

MINISTRY OF ELECTRICITY & WATER

WATER PROJECTS SECTOR

Tender No . MEW/ 85 / 2012-2013

Construction and Maintenance of 5 Nos. R.C.
Ground Reservoirs for Fresh Water, 55 M.I.G
Capacity Each, and Annexed Works at Mutla
High (Stage-II)

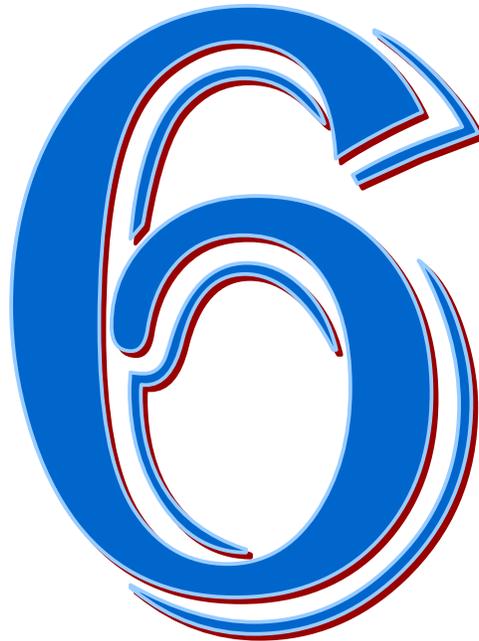
وزارة الكهرباء والماء

قطاع مشاريع المياه

مناقصة رقم و ك م / 85 / 2012-2013

انشاء وانجاز وصيانة عدد 5 خزانات أرضية من الخرسانة المسلحة
للمياه العذبة سعة كل منها 55 مليون جالون إمبراطوري مع الاعمال
الملحقة بمنطقة المطلاع العالي (المرحلة الثانية)

الجزء السادس : جداول الأسعار



SECTION SIX:
PRICE SCHEDULES

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	SEC. 6 - SCHEDULE OF RATES & BILL OF QUANTITIES

SCHEDULE OF RATES & BILL OF QUANTITIES

ABBREVIATIONS	
No.	Number
Mt.	Metre
L.M.	Linear Metre
C.M.	Cubic Metre
S.M.	Square Metre
K.D.	Kuwaiti Dinar
Fils.	One KD. = 1000 Fils
Fl.	Flanged
S.V.	Sluice Valve
B.V.	Butterfly Valve
W.O.	Washout Valve
Soc.	Socket
Sp.	Spigot
D.I.	Ductile Iron
St.	Steel
Mec.C.	Mechanical Coupling
R.C.	Reinforced Concrete
P.C.	Plain Concrete
It.	Item
L.S.	Lump Sum
Dia.	Diameter
SYT.	System
F.W.	Fresh Water
B.W.	Brackish Water
H.D.P.E	High Density Polyethelene Pipe

NOTES:

- 1) All R.C. surfaces inside and outside of R.C. Reservoir should be fair faced finished.
- 2) The Tenderer should read and study carefully the 'Method of Measurement' as specified in the Contract Documents before pricing any item in the Bill of Quantities.
- 3) The Polyurethane Sealant shall be strictly applied in accordance to B.S. specification and manufacturer's instructions. The application of the polyurethane shall be done by well trained staff from the manufacturer or his Kuwaiti Agent, and the staff should be approved by the Engineer.

SECTION 6		BILL OF QUANTITY NO. 1		CIVIL WORKS FOR R.C. RESERVOIRS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	<u>Allow for all charges for</u>						
1	Structural excavation below reservoirs in any type of soil, cemented soil or rocky soil from natural ground level up to any depth as mentioned in drawings, specifications and method of measurements and disposal of surplus material to approved public dump yard or as directed by the Engineer	CM	663000				
2	Backfilling with selected excavated soil and compaction around the reservoir walls from formation level up to natural ground level as mentioned in specifications and method of measurements.	CM	1000				
3.	Backfilling with soil brought from borrow pits outside the site and compaction from formation level up to natural ground level around the reservoirs as mentioned in specifications and method of measurements.	CM	9000				
4	Structural fill around the reservoirs and/or under the roads, pipe lines and valve chambers etc., using the selected excavated soil, well compacted in layers as per specifications and to the satisfaction of the Engineer.	CM	2000				
5	Structural fill with soil brought from borrow pits outside the site and compaction from finished ground level up to natural ground level as mentioned in specifications and method of measurements.(between reservoirs, between reservoir and boundary wall and between reservoir and open area)	CM	105000				
6	Structural fill from Natural ground level to Finished ground level in the open areas						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	(other than areas indicated in Item No.4) as shown in the drawings W.P.D. 6397 / 05 & 06, with the soil brought from borrow pits outside the site, well compacted in layers and with proper slope towards boundary wall, wherever it is required, as per specifications and to the satisfaction of the Engineer.	CM	76000				
7	Cement soil stabilization with 5% cement of selected excavated soil weight under foundation or wherever as required by the Engineer.	CM	1000				
8	Cement soil stabilization with 5% cement of soil weight (Soil brought from borrow pits outside the site) under foundation or wherever as required by the Engineer.	CM	26000				
9	Plain cement concrete (N25) as per specification, complete in place in blinding and alike.	CM	27850				
10	Supply and lay two layers of Polyethylene Sheets 0.3 mm. thick each on top of blinding, the sheets should be welded together as per Manufacturer's instructions.	CM	256950				
11	Reinforced concrete (N30) in floor slab, complete in place including the sides of the sumps.	CM	47950				
12	Reinforced concrete (N30) in wall footings, complete in place as per specification.	CM	11400				
13	Ditto - but in column footings.	CM	4940				
14	Ditto - but in baffle wall footings.	CM	670				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
15	Ditto - but in walls including the walls of washout valve chambers, walls of outlet valve chambers connected to the reservoir, up stand over reservoir and walls of the roof drain channel.	CM	14500				
16	Ditto - but in baffle walls	CM	2500				
17	Ditto - but in columns including column head	CM	9140				
18	Ditto - but in roof slabs.	CM	60700				
19	Ditto - but in stairs and alike.	CM	100				
20	Supply and fix white aluminum handrail 90cm. high with approved sections to both sides of R.C. stairs around the reservoir, consisting of vertical posts 80x80mm covered with aluminum plate, base plate fixed to the stairs with Hilti bolts dia. 12mm, the distance between the posts shall be 100cm, horizontal bars 80x40mm, 3mm thick one at top and one at the middle of the handrail. (Detailed drawings to be submitted for approval.)	LM	320				
21	Reinforced concrete (N30) in Parapet 20cm thick & 30/40cm high at edge of roof slabs.	CM	300				
22	Expansion joint in roof slabs include for: - 200mm PVC water stop with center bulb. - 2cm expansion joint filler (sponge rubber). - 2x2cm polysulphide sealant. All complete as per specification and drawings.	LM	46200				
23	Expansion joints in floor slabs include for:						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	- 250mm PVC water stop with center bulb. - 2cm expansion joint filler (sponge rubber). - 4x2cm polyurethane sealant. All complete as per specification and drawings.	LM	23070				
24	Contraction Joints in floor slabs include for: - 250mm PVC water stop - 4x2cm polyurethane sealant. - Two coats of tar paints. All complete as per specification and drawings.	LM	21960				
25	Semi-expansion joints between wall footings and floor slabs include for: - 250mm PVC water stop - Two coats of tar paints (bond breaker). - 4x2cm Polyurethane sealant. All complete as per specification and drawings.	LM	6540				
26	Expansion joints in walls and wall footings include for: Note: The measurement of expansion joint is the length of water stop only. - 250mm PVC water stop with center bulb. - 2cm expansion joint filler (sponge rubber). - 4x2cm sealant. (Divide Wall-Both Sides Polyurethane Side Wall-Inside Polyurethane, Outside Polysulphide). The rate shall include for expansion joint filler and Sealant in the roof drainage channel. All complete as per specification and drawings.	LM	2460				
27	Contraction joints in walls and wall footings include for: - 250mm PVC water stop						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
28	- 4x2cm sealant. (Divide Wall-Both Sides Polyurethane Side Wall-Inside Polyurethane, Outside Polysulphide). - Two coats of tar paint. All complete as per specifications and drawings.	LM	2160				
29	Contraction joints in walls only include for: - 250mm PVC water stop - 4x2cm sealant. (Divide Wall-Both Sides Polyurethane Side Wall-Inside Polyurethane, Outside Polysulphide). - Two coats of tar paint. All complete as per specification and drawings.	LM	2660				
30	Individual Elastomeric Neoprene bearing pads of size 10x10x2cm. 50cm., center to center, fixed to the concrete with approved glue and surrounded with sponge rubber between roof slab and external walls. All as per drawing, specification & manufacturer's instructions.	LM	4500				
31.	Ditto - but between roof slab and dividing wall, the rate shall include for 2 pieces of neoprene bearing pads of size 10x10cm x 2cm thick, 50cm centre to centre and 2x2cm. Polyurethane sealant from both faces.	LM	1115				
	Sliding joint between external walls and roof slabs, include for: - 250mm PVC water stop - 2x2cm Polyurethane sealant into internal sides. All complete as per specification &						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	drawings.	LM	4506				
32.	Construction joints between walls and wall footings include for: - 250mm PVC water stop - 4x2cm sealant. (Divide Wall-Both Sides Polyurethane Side Wall-Inside Polyurethane, Outside Polysulphide). - Two coats of approved bitumenous paint at the kicker of 30cm wide from the internal surfaces. All as per specification and drawings.	LM	5650				
33.	Construction joints in walls and wall footings include for: - 250mm PVC water stops. - 4x2cm sealant. (Divide Wall-Both Sides Polyurethane Side Wall-Inside Polyurethane, Outside Polysulphide). All as per specification and drawings.	LM	400				
	<u>ALLOW FOR ALL CHARGES SUPPLY AND FIX THE FOLLOWING ITEMS IN THE RESERVOIR</u>						
34.	800mm. dia. 1.10m. Long D.I. double flanged distance piece with one puddle in overflow piping.	NO	20				
35.	Ditto - but 800mm. dia. for outlet.	NO	20				
36.	Ditto - but for 800mm. dia. inlet.	NO	20				
37.	Ditto- but for 600mm. dia. for Circulation Outlet	NO	10				
38.	Ditto- but for 600mm. dia. for Circulation						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	Inlet	NO	10				
39.	400mm. dia. 1.0m. Long Ductile Iron double flanged distance piece with one puddle in washout piping.	NO	30				
40.	800mm. dia. 90° D.I. Flanged Bend in overflow.	NO	20				
41.	800mm. dia. D.I. Flanged Bell-Mouth in over flow.	NO	20				
	<u>All the following stainless steel items shall be inspected in the workshop before delivering to site.</u>						
42.	Stilling well of 250mm. dia. stainless steel (316L) perforating pipe to be fixed properly to the floor slab and roof slab complete with 300mm. dia. puddle flange distance piece and closure plate in roof. All complete as shown in the drawing and satisfaction of the Engineer.	NO	10				
43.	Stainless Steel (316L) water level indicator with seamless stilling well pipe complete as shown in the drawing.	NO	10				
44.	Stainless Steel (316L) roof vent 150mm. dia. seamless pipe provided with approved stainless steel screen.	NO	210				
45.	Internal Ladder composed of Stainless Steel (316L) sections and cage inside the reservoir as shown on the drawings.	NO	30				
46.	Internal Ladder composed of Stainless Steel (316L) sections and cage for outlet chambers.	NO	20				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
47.	Ditto - but for washout chambers.	NO	30				
48.	200x150cm. stainless steel (316L) cover and frame, dust proof and water sealed, fixed to the reservoir roof slab, provided with stainless steel dust proof lock and master key and shall be chemically treated (prickling and passivation).	NO	10				
49	100x100cm. stainless steel (316L) cover and frame, dust proof and water sealed, fixed to the reservoir roof slabs over outlet and washout chambers , provided with stainless steel dust proof lock and master key and shall be chemically treated (prickling and passivation).	NO	80				
50	60x60cm. stainless steel (316L) cover and frame, dust proof and water sealed, fixed to the reservoir roof slabs, provided with stainless steel dust proof lock and master key and shall be chemically treated (prickling and passivation).	NO	190				
51	Supply and fix stainless steel (316 L) hand rail 90cm high around the outlet and washout sumps inside the reservoir, consisting of vertical post Ø50mm thickness 3mm, stainless steel base plate fixed to the floor with stainless steel board 12mm dia. , the distance between the post shall be 1m, horizontal bar 50mm dia. , one at top and one at middle. Detailed drawing to be submitted for engineer's approval.	NO	50				
52	22.5x22.5cm. C.I. Surface Box and frame painted with two coats of approved bituminous paint, fixed to the roof of recirculation,washout and outlet chambers.	NO	60				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
53	Stainless Steel (316L) openings needed for the control system shall be fixed to the reservoir roof slab, location and sizes as shown on the drawings, the Contractor shall submit complete details for the approval of the Engineer. The following in drainage works around the reservoirs, all to be done as per specification, drawings & satisfaction of the Engineer. (Detailed drawings to be submitted for approval before commencement of the works).	NO	10				
54	<u>Deep excavation in any type of soil including cemented soil or rock, the rate shall include for backfilling with soil brought from borrow pits outside the site and compaction.</u>						
54.1	Trenches for 400mm. dia. pipe.	LM	260				
54.2	Trenches for 800mm. dia. pipe.	LM	340				
54.3	Trenches for 1000mm. dia. pipe.	LM	1370				
54.4	Trenches for 1200mm. dia. pipe.	LM	270				
54.5	Trenches for 1600mm. dia. pipe.	LM	450				
55	<u>HDPE (High Density Polyethylene) Pipes</u>						
55.1	400mm. dia.	LM	260				
55.2	800mm. dia.	LM	340				
55.3	1000mm. dia.	LM	1370				
55.4	1200mm. dia.	LM	270				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
55.5	1600mm. dia.	LM	450				
56	<u>The following in drainage manholes and outfall structure:</u>						
56.1	Excavation in any type of soil including cemented soil or rock, the rate shall include for backfilling with soil brought from borrow pits outside the site & compaction.	CM	1000				
56.2	Plain concrete N25	CM	30				
56.3	Ditto - with smooth hard finish in benching of manholes.	CM	30				
56.4	Reinforced Concrete N25 in Floor Slabs.	CM	70				
56.5	Ditto - in Walls	CM	300				
56.6	Ditto - in Roof Slabs	CM	50				
56.7	60cm. dia. D.I. Medium duty Cover and Frame	NO	37				
56.8	Stainless Steel (316L) Steps 25mm. dia.	NO	100				
56.9	Lifting eyes painted with bituminous paint	NO	148				
56.10	Stainless Steel Ladder (316L) without cage	NO	21				
56.11	Stainless Steel Ladder (316L) with cage	NO	16				
56.12	Bituminous paint to external surface of walls up to ground level, with one coat of primer and 2 coats of approved rubber rich high build bituminous paint of different colors to total dry film thickness not less than 200 microns.	SM	1500				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
56.13	R.C. N25 in walls of out fall structure	CM	15				
56.14	R.C. N25 in floor slab of the out fall structure. The rate shall include for spreading of 10m ³ of aggregate at the end of drainage line.	CM	15				
56.15	R.C. N25 in sloped slab to be constructed on the side slope at the Outfall Structure, 20cm thick, 4m wide. The contractor has to submit complete details for approval before commencement of construction.	CM	20				
56.16	Excavation at the existing cliff, if needed around the Outfall Structure. The rate shall include for trimming of the side slopes and bottom of the pond.	CM	200				
57	Allow for all costs and expenses involved in cleaning and washing the reservoirs (5x55 M.I.G. each) as per specification and to the satisfaction of the Engineer.	LS	LS				
58	Allow for all costs and expenses for testing of the reservoirs (5x55 M.I.G. each) and losses of water during testing process.	LS	LS				
59	The following in backfilling around and over roof slabs including bituminous painting and roof drainage system,, all as shown in the specification, drawings. (Detailed working drawing to be submitted for approval).						
59.1	Three coats of approved hot bitumen on the entire area of roof slab. (200 microns of rubber rich high build bituminous paint of different colors).	SM	255365				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
59.2	Three coats of approved hot bitumen on the outside surface of the reservoir walls (200 microns of rubber rich high build bituminous paint of different colors).	SM	33120				
59.3	Free drainage gravels 10 cm. thick layers.	CM	25400				
59.4	One layer of filter fabric.	SM	253850				
59.5	U.P.V.C. Pipe Piece 150mm. dia., 20cm. long, covered with filter fabric at one end. 10.0m apart.	NO	240				
59.6	Backfilling and compaction above roof slab with selected excavated soil, etc.	CM	1000				
59.7	Backfilling and compaction above roof slab with soil brought from borrow pits outside the site, etc.	CM	51000				
59.8	Backfilling around the reservoirs walls from roof level up to natural ground level with selected excavated soil	CM	1000				
59.9	Backfilling around the reservoirs walls from roof level up to natural ground level with soil brought from borrow pits outside the site	CM	86000				
59.10	Supply and lay 400mm dia. HDPE pipeline connecting roof drain and RC Interceptor on side slope of the reservoir duly concealed with N25 concrete all around the pipe 150mm thick as per approved drawings.	LM	400				
59.11	Backfilling and compaction with gatch soil along the side walls of the reservoir where the inlet and outlet valve chambers are located.	CM	1200				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
59.12	Complete R.C. Interceptor with heavy duty Gully Grate.	NO	30				
60	<p><u>SURFACE ERROSION CONTROL FOR BACKFILLING AROUND RESERVOIR WALLS</u></p> <p>Supply and lay a layer of three dimensional ultraviolet resistant polyethylene or polypropylene mesh (18-20mm thick) on the side slopes of backfilling around the reservoir to retain and protect the soil surface from erosion due to wind, rain and runoff. The installation of three dimensional mesh should be as per manufacturer's instruction and satisfaction of the Engineer and covered with 5cm. thick agriculture soil.</p> <p style="text-align: center;">or</p> <p>Supply and apply polymeric soil stabilizer with water mix, non-toxic, non-inflammable and non-contaminate on the side slopes of backfilling around the reservoir to retain and protect the soil surface from erosion due to wind, rain and runoff and resistant to climate conditions prevailing in summer and winter. The application shall be strictly done according to the specification, manufacturer's instructions and satisfaction of the Engineer.</p>	SM	22500				
61	Supply and paint liquid applied (4mm dry thick after application) urethane based water proofing membrane such as non-toxic "CIM" or similar approved to the concrete surface around the joints on the floor slabs and walls inside the reservoir (40cm width) and shall consist of the following:						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	- Bonding agent (prime coat). - 3 coats of CIM or equivalent, reinforced with polyester fabric strip (40cm width - 130g/m ²) the application of all materials shall be strictly done according to the specification, manufacturer's instructions and satisfaction of the Engineer.	LM	56300				
62	Ditto - but over the expansion joints in the roof slab of the reservoir. Width of water proofing membrane shall be 25cms and 3mm thick, width of the fiber mat shall be 18cm all as per specifications.	LM	46200				
	<u>ROAD WORKS</u>						
63	Stripping and grubbing 20cm thick as per specifications and drawings.	SM	33000				
64	Excavate mechanically and/or manually high level areas, in any type of soil including cemented soil or rock.	CM	7000				
65.	Provide approved earth fill needed to fill low level areas, backfill and compact as per specification and drawings. (The contractor has to submit road profiles for approval before commencement of construction).	CM	7000				
66.	Compact, finish and prepare including subsequent protection of the subgrade surface under the cross section of the road as per drawing and specifications.	LS	LS				
	<u>SUPPLY AND APPLY THE FOLLOWING:</u>						
67.	Prime coat as per specification and drawings.	SM	33000				
68.	Tack coats as per specifications and						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	drawings.	SM	33000				
69.	Asphalt concrete type (I) 6cm. thick as per specifications and drawings.	SM	33000				
70.	Asphalt concrete type (II) 6cm. thick, as per specification and drawings.	SM	33000				
71.	Asphalt concrete type (III) 6cm. thick, as per specification and drawings.	SM	33000				
72.	Precast concrete Sunken Kerb Stones 20x20cm., the rate shall include for the plain concrete (N15) below and back to the Kerb Stones, the expansion joints, all as per specifications and drawings.	RM	15000				
73.	Supply, spread and compact gatch at the shoulders of road in fill, the gatch shall be supplied from approved and selected borrow pits and shall meet the specification of Ministry of Public Works.	SM	20000				
74.	Supply and lay interlocking tiles around the building areas.	SM	7000				
75.	<u>SITE GRADING AND LEVELING</u> The site around the reservoirs has to be properly graded and leveled with approved slopes to get rid of the rain water through the drainage system; the contractor has to submit detailed drawing for site grading and leveling and to be approved by the Engineer before commencement of construction. The rate shall include for removal of shrubs, cut trees and other unwanted materials to the Municipal designated areas	LS	LS				
TOTAL CARRIED TO COLLECTION PAGE							

SECTION 6		BILL OF QUANTITY NO. 1		CIVIL WORKS FOR R.C. RESERVOIRS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
76.	The site area on the <u>North side of the existing reservoirs (A to D) between the road and the boundary wall</u> covered by this contract has to be properly graded and leveled. The contractor has to submit detailed drawing for site grading and leveling and to be approved by the Engineer before commencement of construction. The rate shall include for removal of shrubs, cut trees and other unwanted materials to the Municipal designated areas	LS	LS				
77	Construction of R.C. Trench of size 1.5M x 1.0M for mechanical services near Chemical building complex. For all the details, refer drawing no. WPD/6397/060, specifications and as directed by the Engineer.						
77.1	Excavation and backfilling	CM	700				
77.2	P.C.C (N-15)	CM	35				
77.3	R.C.C for Base	CM	100				
77.4	R.C.C for wall including fixing edge angle as shown in the drawing.	CM	120				
77.5	4 mm thick Bituminous water proofing membrane and 20 mm thick screed for the base over the blinding.	SM	300				
77.6	4 mm thick Bituminous water proofing membrane and 6 mm thick protection board for the external face of the walls.	SM	500				
77.7	Supply, fabricate and fix 6 mm thick chequered plate including one coat of						
TOTAL CARRIED TO COLLECTION PAGE							

SECTION 6		BILL OF QUANTITY NO. 1		CIVIL WORKS FOR R.C. RESERVOIRS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
78.	<p>primer and two coats of approved enamel paint. For dimensions, handles, stiffening angle and fixation refer the above drawing. The gap between plates after placing to be filled with proper approved gasket. All as per specifications and directions of the Engineer.</p> <p><u>TRAINING</u></p> <p>Training of MEW staff inside and outside Kuwait as per the attached Appendix No. 16 of the training courses, the number of trainees will be as per the attached appendix. The contractor will be paid according to the schedule of price of the training course.</p>	SM	500				
79.	<p><u>Allow for any missing Item:</u> Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11)</p> <p><u>Important: -</u> The Contractor must submit a complete detailed breakdown for this item of work with his offer.</p>	LS	LS				
TOTAL CARRIED TO COLLECTION PAGE							

