended to be used by the contractor for the ordering of materials.

Method Of Measurement

The Unit Rate shall include the following:

(The following requirements are complementary to the mentioned items in the B.O.Q.),

A. General

1. Supply of materials and equipment.
2. Off loading and handling to place of installation.
3. Installation of materials and equipment.
4. All civil and builders work , whether temporary or permanent, as required for the complete installation, including :-
 - a. Excavation, bedding backfilling, riggings, hoisting, water proofing, cleaning, protection and painting.
 - b. Concrete plinths, bases and supports.
 - c. Chasing through walls and slabs, cutting and pinning for passage of all pipes conduits ducts, pipe sleeves, and equipment.
 - d. Closing of all shafts and openings between floors and slabs after installation of services
 - e. Repatching, fixing of pipe and duct hangers and supports to structure,
 - f. All frames for air outlets and louvers and wall mounted fans,
 - g. Flashing and waterproofing of all pipe, pipe sleeves, ducts crossing walls and slabs.
5. Testing & Commissioning: -
 - a. All testing, balancing, adjusting, commissioning and handling to client complete operational equipment.
 - b. All testing, balancing, adjusting, commissioning and handling to client complete operational systems.
 - c. All testing materials.
6. Painting, cleaning, proper protection of all equipment, plants, pipes, ducts, insulations, electrical installations and structures.
7. Disinfections, flushing and water treatment.
8. All labor, materials, tools, instruments, electric power supply fuel and water required for installation, testing, balancing, adjusting, disinfections, flushing, operation and commissioning.
9. Coordination with other trades
10. Thermal insulation for all equipment, valves, trimming and accessories
11. System identifications, tags, labels, nameplates, and charts.
12. Shop-drawings and record drawings.
13. Flexibility (expansion) analysys for all piping systems
14. Spare parts and components for ideal running of all services and equipment.
15. Spare parts information and tools.
16. Operation and maintenance manuals.

17. Training
18. Samples as required by the Engineer.
19. Inspection, testing and rejection of all materials and workmanship.
20. Maintenance of all items supplied by contractor as per contract conditions
21. Warranty and manufacturer guarantee for a period as specified, but not less than one year.
22. Coordination with other contractors, and specialty suppliers such as kitchen and laundry, Fixed furniture and finishing contractors... etc
23. Liaising with the structural contractors and providing all necessary details and information for all related systems, such as vibration control, structural openings plinth and equipment loads, kinetic floating slabs, etc...
24. Liaising with local authorities and official departments, such as Civil Defense Department, water authority, Electrical Authorities, municipality, etc... As to obtain and grant all necessary approvals for the shop drawings, materials and equipment.

Note:

- a. Where BOQ item is stated as "Install only", all above shall be mandatory except for item 1 ,5.a ,14, 15, 16, 17 and 18. The unit rate shall include coordination with the engineer for the proper equipment selections and verification of the client opted selections as required to meet the design specifications and the actual systems requirements based on site conditions. The price shall also include supply, install test and commission of all equipment related trimmings and ancillaries as shown on drawings or called for in specifications and all other tender documents.
- b. Where BOQ item is stated as "Supply only", item 1 ,5.a ,14, 15, 16, 17 and 18. shall only be mandatory.
- c. Provisional sum items to be priced by the bidder as for supply, install, test and commission item. Bidders to allow for attendance and profit for these items if supplied, installed and commissioned by others.

B. Units of Measurement and Abbreviations

The Bills of Quantities have been prepared in accordance with the Principles of Measurement (International) (POMI) for works of construction, June 1979 as published by the Royal Institution of Chartered Surveyors unless otherwise stated in the Preambles and this is deemed to be the Method of Measurement for this Contract. Unless otherwise stated, all works have been measured net as fixed in its place with no allowance for laps or waste and irrespective of any local customs. Where there is a divergence between the Principles of Measurement and the Preambles the Preambles shall take precedence.