SECTION 6		BILL OF QUANTITY NO. 1			CIVIL WORKS			
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	

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SECTION 6		BILL OF QUANTITY NO. 2				PIPEWORKS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE				
					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
1	<u>EARTH WORKS :</u>								
1.1	Excavate trenches from ground level to a depth exceeding 2 m but not exceeding 3 m in depth. In any type of soil including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipeline Ø 1200 mm	L.M.	2600						
(b)	For pipeline Ø 400 mm	L.M.	165						
(c)	For pipeline Ø 300 mm	L.M.	150						
(d)	For pipeline Ø 100 mm	L.M.	320						
(e)	For pipeline Ø 50 mm	L.M.	50						
1.2	Excavate trenches from ground level to a depth exceeding 3 m but not exceeding 4 m in depth. In any type of soil including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipeline Ø 1600 mm	L.M.	900						
(b)	For pipeline Ø 1200 mm	L.M.	500						
(c)	For pipeline Ø 800 mm	L.M.	200						
1.3	Excavate trenches from ground level to a depth exceeding 4 m but not exceeding 5 m in depth. In any type of soil including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipeline Ø 2000 mm	L.M.	550						
(b)	For pipeline Ø 1600 mm	L.M.	800						
(c)	For pipeline Ø 1200 mm	L.M.	330						
(d)	For pipeline Ø 800 mm	L.M.	200						
1.4	Extra over Excavation for excavation exceeding 5 m below ground level to any depth and in any type of soil Including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipe line of any diameter.	L.M.	100						
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
2	<p><u>PIPELINES :</u></p> <p>Supply and Installation of the D.I. Pipes, complete with all accessories, transport to site of work and place on wooden blocks or sand bags.</p> <p>D.I. pipes with push-on flexible joints, complete with all accessories including rubber rings, polyethelene sleeves double encasement, lubricants, tapes, wires etc.</p> <p>The test pressure shall be as per drawings and to the approval of the Engineer.</p> <p>Note: The numbers shown in brackets before each item denotes the Item Number of that item as shown on Drawing No. W.P.D. 6397 / 14.</p>								
2.1	(1) For pipeline Ø 2000 mm	L.M.	550						
2.2	(2) For pipeline Ø 1600 mm	L.M.	1700						
2.3	(3) For pipeline Ø 1200 mm	L.M.	3430						
2.4	(4) For pipeline Ø 800 mm	L.M.	400						
2.5	(61) For pipeline Ø 400 mm	L.M.	165						
2.6	(62) For pipeline Ø 300 mm	L.M.	150						
2.7	(63), (98) For pipeline Ø 100 mm	L.M.	320						
2.8	(99) For pipeline Ø 50 mm	L.M.	50						
	<p>Note: Actual pipe lengths of pipelines shall be as per workshop drawing and to the approval of the Engineer. All pipe lengths shall be calculated excluding the valves and fittings.</p>								
3	<p><u>PIPELINE FITTINGS :</u></p> <p>Supply and Installation of the Valves & Fittings with all accessories, transport to site of work and place on wooden blocks.</p> <p>End Flange Drilling for all fittings shall be according to ISO PN10.</p> <p>Note: The numbers shown in brackets before each item denotes the Item Number of that item as shown on Drg. No. W.P.D. 6397 / 14.</p>								
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
3.1	Flanged Spigot Pipe with 2 Puddle Flanges :								
(a)	(5) Ø 2000 mm	No.	1						
(b)	(6) Ø 1600 mm	No.	12						
(c)	(7) Ø 1200 mm	No.	10						
(d)	(8) Ø 800 mm	No.	6						
3.2	Flanged Spigot Pipe with 1 Puddle Flange :								
(a)	(69) Ø 400 mm	No.	1						
(b)	(70) Ø 300 mm	No.	2						
(c)	(9), (100) Ø 100 mm	No.	5						
3.3	Flanged Spigot Pipe :								
(a)	(10) Ø 800 mm	No.	20						
(b)	(67) Ø 400 mm, Length = 5.21m	No.	1						
(c)	(68) Ø 400 mm, Length = 2	No.	1						
3.4	Double Flanged Pipe :								
(a)	(64) Ø 400 mm, Length = 3.00m	No.	2						
(b)	(65) Ø 400 mm, Length = 0.50m	No.	4						
3.5	Double Spigot Pipe :								
(a)	(66) Ø 400 mm, Length = 0.70m	No.	1						
3.6	Motorized Butterfly Valve with Electronic Actuator as per TIC specifications :								
(a)	(14) Ø 2000 mm	No.	1						
(b)	(15) Ø 1600 mm	No.	12						
(c)	(16) Ø 1200 mm	No.	11						
(d)	(17) Ø 800 mm	No.	16						
(e)	(75) Ø 400 mm	No.	1						
(f)	(76) Ø 300 mm	No.	2						
3.7	Manual Butterfly Valve:								
(a)	(17A) Ø 800 mm	No.	10						
(b)	(59) Ø 600 mm	No.	10						
3.8	Double Orifice Air Valve :								
(a)	(22) Ø 300 mm	No.	5						
(b)	(23) Ø 200 mm	No.	2						
3.9	Sluice Valve :								
(a)	(18) Ø 400 mm	No.	34						
(b)	(19) Ø 300 mm	No.	5						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
(c)	(20) Ø 200 mm	No.	2				
(d)	(21), (101) Ø 100 mm	No.	5				
3.10	Socket Flange :						
(a)	(24) Ø 2000 mm	No.	2				
(b)	(25) Ø 1600 mm	No.	17				
(c)	(26) Ø 1200 mm	No.	18				
(d)	(27) Ø 800 mm	No.	6				
(e)	(83) Ø 400 mm	No.	1				
(f)	(84) Ø 300 mm	No.	2				
(g)	(102) Ø 100 mm	No.	2				
3.11	Socket Reducer :						
(a)	(28) Ø 2000 x 1600 mm	No.	1				
(b)	(29) Ø 1600 x 1200 mm	No.	1				
(c)	(85) Ø 400 x 100 mm	No.	1				
(d)	(107) Ø 100 x 50 mm	No.	2				
3.12	All Socket Tee :						
(a)	(30) Ø 2000 x 2000 mm	No.	1				
(b)	(31) Ø 1600 x 1600 mm	No.	3				
(c)	(32) Ø 1600 x 1200 mm	No.	5				
(d)	(33) Ø 1600 x 800 mm	No.	6				
(e)	(44) Ø 1200 x 1200 mm	No.	2				
(f)	(34) Ø 1200 x 800 mm	No.	8				
(g)	(35) Ø 800 x 100 mm	No.	4				
(h)	(78) Ø 400 x 400 mm	No.	1				
(i)	(79) Ø 400 x 300 mm	No.	1				
(j)	(80) Ø 400 x 100 mm	No.	3				
(k)	(81) Ø 300 x 300 mm	No.	1				
(l)	(82) Ø 300 x 100 mm	No.	1				
(m)	(105) Ø 100 x 50 mm	No.	1				
(n)	(106) Ø 50 x 50 mm	No.	1				
3.13	All Flanged Tee :						
(a)	(77) Ø 400 x 100 mm	No.	4				
3.14	Double Socket Tee With Flanged Branch :						
(a)	(36) Ø 2000 x 600 mm	No.	2				
(b)	(60) Ø 1600 x 1200 mm	No.	1				
(c)	(37) Ø 1600 x 400 mm	No.	7				
(d)	(38) Ø 1200 x 200 mm	No.	2				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
3.15	Flanged Bend :						
(a)	(48) Ø 800 mm x 45°	No.	10				
(b)	(74) Ø 100 mm x 90°	No.	4				
3.16	Flanged Duckfoot Bend :						
(a)	(42) Ø 400 mm x 90°	No.	4				
3.17	Socket Bend :						
(a)	(43) Ø 1600 mm x 45°	No.	6				
(b)	(45) Ø 1200 mm x 45°	No.	18				
(c)	(46) Ø 800 mm x 45°	No.	10				
(d)	(71) Ø 400 mm x 90°	No.	1				
(e)	(72) Ø 300 mm x 90°	No.	1				
(f)	(73) Ø 100 mm x 90°	No.	1				
(g)	(103) Ø 100 mm x 90°	No.	1				
(h)	(104) Ø 100 mm x 45°	No.	1				
3.18	Double Socket Collar :						
(a)	(49) Ø 1600 mm	No.	6				
(b)	(50) Ø 1200 mm	No.	7				
(c)	(51) Ø 800 mm	No.	10				
(d)	(86) Ø 400 mm	No.	2				
(e)	(87) Ø 300 mm	No.	1				
3.19	Viking Johnson Coupling :						
(a)	(52) Ø 800 mm	No.	10				
3.20	Blank Flange :						
(a)	(54) Ø 2000 mm	No.	1				
(b)	(55) Ø 1600 mm	No.	5				
(c)	(56) Ø 1200 mm	No.	7				
(d)	(57) Ø 800 mm	No.	20				
(e)	(58) Ø 600 mm	No.	20				
(f)	(88) Ø 400 mm	No.	2				
3.21	Reducing Flange :						
(a)	(39) Ø 600 x 400 mm	No.	1				
(b)	(40) Ø 600 x 300 mm	No.	1				
(c)	(41) Ø 400 x 300 mm	No.	4				
	Note: The Contractor shall submit technical details and shop drawing for MEW approval prior to placing the order.						
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
4	<u>TIE-IN POINTS ON MAIN PIPELINES :</u>								
	Cut the respective existing pipelines and connect the proposed pipelines, as mentioned below:								
4.1	Tie-in Point No. 1: Connect the proposed Ø2000mm inlet pipeline to the existing Ø2000mm inlet pipeline.	L.S.	L.S.						
4.2	Tie-in Point No. 2 & 3: Connect the proposed Ø1200mm inlet pipeline to the Ø1200mm R.O. pipeline No. 3 & No. 4.	L.S.	L.S.						
4.3	Tie-in Point No. 4 & 5: Connect the proposed Ø1200mm outlet pipeline to the existing Ø1200mm outlet pipeline.	L.S.	L.S.						
4.4	Tie-in Point No. 6, 7, 8 & 9: Connect the proposed Ø800mm reservoir inlet pipelines to the existing Ø800mm inlet pipeline branches.	L.S.	L.S.						
4.5	Tie-in Point No. 10 & 11: Connect the proposed Ø800mm reservoir outlet pipelines to the existing Ø800mm outlet pipeline branches.	L.S.	L.S.						
4.6	Tie-in Point No. 12 & 13: Connect the proposed Ø300mm emergency motive water pipeline to the existing Ø300mm motive water pipeline.	L.S.	L.S.						
4.7	Tie-in Point No. 14, 15, 16 & 17: Connect the proposed Ø100mm motive water pipelines to the existing Ø100mm branches (4 Nos.) on the R.O. pipelines.	L.S.	L.S.						
	These connecting works at the tie-in points shall be carried out in coordination with the concerned department and as mentioned in drawing no. W.P.D. 6397 / 14, specifications and to the approval of the Engineer.								
	The rate shall include for all excavation processes, cutting of pipelines, removal of existing socket flanges, blank flanges, thrust blocks including all H-beams, etc., transporting								
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
5	<p>the excavated material and handing over to MEW stores, clearing all debris from the site and connecting the proposed pipelines as shown on the drawings.</p> <p><u>DIVERSION OF EXISTING Ø800mm D.I. BRACKISH WATER PIPELINE FROM WELL NO. 23 TO WELL NO. 24 :</u></p> <p>This work has to be coordinated with the concerned department and should be carried out before the start of the reservoirs and their pipeline works. Refer drawing no. W.P.D. 6397 / 10 & 14 for details of the diverted pipeline route, fittings, chambers, location and details.</p>								
5.1	<u>Earth Works :</u>								
5.1.1	Excavate trenches from ground level to a depth exceeding 2 m but not exceeding 3 m in depth. In any type of soil including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipeline Ø 800 mm	L.M.	700						
5.1.2	Excavate trenches from ground level to a depth exceeding 3 m but not exceeding 4 m in depth. In any type of soil including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipeline Ø 800 mm	L.M.	500						
5.1.3	Excavate trenches from ground level to a depth exceeding 4 m but not exceeding 5 m in depth. In any type of soil including backfilling, carting away the surplus etc. All to be done as per drawing and to the approval of the Engineer.								
(a)	For pipeline Ø 800 mm	L.M.	300						
5.2	<u>Pipelines :</u>								
	Take delivery from MEW stores and install the D.I. Pipes, complete with all accessories,								
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
5.2.1	<p>transport to site of work and place on wooden blocks or sand bags. D.I. pipes with push-on flexible joints, complete with all accessories including rubber rings, polyethelene sleeves double encasement, lubricants, tapes, wires etc. The test pressure shall be as per drawings and to the approval of the Engineer.</p> <p>(89) For pipeline Ø 800 mm</p> <p>Note: The numbers shown in brackets before each item denotes the Item Number of that item as shown on Drg. No. W.P.D. 6397 / 14.</p> <p>Note: Actual pipe lengths of pipelines shall be as per workshop drawing and to the approval of the Engineer. All pipe lengths shall be calculated excluding the valves and fittings.</p>	L.M.	1500						
5.3	<p><u>Pipeline Fittings :</u></p> <p>Take delivery from MEW stores and install the Valves & Fittings with all accessories, transport to site of work and place on wooden blocks. End Flange Drilling for all fittings shall be according to ISO PN10.</p> <p>Note: The numbers shown in brackets before each item denotes the Item Number of that item as shown on Drg. No. W.P.D. 6397 / 14.</p>								
5.3.1	<p>All Socket Bend:</p> <p>(a) (90) Ø 800 mm x 45°</p>	No.	4						
5.3.2	<p>Double Socket Tee with Flanged Branch:</p> <p>(a) (91) Ø 800 x 300 mm</p> <p>(b) (92) Ø 800 x 150 mm</p>	No.	1						
5.3.3	<p>Sluice Valve:</p> <p>(a) (93) Ø 300 mm</p> <p>(b) (94) Ø 150 mm</p>	No.	1						
5.3.4	<p>Double Orifice Air Valve:</p> <p>(a) (95) Ø 150 mm</p>	No.	1						
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
5.3.5 (a)	Flanged Duckfoot Bend: (96) Ø 300 mm x 90°	No.	1						
5.3.6 (a)	Double Socket Collar: (97) Ø 800 mm	No.	2						
	Note: The Contractor shall submit technical details and shop drawing for MEW approval prior to placing the order.								
5.4	<u>Tie-in Points A & B :</u>								
5.4.1	After laying the new pipeline and fittings at the diverted route, coordinate with the concerned department and take their permission to cut the existing Ø800mm pipeline at the Tie-in Points A & B, and fix Ø800mm Double Socket Collars to connect to the new diverted pipeline, as shown on drawing no. W.P.D. 6397 / 10, all to the approval of the Engineer.	L.S.	L.S.						
5.5	<u>Removal of Existing Ø800mm D.I. Pipeline :</u>								
5.5.1	Manual excavation to the required depth of the pipeline, carefully to avoid damaging the pipes, removal of existing Ø800mm pipeline, backfilling with excavated earth or earth brought from outside, if the excavated earth is not suitable for backfilling and compaction as per contract specifications. The rate shall also include for the removal of complete pipeline and fittings and handing over to MEW stores.	L.M.	1500						
6	<u>MOBILE PUMP :</u>								
	Supply and deliver to site, diesel mobile pumps complete. The capacity of each pump should be 10 litres/second with a lifting head of 8 meters.								
	The pumps are required for the removal of leakage water from the sump pits of manholes or valve chambers.								
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	<p>The rates shall include for but not limited to all necessary hoses, valves, couplings, fittings, etc., and any other item required to complete the work to the best standards and workmanship. All to be to the satisfaction of the Engineer.</p> <p>Note: The Contractor shall submit specification and shop drawing for MEW approval prior to placing the order.</p> <p>7 <u>THRUST BLOCK :</u></p>	No.	2					
7.1	Reinforced Concrete 35N/mm ² with sulphate resisting cement type V including additional excavation, removal of soil, cart way surplus materials, formwork, reinforcement, selection steel beams embedded in concrete (H beam, I beam and/or similar). Two coats of bituminous paint to surfaces concrete not cast against undistributed ground, compacted backfilling to ground level & all incidental materials and work.	C.M.	2000					
7.2	Plain concrete 15N/mm ² with sulphate resisting cement type V including all necessary formwork for blending bed 75 mm thick under base slab.	C.M.	200					
	<p>8 <u>PIPE LAYING ANCILLARIES :</u></p>							
8.1	Provide and install marker tape over pipes.	L.M.	3850					
8.2	Supply all materials, equipment, and labour to clean and disinfect the proposed water pipeline (Inlet and outlet) including supply, disposal of water and chemicals.	L.S.	L.S.					
8.3	Provide and install marker posts at chambers as approved by the Engineer.	No.	47					
	<p>9 <u>REINFORCED CONCRETE VALVE CHAMBERS :</u></p> <p>The following to be constructed in accordance with the Drawings, Specifications and to the approval of the Engineer, including excavation</p>							
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SECTION 6		BILL OF QUANTITY NO. 2				PIPEWORKS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE				
					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
	for chambers in any materials to the required formation level, backfill as shown on Drawings.								
9.1	Plain concrete 15N/mm ² with sulphate resisting cement type V including all necessary formwork for Blending bed 100 mm thick under membrane.	C.M.	140						
9.2	50 mm thick sulphate resisting cement and sand screed inside the chamber.	C.M.	50						
9.3	Reinforced Concrete 35N/mm ² with sulphate resisting cement type V including all reinforcement, formwork, Construction joints, additive, curing, etc., Complete for base slabs.	C.M.	900						
9.4	-Ditto- but for walls	C.M.	1000						
9.5	-Ditto- but for cover slabs to roof including 4 No. built-in lifting hooks, 610mm dia opening for access cover as required and hoisting and fixing in position.	C.M.	120						
9.6	Mass Concrete 35N/mm ² with sulphate resisting cement type V including all necessary formwork for pipe support inside chamber.	C.M.	25						
9.7	Water Proofing Membrane:								
9.7.1	4mm thick water proofing membrane to horizontal surfaces of base with 20mm screed.	S.M.	1200						
9.7.2	4mm thick water proofing membrane to vertical surfaces of wall with 6mm protection board.	S.M.	4000						
10	<u>METALS :</u>								
10.1	Supply 400mm wide stainless steel (316L), vertical ladder without cage, height between 3mt to 4mt consisting of 12mm thick flat bar stringer 65mm wide 25mm dia. Solid rungs spaced 300mm a part and fixing to concrete wall.	Nos.	32						
10.2	-Ditto- but ladders with cage for height more								
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SECTION 6		BILL OF QUANTITY NO. 2		PIPEWORKS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)	SCHEDULE					
		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	than 4.0 Mt.	Nos.	15				
10.3	Supply and fix Ø610mm medium duty Ductile Iron access cover and frame complete with anchors and bedded in cement mortar including bituminous paint to under side of frame.	Nos.	47				
10.4	Supply and fix ductile iron surface Valve box, bedded in cement mortar including bituminous paint to under site of frame.	Nos.	39				
10.5	Supply and fix Ø42mm Carbon steel (to AISI-C-60) valve extension spindle with and including galvanized mild steel holding brackets, straps, plates, flanges guide pipes etc., and fixing to concrete.	Nos.	39				
10.6	Supply and fix Ø150mm Stainless Steel seamless pipe Air ventilator for main valve chambers as per drawing and specifications.	Nos.	47				
11	<u>ALLOW FOR ANY MISSING ITEM</u>						
11.1	Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in the BOQ and/or Drawings. (Refer Section 5, Particular Specifications, Clause 5.13.11). Important: The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S.	L.S.				