The price shall include for all materials and labour and for the provision and use of all plant - whether mechanical required or non-mechanical required for the expeditious carrying out of the works in their proper sequence - for shifting, altering and adapting such temporary work and plant as may be required during the progress of works and removing at completion and making good any surfaces disturbed; and if not included in any prices inserted against the clauses of the Conditions of Contract above, for the Guarantees and bonds required; for the costs of preparing a tender; and the final account; and for all other establishment charges and on costs of whatever nature. No claim for additional payment will be allowed for any error or misunderstanding by the Contractor in these respects.

All units of measurement shall be based on the Metric System of weights and measurements except where other units are specifically for standard products.

The Metric terms and symbols occurring in the Contract Documents are based on the "System International d'Unites (S. I. System)"

<u>Abbreviation</u>	<u>Definition</u>
MR.	Linear meter run
M2	Square meter
M3	Cubic meter
kg	Kilogram
mm	Millimeter
cm	Centimeter
No.	Number
LS - Item	Lump Sum
PS	Provisional Sum
Set	Complete Package Unit

C. Method Of Measurement

1. Pipe work:

The unit price shall include: -

- All pipe fittings and joints such as elbows, traps, bends, tees, reducers, unions, sockets, all stub ups, couplings, flanges, and all other joining materials.
- All flexible joints, couplings, anchoring, sleeves, floor plates, puddle flanges adapters and dielectric unions for connecting dissimilar materials , plugs, taps and end caps.
- All automatic air vents with isolating valves, drain cocks vent cap, cowls, clean outs and rodding eyes.
- All pipe insulations, cladding and protections.
- All pipes acoustic insulation including claddings trays.
- All pressure gages, temperature gages and thermometers, balancing and measuring taps, test point as shown on drawings or as called for in specifications and as deemed necessary for systems testing, balancing and commissioning.
- All pipe hangers, saddles supports, pipe trays and ladders.
- All tie inn points to existing networks, headers, etc. as shown in drawings and as per Engineer's Instructions.
- Seismic springs and snubbers suspensions for the unit frame.
- Special connections, special joints and isolated joints in pipes.
- Flexibility (expansion) analysys.
- Expansion loops, expansion compensators, bellows with guides and anchors substantiated by thermal expansion calculations by the supplier.
- Painting with anticorrosion coats for piping and supports.
- All shock absorbers and joints.
- All Fire retardant and protection sealants for all pipes crossing fire rated structures.
- Excavation and back filling, chasing in walls, making good, painting, pipe protection against corrosion, pipe coating,

All as required per specifications and/or as shown on drawings.

Pipe work shall be measured in meter run (MR).

2.

4. Municipality Water Meter (Totalizer):

The unit price shall include installation of the municipality water meter.

Prices shall also include supply and installation of two isolating valves, Strainer, Weatherproof cabinet with insulation and hinged door. All other accessories as shown in the drawing and called for in the specifications.

5. Main Flow Meter:

Including :(water, fuel, gas types).

The unit price shall include: -

- Flow Meter with Local LCD reading
- Two isolating valve
- Flow transmitter
- Cables and conduits
- All other accessories as shown in the drawing and called for in the specification.

6. Domestic Water Electric Heater

The unit price shall also include all angle valves, check valves, safety valves, automatic air vent, thermometer, electric coil element, with copper tubes connections, high temperature cut outs. All fixation and supports, all electrical wiring to nearest isolating switch, automatic controls and switches, brackets and bolts.

7. Split Units:

The unit price shall also include:

All refrigeration pipes between the indoor and outdoor units.

Their fittings, insulation and supports. All condensate piping, drain pan, room thermostats and all power and control lines from outdoor to indoor units, and from isolation switches installed by outdoor unit to the equipment.

The price shall also include the concrete base and steel skids for outdoor units, vibration isolators, all interconnecting power and control wiring as shown on the Drawings and as called for in the Specifications.