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MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS AND OPERATIONS & MAINTENANCE SECTOR	SECTION-6, BILL OF QUANTITY NO.2, RESERVOIR PIPEWORK

COLLECTION

Item	DESCRIPTION	TOTAL AMOUNT	
		KD	FILS
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SECTION 6		BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundry at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	2600				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer approval.	Cu.M	700				
2	CONCRETE						
2.1	<u>Plain Concrete</u>						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	50				
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams.	M ²	730				
2.1.3	Provide and lay foam concrete for bathrooms including all materials, workmanship, all complete as per drawings, specifications and approval of engineer.	M ²	50				
2.2	<u>Reinforced Concrete</u>						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade, 150mm thick.	M ³	130				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	250				
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SECTION 6		BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for tie/ground beams.	M ³	120				
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for column necks.	M ³	15				
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	70				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	230				
2.2.7	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for staircase steps and landings	M ³	10				
2.2.8	-- Ditto -- but for Parapet wall	M ³	20				
2.2.9	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	200				
2.2.10	A. Ribbed slab/hordi slab one way thick 50 cm	M ²	370				
3	MASONRY						
3.1	Concrete Unit Masonry						
3.1.1	Supply and build external double wall of solid sand cement blocks 10 cm thick, each including insulation 5cm of extruded polystyrene, external cladding with 7 cm th. grey color Sand lime bricks with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	670				
3.1.2	Supply and build 7 cm thcik grey color sand lime bricks cladding for fairface walls	M ²	180				
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SECTION 6		BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
3.1.3	Supply and build internal walls of solid sand cement blocks 20cm thick, including all materials as per drawings specifications and satisfaction of engineer.	M ²	950				
3.1.4	Ditto - but for 15 cm thick	M ²	50				
4	<u>METALS - Metal Fabrications</u>						
4.1	Galvanized steel chequered plate, for trench covers including all fixing and supporting accessories	M ²	70				
4.2	Supply, fix and install galvanized steel pipe Hand rails with 2 primer coats and 3 coats of epoxy paint, all complete as per specifications, drawings and approval of the Engineer.	LM	40				
5	THERMAL & MOISTURE PROTECTION <u>Bituminous Damp-Proofing</u>						
5.1	Cold applied bituminous emulsion paint (2coats) for toilets.	M ²	100				
5.2	<u>Sheet Water Proofing</u>						
5.2.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystyrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M ²	880				
5.2.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	100				
5.2.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	870				
6	<u>DOORS & WINDOWS</u>						
6.1	<u>Aluminum Doors</u> Provide& install extruded powder coated aluminum for doors with pressed profiled including aluminum frame, weather sealing, fixing accessories, sealant, rubber having fixed/hinged panels with glass or aluminum slice where necessary, fitted & fixed in position including all hardware, iron mongery, workmanship etc., all complete as per drawings, specifications and approval of Engineer.						
6.1.1	AD -1 - Size 1000x2200mm	No	1				
6.1.2	AD -2 - Size 2000x2500mm	No	3				
6.1.3	AD -3, Size 1000x2200mm	No	15				
6.1.4	AD -4, Size 800x2200mm	No	10				
6.1.5	AD -5 - Size 1500x2200mm	No	3				
6.1.6	AD -6 - Size 2000x2200mm	No	1				
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SECTION 6		BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
6.2	<u>Aluminum Windows</u> Provide and install extruded powder coated approved color for windows and fly screens, complete with 6mm single / double glass approved color with moveable and / or fixed aluminum panels and aluminum frame all complete as per drawings, specifications and approval of engineer						
6.2.1	AW-1, Size 1800 x 1200mm (Fixed)	No	18				
6.2.2	AW-2, Size 1200 x 1200mm (Fixed)	No	6				
6.2.3	AW-4, Size 3400 x 1500mm (Fixed/Sliding)	No	4				
6.2.4	AW-5, Size 2800 x 1500mm (Fixed/Sliding)	No	2				
6.2.5	AW-6, Size 5100 x 1500mm (Fixed/Sliding)	No	2				
6.3	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship all complete as per drawings, specifications and approval of engineer						
	SD 1 - Size - 1000 x 2200 mm (fire rated 2.0 HR)	No.	1				
	SD 7 - Size : 2500 x 2500mm (fire rated 2.0 HR)	No.	2				
7	FINISHES						
7.1	<u>Lathe and Plaster</u>						
7.11	Internal cement plaster for walls	M ²	3000				
8	<u>Ceramic Tiles</u>						
8.1	Supply and Install ceramic tiles from approved sources including internal Beds and Coves, bedded, jointed, pointed, backing materials, grouting, cleaning etc., complete as per specifications, drawings and approval of the						
8.1.1	Antique ceramic tiles 300x300x12 mm for floor in offices and reception area	Sq.M	200				
8.1.2	Glazed ceramic tiles 200x200x6 mm for walls in kitchen and toilets	Sq.M	250				
8.1.3	Unglazed Ceramic tiles 300x300x12 mm Heavyduty in corridor	Sq.M	260				
8.2	<u>Terrazzo tiles</u>						
8.2.1	Supply and Install Terrazzo floor tiles 300x300x30mm over cement sand mortar & sand cushion with skirting including grouting, grinding, polishing cleaning etc., all complete as per specifications, drawings and approval of the Engineer.	Sq.M	30				
8.2.2	Raised floor system under structure covered with tile sizes 600x600mm, 400mm high, tiles finish with vinyl top	M2	610				
8.3	Reinforcement concrete with hardener for floors, including all materials and workmanship, all complete as per drawings, specifications and approval of engineer in electrical room area.	M ³	55				
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SECTION 6		BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
8.4	White Carrara marble strips (for doors, windows frames at ext. elevation) 100mm wide, 30mm thick.	MR	10				
8.5	Carrara marble tiles, size 400x400x20mm for floors in Reception Area	M ²	70				
8.6	Provide and erect in position Marble frame including all materials and workmanship, all complete as per drawings, specifications and approval of engineer for Doors and windows						
8.6.1	340 mm wide	MR	200				
8.6.2	240 mm wide	MR	140				
8.7	Provide and erect in position Marble sill including all materials and workmanship, all complete as per drawings, specifications and approval of engineer						
	340 mm wide	MR	100				
	240 mm wide	MR	40				
8.8	<u>Bases</u>						
8.8.1	Ceramic skirting tiles 200x100x9.5mm	MR	350				
8.8.2	Terrazzo skirting tiles 250x100x25mm	MR	30				
8.9	White Carrara marble for stairs - Tread 300 mm wide 30mm thk. and Raiser 150mm high,20mm thick -1.50 M Long	MR	120				
8.9.1	Carrara marble skirting tiles 400x100x20mm	MR	40				
9	<u>Suspenders & Ceilings</u>						
9.1	Acoustical tiles 600x600mm including complete supporting system in offices and control rooms	M ²	1100				
9.2	Gypsum board suspended ceiling with emulsion paint. including complete supporting system in kitchen and locker rooms	M ²	50				
9.3	Aluminum linear ceiling system	M ²	50				
10	<u>Painting</u>						
10.1	Internal emulsion paint for walls	M ²	2800				
10.2	Internal emulsion paint for ceilings	M ²	2100				
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SECTION 6		BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
11	<p>Allow for any missing Item:</p> <p>Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11)</p> <p>Important :- The Contractor must submit a complete detailed breakdown for this item of work with his offer.</p>	L.S					

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SECTION 6 BILL OF QUANTITY NO. 3.1.1		ELECTRICAL AND CONTROL BUILDING						
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE			
	Unit Rate		Total Amount		Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils	

COLLECTION OF BILL NO. (3.1.1)

PAGE NO.	AMOUNT	
	K.D.	FILS
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TOTAL CARRIED TO MAIN SUMMARY		

SECTION 6		BILL OF QUANTITY NO. 3.1.2		GENERATOR BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundry at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of	Cu.M	700				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer	Cu.M	600				
2	CONCRETE						
2.1	Plain Concrete						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	50				
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams and cable trenches	M ²	110				
2.2	Reinforced Concrete						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 200 mm thick. with hardener on the surface	M ³	30				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	30				
	--- Ditto ---- But for Fual Tank Base	M ³	20				
	--- Ditto ---- But for Cable trench Base	M ³	12				
	--- Ditto ---- But for Cable trench Walls	M ³	10				
	--- Ditto ---- But for Fual Tank Walls	M ³	36				
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for tie/ground bea	M ³	15				
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SECTION 6		BILL OF QUANTITY NO. 3.1.2		GENERATOR BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for column necks.	M ³	4				
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	10				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	15				
2.2.7	-- Ditto -- but for Parapet wall	M ³	10				
2.2.8	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	15				
2.2.9	A. Ribbed slab/hordi slab one way thick 50 cm	M ²	150				
3	MASONRY						
3.1	<u>Concrete Unit Masonry</u>						
3.1.1	Supply and build external double wall of solid sand cement blocks 10 cm thick, each including insulation 5cm of extruded polystyrene, with 7 cm thick sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	205				
3.1.2	Supply and build internal walls of solid sand cement blocks 20cm thick, including all materials as per drawings specifications and satisfaction of engineer.	M ²	55				
3.1.4	Supply and build 7 cm thick sand lime bricks on parapet fair face walls including all materials as per drawings specifications and satisfaction of engineer.	M ²	95				
3.1.4	Glass block size 20 x 20 x 10 cm system with all reinforcement, sealant, Mortar, Galvanizing iron expansion anchors, Steel angles, Plates and all other Materials complete in all respect as per details on drawings, specificatons and approval of the Engineer.	Sq.M	20				
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SECTION 6		BILL OF QUANTITY NO. 3.1.2		GENERATOR BUILDING			
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				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4	<u>METALS - Metal Fabrications</u>						
4.1	Galvanized steel ladder for roof, with safety cage, 5.45 M high.	No.	1				
4.2	Galvanized steel chequered plate, for trench covers including all fixing and supporting accessories	M ²	55				
5	<u>Sheet Water Proofing</u>						
5.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed grave	M ²	220				
5.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	70				
5.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	220				
6	<u>Aluminum Doors and Windows</u>						
6.1	<u>Aluminum Windows</u> Provide and install extruded powder coated approved color for windows and fly screens, complete with 6mm single / double glass approved color with moveable and / or fixed aluminum panels and aluminum frame all complete as per drawings, specifications and approval of engineer						
6.1.1	AW-1. Size 3800 x 1000 mm (Fixed with double glass)	No	1				
6.1.2	AW-2, Size 1050 x 1000 mm (Fixed with double glass)	No	1				
6.1.3	AW-3, Size 500 x 500 mm (Fixed glass for Exhaust openi	No	2				
6.2	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, all complete as per drawings, specifications and approval of the engineer SD 1 - Size - 2000 x 2500 mm (fire rated 2.0 HR) SD 2 - Size : 1000 x 2500mm (fire rated 2.0 HR) SD 3 - Size - 3600 x 2500 mm (fire rated 2.0 HR)	No.	1				
		No.	1				
		No.	1				
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SECTION 6		BILL OF QUANTITY NO. 3.1.2		GENERATOR BUILDING			
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				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
7	FINISHES <u>Lathe and Plaster</u>						
7.1	Internal cement plaster for walls	M ²	205				
8	<u>Painting</u>						
8.1	Internal emulsion paint for walls	M ²	205				
8.2	Internal emulsion paint for ceilings	M ²	220				
9	<u>Allow for any missing item:</u> Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11) <u>Important</u> :- The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S					
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SECTION 6**BILL OF QUANTITY NO. 3.1.2****GENERATOR BUILDING**

Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils

COLLECTION OF BILL NO. (3.1.2)

PAGE NO.	AMOUNT	
	K.D.	FILS
Page number – 01 (Item 1 to 2.2.3)		
Page number – 02 (Item 2.2.4 to 3.1.4)		
Page number – 03 (Item 4 to 6.2)		
Page number – 04 (Item 7 to 9)		
TOTAL CARRIED TO MAIN SUMMARY		

SECTION 6		BILL OF QUANTITY NO. 3.1.3		MAIN SUBSTATION			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundry at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	800				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer	Cu.M	450				
2	CONCRETE						
2.1	<u>Plain Concrete</u>						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	50				
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams and cable trenches	M ²	130				
2.2	<u>Reinforced Concrete</u>						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 200 mm thick. with hardener on the surface	M ³	35				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	45				
	--- Ditto ---- But for Cable trench Base	M ³	10				
	--- Ditto ---- But for Cable trench Walls	M ³	20				
	-- Ditto --- For Transformer Base	M ³	5				
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SECTION 6		BILL OF QUANTITY NO. 3.1.3		MAIN SUBSTATION			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-	SCHEDULE					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc. as per drawings specification & satisfaction of engineer for tie/ground beams	M ³	25				
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc. as per drawings specification & satisfaction of engineer for column necks.	M ³	5				
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	10				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	30				
2.2.7	-- Ditto -- but for Parapet wall	M ³	10				
2.2.8	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	42				
3	MASONRY						
3.1	<u>Concrete Unit Masonry</u>						
3.1.1	Supply and build external double wall of solid sand cement blocks 10cm th, each including insulation 5cm of extruded polystyrene, with 7 cm thick sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	235				
3.1.2	Supply and build internal walls of solid sand cement blocks 20cm th. including all materials as per drawings specifications and satisfaction of engineer.	M ²	165				
3.1.3	Supply and build 7 cm thick sand lime bricks on parapet fair face walls including all materials as per drawings specifications and satisfaction of engineer.	M ²	125				
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SECTION 6		BILL OF QUANTITY NO. 3.1.3		MAIN SUBSTATION			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4	<u>METALS - Metal Fabrications</u>						
4.1	Galvanized steel ladder for roof, with safety cage, 5.45 M high.	No.	1				
4.2	Galvanized steel chequered plate, for trench covers including all fixing and supporting accessories	M ²	55				
5	<u>Sheet Water Proofing</u>						
5.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M2	280				
5.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	340				
5.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	280				
6	<u>Aluminum Doors and Windows</u>						
6.1	<u>Aluminum Windows</u> Provide and install extruded powder coated approved color for windows and fly screens, complete with 6mm single /double glass approved color with moveable and / or fixed aluminum panels and aluminum frame all complete as per drawings, specifications and approval of engineer						
6.1.1	AW-1, Size 1500 x 1000 mm (Sliding)	No	1				
6.1.2	AW-3, Size 600 x 600 mm (Fixed glass for Exhaust openi	No	1				
6.2	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, all complete as per drawings, specifications and approval of engineer SD 1 - Size - 3000 x 3000 mm (fire rated 2.0 HR) SD 2 - Size : 1000 x 2500mm (fire rated 2.0 HR) SD 3 - Size - 2400 x 3000 mm (fire rated 2.0 HR)	No. No. No.	2 3 2				
7	<u>FINISHES</u> <u>Lathe and Plaster</u>						
7.1	Internal cement plaster for walls	M ²	560				
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SECTION 6		BILL OF QUANTITY NO. 3.1.3		MAIN SUBSTATION			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-	SCHEDULE					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
8	Painting						
8.1	Internal emulsion paint for walls	M ²	560				
8.2	Internal emulsion paint for ceilings	M ²	280				
9	Allow for any missing item: Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11) Important :- The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S	L.S				
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SECTION 6 BILL OF QUANTITY NO. 3.1.3 MAIN SUBSTATION BUILDING							
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE		
	Unit Rate		Total Amount				
Item	Description	Unit	Qty	KD	Fils	KD	Fils

COLLECTION OF BILL NO. (3.1.3)

PAGE NO.	AMOUNT	
	K.D.	FILS
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SECTION 6		BILL OF QUANTITY NO. 3.1.4		RESERVOIR SUBSTATION (2 Nos)			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundary at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	700				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer	Cu.M	500				
2	CONCRETE						
2.1	<u>Plain Concrete</u>						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	30				
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams and cable trenches	M ²	150				
2.2	<u>Reinforced Concrete</u>						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 200 mm thick. with hardener on the surface	M ³	35				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	20				
	--- Ditto ---- But for Cable trench Base	M ³	20				
	--- Ditto ---- But for Cable trench Walls	M ³	20				
	-- Ditto --- For Transformer Base	M ³	10				
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SECTION 6		BILL OF QUANTITY NO. 3.1.4		RESERVOIR SUBSTATION (2 Nos)			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-	SCHEDULE					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc. as per drawings specification & satisfaction of engineer for tie/ground beams	M ³	25				
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc. as per drawings specification & satisfaction of engineer for column necks.	M ³	5				
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	10				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	25				
2.2.7	-- Ditto -- but for Parapet wall	M ³	10				
2.2.8	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	40				
3	MASONRY						
3.1	<u>Concrete Unit Masonry</u>						
3.1.1	Supply and build external double wall of solid sand cement blocks 10cm th, each including insulation 5cm of extruded polystyrene, with 7 cm thick sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	300				
3.1.2	Supply and build internal walls of solid sand cement blocks 20cm th. including all materials as per drawings specifications and satisfaction of engineer.	M ²	40				
3.1.3	Supply and build 7 cm thick sand lime bricks on parapet fair face walls including all materials as per drawings specifications and satisfaction of engineer.	M ²	100				
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SECTION 6		BILL OF QUANTITY NO. 3.1.4		RESERVOIR SUBSTATION (2 Nos)			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4	<u>METALS - Metal Fabrications</u>						
4.1	Galvanized steel ladder for roof, with safety cage, 5.45 M high.	No.	2				
4.2	Galvanized steel chequered plate, for trench covers including all fixing and supporting accessories	M ²	100				
5	<u>Sheet Water Proofing</u>						
5.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M2	250				
5.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	110				
5.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	250				
6	<u>Aluminum Doors and Windows</u>						
6.1	<u>Aluminum Windows</u> Provide and install extruded powder coated approved color for windows and fly screens, complete with 6mm single /double glass approved color with moveable and / or fixed aluminum panels and aluminum frame all complete as per drawings, specifications and approval of engineer						
6.1.1	AW-1, Size 600 x 600 mm (Fixed glass for Exhaust opening)	No	4				
6.2	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, all complete as per drawings, specifications and approval of engineer SD 1 - Size - 2000 x 2200 mm (fire rated 2.0 HR) SD 2 - Size : 1000 x 2200mm (fire rated 2.0 HR)	No. No.	2 2				
7	<u>FINISHES</u> <u>Lathe and Plaster</u>						
7.1	Internal cement plaster for walls	M ²	300				
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SECTION 6		BILL OF QUANTITY NO. 3.1.4		RESERVOIR SUBSTATION (2 Nos)			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
8	Painting						
8.1	Internal emulsion paint for walls	M ²	300				
8.2	Internal emulsion paint for ceilings	M ²	210				
9	Raised Floor system under structure covered with tiles sizes 600 x 600 mm, 400 mm high with vinyl top finish	M ²	60				
10	Allow for any missing item: Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11) Important :- The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S	L.S				
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SECTION 6 BILL OF QUANTITY NO. 3.1.4 RESERVOIR SUBSTATION BUILDING							
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE		
	Unit Rate		Total Amount				
Item	Description	Unit	Qty	KD	Fils	KD	Fils

COLLECTION OF BILL NO. (3.1.4)

PAGE NO.	AMOUNT	
	K.D.	FILS
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Page number – 04 (Item 7 to 10)		
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SECTION 6		BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE				
				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
1	EARTH WORKS							
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundry at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	2000					
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer approval.	Cu.M	3600					
2	CONCRETE							
2.1	<u>Plain Concrete</u>							
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	50					
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams and cable trenches	M ³	90					
2.1.3	Ditto- but for below Slab-on Grade	M ³	150					
2.2	<u>Reinforced Concrete</u>							
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 200 mm thick.	M ³	215					
	-- Ditto but with hardener on the surface	M ³	50					
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	375					
	--- Ditto ---- But for Cable trench Base	M ³	40					
	--- Ditto ---- But for Cable trench Walls	M ³	70					
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SECTION 6		BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE				
				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for tie/ground beams.	M ³	95					
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for column necks.	M ³	27					
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	130					
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	480					
2.2.7	-- Ditto -- but for Parapet wall	M ³	35					
2.2.8	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	415					
3	MASONRY							
3.1	<u>Concrete Unit Masonry</u>							
3.1.1	Supply and build external double wall of solid sand cement blocks 10 cm thick, each including insulation 5cm of extruded polystyrene, with 7 cm thick grey color sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	1600					
3.1.2	Supply and build 7 cm thick grey color sand lime bricks cladding external fairface wall	M ²	300					
3.1.3	Supply and build internal walls of solid sand cement blocks 20cm thick, including all materials as per drawings specifications and satisfaction of engineer.	M ²	1250					
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SECTION 6		BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
3.1.4	Glass block size 20 x 20 x 10 cm system with all reinforcement, sealant, Mortar, Galvanizing iron expansion anchors, Steel angles, Plates and all other Materials complete in all respect as per details on drawings, specificatons and approval of the Engineer.	Sq.M	60				
4	<u>METALS - Metal Fabrications</u>						
4.1	Galvanized steel ladder for roof, with safety cage, 4.0 M high.	No.	1				
4.2	Ditto -- 5.5 M high.	No.	1				
4.3	Galvanized steel chequered plate, for trench covers including all fixing and supporting accessories	M ²	200				
4.4	Supply, fix and install galvenized steel pipe Hand rails 2 primer coats and 3 coats of epoxy paint, all complete, as per specifications, drawings and approval of the Engineer	LM	30				
4.5	Design, supply and fix galvenized steel stair case as shown in the drawing, complete as per drawing, specifications and approval of the Engineer.	LS	LS				
5	<u>THERMAL & MOISTURE PROTECTION</u> <u>Bituminous Damp-Proofing</u>						
5.1	Cold applied bituminous emulsion paint (2coats) for toilets.	M ²	400				
5.2	<u>Sheet Water Proofing</u>						
5.2.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M ²	1650				
5.2.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	1600				
5.2.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	1650				
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SECTION 6		BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE				
				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
6	DOORS & WINDOWS							
6.1	<u>Aluminum Doors</u> Provide& install extruded powder coated aluminum for doors with pressed profiled including aluminum frame, weather sealing, fixing accessories, sealant, rubber having fixed/hinged panels with glass or aluminum slice where necessary, fitted & fixed in position including all hardware, iron mongery, workmanship etc., all complete as per drawings, specifications and approval of Engineer.							
6.1.1	AD - 1 - Size 1000x2200mm	No	23					
6.1.2	AD - 2 - Size 1000x2200mm	No	1					
6.1.3	AD - 4 - Size 2000x2200mm	No	2					
6.2	<u>Aluminum Windows</u> Provide and install extruded powder coated approved color for windows and fly screens, complete with 6mm single / double glass approved color with moveable and / or fixed aluminum panels and aluminum frame all complete as per drawings, specifications and approval of engineer							
6.2.1	AW-1, Size 1800 x 1000 mm (Sliding)	No	31					
6.2.2	AW-2, Size 1200 x 1000 mm (Fixed)	No	4					
6.2.3	AW-3, Size 1800 x 1000 mm (Sliding)	No	4					
6.3	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, al complete as per drawings, specifications and approval of enginee							
	SD 1 - Size - 1000 x 2200 mm (fire rated 2.0 HR)	No.	1					
	SD 2 - Size : 1000 x 2200mm (fire rated 2.0 HR)	No.	12					
	SD 3 - Size - 2000 x 2200 mm (fire rated 2.0 HR)	No.	13					
	SD 4 - Size - 2000 x 2200 mm (fire rated 2.0 HR)	No.	1					
	SD 5 - Size - 1600 x 2200 mm (fire rated 2.0 HR)	No.	1					
	SD 7 - Size - 2500 x 2500 mm (fire rated 2.0 HR)	No.	1					
6.4	Electrically operated steel roller shutter doors including steel guide frames fixed to structure, air tight seals, mastic pointing, etc., painting and all hardware complete:- SD6- Roller shutter door to suit opening size 4000 x 4000mm high overall	No	2					
7	<u>FINISHES</u> <u>Lathe and Plaster</u>							
7.1	Internal cement plaster for walls	M ²	4100					
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SECTION 6		BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
8	<u>Ceramic Tiles</u> <u>For Floor</u> Supply and Install ceramic tiles from approved sources including internal Beds and Coves, bedded, jointed, pointed, backing materials, grouting, cleaning etc., complete as per specifications, drawings and approval of the Engineer.						
8.1	Acid resistance ceramic tiles 300x300x12 mm for floor in lab and analyser room	Sq.M	250				
8.2	Antique Ceramic tiles 300x300x12 mm Heavyduty in corridor and Office rooms	Sq.M	520				
8.3	Unglazed Ceramic tiles 300x300x12 mm Heavyduty in corridor	Sq.M	300				
8.4	Glazed ceramic tiles 200x200x6 mm for walls in kitchen and toilets	Sq.M	330				
	<u>For Skirting and Walls</u>						
8.5	Acid resistance ceramic tiles 200 x 200 x 6 mm for walls in lab and analyser room	Sq.M	250				
8.6	Antique Ceramic tiles 300x100x6 mm for skirting in corridor and Office rooms	MR	380				
8.7	Unglazed Ceramic tiles 300x100x6 mm for skirting	MR	260				
9	<u>Terrazzo tiles</u>						
9.1	Supply and Install Terrazzo floor tiles 300x300x30mm over cement sand mortar & sand cushion with skirting including grouting, grinding, polishing cleaning etc., in corridor all complete as per specifications, drawings and approval of the Engineer.	Sq.M	235				
9.2	Ditto for Skirting 300 x 100 x 6	MR	65				
10	Raised floor system under structure covered with 600x600mm, 400mm high, tiles finish with vinyl top	M ²	520				
11	Provide and erect in position carrara Marble sill including all materials and workmanship, all complete as per drawings, specifications and approval of engineer for Doors & windows						
11.1	340 mm wide	MR	170				
11.2	240 mm wide	MR	60				
12	Provide and erect in position white carrara Marble including all materials and workmanship, all complete as per drawings, specifications and approval of engineer for Doors & windows cills and frames						
12.1	340 mm wide	MR	540				
12.2	240 mm wide	MR	200				
13	Provide and fix in position carrara marble for Stair case Tread 300 m wide x 30 mm thick and Raiser 150 mm wide x 20 mm thick	MR	75				
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SECTION 6		BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
14	<u>Suspenders & Ceilings</u>						
14.1	Acoustical tiles 600x600mm including complete supporting system in offices and control rooms	M ²	1150				
14.2	Gypsum board suspended ceiling with emulsion paint. including complete supporting system in kitchen and locker rooms	M ²	50				
14.3	Aluminum linear ceiling system	M ²	100				
15	<u>Painting</u>						
15.1	Internal emulsion paint for walls	M ²	4000				
15.2	Acrylic paint for ceilings	M ²	1700				
16	<u>Fence:</u> Supply and fix galvanized steel chain link fence around the complete Chemical Complex, 2.00 m high from the final ground level. The rate shall include for, but not limited to, the steel chainlink, the galvanized post, pipes, angles, flat bars, plates, bolts, clamps, concrete footings, painting, manual rolling gates 8m wide (2 Nos.), hinges and locks etc., as per specifications and as shown on the drawings	L.M.	575				
17	<u>Allow for any missing Item:</u> Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11) <u>Important :-</u> The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S	L.S				
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SECTION 6 BILL OF QUANTITY NO. 3.2.1		CHEMICAL AND CONTROL BUILDING						
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE			
					Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils	