8. Valve Chamber and Valve Box:

The unit price shall include all materials and works for the construction of chamber and valve box, such as reinforced concrete, blinding, base, walls, cover iron steps, plastering, framework, shuttering etc. the price shall also include the excavation and backfilling.

9. Sanitary Fixtures

The unit price shall include the complete supply and installation of all of the sanitary fixtures, complete with their mixers, fittings, hanger, soap dispensers, rails, hand grabs, and all other accessories.

The unit price shall also include the supply installation and commissioning of the all angle valves, flexible conduits, all types of traps, including the chrome plated bottle traps, P-traps, all flanges and eschetchions. All adaptors and connectors, all types of sealants and fasteners.

10. Manholes:

Including Petrol interceptors, sediment traps and lint interceptors.

The unit price shall include all materials and works for the construction of manholes such as reinforced concrete, blinding, base, walls, manhole cover frames, benching, clean outs, iron steps, plastering, caulking, framework shuttering etc. shown on drawings and called for in the specification. The price shall also include all related civil works including excavation, backfilling, compacting, protections and making good.

SECTION 13– ELECTRICAL ENGINEERING INSTALLATIONS

BILL OF QUANTITIES

ELECTRICAL INSTALLATIONS

I- METHOD OF MEASUREMENT

A. Complete Items

1. The Bills of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, technical electrical installation specifications issued by Ministry of Public Works and Housing, particular technical specifications issued for this project, Appendixes and Drawings. The documents are to be taken as mutually explanatory and inter-related to one another.
2. Unless otherwise mentioned, all quantities of works shall be measured "Net" in accordance to the approved Shop and As-Built drawings or/as ordered by the engineer, and generally, according to method of payment mentioned in the contract documents.
3. In the case of discrepancy in quantities of works performed by the contractor and those shown on the drawings, and should such discrepancy be acceptable to the employer, then the quantities agreed by the Engineer shall be taken into account in the measurement of quantities.
4. All quantities shown in the Bill of Quantities are approximate, and the purpose of such quantities is to obtain a close estimate of the value of the Tender/Contract. However, the contractor shall be paid for the actual amount of work carried out in accordance with the contract, as determined by direct measurement during the progress of the works whether the actual quantities are more or less than those shown in the Bills of Quantities. Those quantities are not intended to be used by the contractor for the materials take-off and ordering.
5. The Unit Price and the rates inserted in the Bills of Quantities respectively shall be comprehensive and shall include for complying in all respects with the requirements of the project technical specifications, covering all the obligations under the contract and all matters and things necessary for the proper construction, completion of and remedy of defects in the works. No claims for additional payment will be allowed for any error, or misunderstanding of the work involved by the contractor.
6. In the Bills of Quantities, a unit price or rate shall be inserted against items with quantities only. The value of any item left un-priced shall be deemed to be covered by other rates and prices entered in the Bills of Quantities.
7. All measurements of the executed works called for in the Contract shall be based on the unit price stated in the Bills of Quantities and made according to the specifications. Any work done by the Contractor, but not called for in the Contract or not requested in writing by the Engineer, shall not be included in the measurement.
8. The item unit rate of the materials and equipment shall be based on the contract drawings, specifications, all components as required and specified under each related item concerned, technical data, manufacturers requirement and recommendations and Notes on, and all other Contract documents.