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PAGE NO.	AMOUNT	
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Page number – 05 (Item 8 to 13)		
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SECTION 6		BILL OF QUANTITY NO. 3.2.2		CHEMICAL STORES BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundry at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	700				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer approval.	Cu.M	2200				
2	CONCRETE						
2.1	Plain Concrete						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	50				
2.1.2	Plain concrete of compressive strength 15N/mm ² with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams and cable trenches	M ³	55				
2.1.3	Ditto- but for below Slab-on Grade	M ³	100				
2.2	Reinforced Concrete						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 200 mm thick.with hardener on the surface	M ³	200				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	130				
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints,additives curing etc, as per drawings,specifications & satisfaction of engineer for tie/ground beams.	M ³	55				
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SECTION 6		BILL OF QUANTITY NO. 3.2.2		CHEMICAL STORES BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, bearing pad, lead plate, expansion & construction joints, additives curing etc., as per dwgs., specification & satisfaction of engineer for column necks	M ³	35				
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	115				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for tie and roof beams & lintels	M ³	180				
2.2.7	-- Ditto -- but for Parapet wall	M ³	17				
2.2.8	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	160				
3	MASONRY						
3.1	<u>Concrete Unit Masonry</u>						
3.1.1	Supply and build external double wall of solid sand cement blocks 10 cm thick, each including insulation 5cm of extruded polystyrene, with 7 cm thick grey color sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	1000				
3.1.2	Supply and build 7 cm thick grey color sand lime bricks cladding external fairface wall	M ²	140				
3.1.3	Supply and build internal walls of solid sand cement blocks 20cm thick, including all materials as per drawings specifications and satisfaction of engineer.	M ²	150				
3.1.4	Glass block size 20 x 20 x 10 cm system with all reinforcement, sealant, Mortar, Galvanizing iron expansion anchors, Steel angles, Plates and all other Materials complete in all respect as per details on drawings, specifications and approval of the Engineer.	Sq.M	72				
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SECTION 6		BILL OF QUANTITY NO. 3.2.2		CHEMICAL STORES BUILDING				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE				
				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
4	<u>METALS - Metal Fabrications</u>							
4.1	Galvanized steel ladder for roof, with safety cage, resting platforms - 10.45 M high.	No.	1					
5	<u>THERMAL & MOISTURE PROTECTION</u> <u>Bituminous Damp-Proofing</u>							
5.1	<u>Sheet Water Proofing</u>							
5.1.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystyrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M ²	1000					
5.1.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	1050					
5.1.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	1000					
6	<u>DOORS & WINDOWS</u>							
6.1	<u>Aluminum Doors</u> Provide& install extruded powder coated aluminum for doors with pressed profiled including aluminum frame, weather sealing, fixing accessories, sealant, rubber having fixed/hinged panels with glass or aluminum slice where necessary, fitted & fixed in position including all hardware, iron mongery, workmanship etc., all complete as per drawings, specifications and approval of Engineer.							
6.1.1	AD - 2 - Size 2000x2200mm	No	2					
6.1.2	AD - 3 - Size 1000x2200mm	No	3					
6.2	<u>Aluminum Windows</u> Provide and install extruded powder coated approved color for windows and fly screens, complete with 6mm single / double glass approved color with moveable and / or fixed aluminum panels and aluminum frame all complete as per drawings, specifications and approval of engineer							
6.2.1	AW-2, Size 1200 x 1000 mm	No	2					
6.2.2	AW-3, Size 600 x 600 mm	No	4					
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SECTION 6		BILL OF QUANTITY NO. 3.2.2		CHEMICAL STORES BUILDING				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE				
				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
6.3	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, al complete as per drawings, specifications and approval of enginee SD 1 - Size - 2400 x 2200 mm (fire rated 2.0 HR) SD 2 - Size : 2000 x 2200mm (fire rated 2.0 HR) SD 3 - Size - 1000 x 2200 mm (fire rated 2.0 HR)	No.	4					
		No.	1					
		No.	3					
6.4	Electrically operated steel roller shutter doors including steel guide frames fixed to structure, air tight seals, mastic pointing, etc., painting and all hardware complete:- SD6- Roller shutter door to suit opening size 4000 x 4000mm high overall	No	1					
7	<u>FINISHES</u> <u>Lathe and Plaster</u>							
7.1	Internal cement plaster for walls	M ²	1300					
8	<u>Ceramic Tiles</u> <u>For Floor</u> Supply and Install ceramic tiles from approved sources including internal Beds and Coves, bedded, jointed, pointed, backing materials, grouting, cleaning etc., complete as per specifications, drawings and approval of the Engineer.							
8.1	Unglazed Ceramic tiles 300x300x12 mm Heavyduty in corridor <u>For Skirting and Walls</u>	SM	35					
8.2	Unglazed Ceramic tiles 300x100x6 mm for skirting	MR	35					
9	<u>Terrazzo tiles</u>							
9.1	Supply and Install Terrazzo floor tiles 300x300x30mm over cement sand mortar & sand cushion with skirting including grouting, grinding, polishing cleaning etc., in corridor all complete as per specifications, drawings and approval of the Engineer.	SM	235					
9.2	Ditto for Skirting 300 x 100 x 6	MR	65					
10	Provide and erect in position carrara Marblesill including all materials and workmanship, all complete as per drawings, specifications and approval of engineer for Doors and windows							
10.1	340 mm wide	MR	10					
10.2	240 mm wide	MR	10					
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SECTION 6		BILL OF QUANTITY NO. 3.2.2		CHEMICAL STORES BUILDING			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
11	Provide and erect in position white carrara Marble including all materials and workmanship, all complete as per drawings,specifications and approval of engineer for Doors & windows frames						
11.1	340 mm wide	MR	45				
11.2	240 mm wide	MR	10				
12	<u>Painting</u>						
12.1	Internal emulsion paint for walls	M ²	1300				
13	<u>Allow for any missing Item:</u> Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11) <u>Important :-</u> The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S	LS				
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SECTION 6 BILL OF QUANTITY NO. 3.2.2**CHEMICAL STORE BUILDING**

Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils

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SECTION 6		BILL OF QUANTITY NO. 3.2.3		SUBSTATION FOR CHEMICAL WORKS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundary at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	2000				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer approval.	Cu.M	1500				
2	CONCRETE						
2.1	<u>Plain Concrete</u>						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	25				
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings, tie beams and cable trenches	CM	25				
2.2	<u>Reinforced Concrete</u>						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 200 mm thick.	M ³	20				
	-- Ditto but with hardener on the surface	M ³	60				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification & satisfaction of engineer for footings.	M ³	55				
	--- Ditto --- But for Cable trench Base	M ³	20				
	--- Ditto --- But for Cable trench Walls	M ³	25				
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SECTION 6		BILL OF QUANTITY NO. 3.2.3		SUBSTATION FOR CHEMICAL WORKS			
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				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for tie/ground beams.	M ³	35				
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings specification & satisfaction of engineer for column necks.	M ³	10				
2.2.5	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	25				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	80				
2.2.7	-- Ditto -- but for Parapet wall	M ³	20				
2.2.8	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	80				
3	MASONRY						
3.1	<u>Concrete Unit Masonry</u>						
3.1.1	Supply and build external double wall of solid sand cement blocks 10 cm thick, each including insulation 5cm of extruded polystyrene, with 7 cm thick grey color sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	380				
3.1.2	Supply and build 7 cm thick grey color sand lime bricks cladding external fairface wall	M ²	190				
3.1.3	Supply and build internal walls of solid sand cement blocks 20cm thk, including all materials as per drawings specifications and satisfaction of engineer.	M ²	260				
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SECTION 6		BILL OF QUANTITY NO. 3.2.3		SUBSTATION FOR CHEMICAL WORKS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESRVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4	<u>METALS - Metal Fabrications</u>						
4.1	Galvanized steel ladder for roof, with safety cage, 6.0 M high.	No.	1				
4.2	Galvanized steel chequered plate, for trench covers including all fixing and supporting accessories	M ²	60				
5	THERMAL & MOISTURE PROTECTION						
5.1	<u>Sheet Water Proofing</u>						
5.1.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M ²	550				
5.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	100				
5.3	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	600				
6	DOORS & WINDOWS						
6.3	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, al complete as per drawings, specifications and approval of enginee						
	SD 1 - Size - 3000 x3000 mm (fire rated 2.0 HR)	No.	3				
	SD 2 - Size : 1000 x 2500mm (fire rated 2.0 HR)	No.	3				
	SD 3 - Size - 2400 x 3000 mm (fire rated 2.0 HR)	No.	2				
	SD 4 - Size - 4000 x 3000 mm (fire rated 2.0 HR)	No.	1				
7	FINISHES <u>Lathe and Plaster</u>						
	Internal cement plaster	SM	900				
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SECTION 6		BILL OF QUANTITY NO. 3.2.3		SUBSTATION FOR CHEMICAL WORKS				
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				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
8	<u>Terrazzo tiles</u>							
8.1	Supply and Install Terrazzo floor tiles 300x300x30mm over cement sand mortar & sand cushion with skirting including grouting, grinding, polishing cleaning etc., in corridor all complete as per specifications, drawings and approval of the Engineer.	SM	30					
8.2	Ditto for Skirting 300 x 100 x 6	MR	25					
9	<u>Painting</u>							
9.1	Internal emulsion paint for walls	M ²	900					
9.2	Acrylic paint for ceilings	M ²	600					
10	<u>Allow for any missing item:</u> Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11) <u>Important</u> :- The Contractor must submit a complete detailed breakdown for this item of work with his offer.	L.S						
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SECTION 6 BILL OF QUANTITY NO. 3.2.3		SUBSTATION FOR CHEMICAL WORKS						
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					Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils	

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Page number – 03 (Item 8.0 to 10)		
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SECTION 6		BILL OF QUANTITY NO. 3.2.4		CHEMICAL PUMPS AND TANKS			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils

1	EARTHWORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations up to any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundary at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	CM	500				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer approval.	CM	50				
2	CONCRETE WORKS						
2.1	PLAIN CONCRETE						
2.1.1	Cement screed, thickness ranging from 150 mm to 50 mm including leveling and sloping towards the sump inside the chamber and pump tanks	CM	15				

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SECTION 6		BILL OF QUANTITY NO. 3.2.4		CHEMICAL PUMPS AND TANKS			
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils

2.1.2	Plain concrete of compressive strength 15N/mm2 and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding all complete as per drawings, specifications and approval of engineer.	CM	15				
2.2	REINFORCED CONCRETE						
2.2.1	Reinforced concrete of compressive strength 30N/mm2 with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, water stop, additives curing etc., as per drawings, specification and satisfaction of engineer for base	CM	45				
2.2.2	-----DITTO-----but for walls	CM	80				
2.2.3	-----DITTO-----but for supports and pump bases	CM	10				
2.2.4	-----DITTO-----but for roof beams	CM	5				
2.2.5	-----DITTO-----but for roof slab	CM	5				
3.0	THERMAL AND MOISTURE PROTECTION						
3.1	4 MM thick bituminous water proofing membrane above the blinding	SQ.M	120				
3.2	4 MM thick bituminous water proofing membrane and 6 mm thick protection board for external wall surfaces	SQ.M	200				

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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils

4.0	METALS- METAL FABRICATIONS						
4.1	6 mm thick chequered plate fixing for the roof of chambers including necessary stiffeners etc., as shown in the drawing, specifications and as directed by the Engineer.	SQ.M	85				
4.2	Stainless steel ladder 316L without cage 4.0 M height	NO	4				
4.3	Stainless steel Air Vent 150 mm Dia.	NO	4				
4.4	610 mm Dia. Medium duty D.I. Cover and Frame	NO	4				
5	Acid resisting epoxy painting for						
5.1	Floor and walls	SM	370				

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SECTION 6 BILL OF QUANTITY NO. 3.2.4**CHEMICAL STORAGE TANKS**

Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)	SCHEDULE					
		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils

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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	IMPORTANT NOTE: The Tenderer should study and fill up the Technical Schedules For Details Of Proposed Equipment, shown in Appendix No. 21 of Section 7 before filling the rates.							
1	Design, supply, erect and connect, commissioning, test and maintain the following as per drawing and specification with all required to complete the work in an operating condition.							
1.1	Diesel Generator for Control Room:							
1	Automatic Diesel Generator Set 1275 KVA as minimum at control Building complete with vibration isolator, control panel, starting motor,... etc	Nos.	2					
2	Nickel Cadmium Batteries and Battery Charger for diesel generator at control building,	L.S	L.S					
3	Duplex fuel transfer pump electrically operated complete with starter panel for diesel generator at control building.	Set	1					
4	Fuel transfer pump manually operated for diesel generator at control building	No.	1					
5	Underground main fuel storage tanks as per latest specification and regulation of KNPC and KFB with capacity as per specification for diesel generators at control building	No.	1					
6	Daily fuel storage tanks as per latest specification and regulation of KNPC and KFD with capacity as per specification for diesel generators at control building with all necessary fuel pipe, valves... etc.	L.S	L.S					
7	Hospital type Exhaust System including flexible pipe, pipe support, residential silencers, etc. for diesel generators at							
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		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	control building.	L.S	L.S				
8	Ultrasonic level transmitter approved from KNPC for measuring the level of daily fuel tank for diesel generators at control building and send the data to building automation system and industrial PC inside the Synchronization Panel.	L.S	L.S				
9	Ultrasonic level transmitter approved from KNPC for measuring the level of Main Storage tank for diesel generators at control building and send the data to building automation system and industrial PC inside the Synchronization Panel.	L.S	L.S				
10	Synchronization panel for diesel generators at Control building complete with Industrial PCs with 15" as minimum Touch Screen complete with data gathering cables, PLC, Sensor, Relays, etc. to monitor and control the following: - 1) Fuel level to main storage Tanks 2) Fuel level in day tank 3) Start and Stop for each Diesel Generator 4) Kilo Watt (KW) for each Diesel generator 5) Operation of Fuel Pumps 6) Operation of Fire Fighting System 7) Satus of ATS 8) Operation of Fuel Pumps. 9) Operation of Fire Fighting System 10) (KW) for eacch electrical Panel 11) Trouble alarms for each D/G 12) Satus of ATS 13) Recording the history of the system for 365 days 14) Synchronization system. 15) Interphase with Load management system or BAS. <u>CONTROL</u> 1) Start / Stop for each D/G 2) Start / Stop of Fuel Pumps 3) Auto /Manual Synchronization	L.S	L.S				
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					Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils		
	4) Auto/Manual Load sharing 5) Load Management								
III	Diesel generator for Chemical Building								
11	Automatic Diesel Generator Set 3400 KVA as minimum at Chemical Building complete with vibration isolator, control panel, starting motor, etc.	No.	1						
12	Nickel Cadmium Batteries and Battery Charger for diesel generator.	L.S	L.S						
13	Duplex fuel transfer pump electrically operated complete with starter panel for diesel generator.	Set	1						
14	Fuel transfer pump manually operated for diesel generator.	No.	1						
15	Underground main fuel storage tanks as per latest specification and regulation of KNPC and KFB with capacity as per specification for diesel generators at Chemical building	No.	1						
16	Daily fuel storage tanks as per latest specification and regulation of KNPC an KFD with capacity as per specification for diesel generators at Chemical building	L.S	L.S						
17	All required and necessary fuel pipe, valves, etc for diesel generator work at Chemical building	L.S	L.S						
18	Hospital type Exhaust System including flexible pipe, pipe support, residential silencers, etc. for diesel generators at Chemical building.	L.S	L.S						
19	Ultrasonic level transmitter approved from KNPC for measuring the level of daily fuel tank for diesel generators at Chemical building and send the data to Building automation system and industrial PC inside the Main Low								
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		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	Tension Panel	L.S	L.S				
III	Diesel Generator for Old Control Room:						
20	Automatic Diesel Generator Set 1275 KVA as minimum inside weather proof, sound proof container supplied by manufacturer of Diesel generator complete with vibration isolator, control panel, starting motor, Fuel Tanks, circuit breaker, DB's for light and sockets, sliding doors, ladders, fire alarm and fire fighting as per KFD, light fittings for container recommended inside and outside. <i>Note:- Fire alarm and fire fighting system shall be designed and supply by fire fighting and fire alarm contractor.</i>	No.	1				
21	Nickel Cadmium Batteries and Battery Charger for diesel generator inside DG container.	L.S	L.S				
22	Duplex fuel transfer pump electrically operated complete with starter panel for diesel generator inside DG container.	Set	1				
23	Fuel transfer pump manually operated for diesel generator inside DG container.	No.	1				
24	Design, supply and install complete underground diesel tank with all piping, wiring and accessories as per KNPC and KFSD suitable for running all generators for 2 days at full load.	L.S	L.S				
25	All required and necessary fuel pipe, valves, ... etc for diesel generator inside DG container.	L.S	L.S				
26	Design, supply, erect elevator for 8 (eight) persons as per specification complete with all required modification in civil works, Automatic landing system in case of power failure, cables, earthing, and all required to						
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		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	complete the work in an operation condition at Control building.	L.S	L.S				
27	Design, supply, erect elevator for 8 (eight) persons as per specification complete with all required modification in civil works, Automatic landing system in case of power failure, cables, earthing, and all required to complete the work in an operation condition at Chemical building.	L.S	L.S				
28	Design, supply, install, testing and commission Fire Alarm System addressable manual and automatic for the whole project.	L.S	L.S				
29	With all requirements to complete the work to the acceptance of Kuwait Fire Brigade and MEW engineer.	L.S	L.S				
30	Design, supply and install emergency lighting system for the whole project as per K.F.D requirement including self-contained emergency light fitting, electrical installation works, conduits, wires, connection to DBs,...etc.	L.S	L.S				
31	Supply and install Computer for Fire alarm at control room for control building with graphic display.	L.S	L.S				
32	Supply and install Computer for Fire alarm at control room for Chemical building with graphic display.	L.S	L.S				
33	Supply and install all required and necessary control to stop or start HVAC equipment as per required by K.F.D.	L.S	L.S				
34	Supply and install Computer for Fire Alarm with graphic display at guard room complete with the laser printer.	L.S	L.S				
35	Interface Fire alarm system with CCTV system.	L.S	L.S				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
36	Interface Fire alarm system with Public address system	L.S	L.S				
37	Interface Fire alarm system with Building Automation System.	L.S	L.S				
38	Design, supply and connect earthing system for the whole project as per specification.	L.S	L.S				
39	Design, supply, erect and connect earthing system as per specification for all electrical system.	L.S	L.S				
40	Design, supply, erect and connect clean earthing system for all electronic equipment, computer networks, CCTV, Public Address system ... etc.	L.S	L.S				
41	Design, supply, erect and connect lightning system as per specification for all electrical system.	L.S	L.S				
42	All required and necessary cable tray for the whole project.	L.S	L.S				
43	All required and necessary cable gland and cable lugs for the whole project	L.S	L.S				
44	All required stop lock button and Local Control Panel for motor complete with all necessary control cables.	L.S	L.S				
45	All required and necessary control for the whole project.	L.S	L.S				
46	All required electrical instllation to feed power supply to Instrumentaton, CCTV camera HVAC,including : <ul style="list-style-type: none"> • Electric panels, • Wiring & Conduit works, • Switches, MCCB & weather proof enclosure, 	L.S	L.S				
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
47	<ul style="list-style-type: none"> Power & Control Cables works to feed power for the whole project. <p><u>STREET LIGHTING</u></p> <p>Supply, delivery to site, install inclusive of all class K-300 concrete foundations, commission and maintain for a period of two (2) years from the date of completion of work, 10m Double Arm Lighting Column with 2 x 250 Watt High Pressure Sodium Cut-off luminaries along with all necessary control gears incorporating dual power dimming ballasts and power switching devices for energy saving including all wiring/cabling from the feeder pillars to the lighting units in order to centrally and automatically control the lumens output to dim from 100% to 50% at a pre-set time during the night and back to full lumens output at early morning, cut-outs, lamps and sundry materials all as specified, inclusive of all underground (2x16+1x10) sq.mm. CU/PVC/PVC cabling in UPVC duct between feeder pillar and the lighting columns as shown in the proposed street lighting design drawings, complete with all excavations and backfilling, laying of UPVC cable ducts, provision of hand holes / earth-pits with Polymer Matrix Composite frames and covers, compacting / leveling, numbering,etc.</p>	Nos.	333					
48	Ditto for 10m Single Arm Pole with 1 x 250 Watt H.P.S. Cut-off luminaire	Nos.	35					
49	Supply, delivery to site, install inclusive of all concrete foundations, commission and maintain for a period of two (2) years from the date of completion of work, street lighting feeder pillars with astronomical time switch(Type-C) programmable to centrally and automatically control the lumens output of the lamps to dim from 100% to 50% at a pre-set time during the night and back to full lumens output at early morning, complete with all							
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	excavations and backfilling, laying of UPVC cable ducts, road crossing ducts, provision of manholes/earth-pits, cabling, compacting / levelling, protective barrier, numbering, etc.	Nos.	10					
50	Design, supply, erect and connect, commissioning, test and maintain the following as per drawing and specification with all required to complete the work in an operating condition.							
50.1	MLTB at Substation for Control Building withdrawable type Form 4b (TTA Certificate from approved Independent Testing Authority).	L.S	L.S					
50.2	MLTB at Substation for Chemical Building withdrawable type Form 4b (TTA Certificate from approved Independent Testing Authority).	L.S	L.S					
50.3	'ditto ' Main Switchboard for street lighting at Substation of control building.	L.S	L.S					
50.4	' ditto' Main Switchboard for street lighting at Substation of Chemical building.	L.S	L.S					
50.5	'ditto' SMSB for substation of control building.	L.S	L.S					
50.6	'ditto' SMSB for substation of Chemical building.	L.S	L.S					
50.7	'ditto' SMSB for Diesel generator for control building.	L.S	L.S					
50.8	'ditto' MSB for Diesel generator for Chemical building	L.S	L.S					
50.9	"ditto" MCC for Radiator Fan	L.S	L.S					
50.10	'ditto' Submain Switchboard for valve Chamber-1	L.S	L.S					
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
50.11	'Ditto' Submain Switchboard for valve Chamber -2	L.S	L.S				
50.12	'ditto' MSB for control building	L.S	L.S				
50.13	'ditto' MSB for Chemical building	L.S	L.S				
50.14	'ditto' MSB for Chemical Store.	L.S	L.S				
50.15	Intelligent Motor Control Centre for Motive Water Pumps at Chemical building.	L.S	L.S				
50.16	Intelligent Motor Control Centre for Raw Chemicals Unloading Pumps at Chemical and control building.	L.S	L.S				
50.17	Intelligent Motor Control Centre for Raw Chemicals Dosing Pumps at Chemical building	L.S	L.S				
50.18	Intelligent Motor Control Centre for ClO ₂ Generator at Chemical building	L.S	L.S				
50.19	Intelligent Motor Control Centre for ClO ₂ Solution Dosing Pump at Chemical building.	L.S	L.S				
50.20	Intelligent Motor Control Centre for Sample Pumps at Chemical building.	L.S	L.S				
50.21	Intelligent Motor Control Centre for Sump Pumps at Chemical building.	L.S	L.S				
50.22	Motor Control Centre for Water Booster Pump for water tank at Chemical building.	L.S	L.S				
50.23	Motor Control Centre for Chemical Drainage Pumps at Chemical building.	L.S	L.S				
50.24	Intelligent Motor control Centre for ClO ₂ Neutralization Drainage Pumps.	L.S	L.S				
50.25	Starter Panel for Air Handling Unit #1	No.	1				
50.26	Starter Panel for Air Handling Unit #2	No.	1				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
50.27	Starter Panel for Air Handling Unit #3	No.	1				
50.28	Starter Panel for Air Handling Unit #4	No.	1				
50.29	Starter Panel for Air Handling Unit #5	No.	1				
50.30	Starter Panel for Air Handling Unit #6	No.	1				
50.31	Starter Panel for Air Handling Unit #7	No.	1				
50.32	ATS Panel for Diesel Generators at Electrical and Chemical Building	No.	4				
50.33	MLTB for Existing Reservoir Substation.	No.	1				
50.34	MOV Panel No.1 at Reservoir Substation-2	No.	1				
50.35	MOV panel No.2 at Reservoir Substaion-2	No.	1				
50.36	MSB for Chemical and control building	No.	1				
50.37	SMSB for Chemical and Control building.	No.	1				
50.38	MCC For Cio2 Solution Dosing Pump.	No.	1				
50.39	MCC For Air Compressor	No.	1				
50.40	MCC For Cio2 Generator	No.	1				
50.41	MCC for Potable water at Air handling unit area roof of Chemica control building.	No.	1				
50.42	MCC Mechanical at Pump room at Substation for Chemical and Control building.	No.	1				
51	Supply and install the following Distribution Boards complete with incoming and outgoing cables, conduits and wiring, ...etc. as per specification and drawing complete with connection to Building Automation and SCADA System.						
51.1	DB – GL1 Ground floor - for Chemical &						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	Control building	No.	1				
51.2	DB – GL2 Ground floor - for Chemical & Control building	No.	1				
51.3	DB – GL3 Ground floor - for Chemical & Control building	No.	1				
51.4	DB – GL4 Ground floor - for Chemical & Control building	No.	1				
51.5	DB – GL5 Ground floor - for Chemical & Control building	No.	1				
51.6	DB – GL6 Ground floor - for Chemical & Control building	No.	1				
51.7	DB – GP1 for Ground floor - or Chemical & Control building	No.	1				
51.8	DB – GP2 for Ground floor - or Chemical & Control building	No.	1				
51.9	DB – GP3 for Ground floor - or Chemical & Control building	No.	1				
51.10	DB – GP4 f Ground floor - or Chemical & Control building	No.	1				
51.11	DB – GP5 Ground floor - for Chemical & Control building	No.	1				
51.12	DB-Acidos-Bases Ground Floor - Feed from DB-GP4 for Chemical & Control Building.	No.	1				
51.13	DB-EX.L External light for chemical and Control building	No.	1				
51.14	DB – FL1 First Floor – Chemical & Control Building	No.	1				
51.15	DB – FL2 First Floor – Chemical & Control Building	No.	1				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
51.16	DB – FP1 First Floor – Chemical & Control Building	No.	1				
51.17	DB – FP2 First Floor – Chemical & Control Building	No.	1				
51.18	DB – FL/P3 First Floor – Chemical & Control Building	No.	1				
51.19	DB – ST.P – Power for Store Building	No.	1				
51.20	DB – St.L Lighting for Store Building	No.	1				
51.21	DB EX.L External light for Store Building	No.	1				
51.22	DB – R (L/P) Light & Power for Roof (Chemical, & Control Building)	No.	1				
51.23	DB – LS Light for Substation (Chemical. & Control building)	No.	1				
51.24	DB – LP – Power for Substation (Chemi. & Control Building)	No.	1				
51.25	DB – EX.L/P - External light & Power for Substation.	No.	1				
	<u>DB's For Electrical and Control Building, Reservoir Substations</u>						
51.26	DB–GL1 Ground Floor for Electrical & Control Building.	No.	1				
51.27	DB–GL2 Ground Floor for Electrical & Control Building.	No.	1				
51.28	DB – FL1 First Floor for Electrical & Control Building.	No.	1				
51.29	DB – FL2 First Floor for Electrical & Control Building.	No.	1				
51.30	DB–GP Ground Floor for Electrical & Control Building.	No.	1				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
51.31	DB – FP1 First Floor for Chemical & Control Building.	No.	1				
51.32	DB – FP2 First Floor for Electricall & Control Building.	No.	1				
51.33	DB–EX.L Ground Floor for Electrical & Control Building.	No.	1				
51.34	DB – R(L/P) Roof for Electrical and control Building	No.	1				
51.35	DB–D/G-P For Diesel Generator Building	No.	1				
51.36	DB – D/G-L For Diesel Generator Building.	No.	1				
51.37	DB – D/G-EX.L For Diesel Generator Building.	No.	1				
51.38	DB – L light for Substation Building.	No.	1				
51.39	DB – P Power for Substation Building.	No.	1				
51.40	DB – EX.L for External light Roof for substation Building.	No.	1				
51.41	DB-L/P for Reservoir Substation	No.	1				
51.42	DB-EX.L/P For Reservoir Substaion	No	1				
51.43	DB-A/C for Electrical and Control Building.	No.	4				
51.44	DB-A/C for Substation(Electrical & Control Building).	No.	1				
51.45	DB-A/C for Reservoir Substation-1	No.	1				
51.46	DB-A/C for Reservoir substation-2	No.	1				
51.47	DB-Guard Room consist of 100A Isolator, 6No 10A MCB, 4No. 15A MCB , 4No. 25A MCB, 2 No. 30A MCB all with built-in earth leakage.	No.	1				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
51.48	MCCB 60A TP complete with audio visual alarm for Elevator for Chemical and control building.	No.	1				
51.49	MCCB 60A TP complete with audio visual alarm for Elevator at Electrical and control building.	No.	1				
51.50	MCCB 160A TP complete with audio visual Alarm for UPS at Chemical and control building.	No.	2				
51.51	MCCB 1000A TP complete with earth leakage for Chiller at the roof of service building for Chemical and control building	No.	1				
51.52	MCCB 60A TP with earth leakage in enclosure suitable for zone-2 for crane at Chemical Store.	No.	2				
51.53	MCCB 160A TP complete with audio visual Alarm for UPS at Existing reservoir substation	No.	2				
51.54	MCCB 160A TP for UPS with audio visual alarm ,earth leakage for UPS at Electrical and control building	No.	2				
51.55	MCCB 160A TP for UPS with audio visual alarm ,earth leakage for UPS at New Reservoir Substation-2 building.	No.	2				
51.56	MCCB 60A TP in weather proof enclosure for Water jacket Heater for Diesel generator for Chemical building.	No.	1				
51.57	MCCB 60A TP in weather proof enclosure for Water jacket Heater for Diesel generator for Electrical and control building.	No.	1				
51.58	DB for Valve Chamber in weatherproof enclosure IP65 as per drawing and specification complete with all excavation and backfilling, laying of UPVC cable ducts,						
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	earthing pits, compacting, leveling, protective barrier, foundation of the panels, manhole for the panel, ... etc. and status of each DBs to be monitored in SCADA and Building Automation System. <i>Note:- The exact location for DB-valve chamber shall be determined at site.</i>	No.	68					
51.59	DB1 for CCTV in weatherproof enclosure similar to DB for Valve chamber IP65 as per drawing and specification complete with all excavation and backfilling, laying of UPVC cable ducts, earthing pits, compacting, leveling, protective barrier, foundation of the panels, manhole for the panel, ... etc. . The DB shall include the following: - <ul style="list-style-type: none"> • 1 No. 100A T.P. Isolator • 30 Nos. 15A mcb with Built -in Earth leakage. • Each camera CB status to be monitored in SCADA system and Building Automation system. 	No.	1					
51.60	Ditto for DB2 for CCTV	No.	1					
51.61	Ditto for DB3 for CCTV	No.	1					
51.62	Ditto for DB4 for CCTV	No.	1					
51.63	Ditto for DB5 for CCTV	No.	1					
51.64	Ditto for DB6 for CCTV	No.	1					
51.65	Ditto for DB7 for CCTV	No.	1					
51.66	Ditto for DB8 for CCTV	No.	1					
51.67	Ditto for DB9 for CCTV	No.	1					
51.68	Ditto for DB10 for CCTV	No.	1					
51.69	Ditto for DB11 for CCTV	No.	1					
51.70	Ditto for DB12 for CCTV	No.	1					
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
51.71	DB-Power for Instrument Shelter in weatherproof enclosure for instrumentation equipments at the top of reservoirs as per the drawing and specification as follows, for New Reservoirs Stage-II 1) 1No 30A MCCB Incomer 2) 4Nos.10AMCBwith built-in earth leakage. 3) 6Nos. 15 MCB with built-in earth leakage	No.	12					
51.72	Ditto DB-Power for Instrument Shelter at Existing Reservoirs	No.	17					
51.73	DB1 for instruments at control room for electrical and control Building consists of : 1No.100A T.P Isolator 30No. 15A SP MCB with built in earth leakage. Each mcb status to be monitored in SCADA and Building Automation system.	No.	1					
51.74	Ditto for DB2 for instrumentation at control room for electrical and control building.	No.	1					
51.75	Ditto for DB3 for instrumentation at control room for electrical and Control building	No.	1					
51.76	Ditto for DB4 for instrumentation at control room for electrical and Control building.	No.	1					
51.77	Ditto for DB5 for instrumentation at control room for reservoir substation #1	No.	1					
51.78	Ditto for DB6 for instrumentation at control room for reservoir substation #2	No.	1					
51.79	Ditto for DB7 for instrumentation at control room for Chemical Building	No.	1					
51.80	Ditto for DB8 for instrumentation at control room for Chemical building	No.	1					
52	Supply, erect and connect to their respective DB's following points including conduit, wiring, earthing, wiring accesories, switches							
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	all as required and as shown in the drawings for the whole project:-						
52.1	Light Points	No.	2400				
52.2	Extract Fan Points	No.	10				
52.3	Single phase Socket Points	No.	700				
52.4	Three Phase Socket Points	No.	130				
53	Supply, erect and connect to their respective boards following sockets and JB's including conduit wiring, cables, earthing, sockets, JB's 20A DP switch all as shown in the drawings						
53.1	Three phases socket 32A water tight (IP67) complete with switch inside valve chamber and near motorized valve.	Nos.	130				
53.2	Single phase socket 16A watertight (IP 67) complete with switch inside the Chamber of flow meter.	No.	70				
53.3	13 Amps. 3PIN Switch Socket	No.	215				
53.4	13 Amps. 3PIN Twin Socket	No.	26				
53.5	J.B for 20 A DP Switch	No.	20				
53.6	J.B for WH with 20A DP Switch	No.	6				
53.7	Outlet box furnished by thr manufacturer with the following: a) Twin BS 1363 switched socket 13A b) Telephone outlet as per M.O.C standard specification. c) Data outlet for computer networks.	No.	95				
53.8	16 Amps. WT Switch Socket Industrial Type (IP 67).IEC 60079	No.	230				
53.9	13 Amps. Explosion-proof Switch Socket Industrial Type (IP 67).	No.	38				
54	Supply,erect and connect the following light fittings including lamps, suitable hangers,						
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	supports, steel works, civil works, silicon rubber cable all as required to complete the work.							
54.1	LED Recessed / Down light Type (M) with DALI Control gear.	No.	260					
54.2	LED Recessed / Down light Type (N)	No.	10					
54.3	LED light fitting type A3/2/20 LED	No.	138					
54.4	LED light fitting type A3/2/20E (LED) but with 3 hours Emergency Battery.	No.	50					
54.5	LED light fitting type A7/2/20 LED	No.	68					
54.6	LED light fitting type A7/1/20 (LED)	No.	759					
54.7	LED light fitting type A13/2/58	No.	25					
54.8	LED light fitting Type A5/4/10 LED (LENS Optic) with DALI control gear.	No.	710					
54.9	LED light fitting type A5/4/10E (LED Lens optic) but with 3 hours Emergency Battery.	No.	24					
54.10	LED light fitting Type A5/4/10 LED (with opal Optic) with DALI control gear	No.	200					
54.11	LED light fitting type A5/4/10E (LED) (with opal optic) but with 3 hours Emergency Batt:	No.	10					
54.12	Low Bay LED Light fitting type 'H1'	No.	43					
54.13	LED High bay light fitting type 'H' used in explosive atmospheres of gas or vapour suitable for Zone 2.	No.	100					
54.14	LED Light fitting type B5/5 (LED)	Nos.	55					
54.15	LED Light fitting type B5/3 (LED)	Nos.	70					
54.16	LED Light fitting type B4/3 (LED)	Nos.	36					
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
54.17	OBSTRUCTION LIGHT complete with Photo electric cell controller as per specification for Communication tower near Operation and maintenance complex complete with the circuit to Instrumentation DB at Electrical and control building. <i>(Status shall be monitoring through Scada and Building Automation System)</i>	Nos.	2					
55	Supply, erect and connect the following cables complete with all excavation, backfilling, laying of cable tiles, compacting ... etc.							
55.1	1 C-800 mm ² XLPE/AWA/PVC Cable	MTR	342					
55.2	1 C-630 mm ² XLPE/AWA/PVC Cable	MTR	50					
55.3	4 C-300 mm ² XLPE/SWA/PVC Cable	MTR	50					
55.4	4 C-240 mm ² XLPE/SWA/PVC Cable	MTR	2010					
55.5	4 C-185 mm ² XLPE/SWA/PVC Cable	MTR	475					
55.6	4 C-150 mm ² XLPE/SWA/PVC Cable	MTR	50					
55.7	4 C-120 mm ² XLPE/SWA/PVC Cable	MTR	22,610					
55.8	4 C-95 mm ² XLPE/SWA/PVC Cable	MTR	630					
55.9	4 C-70 mm ² XLPE/SWA/PVC Cable	MTR	220					
55.10	4 C-50 mm ² XLPE/SWA/PVC Cable	MTR	2,460					
55.11	4 C-35 mm ² XLPE/SWA/PVC Cable	MTR	72,000					
55.12	4 C-25 mm ² XLPE/SWA/PVC Cable	MTR	756					
55.13	4 C-16 mm ² XLPE/SWA/PVC Cable	MTR	6,640					
55.14	4 C-10 mm ² XLPE/SWA/PVC Cable	MTR	33,330					
55.15	4 C-6 mm ² XLPE/SWA/PVC Cable	MTR	512					
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
55.16	3 C x 2.5 mm ² XLPE/SWA/PVC Cable.	MTR	29,350				
55.17	2 C x 4 mm ² XLPE/SWA/PVC Cable.	MTR	50				
55.18	Heavy duty multi-core mineral insulated copper cables with heavy sheath overall with PVC-						
55.19	2 C x 2.5 mm ²	MTR	100				
55.20	Ditto 2 C x 4 mm ²	MTR	100				
55.21	Ditto 4 C x 6 mm ²	MTR	15				
55.22	Ditto 4 C x 16 mm ²	MTR	50				
55.23	Ditto 4 C x 25 mm ²	MTR.	50				
55.24	Ditto 4 C x 35 mm ²	MTR	195				
55.25	Ditto 4 C x 50 mm ²	MTR	230				
55.26	All other cables required to complete the work but not mentioned above	L.S	L.S				
56	Supply, erect and connect the following cable duct and complete with all excavation, backfilling, laying / compacting.						
56.1	Cable duct 2-way UPVC cable duct (2 Nos.) 15 cm each.	MTR	2500				
56.2	Ditto for cable duct 4-way with UPVC cable duct 4 Nos. 15cm each.	MTR	3000				
56.3	Ditto for cable duct 6-way with UPVC cable duct 6 Nos. 15cm each.	MTR	1000				
56.4	Supply, erect and connect the following reinforced concrete manhole: -						
56.5	Manhole 1m x 1m x1m complete with heavy duty cover.	Nos.	100				
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
56.6	Manhole 1.5m x 1.5m x1.5m complete with heavy duty cover.	Nos.	50				
56.7	Manhole 3m x 3m x 3m complete with heavy duty cover.	Nos.	20				
56.8	All required and necessary control.	L.S	L.S				
57	Design supply, install, testing and commission Telephone System for whole project including MDF, TTB, Cable duct, Cat. 5 telephone cable, 3-way American JACK telephone socket as per drawing, conduits, telephone cables, cable duct and handholes and all requirements complete the works to the acceptance of M.O.C and MEW engineer and interface to PABX. Notes: The contractor shall be responsible to obtain the License from Ministry of Communication for all telephone works	L.S	L.S				
58	Training of MEW Staff as per specification.	L.S	L.S				
59	The contractor shall supply the following Spare Parts:						
59.1	LED Recessed / Down light Type (M) with DALI Control gear.	Nos.	10				
59.2	LED Recessed / Down light Type (N)	Nos.	10				
59.3	LED light fitting type A3/2/20 LED	Nos.	10				
59.4	LED light fitting type A3/2/20E (LED) but with 3 hours Emergency Battery.	Nos.	10				
59.5	LED light fitting type A7/2/20 LED	Nos.	100				
59.6	LED light fitting type A7/1/20 (LED)	Nos.	100				
59.7	LED light fitting Type A5/4/10 LED (LENS Optic) with DALI control gear.	Nos.	100				
59.8	LED light fitting type A5/4/10E (LED Lens						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	optic) but with 3 hours Emergency Battery.	Nos.	100				
59.9	LED light fitting Type A5/4/10 LED (with opal Optic) with DALI control gear.	Nos.	100				
59.10	LED light fitting type A5/4/10E (LED) (with opal optic) but with 3 hours Emergency Battery	Nos.	100				
59.11	Low Bay LED Light fitting type 'H1'	Nos.	10				