SECTION 13– ELECTRICAL ENGINEERING INSTALLATIONS (CONT'D)

In addition to the above-mentioned requirements, The item unit rate shall include the followings:

The following requirements are complementary to the mentioned items in the B.O.Q;

- A. Supply of materials and equipment.
- B. Off loading and handling from trucks on site to place of installation (including carnage, unpacking, erecting in place).
- C. On-site material protection and storage before installation.
- D. Installation of materials and equipment.
- E. All civil works required and related to the electrical works, such as: equipment, tools, concrete bases and supports, cutting and chasing through block and concrete walls and slabs for passage of conduits, sleeves, trays, trunking and ladders, concrete re-patching, fixing of conduits, trunking, cable trays/ladders and supports to structure, excavation and back-fillings, riggings, hoisting, waterproofing, cleaning, protection and painting, fire sealant materials to ensure the compartment(ion) integrity .
- F. All testing, commissioning and operation by independent company (if required), including all expenses of tests requested by the engineer, and all costs of repairs to damage(s) caused until issuing the satisfactory completion certificate by the Project's Engineer
- G. All labor, materials, tools, instruments, electric power supply, fuel and water required project's execution, testing, operation and commissioning.
- H. Installation identifications, tags, labels, nameplates, and charts.
- I. Preparation of the shop-drawings and As-built drawings.
- J. Preparation of the operation and maintenance manuals.
- K. Training.
- L. Samples as required by the Engineer.
- M. Maintenance as per the Contract Conditions.
- N. Coordination with other specialty contractors, such as special equipment supplier(s) and subcontractor(s) etc.
- O. All final tie-in connections to all mechanical, special systems and machines, all as per the approved workshop drawings prepared by the specialty contractor.

SECTION 13– ELECTRICAL ENGINEERING INSTALLATIONS (CONT'D)

9. Where BOQ item is stated (Install only), all above mentioned items shall be mandatory and within the contractor's scope of work and item's price, except for items 8. A , K, L and M.

10. **Materials and Equipment, such as but not limited:**

10.1 Empty PVC or Galvanized Steel Conduit

The unit rate shall include all conduit, fittings and joints such as bends, tees, elbows, boxes, supports, adapters, pull cords, excavation and back-filling, chasing in walls and opening in slabs, conduit drain, painting and protection against corrosion unless otherwise mentioned.

Conduits shall be measured in meter run (MR).

10.2 Cable for Power Distribution Networks and Low Current Systems

The item unit rate shall include all Armored, Non-Armored sheathed, 600/1000V or 2 hours fire resistant for power cables, and 450/750V for wires, continuous protective support, such as but not limited to PVC and/or galvanized steel conduits, hot dip galvanized cable trays for power cables horizontal runs, GI trunking for vertical and horizontal low current systems cables and cable ladders for power cables vertical rises, cable glands, termination lugs and joints, excavation and back filling, chasing in walls and opening in slabs, concrete trenches and draw manholes including covers and drain, cable support, painting and protection against corrosion, and cable termination at both ends and all accessories needed as specified and as shown on the drawings.

Note:

- a) Sizing of the hot dip galvanized steel cable trays and ladders shall be carried-out by the contractor based on the distance between two adjacent cables is twice the biggest cable diameter and 25% space for future, cable tray thickness shall not be less than 1.6 mm.
- b) Sizing of the hot dip galvanized steel and/or PVC cable trunking shall be carried-out by the contractor based on the filling factor shall not exceeds 40% of the trunk area, cable trunking thickness shall not be less than 1.2 mm.

Cable shall be measured in meter run (MR).

10.3 Secondary Distribution Board (DB).

The item unit rate shall include all circuit breakers, moulded case, miniature and earth leakage type, bus-bars, termination blocks, enter assemblies glands, selector switches, push-buttons and indicator lamps, metering and measurement instruments, contactors, relays, manual change over switch, current transformers, control wiring and cabling, metal clad assemblies, concrete plinths, concrete trenches with heavy duty steel cover and drain, all required bolts, washers and nuts, painting and protection against dust and corrosion, and all other requirements as specified and detailed on the drawings.

Secondary Distribution Board (DB) shall be measured in Lump Sum (L.S.)