59.12	LED Light fitting type B5/5 (LED)	Nos.	10				
59.13	LED Light fitting type B5/3 (LED)	Nos.	10				
59.14	LED Light fitting type B4/3 (LED)	Nos.	10				
59.15	LED High bay light fitting type 'H' used in explosive atmospheres of gas or vapour suitable for Zone 2.	Nos.	10				
59.16	Centrifugal Roof Extract Fan for (Valve Chamber) Speed: 1350 RPM Maximum air flow: 2,100m ³ /h. The Fan shall be similar to type CTH B/4-225 from SOLER & PALAN or equal approved	Nos.	10				
59.17	PV Panel.	Nos.	100				
59.18	Inverter one for each type complete with transformer	L.S	L.S				
59.19	Power Quality meter	No.	1				
59.20	Air Circuit Breaker Lifter	No.	2				
59.21	Portable Thermometer "Non-contact" temperature measurement	Nos.	1				
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					Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
60	<u>PHOTOVOLTAIC SOLAR SYSTEM</u>							
60.1	Design, supply, erect, connect, test and commission the PV Power System complete with PV Panels, PV mounting system, inverter, combiner boxes, Power optimizer, cables, Transformer, earthing system, lightning system and all other required equipment and materials to operate the system in an operation condition for Mutla project at the roof of the Electrical and control building, Substation building, Diesel generator building, Reservoir substation building, Chemical and-Control building, and Chemical Store building and Car Shed and equipment shed to generate solar power 700 kW AC as minimum at 20°C. <ul style="list-style-type: none"> - PV Panels - PV mounting system - Inverter in weatherproof container - Combiner boxes - Power optimizer - Cables - Transformer - Earthing system - Lightning system - Ceiling reinforcements to withstand all PV loads. 	L.S	L.S					
60.2	Car Parking Shed complete with foundation as per specification.	Nos.	26					
60.3	Equipment Shed complete with foundation as per specification.	Nos.	8					
60.4	Design, supply and install automatic washing system complete with GRP storage tank, booster set, filter, soap concentrate and soap pump, master and zone valves, automatic controller, water distribution system consisting of necessary and required UV piping, nozzles, valves, pressure gauges, ..etc. to complete the system in proper operational condition, for the whole project.	L.S	L.S					
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
60.5	Supply and install prefabricated room size 4Mx4M, clear height 2.5M with sandwich panels minimum 4" thick and one split A/C Unit 24,000 Btu/hr., complete with necessary foundation to contain automatic washing system except GRP tank, nozzles, outside piping and cabling, for the whole project	L.S	L.S					
61	Renovation of Mutla recirculation Pumping Station and Control room as per specification.	L.S	L.S					
62	Inspection of equipment by Third Party as per specification.	L.S	L.S					
63	Mimic diagram in front of all electrical panel	L.S	L.S					
64	Supply, erect and connect Bus duct rating 3000A TP & N+E (IP67).	MTR	160					
65	Supply, erect and connect Bus duct rating 1200A TP & N+E (IP67).	MTR	160					
66	Supply, erect and connect Bus duct rating 2500A TP & N+E (IP67).	MTR	160					
67	Supply, erect and connect Bus duct rating 6000A TP & N+E (IP67).	MTR	100					
68	Supply and install electrical schematic diagram on the wall in each electrical room in lockable aluminium cabinet with safety glass enclosure with minimum dimension 2Mx1.2Mx0.3M.	Nos.	10					
69	3000A TP & N + E Terminal Box in weatherproof enclosure IP65 for external D/G.	Nos.	2					
70	500A TP & N + E Terminal Box in weatherproof enclosure IP65 for external D/G.	Nos.	2					
71	Modular UPS preconfigured for parallel redundancy sized minimum 60KVA/60KW; consists of two modules of 60KVA/60KW							
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
72	with 6 hours backup time at 60KW load, unity power factor. Control unit 15” LED Touch Screen with high efficiency upto 97% using advanced three-level inverter. Batteries lifetime up 12 years. SNMP/Modbus card included at Electrical and control building.	No.	1					
73	Modular UPS preconfigured for parallel redundancy sized minimum 60KVA/60KW; consists of two modules of 60KVA/60KW with 6 hours backup time at 60KW load, unity power factor. Control unit 15” LED Touch – Screen with high efficiency upto 97% using advanced three-level inverter. Batteries lifetime up 12 years. SNMP/Modbus card included at Reservoir Substation No.1.	No.	1					
74	Modular UPS preconfigured for parallel redundancy sized minimum 60KVA/60KW; consists of two modules of 60KVA/60KW with 6 hours backup time at 60KW load, unity power factor. Control unit 15” LED Touch Screen with high efficiency upto 97% using advanced three-level inverter. Batteries lifetime up 12 years. SNMP/Modbus card included at Existing Control room.	No.	1					
75	Modular UPS preconfigured for parallel redundancy sized minimum 60KVA/60KW; consists of two modules of 60KVA/60KW with 6 hours backup time at 60KW load, unity power factor. Control unit 15” LED Touch Screen with high efficiency upto 97% using advanced three-level inverter. Batteries lifetime up 12 years. SNMP/Modbus card included at Chemical and Control Building.	No.	1					
75	Design, supply, erect, and connect light management system complete with all required electronic card, PC, Data gathering panels, cables, operation station at substation complete with PC and Laser printer, Programmer relays, controls, LCD colour monitor, printer, backup power supply,							
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	sensors, transmitter, occupancy sensor and daylight sensor, DALI dimmer, transmitter, .etc. and all required to complete the work in an operation condition for controlling all internal lightings, external lightings, and street lighting for the whole project and connect the data to Building Automation and SCADA.	No.	1					
76	Design, Supply and install new MLTB as per drawing at Existing reservoir Substation.	L.S	L.S					
77	Design, Supply and install new EMSB as per drawing at Existing reservoir Substation.	No.	1					
78	Dismantle existing MLTB at existing reservoir substation and deliver to MEW store at Subhan.	L.S	L.S					
79	Replace cables which are defective or short in length by new cables at existing reservoir substation.	L.S	L.S					
80	Provide temporary panel and portable Diesel Generator with sufficient capacity to avoid interruption of power supply during dismantling of existing panel and installation of new panel.	L.S	L.S					
81	Inspection at manufacturer's premises and at site, the following by Third Party and two MEW engineer from technical service department.							
81.1	PV Solar system	L.S	L.S					
81.2	Lighting control system and all LED light fittings.	L.S	L.S					
81.3	Diesel generator	L.S	L.S					
81.4	All electrical panels (MLTB, MCC, MSB, etc.)	L.S	L.S					
81.5	Building Automation System	L.S	L.S					
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		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils
81.6	All required and necessary Power cables for the whole project.	L.S	L.S				
81.7	All required weatherproof enclosure for whole the project.	L.S	L.S				
81.8	All required and necessary cable tray for whole the project.	L.S	L.S				
81.9	Design, supply, erect and connect clean earthing system for all electronic equipment, computer networks, CCTV, Fire Alarm etc...	L.S	L.S				
82	Supply and installation of Scada system complete with computers, servers, ATC at Electrical control room complete with all requirement to connect DG, MLTB, MSB, SMSB, DB etc to Scada system for Power and control cables, electronic cards, PLC etc.	L.S	L.S				
83	Any other item required, but not mentioned above to complete the works in good operating condition (state below and include price). 1. 2. 3.	L.S	L.S				
	<u>Attention:-</u> 1) The agent of LED light fittings must have ISO-9000/9001 Certification. 2) <u>The agent of PV Solar System shall have ISO-9000/9001 Certification</u>						
	<u>INTEGRATED BUILDING MANAGEMENT SYSTEM</u>						
84	Design, supply, install, label, test, commission, document and maintain the system in all buildings complete with connection, data gathering, sensors, transmitters, controllers, integrating, connection with all required						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	software and hardware as per specifications	L.S	L.S				
84.1	Enterprise Integrated Building Management System integrating all the systems detailed in the specifications.	L.S	L.S				
84.2	All related hardware and software requirements for third party integration and web access.	L.S	L.S				
84.3	Automation controller and DDCs	No.	1				
84.4	Main system server as per specifications	L.S	L.S				
84.5	Communication gateway network controller.	No.	1				
84.6	Workstation computers for monitoring and control	No.	1				
84.7	Color laser printers	No.	1				
84.8	UPS 10kVA for 12 hours	L.S	L.S				
84.9	Web based operator workstation license	L.S	L.S				
84.10	All required power cables, fiber optic transmitter/receiver, racks, software, hardware, ... etc. and all the requirements to complete the works in an operating condition	L.S	L.S				
85	<u>IP Telephone</u>						
	Design, supply, install, label, erect, integrate with existing PBX at administration building, test, commission, document and maintain the system as per regulations and specifications of Ministry of Communication including E1 services, IP phone sets, conduits, system management and all other accessories						
85.1	IP PBX server including VoIP, interface cards for up to 100 VoIP users, E1 interface card and all other accessories	No.	1				
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		Unit Rate		Total Amount			
Item	Description	Unit	Qty	KD	Fils	KD	Fils
85.2	IP PBX VoIP management software	No.	1				
85.3	VoIP analog gateway 24 ports with all accessories	No.	1				
85.4	IP Phone set Type A	Nos.	20				
85.5	IP Phone set Type B	Nos.	80				
85.6	All required power cables, fiber optic transmitter/receiver, hardware, software ...etc. and all the requirements to complete the works in an operating condition	L.S	L.S				
85.7	Connecting Al Mutlaa project with MOC phone lines with minimum 2Nos PSTN Phone line through suitable means to establish IP TEL system, DID and DOD	L.S	L.S				
85.8	Operator Console	Nos.	1				
86	<u>Passive Network</u> Design, supply, install, label, erect, test, commission, document and maintain the passive cabling network components from approved vendors with all the requires accessories as per following specifications:						
86.1	Supply and install UTP Cat6A indoor cabling for 160 points	L.S	L.S				
86.2	Installation, termination and testing UTP Cat6A points with dual points floor boxes, outlets, RJ45 faceplates, wall mounts	Nos.	160				
86.3	Supply and install 48-port Cat6A/fiber intelligent patch panels	Nos.	4				
86.4	Supply and install UTP Cat6A patch cords 1m	Nos.	200				
86.5	Supply and install UTP Cat6A patch cords 3m	Nos.	200				
86.6	Supply, install, label, terminate and 6 core						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	single mode (OS1) fiber optics cables for external cabling	L.S	L.S				
86.7	Supply, install, label, terminate and test 6 core multimode (OM3) fiber optics cables	L.S	L.S				
86.8	Supply, install, label, terminate and test 6 core multimode (OM4) fiber optics cables	L.S	L.S				
86.9	Supply and install fiber patch cords 3m with fiber jumpers	Nos.	20				
86.10	Supply and install fiber patch cords 1m with fiber jumpers	Nos.	20				
86.11	Supply and install wall mounted cabinets with all required accessories (power supplies, cable management, fans, etc.)	Nos.	8				
	<u>Active Network</u>						
87	Design, supply, install, label, erect, test, commission, document and maintain the active network components with all the requires accessories as per the following specifications:						
87.1	48 port 10/100/1000 10GBase stackable managed switchPoE with 4 SFP ports with module and transceivers	Nos.	4				
87.2	8 port 10/100/1000 10GBase stackable managed switch PoEwith 2 SFP	Nos.	4				
87.3	Wireless Access Points 802.11g/n-d2.0 2.4-GHz Mod Unified AP; 3 RP-TNC; ETSI, 2.4-GHz 3 dBi Triple Omni Antenna 3 RP-TNC; Spare-POE	Nos.	24				
87.4	Access control server hardware& software based Microsoft, power Cord UK, security software installed and configured	Nos.	1				
87.5	Wireless Control System LS with PLUS License for 25APs, Windows/Linux Hardware						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	server required. Minimum requirement for wireless control software	L.S	L.S				
87.6	Network management system including all sub-systems with software license for 100 devices	Nos.	1				
87.7	Office Computer (PC) and interconnect it to office LAN with latest hardware and software configurations including Antivirus/Firewall ...etc as per MEW Engineer instructions.	Nos.	19				
87.8	Computer table, Chair, cupboard etc for each office computer as per MEW Specifications at the time of approval	Nos.	19				
87.9	Printer A3/A4	Nos.	4				
	<u>Public Address System</u>						
88	Design, supply, install, label, test, commission, document and maintain public address system complete with all required software and hardware as per specifications:						
88.1	Power amplifier(120W)	L.S	L.S				
88.2	Power amplifier(60W)	L.S	L.S				
88.3	Paging mic console with accessories	No.	1				
88.4	Source and zone selector	No.	1				
88.5	AM/FM digital tuner	No.	1				
88.6	Recorder	No.	1				
88.7	19" rack	No.	1				
88.8	CD player	No.	1				
88.9	6W recessed ceiling mounted loud speaker (as minimum) <i>(exact location of loud speakers shall be</i>	L.S	L.S				
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	<i>determined at site and after providing sound calculations)</i>							
88.10	12W recessed ceiling mounted loud speaker (as minimum) <i>(exact location of loud speakers shall be determined at site and after providing sound calculations)</i>	L.S	L.S					
88.11	All other required power cables, Cat6A cables, hardware, software ...etc. and all the requirements to complete the works in an operating condition. <u>Access Control System</u>	L.S	L.S					
89	Design, supply, install, label, test, commission, document and maintain access control system complete with all required software and hardware as per specifications:							
89.1	Enterprise security management system supporting up to 100 fingerprint reader (IP reader)	Nos.	1					
892	IP based reader fingerprint sensors	Nos.	1					
89.3	Magnetic door lock 500lb	L.S	L.S					
89.4	Request to exit button	L.S	L.S					
89.5	Access control system integration with integrated building management system	L.S	L.S					
89.6	All other required power cables, Cat6A cables, hardware, relays, software ...etc. and all the requirements to complete the works in an operating condition <u>Load Management System</u>	L.S	L.S					
90	Design, supply, install, label, test, commission, document and maintain the system complete with connection, data gathering, sensors,							
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	transmitters, controllers, integrating, connection with internet to MEW HQ with all required software & hardware as per specifications:							
90.1	Enterprise load management system integrating the following: - PV panel automatic washing system - Inverter doors open/close sensing - Fault diagnostics - PV system parameters - Energy optimization - Meteorological System - Environmental monitoring system	L.S	L.S					
90.2	All related hardware and software requirements for third party integration and web access	L.S	L.S					
90.3	Automation controller	L.S	L.S					
90.4	Main system server as per specifications	Nos.	1					
90.5	Communication gateway network controller	L.S	L.S					
90.6	Workstation computers for monitoring and control	Nos.	1					
90.7	Colour laser printers	Nos.	1					
90.8	UPS 10kVA for 12 hours	Nos.	1					
90.9	All required power cables, fiber optic transmitter/receiver, racks, software, hardware, ...etc. and all the condition	L.S	L.S					
	<u>Annexed Works for Mutla Low (E15)</u>							
91	Supply, erect, and necessary modification for the existing MLTB by extending the busbar and other related works, so as to connect the feeders for new SMSB valve chambers and to make system in operating condition.	L.S	L.S					
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
92	SMSB- Valve chambers 1 No. 250A MCCB T.P, Incomer 18No. 40A MCCB T.P Note. MCCB status ON/OFF and Trip (ELCB) aux contact to be hardwired to control system BMS via junction box as per drawing.	Nos.	3					
93	DB for CCTV in weatherproof enclosure IP65 as per drawing and following specification complete with all excavation and backfilling, laying of power cables Direct buried/UPVC cable ducts, as and when required, earthing pits, compacting, levelling, protective barrier, foundation of the panels, manhole for the panel, ... etc. And Status of each DBs to be monitor in SCADA. a) 1No. 30A MCCB as Incomer b) 24No.s 10A MCBs with Built-in earth leakage. c) Provision for terminal Blocks for Status monitoring scada.	Nos.	3					
94	DB-Power for Instrument Shelter in weatherproof enclosure for instrumentation equipments at the top of reservoirs including cabling, testing and commissioning as per the drawing and specification as follows, for New Reservoirs Stage-II 1) 1No 30A MCCB Incomer 2) 4Nos.10AMCBwith built-in earth leakage. 3) 6Nos. 15 MCB with built-in earth leakage	Nos.	11					
95	Supply, erect and connect the following cables to the existing SMSB-E complete with all excavation, UPVC ducts backfilling, laying of cable tiles, compacting, cable glanding/tray termination etc for CCTV Cameras.							
95.1	3C x 2.5 mm ² XLPE/GSWA/PVC Cable.	MTR	7425					
95.2	3C x 35mm ² XLPE/SWA/PVC Cable	MTR	1500					
	-Ditto- Power Cables for SMSB Valve Chambers.							
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
95.3	4Cx 185 mm ² XLPE/SWA/PVC Cable. -Ditto- Power cables for DB-Instrument Shelter	MTR	1800				
95.4	4Cx10mm ² XLPE/SWA/PVC Cable (Actual length & size of all cables may be re-estimated according to the voltage drop and not less than specified)	MTR	1000				
96	All necessary weatherproof works for the entire project.	L.S	L.S				
97	Design supply, install, and testing, commissioning earthing system for whole the project as per specification.	Item	Item				
98	All required and necessary civil and builder works associated with electrical works including foundation of panels, manholes for panels, duct, excavation, backfilling, etc.	L.S	L.S				
99	The contractor shall supply the following Spare Parts: a) 5 No. 10A MCB with Built-in earth Leakage.	Nos.	5				
100	Allow for any item of works shown on the drawing or described in specification or required to complete the works in an operating condition but not covered in the Bill of Quantities. The payment will be done for actual work executed during the construction period according to the breakdown list. <u>ELECTRICAL WORKS FOR WATER TOWER NO. D14</u>	L.S	L.S				
101	Supply, erect, connect, test, commissioning and maintain the following as per drawing and						
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	specification including wiring, earthing, protection, Supports , engraving on mimic diagram and Aux. contact for each MCCB,ELCB to monitor of ON/OFF/TRIP status in to DCS System, via local Junction Box with all required to complete the work in an operating condition for the following...							
101.1	SMSB for MOVs	Nos.	2					
101.2	MCCB 160A complete with E/L in weatherproof enclosure.	Nos.	1					
101.3	MCCB 100 A complete with E/L in weatherproof enclosure.	Nos.	1					
101.4	MCB 32 A complete with E/L in weatherproof enclosure	Nos.	2					
101.5	MCB 20 A complete with E/L in weatherproof enclosure	Nos.	35					
101.6	MCB 20 A complete with E/L in weatherproof enclosure(IP 67)	Nos.	30					
101.7	DB for CCTV and instruments consists of 32A Isolator, 24 Nos. MCB 10A with Built-in earth leakage.	Nos.	1					
101.8	DB for Instrumentation consists of 32A Isolator, 36 Nos. MCB 10A with Built-in earth leakage.	Nos.	2					
102	Supply, erect, connect, test, commissioning and maintain the following cables in UPVC duct and complete with all excavation, backfilling, laying of cable tiles, compacting with screen sand including cable glanding, termination, warning tape, marker post etc.							
102.1	-Ditto-Power cables 3CX2.5 Sq.mm for CCTV Camera (CU/XLPE/PVC/GSWA), 600/1000V	MTR	2100					
102.2	-Ditto- Power cables 3CX2.5 Sq.mm for GRP							
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
	shelter, Flow meter, DCS Panel etc.. (CU/XLPE/PVC/GSWA), 600/1000V	MTR	900				
102.3	Ditto for power cables 4Cx6 Sq.mm	MTR	70				
102.4	Ditto for power cables 4Cx10Sq.mm	MTR	2100				
102.5	Ditto for power cables 4Cx25Sq.mm	MTR	200				
102.6	Ditto for supply and laying of UPVC cable duct(Dial110mm, 4.5mm thick) for CCTV power and FO cables	MTR	1500				
103	Light fittings type A7/1/36 with door switch for GRP Housing	Nos.	13				
104	Lockable cabinet (GRP Housing) with 2.5M x 1.5M x 2.5 M for SMSB with weatherproof (in site) including required RC foundation ducts, protection barrier etc...	Nos.	2				
105	Allow for any item of electrical work shown on the drawing or described in specification or required to complete the works in an operating condition but not covered in the Bill of Quantities	L.S	L.S				
	Note: - The related Electrical works for integration with DCS to be coordinated with TIC contractor						
	<u>ELECTRICAL WORKS FOR WATER TOWER NO D16</u>						
106	Supply, erect, connect, test, commissioning and maintain the following as per drawing and specification including wiring, earthing, protection, Supports engraving on mimic diagram and Aux. contact for each MCCB,ELCB to monitor of ON/OFF/TRIP status in to DCS System, via local Junction Box with all required to complete the work in an operating condition for the following...						
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				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
106.1	SMSB for MOVs	Nos.	2				
106.2	MCCB 160A complete with E/L in weatherproof enclosure.	Nos.	1				
106.3	MCCB 100 A complete with E/L in weatherproof enclosure.	Nos.	1				
106.4	MCB 32 A complete with E/L in weatherproof enclosure	Nos.	2				
106.5	MCB 20 A complete with E/L in weatherproof enclosure	Nos.	46				
106.6	MCB 20 A complete with E/L in weatherproof enclosure(IP 67)	Nos.	42				
106.7	DB for CCTV and instruments consists of 32A Isolator, 24 Nos. MCB 10A with Built-in earth leakage	Nos.	1				
106.8	DB for Instrumentation and instruments consists of 32A Isolator, 36 ways. MCB 10A with Built-in earth leakage	Nos.	2				
107	Supply, erect, connect, test, commissioning and maintain the following cables/ducts and complete with all excavation, backfilling, laying of cable tiles, compaction with screen sand including cable glanding , termination ,warning tape, marker post etc.						
107.1	Power cables 3CX2.5 Sq.mm for CCTV Camera (CU/XLPE/PVC/GSWA),	MTR	2100				
107.2	Power cables 3CX2.5 Sq.mm for GRP shelter, Flow meter, DCS Panel etc.. (CU/XLPE/PVC/GSWA),	MTR	1500				
107.3	Ditto for power cables 4Cx6Sq.mm	MTR	70				
107.4	Ditto for power cables 4Cx10Sq.mm	MTR	3700				
107.5	Ditto for power cables 4Cx25Sq.mm	MTR	300				
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
107.6	Supply and laying of UPVC cable duct (φ110mm,4.5mm thick)for CCTV Power and F.O cables	MTR	1200					
108	Light fittings type A7/1/36 with door switch for GRP Housing	Nos.	15					
109	Lockable cabinet (GRP Housing) with 2.5M x 1.5M x 2.5 M for SMSB with weatherproof (in site) including required RC foundation ducts, protection barrier etc...	Nos.	2					
110	Allow for any item of electrical work shown on the drawing or described in specification or required to complete the works in an operating condition but not covered in the Bill of Quantities Note: - The related Electrical works for integration with DCS to be coordinated with TIC contractor.	L.S	L.S					
<u>ELECTRICAL WORKS FOR WATER TOWER NO D20</u>								
111	Supply, erect, connect, test, commissioning and maintain the following as per drawing and specification including wiring, earthing, protection, Supports engraving on mimic diagram and Aux. Contact for each MCCB,ELCB to monitor of ON/OFF/TRIP status in to DCS System, via local Junction Box with all required to complete the work in an operating condition, for the following...							
111.1	MCB 32 A complete with E/L in weatherproof enclosure	Nos.	2					
111.2	DB for CCTV and instruments (in the field) consists of 32A Isolator, 24 Nos. MCB 10A with Built-in earth leakage in weatherproof enclosure.	Nos.	2					
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
112	Supply, erect, connect, test, commissioning and maintain the following cables/ducts and complete with all excavation, backfilling, laying of cable tiles, compaction with screen sand including cable glanding ,termination, warning tape, marker post ... etc.							
112.1	Power cables 3CX2.5 Sq.mm (CU/XLPE/PVC/GSWA),	MTR	3000					
112.2	Power cables 4CX6 Sq.mm (CU/XLPE/PVC/GSWA),	MTR	600					
113	Allow for any item of electrical work shown on the drawing or described in specification or required to complete the works in an operating condition but not covered in the Bill of Quantities	L.S	L.S					
	<u>Annexed Electrical Works for D8 Water Towers</u>							
114	Supply, erect, and connect the following as per drawing and specification with all required to complete the work in an operating condition.							
114.1	DB for CCTV in weatherproof enclosure IP54 as per drawing and following specification complete with all excavation and backfilling, laying of power cables Direct buried/UPVC cable ducts, as and when required, earthing pits, compacting, levelling, protective barrier, foundation of the panels, manhole for the panel, ... etc. And Status of each DBs to be monitor in SCADA. a) 1No. 30A MCCB as Incomer b) 24No.s 10A MCBs with Built-in earth leakage. c) Provision for terminal Blocks for Status monitoring in BMS system.	No.	1					
115	Supply, erect and connect the following cables complete with all trays/UPVC ducts (Dia-							
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	110mm, 4.5mm thick) including excavation, backfilling, laying of cable tiles, compacting, termination, warning tape, marker post etc..							
	a) 3C x 2.5 mm ² XLPE/GSWA/PVC Cable.	MTR	2130					
	b) 4 C x 10 mm ² XLPE/SWA/PVC Cable	MTR	10					
116	All required weatherproof enclosure for whole the project.	L.S	L.S					
117	The contractor shall supply the following Spare Parts: a) 5 No. 10A MCB with Built-in earth Leakage.	Nos.	5					
118	Allow for any item of works shown on the drawing or described in specification or required to complete the works in an operating condition but not covered in the Bill of Quantities. The payment will be done for actual work executed during the construction period according to the breakdown list	L.S	L.S					
<u>ANNEXED ELECTRICAL WORKS FOR JAHRA PUMPING STATION- P18</u>								
119	Design, supply, erect and connect the following as per drawing and specification with all required earthing works to complete the work in an operating condition.							
119.1	DB-isolator 60A for main isolation,IP54	No.	1					
119.2	DB-TIC consist of the following: - 1No.60A incomer MCCB T.P (with aux contacts for status monitoring) - 4No.s 30A breaker - 2No.s 20Abreaker	No.	1					
120	DB for CCTV in weatherproof enclosure IP54 as per drawing and following specification complete with all excavation and backfilling,							
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				Unit Rate		Total Amount		
Item	Description	Unit	Qty	KD	Fils	KD	Fils	
	laying of power cables through UPVC cable ducts, as and when required, earthing pits, compacting, levelling, protective barrier, foundation of the panels, manhole for the panel, ... etc. And Status of each DBs to be monitor in SCADA.							
	1No. 30A incomer MCCB T.P (with aux contacts for status) 12No.s 10A breaker with built-in earth leakage. Note: MCCB status ON/OFF and Trip (ELCB) aux contact to be hardwired to DCS control system.	Nos.	3					
121	Design, Supply, Install, test and commission of Redundant industrial grade AC uninterruptible power supply units 6KVA and 8hrs battery back in full load. Including Inverter, charger, communication ports, and hardwired alarm signals for UPS and Battery, to the control system panels	No.	1					
122	Supply, install, connect, test and commission the following electrical cables including DB wiring in PVC conduits by PVC three core wires, draw boxes, ceiling rose for indoor installations and trench excavation, UPVC cable ducts (Dia-110mm, 4.5mm thick), backfilling, sand compacting, glanding, termination etc for outdoor installations as per MEW General Specification for Electrical Installation drawings for control room and field.							
122.1	3CX2.5Sq.mm CU/PVC/XLPE/GSWA cable	MTR	1950					
122.2	Ditto...3CX16Sq.mm CU/PVC/XLPE/SWA cable	MTR	25					
122.3	Ditto...3CX25Sq.mm CU/PVC/XLPE/SWA cable	MTR	500					
	Note. Actual length and size to be as per voltage drop calculations, but not less than specified size.(by contractor)							
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SECTION 6

BILL OF QUANTITY NO. 4

ELECTRICAL WORKS

Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils
123	All required weatherproof enclosure for whole the project.	Item	Item				
124	The contractor shall supply the following Spare Parts: a) 5 Nos. 10A MCB with Built-in earth Leakage. b) 2Nos. 30A MCB with Built-in earth Leakage.	Nos.	5				
		Nos.	2				
125	Allow for any item of works shown on the drawing or described in specification or required to complete the works in an operating condition but not covered in the Bill of Quantities.	L.S	L.S				
Total From This Page Carried to Collection							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS AND OPERATIONS & MAINTENANCE SECTOR	SECTION-6, BILL OF QUANTITY NO.4, ELECTRICAL WORKS

COLLECTION

ITEM	DESCRIPTION	TOTAL AMOUNT	
		KD	FILS
	TOTAL FROM PAGE NO. 1		
	TOTAL FROM PAGE NO. 2		
	TOTAL FROM PAGE NO. 3		
	TOTAL FROM PAGE NO. 4		
	TOTAL FROM PAGE NO. 5		
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	TOTAL FROM PAGE NO. 23		
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MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS AND OPERATIONS & MAINTENANCE SECTOR	SECTION-6, BILL OF QUANTITY NO.4, ELECTRICAL WORKS

ITEM	DESCRIPTION	TOTAL AMOUNT	
		KD	FILS
	TOTAL FROM PAGE NO. 24		
	TOTAL FROM PAGE NO. 25		
	TOTAL FROM PAGE NO. 26		
	TOTAL FROM PAGE NO. 27		
	TOTAL FROM PAGE NO. 28		
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	TOTAL FROM PAGE NO. 43		
	TOTAL		