10.4 Lighting Point (for Internal & External Lighting Fixtures having a conductor size up to and including 4mm²)

The item unit rate shall include all PVC and/or galvanized steel conduits, switches and grid switches, bolted ceiling roses, cables and/or wires up to 4 mm² from the appropriate distribution board and/or control panel to the served lighting point, galvanized steel trunking, transformer(s) installations complete with all in and out cables up to the served lighting fixture as per the manufacturer's recommendations, heat resistant cables from the ceiling rose to the lighting fixture enclosed in galvanized steel PVC coated flexible conduits for exposed installation and heavy duty PVC flexible conduits for recessed installations above false ceiling , and all other accessories needed in accordance to the relevant codes of practice and highest prevailing engineering standards.

Lighting point shall be measured in Number (No.).

Note; where lighting point is served by wire size more than 4 mm², then; supply circuit will be measured on meter run (M.R) separately as per item 10.2 aforementioned.

All external lighting installations shall be carried out by using cables Cu/XLPE/PVC type.

10.5 Power Outlet

The item unit rate shall include all PVC and/or galvanized steel conduits, U-channels and floor or wall mounting boxes, power socket outlet including face plate and/or fused or non fused connection units, double pole switches, all rated as indicated, plugs for industrial range socket outlets, power cables and/or wires up to and including 4mm² conductor size from the appropriate distribution board to the served point, all other accessories needed as shown on the drawings and as called for in the specifications and in accordance with relevant codes of practice and highest prevailing engineering standards.

Outlets face plate color, material shape and type of finishes shall be as per the Engineer approval, back boxes of the outlets shall be coordinated with the approved type /model of the outlets intended to be used on this project.

Power outlet shall be measured in Number (No.).

Note; where power point is served by wire size more than 4 mm², then; supply circuit will be measured on meter run (M.R) separately as per item 10.2 aforementioned.

10.6 Isolating Switch Complete with Wiring (Having a conductor size up to and including 4mm²)

The item unit rate shall include all PVC and/or galvanized steel conduits, trunking and/or cable trays as described on item 10.2 aforementioned, isolating switch rated as indicated, mounting back box, steel angles for pedestal mounted isolating switches, power cables and/or wires up to and including 4mm² conductor size from the appropriate distribution board , MCC or CP to the served isolator, and from isolator to the served equipment, painting and protection against corrosion, and all other requirements and accessories needed as shown on the drawings and as called for in the specifications and in accordance with relevant codes of practice and highest prevailing engineering standards.

Isolating switch shall be measured in Number (No.).

10.7 Lighting Fixture

The item unit rate shall include the lighting fixture as described in the tender documents complete with all supports, suspension clamps, tri-phosphor fluorescent lamps, electronic switchgears/ ballast, transformers for LV type fixtures, internal heat resistance wires and/or cables, back boxes in concrete slabs, wall and / or stone, chasing in walls or slabs, opening in false ceiling tiles, mounting frames to conceal around the fixture's cut-outs, sealant and making good around opening and chasing, and all accessories needed as shown on the drawings and as called for in the specifications, all in accordance with relevant codes of practice and highest prevailing engineering standards.

Lighting fixture shall be measured in Number (No.).

10.8 Earthing and Bonding Systems

The item unit rate shall include all bare and/or PVC covered copper tapes, socket lugs, bolts, nuts, washers, reverts, clamps, cleats, earth electrodes (rods or plates), test clamps, earth collecting bars, PVC and/or galvanized steel conduits, cable trays, ladders and trunking, equipotential bonding with all metal works, concrete manhole with steel covers and drain, excavation and back-filling, chasing in walls, and opening in slabs, termination of the protective conductors or tapes at both ends, any measures to be taken to reduce the soil resistivity to achieve 2 ohms, all accessories needed as shown on the drawings and as called for in the specifications, and in accordance with relevant BSEN codes of practice and highest prevailing engineering standards.

Earthing, and Bonding systems shall be measured in Lump Sum (L.S).

10.9 Telephone and/or Data Outlet

The item unit rate shall include all PVC and/or galvanized steel conduits/ trunking, telephone and/or data RJ-45 (cat.6) socket outlet as indicated, galvanized steel wall and/or floor mounting box, cat.6 cable from the appropriate telephone junction box(es) and/or data patch panel (s) to the served telephone or data points including all other accessories needed as shown on the drawings and as called for in the specifications and in accordance with relevant codes of practice and highest prevailing engineering standard.

Note; Outlets face plate color, material shape and type of finishes shall be as per the Engineer approval, back boxes of the outlets shall be coordinated with the approved type /model of the outlets intended to be used on this project.

Telephone and/or Data Outlets shall be measured in Number (No.).

10.10 Intermediate distribution Frame (IDF)

The item unit rate shall include all terminals blocks, termination of the incoming and out-going cables, inter-assembly patching cables, supports, steel enclosure with lockable door, glands, 19" steel rack with glass front doors and built-in power supply and ventilation fan, chasing in walls, earthing terminals and connection with the appropriate earthing system, and all accessories needed as shown on the drawings and as called for in the specifications and in accordance with relevant codes of practice and highest prevailing engineering standards.

Intermediate Distribution Frame (IDF) shall be measured in Number (No.).

10.11 Fire Detection and Alarm System

The unit price shall include the detection and alarm system's devices, cables and /or wires, PVC and / or galvanized steel conduits, from the appropriate control panel to the served device, appropriate mounting boxes (galvanized steel for wall mounted and PVC for recessed in slab installations),

chasing in walls and opening in concrete slabs and/or false ceiling, making good around opening, excavation and backfilling , concrete manhole with steel cover for external networks, galvanized steel supports and all accessories needed for proper performance of the system as shown on the drawings, manufacturer's recommendations and as called for in the specifications.

Fire Detection and Alarm System's devices shall be measured in Number (No.) and/or Lump sum (L.S) as indicated

10.12 CCTV system

CCTV system will be dry/empty system which shall consist of empty boxes with conduits, collections boxes all with pull cord that will help & facilities future installations in accordance with Client requirements

CCTV System Installation shall be measured in Number (No.) and/or Lump sum (L.S) as indicated

II- **List of the recommended manufacturers of the electrical equipment and materials**

The approved manufacturers mentioned in the tender documents are to reflect the minimum material specifications and quality intended to be used by the contractor.

III. **Names of Manufacturers of Materials and Equipment offered by the bidders Form**

The Bidder shall fill herein under the names of companies, manufacturing, country of origin, and details of materials & equipment mentioned here, and shall enclose with his submitted bid for construction, completion and maintenance of this project.

As applicable to this tender / contract document; the contractor shall specify the material and equipment intended to be used for this project from the recommended list of approved manufacturers, any deviations from the said list shall be clearly marked and will be subject to the Engineer review and approval.

The list is prepared as to be the most comprehensive and cover all items related to the project. However;

The bidder/ contractor shall add any missing item(s) not included hereunder.

The bidder / contractor shall insert Not Applicable (NA) for item(s) not used in this tender / contract.

SECTION 13– ELECTRICAL ENGINEERING INSTALLATIONS (CONT'D)

Item	Material or Equipment	Name of Supplier/ Manufacturer Country of Origin
1	XLPE insulated non-armored / armored single-core/multi-core power cables	
2	PVC Wires	
3	PVC Conduits and Accessories	
4	Cable Trunking (Steel or PVC)	
5	Cable Trays / ladders and Accessories	
6	Fire detection and alarm system	
7	Earthing and Bonding Systems	
8	Power Outlets	
9	Telephone/Data socket outlet, IDF, structural cabling system	
10	Water Proof Power Socket Outlets	
11	Isolating Switches (All types and rating)	
12	Galvanized Steel Conduit	
13	Indoor Fixtures (Provide catalogue cuts for all types)	
14	Outdoor Lighting Fixtures (Provide catalogue cuts for all types)	
15	Switchgears (Secondary distribution board)	
16	Lighting Switches	
	Add any missing item(s) hereunder;	