SECTION 6		BILL OF QUANTITY NO. 5.1		Mutla High Stage 2 -TIC Works			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	Mutla High WDC					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
Mutla High (E14) WDC							
1.0	Rehabilitation of existing Mutla High WDC - TIC system Site Survey, Engineering, Supply, transport to site, Installation, Cabling, Configuration, integrated factory acceptance test (IFAT), commissioning, SAT, training, maintenance and guarantee of Field instruments, Distributed Control system, Video surveillance system, VoIP and Telecommunication System at Mutla High WDC for local monitoring and control from Local Control centre & integrate with Remote control centre's at E15,D20,D8,P18,RO,E20,D14,E13, NRCC (Doha) and NCC Shuwaikh National Control Centre Shuwaikh. as per Dwg no: WPD/6397/E14/I/03. The scope includes to replace the existing Rotork control system and associated equipments such as control panles, mimic panels, console, etc.. dismantle and handover to MEW stores.						
1.1	Industrial type Process Operator Work Stations (OWS) with 24" dual head full HD LED Display Monitor, which includes dual HDMI inputs, Industrial functional keyboard, mouse, etc..including supply & install of ergonomic operator consoles. The OWS shall be latest model & configurations from OEM at the time of approval. The OWS shall integrate with DCS server via. redundant F.O TCP/IP Ethernet LAN (1000mbps) and configure the D16 & E13 Process mimics, alarm, events, trends, SOE, reports including status of controllers, IO mapping, LAN & WAN communications etc.. as per MEW Engineer instructions.	Nos	3				
1.2	<u>Display Wall, Controller and related Software for Process and Video surveillance system</u> 70" DLP with large screen station with redundant Display wall controller and required hardware and Control room Management software configuration to display the Complete Process plant (E14,E15,D20,D8,P18,RO,E20,D14,E13) signals and video surveillance system for the operations and visualize the real-time content. The software should be unlimited possibilities to control and manage displays sources and data to be available over the network and other work stations. The complete system should be latest (full HD, solid state (LED) illumination with rear projection, redundant LED-lit, and latest at the time of approval.						
1.2.1	Ditto..2x2nos of 70" DLP with large screen station for Process	Item	1				
1.2.2	Ditto..1x2nos of 70" DLP with large screen station for Electrical	Item	1				
1.2.3	Ditto...Redundant Display wall controller with KVM switch and 15" rack console	Item	1				
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SECTION 6		BILL OF QUANTITY NO. 5.1		Mutla High Stage 2 -TIC Works				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTANANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	Mutla High WDC						
		Unit Price		Total Amount				
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
1.3	Dual redundant fault tolerant DCS Server with enclosure including hardware & software with long term (min.3 years) data logging storage archive, historian, alarms, events, reports, Alarm management system, I/O's and OPC, etc.. to connect and configure into HMI device, DCS controllers, Engineering Stn, large screen stn, etc.. via. dual redundant F.O Ethernet TCP/IP LAN. Including the original software License. The price includes rack console (15" LED) Monitor and KVM Switch to connect and configure into redundant DCS server.	Item	1					
1.4	Engineering Station with 15" LED rack console type monitor including the required software to development/modify the DCS programme, process simulation, controller simulations, Simulation of I/O modules, Hart / PROFIBUS Devices, field bus device simulation/calibration and Process Modeling software and interface with thirdparty deivce, data and process dual F.O LAN including required hardware and software with original License.	Item	1					
1.5	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes.	Nos	3					
1.6.	Industrial type Control console desk to monitor&control of E14&E15 WDC inlet and outlet Flows, Pressure, Levels/volume, valve operations, providing new digital / bargraph indicators, volume indicators, LED lamps, Push buttons, Selector Keys, engraved mimic flow diagrams and alarm annunciator widows, etc.. fully hardwired logics, as per MEW Engineer Instruction, refer to tender drawing. Price Break down to be submitted for each item as per dwg. along with tender bid.	Item	1					
1.7	Hot/standby Fail-safe fault tolerant DCS Controller with enclosure including, dual redundant PSUs, CPUs, analogue & digital I/O modules, Communication modules, etc.. and 15"LED /HMI touch screen Industrial PC system with cabinet and inter-connect to redundant F.O LAN and Field device via. Field marshalling system.	Nos	4					
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SECTION 6		BILL OF QUANTITY NO. 5.1		Mutla High Stage 2 -TIC Works			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	Mutla High WDC					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.8	Dual Redundant fiber optic TCP/IP LAN with distributed server architecture complete with required network accessories including redundant optical gigabit managed Ethernet network switches, routers (as per IEEE 802.3z Ethernet std), cable and accessories, to interconnect between DCS controller and thirdparty system new and existing PLC/DCS and to communicate with WAN remote control centre's to NRCC and NCC(Shuwaikh) via. redundant fiber optic cables as a failsafe fault tolerant redundant ring network and Microwave radio system, as per Note: LAN/ WAN network to be seperate and WAN switch/ Router for Fiber and MW Radio system to be as per Dwg no: WPD/6397/E14/I/03	Item	1				
1.9	Integration/Upgradation/Modification with existing B.W PLC/RTU kingfisher/citect SCADA HMI, to interconnect and configure into new DCS system	Item	1				
1.10	Integration/Modification with existing Stage.I F.W Reservoir Siemens DCS PCS V8.0/S7-400H conrol system, to interconnect and configure all the signals into new DCS	Item	1				
1.11	Integration/configuration with new D.G system PLCs into new DCS system	Item	1				
1.12	Integration/configuration with new BMS PLCs into new DCS system	Item	1				
1.13	Integration/configuration with new Irrigation system PLCs into new DCS system	Item	1				
1.14	Field Marshalling and interposing cabinet (FTA) to accommodate the complete signals. which includes isolated redundant field power supply units, fused terminals, circuit breakers with ELCBs, interposing relays (all digital signals), signal splitter/barrier (for all analogue signals), earth/shield bus bars, inter-connection cables to redundant DCS IO system cabinet, Mimic Panels, electrical equipments, field instrument, etc.. and fully hardwired logics. Note:- The FMC shall be located inside the Elect&Control Bldg, Reservoiri Substation-1, 2, 3 and Existing Re-circulation Pump control Bldg. to interconnect with field device and to redudnat DCS controller. The existing field signals from the existing panels shall be routed to the new DCS Field Marshalling cabinet in the existing Re-circulation Pump Elect&control Bldg.	Item	4				
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		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.15	Integrate, modify and configure the existing Electrical system, HVAC system, Fire alarm system to obtained the aux. contact for monitoring and control signals into redundant DCS system, including HMI workstations, mimics, alarms, SOE, event, trends, Report and logics etc. for monitoring and control of Electrical power distribution (SLD) system as per specification. (Refer more details into Electrical Spec, dwg and BoQs)	Item	1				
1.16	Necessary control room furniture's including suspension cushions high back chair (5 Nos) for each operator work stations and control consol, steel file cabinets (1) for storage of A1/A3 size drawings and documents, etc... to be provided as per MEW Engineer instructions. <i>Field Instrumentation for E14</i> Design, Supply, Install, Calibrate, Cabling, Hook-up, Configure, Test and Commission of field instruments with latest technology as per spec and drawings for the followings items... the price includes instrument Tapping points, instrument stanchion, SS316L hookup impulse tubes, fillings, valves, and SS316L cable trays, covers, conduit with fitting accessories for the following..	Item	1				
1.17	Pressure Transmitter. (PIT) smart with Hart protocol having local LCD display, mounting accessories, SS316L manifold and hook materials, as per spec.	Nos.	3				
1.18	Remote Mount Temperature Transmitter (TIT), Duplex Pt100/RTD with thermo well, as per specifications.	Nos.	3				
1.19	Non-contact type radar Level transmitter (install on the roof of the reservoir inside GRP IHB), having smart type with Hart Protocol, LCD volume display, datalogger, mounting accessories.	Nos.	44				
1.20	Non-contact radar level transmitter having Wireless HART, with extended antenna, recharable battery (min.10years,1 sec.scan rate at 80°C ambient), using the IEEE 802.15.4/ISA 100.11a std, radio operating at 2.4GHz, with fault tolerant redundant wireless gateway and integrate with the host DCS control system through Modbus TCP/IP connection, or HART port, and Modbus serial connection. which covers integration, device diagnostics, security and standardization on HART IP. The network range to be extended to cover the wireless device as fault tolerant mesh network /redundant communication routes to provide the crucial 99.99% reliabilitv	Nos	29				
1.21	Differential Pressure Transmitter with Smart type (2 wire,24vDC,4-20mA) having Hart Protocol, built-in LCD display, with SS316L hookup, five manifold and mounting accessories, as per spec.	Nos.	2				
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		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.22	Chamber flood level switches with IP68 SS316L Junction Box and cable Gland.	Nos.	120				
1.23	Electrical Actuators (retrofit- modify and install on the existing sluice and butterfly Manual valves), as per specifications. Note:- The Supply, install of new Motorised butterfly valve shall refer to Mechanical BOQ. The cabling, testing and commissioning as per TIC works.	Nos.	48				
1.24	Pressure Switch with SS316L Hookup materials, two way manifold and 2" pipe mounting accessories.	Nos.	8				
1.25	Differential Pressure Gauge with SS316L Hookup materials, five way manifold and 2" pipe mounting accessories.	No	2				
1.26	Electromagnetic flow meter complete with sensor and remote mounted transmitter with GRP IHB (600 x 600 x 500) as per spec.						
1.26.1	Ø 1200 mm, pressure rating PN16 and flange drilling as per	Nos.	4				
1.27	Design, Supply, Install of field Junction Boxes (GRP) with all accessories such as double compression type cable glands (SS316L), plugs, earth tags, shroud, nuts, bolts, with mounting accessories including 30% spare terminals, etc.. as per spec. and dwg. for the followings...						
1.27.1	Ditto...JB for Analogue (JBA)	Nos.	26				
1.27.2	Ditto...JB for Digital Signals (JBD)	Nos.	26				
1.27.3	Ditto...JB for Control Signals (JBC)	Nos.	26				
1.27.4	Ditto...JB for Electrical Signals (JBE)	Nos.	22				
1.28	Supply, install customized Portable ISO furnished GRP container/shelter, size 2.0mtr (L) x 1.5 mtr (W) x 2.5 mtr (H), With Patricians. The cabinet shall supply furnished ceilings, floors, Sliding windows, double doors, with heat insulation, filters, louvers, etc.. to protect heat, humidity, moisture and proper ventilation. The cabinet shall be provide with necessary accessories such as Power socket, split a/c, Fluorescent lighting, Wall mounted J-box, intercom phone to control room, door limit switches, temperature switches (hardwired to DCS), Stainless steel trays, R.C foundation, mounting frame with installation accessories, etc.. Install the location as shown on the drawings.	Nos.	22				
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				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.29	Supply and lay of U-PVC cable duct with all accessories, including trench excavation, compaction with screen sand, backfilling, and steel wired warning tape, polyethylene cable tiles, draw pits, route marker, etc. as per dwg and spec						
1.29.1	Ditto.. U-PVC cable duct 2" (50mm) OD, 3.0mm WT	Mtr	1,200				
1.29.2	Ditto.. U-PVC cable duct 4" (110mm) OD, 4.5mm WT	Mtr	4,500				
1.29.3	Ditto.. U-PVC cable duct 10" (250mm) OD, 6.0mm WT	Mtr	10,150				
1.30	Design, supply, lay, terminate the following I&C cables, as per the specifications and drawings.						
1.30.1	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V for Analogue and Digital signal cable	Mtr	20,000				
1.30.2	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V for Profibus Dp cable, incompliance with Profibus DP std.	Mtr	16,000				
1.30.3	Ditto..15pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V, for Analogue and Digital signal cable	Mtr	15,000				
1.30.4	Ditto..19corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	18,000				
1.30.5	Ditto..60corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	34,400				
1.30.6	Ditto..70corex1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	11,000				
1.31	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the complete TIC System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	<u>Mutla High Chemical System</u>						
2.0	Site Survey, Engineering, Supply, transport to site, Installation, Cabling, Configuration, integrated factory acceptance test (IFAT), commissioning, SAT, training, maintenance and guarantee of Field instruments, Distributed Control system, Video surveillance system, VoIP and Telecommunication System at Mutla High Chemical local monitoring and control centre & integrate with Remote control centre's at E20 chemical, CNRCC (Doha) chemical and Shuwaikh Chemical National Control Centre Shuwaikh. as per Dwg no: WPD/6397/1/08. The existing chemical system at Re-circulation building, Chlorination system Building (constructed under C1 contract) to be integrated into proposed Chemical control building DCS system. The existing SCADA system at chlorination to be replaced with latest DCS based HMI system and integrate with existing PLC/RTUs (Kingfisher RTU), Mimic, etc.. and commission the complete system loops including the field equipments.						
2.1	Industrial type Process <u>Operator Work Stations</u> (OWS) with 24" dual head full HD LED Display Monitor, which includes dual HDMI inputs, Industrial functional keyboard, mouse, etc..including supply & install of ergonomic operator consoles. (Note. 2 Nos OWS with dual head 24" led monitos withergonomic consol to be located in the proposed new chemical control bldg. and 2 Nos OWS with dual head 24" led monitos withergonomic consol to be located in the existing chlorination bldg control room.) The OWS shall integrate with DCS server via. redundant F.O TCP/IP Ethernet LAN (1000mbps) and configure the D16 & E13 Process mimics, alarm, events, trends, SOE, reports including status of controllers, IO mapping, LAN & WAN communications etc.. as per MEW Engineer instructions.	Nos	3				
2.2	<u>Display Wall, Controller and related Software for Process and Video surveillance system</u> <u>70" DLP with large screen station</u> with redundant Display wall controller and required hardware and Control room Management software configuration to display the Complete Process plant (E20, E14 Chemical) signals and video surveillance system for the operations and visualize the real-time content. The software should be unlimited possibilities to control and manage displays sources and data to be available over the network and other work stations. The complete system should be latest (full HD, solid state (LED) illumination with rear projection, redundant LED-lit,						
2.2.1	Ditto..2x2nos of 70" DLP with large screen station for Process	Item	1				
2.2.2	Ditto..1x2nos of 70" DLP with large screen station for Electrical	Item	1				
2.2.3	Ditto...Redundant Display wall controller with KVM switch and 15" rack console	Item	1				
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		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.3	Dual redundant fault tolerant DCS Server with enclosure including hardware & software with long term (min.3 years) data logging storage archive, historian, alarms, events, reports, Alarm management system, I/O's and OPC, etc.. to connect and configure into HMI device, DCS controllers, Engineering Stn, large screen stn, etc.. via. dual redundant F.O Ethernet TCP/IP LAN. Including the original software License. The price includes rack console (15" LED) Monitor and KVM Switch to connect and configure into redundant DCS server.	Item	1				
2.4	Engineering Station with 15" LED rack console type monitor including the required software to development/modify the DCS programme, process simulation, controller simulations, Simulation of I/O modules, Hart / PROFIBUS Devices, field bus device simulation/calibration and Process Modeling software and interface with thirdparty deivce, data and process dual F.O LAN including required hardware and software with original License.	Item	1				
2.5	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes. Note:-3 nos on the chlorine di-oxide control room and 2 nos on the existing chlorination building to be located.	Nos	4				
2.6	Industrial type Control console desk to monitor&control of Chlorine di-oxide plant providing new digital / bargraph indicators, volume indicators, LED lamps, Push buttons, Selector Keys, engraved mimic flow diagrams and alarm annunciator widows, etc.. fully hardwired logics, as per MEW Engineer Instruction, refer to tender drawing. Price Break down to be submitted for each item as per dwg. along with tender bid.	Item	1				
2.7	Hot/standby Fail-safe fault tolerant DCS Controller with enclosure including, dual redundant PSUs, CPUs, analogue & digital I/O modules, Communication modules, etc.. and 15"LED /HMI touch screen Industrial PC system with cabinet and inter-connect to redundant F.O LAN and Field device via. Field marshalling system.	Nos	3				
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		Unit Price		Total Amount				
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
2.8	Dual Redundant fiber optic TCP/IP LAN with distributed server architecture complete with required network accessories including redundant optical gigabit managed Ethernet network switches, routers (as per IEEE 802.3z Ethernet std), cable and accessories, to interconnect between DCS controller and thirdparty system new and existing PLC/DCS and to communicate with WAN remote control centre's to CNRCC and CNCC(Shuwaikh) via. redundant fiber optic cables as a failsafe fault tolerant redundant ring network and Microwave radio system, as per spec and drawings.WPD/6397/I/08 Note: LAN/ WAN network to be seperate and WAN switch/ Router for Fiber and MW Radio system to be as per Dwg no: WPD/6397/I/08	Item	1					
2.9	Integration/Upgradation/Modification with existing Chemical PLC/RTU kingfisher, to interconnect and configure into new DCS system	Item	1					
2.10	Integration/configuration with new D.G system PLCs into new DCS system	Item	1					
2.11	Integration/configuration with new BMS PLCs into new DCS system	Item	1					
2.12	Integration/configuration with new Irrigation system PLCs into new DCS system	Item	1					
2.13	Local control Panel with 15" LED HMI industrial PC for Chlorine Di-oxide plant as per the drawings, full hardwired logics configuration and interconnect to DCS system	Nos	42					
2.14	Field Marshalling and interposing cabinet (FTA) to accommodate the complete signals. which includes isolated redundant field power supply units, fused terminals, circuit breakers with ELCBs, interposing relays (all digital signals), signal splitter/barrier (for all analogue signals), earth/shield bus bars, inter-connection cables to redundant DCS IO system cabinet, Mimic Panels, electrical equipments, field instrument, etc.. and fully hardwired logics.	Item	1					
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		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.15	Integrate, modify and configure the existing Electrical system, HVAC system, Fire alarm system to obtained the aux. contact for monitoring and control signals into redundant DCS system, including HMI workstations, mimics, alarms, SOE, event, trends, Report and logics etc. for monitoring and control of Electrical power distribution (SLD) system as per specification. (Refer more details into Electrical Spec, dwg and BoQs)	Item	1				
2.16	Necessary control room furniture's including suspension cushions high back chair (5 Nos) for each operator work stations and control consol, steel file cabinets (1) for storage of A1/A3 size drawings and documents, etc... to be provided as per MEW Engineer instructions. Note. Field Instruments shall refer to Chemcial System BOQ item.	Item	1				
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SECTION 6		BILL OF QUANTITY NO. 5.1		Mutla High Stage 2 -TIC Works			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	Mutla High WDC					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	<u>COLLECTION SHEET</u>						
	Total from Page No. 1						
	Total from Page No. 2						
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SECTION 6		BILL OF QUANTITY NO. 5.2		Rehabilitation of existing remote sites -TIC & DCS Works				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount		
		Unit	Q'ty	KD	Fils	KD	Fils	
	<u>Jaleeb Al Shuyoukh Water Towers (D16)</u> <u>Rehabilitation of existing D16 stn. Water Towers - TIC system</u>							
1.0	Site Survey, Engineering, Supply, transport to site, Installation, Cabling, Configuration, integrated factory acceptance test (IFAT), commissioning, SAT, training, maintenance and guarantee of Field instruments, Distributed Control system, Video surveillance system, VoIP and Telecommunication System at Jaleeb Al Shuyoukh water towers, monitoring and control at Local Control centre & Remote control centre's from West Funitees and National Control Centre Shuwaikh. for the following items; as per Dwg no: WPD/6397/D16//03. The scope includes dismantle the existing equipments and handover to MEW stores.							
1.1	Industrial type Process <u>Operator Work Stations</u> (OWS) with 24" dual head full HD LED Display Monitor, which includes dual HDMI inputs, Industrial functional keyboard, mouse, etc..including supply & install of ergonomic operator consoles. The OWS shall be latest model & configurations from OEM at the time of approval. The OWS shall integrate with DCS server via. redundant F.O TCP/IP Ethernet LAN (1000mbps) and configure the D16 & E13 Process mimics, alarm, events, trends, SOE, reports including status of controllers, IO mapping, LAN & WAN communications etc.. as per MEW Engineer instructions.	Nos	2					
1.2	<u>Display Wall, Controller and related Software for Process and Video surveillance system</u> 2nos of <u>70" DLP with large screen station</u> with redundant Display wall controller and required hardware and Control room Management software configuration to display the Complete Process plant (D16&E13) signals and video surveillance system for the operations and visualize the real-time content. The software should be unlimited possibilities to control and manage displays sources and data to be available over the network and other work stations. The complete system should be latest (full HD, solid state (LED) illumination with rear projection, redundant LED-lit, and latest at the time of approval.	Item	1					
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SECTION 6		BILL OF QUANTITY NO. 5.2		Rehabilitation of existing remote sites -TIC & DCS Works					
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount			
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.3	Dual redundant fault tolerant DCS Server with enclosure including hardware & software with long term (min.3 years) data logging storage archive, historian, alarms, events, reports, Alarm management system, I/O's and OPC, etc.. to connect and configure into HMI device, DCS controllers, Engineering Stn, large screen stn, etc.. via. dual redundant F.O Ethernet TCP/IP LAN. Including the original software License. The price includes rack console (15" LED) Monitor and KVM Switch to connect and configure into redundant DCS server.	Set	1						
1.4	Engineering Station with 15" LED rack console type monitor including the required software to development/modify the DCS programme, process simulation, controller simulations, Simulation of I/O modules, Hart / PROFIBUS Devices, field bus device simulation/calibration and Process Modeling software and interface with third-party device, data and process dual F.O LAN including required hardware and software with original License.	Item	1						
1.5	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes.	Nos	2						
1.6	Industrial type Control console desk to monitor&control of towers, Re-arrange the existing Mosaic MIMIC into new control console providing new digital / bargraph indicators, volume indicators, LED lamps, Push buttons, Selector Keys, engraved mimic flow diagrams and alarm annunciator widows, etc.. fully hardwired logics, as per MEW Engineer Instruction, refer to tender drawing. Price Break down to be submitted for each item as per dwg. along with tender bid.	Item	1						
1.7	Hot/standby Fail-safe fault tolerant DCS Controller with enclosure including, dual redundant PSUs, CPUs, analogue & digital I/O modules, Communication modules, etc.. and 15"LED /HMI touch screen Industrial PC system with cabinet and inter-connect to redundant F.O LAN and Field device via. Field marshalling system.	Nos	2						
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SECTION 6		BILL OF QUANTITY NO. 5.2		Rehabilitation of existing remote sites -TIC & DCS Works					
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount			
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.8	Dual Redundant fiber optic TCP/IP LAN with distributed server architecture complete with required network accessories including redundant optical gigabit managed Ethernet network switches, routers (as per IEEE 802.3z Ethernet std), cable and accessories, to communicate with WAN remote control centre's to West Funitees and NCC(Shuwaikh) via. redundant fiber optic cables as a failsafe fault tolerant redundant ring network and Microwave radio system, as per spec and drawings. Note: LAN/ WAN network to be seperate and WAN switch/ Router for Fiber and MW Radio system to be as per Dwg no: WPD/6397/D16/I/03	Item	1						
1.9	Field Marshalling and interposing cabinet (FTA) to accommodate the complete signals. which includes isolated redundant field power supply units, fused terminals, circuit breakers with ELCBs, interposing relays (all digital signals), signal splitter/barrier (for all analogue signals), earth/shield bus bars, inter-connection cables to redundant DCS IO system cabinet, Mimic Panels, electrical equipments, field instrument, etc.. and fully hardwired logics.	Item	1						
1.10	Integrate, modify and configure the Electrical system, HVAC system, Fire alarm system to obtained the aux. contact for monitoring and control signals into redundant DCS system, including HMI workstations, mimics, alarms, SOE, event, trends, Report and logics etc. for monitoring and control of Electrical power distribution (SLD) system as per specification. (Refer more details into Electrical Spec, dwg and BoQs)	Item	1						
1.11	Necessary control room furniture's including suspension cushions high back chair (2 Nos) for each operator work stations and control consol, steel file cabinets (1) for storage of A1/A3 size drawings and documents, etc... to be provided as per MEW Engineer instructions.	Item	1						
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SECTION 6		BILL OF QUANTITY NO. 5.2		Rehabilitation of existing remote sites -TIC & DCS Works				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	Unit Price		Total Amount				
		KD	Fils	KD	Fils			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
	<u>Field Instrumentation at Jaleeb Al Shuyoukh Water Towers</u>							
	Design, Supply, Install, Calibrate, Cabling, Hook-up, Configure, Test and Commission of field instruments with latest technology as per spec and drawings for the followings items... the price includes instrument Tapping points, instrument stanchion, SS316L hookup impulse tubes, fillings, valves, and SS316L cable trays, covers, conduit with fitting accessories for the following..							
1.12	Pressure Transmitter. (PIT) smart with Hart protocol having local LCD display, mounting accessories, SS316L manifold and hook materials, as per spec.	Nos.	4					
1.13	Remote Mount Temperature Transmitter (TIT), Duplex Pt100/RTD with thermo well, as per specifications, including required tapping points.	Nos.	4					
1.14	Level transmitter (LIT) using differential pressure measurement method, Smart type with Hart Protocol, LCD volume display (install at ground floor GRP IHB), mounting accessories, SS316L manifold and hook materials, as per spec.	Nos.	16					
1.15	Level transmitter (Dp type) having Wireless HART, with extended antenna, rechargeable battery (min.10years,1 sec.scan rate at 80°C ambient), using the IEEE 802.15.4/ISA 100.11a std, radio operating at 2.4GHz, with fault tolerant redundant wireless gateway and integrate with the host DCS control system through Modbus TCP/IP connection, or HART port, and Modbus serial connection. which covers integration, device diagnostics, security and standardization on HART IP. The network range to be extended to cover the wireless device as fault tolerant mesh network /redundant communication routes to provide the crucial 99.99% reliability	Nos	8					
1.16	Differential Pressure Transmitter with Smart type (2 wire,24vDC,4-20mA) having Hart Protocol, built-in LCD display, with SS316L hookup, five manifold and mounting accessories, as per spec.	Nos.	2					
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SECTION 6		BILL OF QUANTITY NO. 5.2		Rehabilitation of existing remote sites -TIC & DCS Works					
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount			
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.17	Chamber flood level switches with IP68 SS316L Junction Box and cable Gland.	Nos.	40						
1.18	Electrical Actuators (retrofit- modify and install on the existing sluice and butterfly Manual valves), as per specifications.	Nos.	28						
1.19	Pressure Switch with SS316L Hookup materials, two way manifold and 2" pipe mounting accessories.	Nos.	8						
1.20	Differential Pressure Gauge with SS316L Hookup materials, five way manifold and 2" pipe mounting accessories.	No	2						
1.21	Electromagnetic flow meter complete with sensor and remote mounted transmitter with GRP IHB (600 x 600 x 500) as per spec.								
1.21.1	Ø 800 mm, pressure rating PN16 and flange drilling as per piping.	Nos.	2						
1.21.2	Ø 600 mm, pressure rating PN16 and flange drilling as per piping.	Nos.	2						
1.22	Design, Supply, Install of field Junction Boxes (GRP) with all accessories such as double compression type cable glands (SS316L), plugs, earth tags, shroud, nuts, bolts, with mounting accessories including 30% spare terminals, etc.. as per spec. and dwg. for the followings...								
1.22.1	Ditto...JB for Analogue (JBA)	Nos.	9						
1.22.2	Ditto...JB for Digital Signals (JBD)	Nos.	9						
1.22.3	Ditto...JB for Control Signals (JBC)	Nos.	8						
1.22.4	Ditto...JB for Electrical Signals (JBE)	Nos.	8						
1.23	Supply, install customized Portable ISO furnished GRP container/shelter, size 2.0mtr (L) x 1.5 mtr (W) x 2.5 mtr (H), With Patricians. The cabinet shall supply furnished ceilings, floors, Sliding windows, double doors, with heat insulation, filters, louvers, etc.. to protect heat, humidity, moisture and proper ventilation. The cabinet shall be provide with necessary accessories such as Power socket, split a/c, Fluorescent lighting, Wall mounted J-box, intercom phone to control room, door limit switches, temperature switches (hardwired to DCS), Stainless steel trays, R.C foundation, mounting frame with installation accessories, etc.. Install the location as shown on the drawings.	Nos.	9						
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Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount			
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.24	Supply and lay of U-PVC cable duct with all accessories, including trench excavation, compaction with screen sand, backfilling, and steel wired warning tape, polyethylene cable tiles, draw pits, route marker, etc. as per dwg and spec								
1.24.1	Ditto.. U-PVC cable duct 2" (50mm) OD, 3.0mm WT	Mtr	400						
1.24.2	Ditto.. U-PVC cable duct 4" (110mm) OD, 4.5mm WT	Mtr	850						
1.24.3	Ditto.. U-PVC cable duct 10" (250mm) OD, 6.0mm WT	Mtr	1,200						
1.25	Design, supply, lay, terminate the following I&C cables, as per the specifications and drawings.								
1.25.1	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V for Analogue and Digital signal cable	Mtr	2,100						
1.25.2	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V for Profibus Dp cable, incompliance with Profibus DP std.	Mtr	1,480						
1.25.3	Ditto..15pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V, for Analogue and Digital signal cable	Mtr	2,250						
1.25.4	Ditto..19corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	2,000						
1.25.5	Ditto..60corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	2,000						
1.25.6	Ditto..70corex1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	2,250						
1.26	Required civil modifications to renovate the existing control room including aluminium wall patricians upto ceiling for DLP Screens and panel room, and required modification to install control panels, including cable trench, ducts, painting, etc..to re-arrange the new and existing equipments as per the ergonomic study by the Specialists.	Item	1						
1.27	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the complete TIC System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
		<u>Saad Al-Abdullah (D14) Water Towers</u>							
		<u>Rehabilitation of existing D14 stn. Water Towers - TIC system</u>							
2.0	Site Survey, Engineering, Supply, transport to site, Installation, Cabling, Configuration, integrated factory acceptance test (IFAT), commissioning, SAT, training, maintenance and guarantee of Field instruments, Distributed Control system, Video surveillance system, VoIP and Telecommunication System at Saad Al-Abdullah (D14) Water Towers, monitoring and control at Local Control centre & Remote control centre's from Mutlaa High and National Control Centre Shuwaikh. for the following items;as per Dwg no: WPD/6397/D14/I/03. The scope includes dismantle the existing equipments and handover to MEW stores.								
2.1	Industrial type Process <u>Operator Work Stations</u> (OWS) with 24" dual head full HD LED Display Monitor, which includes dual HDMI inputs, Industrial functional keyboard, mouse, etc..including supply & install of ergonomic operator consoles. The OWS shall be latest model & configurations from OEM at the time of approval. The OWS shall integrate with DCS server via. redundant F.O TCP/IP Ethernet LAN (1000mbps) and configure the D16 & E13 Process mimics, alarm, events, trends, SOE, reports including status of controllers, IO mapping, LAN & WAN communications etc.. as per MEW Engineer instructions.	Nos	2						
2.2	<u>Display Wall, Controller and related Software for Process and Video surveillance system</u> 2nos of <u>70" DLP with large screen station</u> with redundant Display wall controller and required hardware and Control room Management software configuration to display the Complete Process plant (D16&E13) signals and video surveillance system for the operations and visualize the real-time content. The software should be unlimited possibilities to control and manage displays sources and data to be available over the network and other work stations. The complete system should be latest (full HD, solid state (LED) illumination with rear projection, redundant LED-lit, and latest at the time of approval.	Item	1						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.3	Dual redundant fault tolerant DCS Server with enclosure including hardware & software with long term (min.3 years) data logging storage archive, historian, alarms, events, reports, Alarm management system, I/O's and OPC, etc.. to connect and configure into HMI device, DCS controllers, Engineering Stn, large screen stn, etc.. via. dual redundant F.O Ethernet TCP/IP LAN. Including the original software License. The price includes rack console (15" LED) Monitor and KVM Switch to connect and configure into redundant DCS server.	Set	1						
2.4	Engineering Station with 15" LED rack console type monitor including the required software to development/modify the DCS programme, process simulation, controller simulations, Simulation of I/O modules, Hart / PROFIBUS Devices, field bus device simulation/calibration and Process Modeling software and interface with data and process dual F.O LAN including required hardware and software with original License.	Item	1						
2.5	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes.	Nos	2						
2.6	Industrial type Control console desk to monitor&control of towers, Re-arrange the existing Mosaic MIMIC into new control console providing new digital / bargraph indicators, volume indicators, LED lamps, Push buttons, Selector Keys, engraved mimic flow diagrams and alarm annunciator widows, etc.. fully hardwired logics, as per MEW Engineer Instruction, refer to tender drawing. Price Break down to be submitted for each item as per dwg. along with tender bid.	Item	1						
2.7	Hot/standby Fail-safe fault tolerant DCS Controller with enclosure including, dual redundant PSUs, CPUs, analogue & digital I/O modules, Communication modules, etc.. and 15"LED /HMI touch screen Industrial PC system with cabinet and inter-connect to redundant F.O LAN and Field device via. Field marshalling system.	Nos	2						
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SECTION 6		BILL OF QUANTITY NO. 5.2		Rehabilitation of existing remote sites -TIC & DCS Works				
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD
2.8	Dual Redundant fiber optic TCP/IP LAN with distributed server architecture complete with required network accessories including redundant optical gigabit managed Ethernet network switches, routers (as per IEEE 802.3z Ethernet std), cable and accessories, to communicate with WAN remote control centre's at West Funitees and NCC(Shuwaikh) via. redundant fiber optic cables as a failsafe fault tolerant redundant ring network and Microwave radio system, as per spec and drawings Note: LAN/ WAN to be seperate and WAN switch/ Router for Fiber and MW Radio system as per Dwg no: WPD/6397/D14/I/03	Item	1					
2.9	Field Marshalling and interposing cabinet (FTA) to accommodate the complete signals. which includes isolated redundant field power supply units, fused terminals, circuit breakers with ELCBs, interposing relays (all digital signals), signal splitter/barrier (for all analogue signals), earth/shield bus bars, inter-connection cables to redundant DCS IO system cabinet, Mimic Panels, electrical equipments, field instrument, etc.. and fully hardwired logics.	Item	1					
2.10	Integrate, modify and configure the Electrical system, HVAC system, Fire alarm system monitoring and control signals into redundant DCS system, including HMI workstations, mimics, alarms, SOE, event, trends, Report and logics etc. for monitoring and control of Electrical power distribution (SLD) system as per specification. (Refer more details into Electrical Spec, dwg and BoQs)	Item	1					
2.11	Necessary control room furniture's including suspension cushions high back chair (2 Nos) for each operator work stations and control consol, steel file cabinets (1) for storage of A1/A3 size drawings and documents, etc... to be provided as per MEW Engineer instructions.	Item	1					
2.12	Required civil modifications to renovate the existing control room including aluminium wall patricians upto ceiling for DLP Screens and panel room, and required modification to install control panels, including cable trench, ducts, painting, etc..to re-arrange the new and existing equipments as per the ergonomic study by the Specialists.	Item	1					
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		KD	Fils	KD	Fils		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	Field Instrumentation at Saad Al-Abdullah (D14) Water Towers						
	Design, Supply, Install, Calibrate, Cabling, Hook-up, Configure, Test and Commission of field instruments with latest technology as per spec and drawings for the followings items... the price includes instrument tapping points , instrument stanchion, SS316L hookup impulse tubes, fillings, valves, and SS316L cable trays, covers, conduit with fitting accessories for the following..						
2.13	Pressure Transmitter. (PIT) smart with Hart protocol having local LCD display, mounting accessories, SS316L manifold and hook materials, as per spec.	Nos.	2				
2.14	Remote Mount Temperature Transmitter (TIT), Duplex Pt100/RTD with thermo well, as per specifications., including tapping points	Nos.	2				
2.15	Level transmitter (LIT) using differential pressure measurement method, Smart type with Hart Protocol, LCD volume display (install at ground floor GRP IHB), mounting accessories, SS316L manifold and hook materials, as per spec.	Nos.	12				
2.16	Level transmitter (Dp type) having Wireless HART, with extended antenna, rechargeable battery (min.10years,1 sec.scan rate at 80°C ambient), using the IEEE 802.15.4/ISA 100.11a std, radio operating at 2.4GHz, with fault tolerant redundant wireless gateway and integrate with the host DCS control system through Modbus TCP/IP connection, or HART port, and Modbus serial connection. which covers integration, device diagnostics, security and standardization on HART IP.	Nos	6				
	The network range to be extended to cover the wireless device as fault tolerant mesh network /redundant communication routes to provide the crucial 99.99% reliability						
2.17	Differential Pressure Transmitter with Smart type (2 wire,24vDC,4-20mA) having Hart Protocol, built-in LCD display, with SS316L hookup, five manifold and mounting accessories, as per spec.	Nos.	1				
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.18	Chamber flood level switches with IP68 SS316L Junction Box and cable Gland.	Nos.	34						
2.19	Electrical Actuators (retrofit- modify and install on the existing sluice and butterfly Manual valves), as per specifications.	Nos.	25						
2.20	Pressure switch with SS316L Hookup materials, two way manifold and 2" pipe mounting accessories.	Nos.	6						
2.21	Differential Pressure Gauge with SS316L Hookup materials, five way manifold and 2" pipe mounting accessories.	No	1						
2.22	Electromagnetic flow meter, complete with sensor and remote mounted transmitter, as per spec. (replacement of existing flow meter with new, including the required modifications) Ditto..Ø800mm,PN16, flange Drilling as per existing piping. Note. This price includes new flanged piping spools engineering and fabrications to match new flow meter flange-to- flange dimensions.	Nos.	2						
2.23	Design, Supply, Install of field Junction Boxes (GRP) with all accessories such as double compression type cable glands (SS316L), plugs, earth tags, shroud, nuts, bolts, with mounting accessories including 30% spare terminals, etc.. as per spec. and dwg. for the followings...								
2.23.1	Ditto...JB for Analogue (JBA), min size. 600x600x450mm	Nos.	7						
2.23.2	Ditto...JB for Digital Signals (JBD), min size. 800x800x450mm	Nos.	7						
2.23.3	Ditto...JB for Control Signals (JBC) min size. 1200x800x450mm	Nos.	7						
2.23.4	Ditto...JB for Electrical Signals (JBE) min size. 1200x800x450mm	Nos.	7						
2.24	Supply, install customized Portable ISO furnished GRP container/shelter, size 2.0mtr (L) x 1.5 mtr (W) x 2.5 mtr (H), With Patricians. The cabinet shall supply furnished ceilings, floors, Sliding windows, double doors, with heat insulation, filters, louvers, etc.. to protect heat, humidity, moisture and proper ventilation. The cabinet shall be provide with necessary accessories such as Power socket, split a/c, Fluorescent lighting, Wall mounted J-box, intercom phone to control room, door limit switches, temperature switches (hardwired to DCS), Stainless steel trays, R.C foundation, mounting frame with installation accessories, etc.. Install the location as shown on the drawings.	Nos.	7						
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Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount			
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.25	Supply and lay of U-PVC cable duct with all accessories, including trench excavation, compaction with screen sand, backfilling, and steel wired warning tape, polyethylene cable tiles, draw pits, route marker, etc. as per dwg and spec								
2.25.1	Ditto.. U-PVC cable duct 2" (50mm) OD, 3.0mm WT	Mtr	300						
2.25.2	Ditto.. U-PVC cable duct 4" (110mm) OD, 4.5mm WT	Mtr	650						
2.25.3	Ditto.. U-PVC cable duct 10" (250mm) OD, 6.1mm WT	Mtr	750						
2.26	Design, supply, lay, terminate the following I&C cables, as per the specifications and drawings. <u>Instrument and actuator communication Cable</u>								
2.26.1	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V	Mtr	1,900						
2.26.2	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V for Profibus Dp cable, as per Profibus Dp std.	Mtr	1,500						
2.26.3	Ditto..15pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V	Mtr	2,200						
	<u>Control Cable -for MOV and Electrical Signals</u>								
2.26.4	Ditto..19corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V	Mtr	1,900						
2.26.5	Ditto..60corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V	Mtr	2,200						
2.26.6	Ditto..70corex1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	2,100						
2.27	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
			<u>Mutlaa Low (E15) WDC</u>						
			<u>Rehabilitation of existing Mutla Low WDC - TIC system</u>						
3.0	Site Survey, Engineering, Supply, transport to site, Installation, Cabling, Configuration, integrated factory acceptance test (IFAT), commissioning, SAT, training, maintenance and guarantee of Field instruments, Distributed Control system, Video surveillance system, VoIP and Telecommunication System at Mutla Low (E15) WDC, monitoring and control at Local Control centre & Remote control centre's from Mutlaa High and NRCC, National Control Centre Shuwaikh for the following. The price includes to dismantle of field and control room equipments and transport to MEW store.								
3.1	Industrial type Process <u>Operator Work Stations</u> (OWS) with 24" dual head full HD LED Display Monitor, which includes dual HDMI inputs, Industrial functional keyboard, mouse, etc.. supply & install on the ergonomic consoles. The OWS shall be latest model & configurations from OEM at the time of approval. The OWS shall integrate with DCS server via. redundant F.O TCP/IP Ethernet LAN (1000mbps) and configure the E14,E15,P18 Process mimics, alarm, events, trends, SOE, reports including status of controllers, IO mapping, LAN & WAN communications etc.. as per MEW Engineer instructions.	Nos		2					
3.2	<u>Display Wall, Controller and related Software for Process and Video surveillance system</u> 2nos of <u>70" DLP with large screen station</u> with redundant Display wall controller and required hardware and Control room Management software configuration to display the Complete Process plant (E14,E15,P18) signals and video surveillance system for the operations and visualize the real-time content. The software should be unlimited possibilities to control and manage displays sources and data to be available over the network and other work stations. The complete system should be latest (full HD, solid state (LED) illumination with rear projection, redundant LED-lit, and latest at the time of approval.	Item		1					
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
3.3	Dual redundant fault tolerant DCS Server with enclosure including hardware & software with long term (min.3 years) data logging storage archive, alarms, events, reports, Alarm management system, I/O's and OPC, etc.. to connect and configure into HMI device, DCS controllers, Engineering Stn, large screen stn, etc.. via. dual redundant F.O Ethernet TCP/IP LAN. Including the original software License. The price includes rack console (15" LED) Monitor and KVM Switch to connect and configure into redundant DCS server networks.	Set	1						
3.4	Engineering Station with 15" LED rack console type monitor including the required software to development/modify the DCS programme, process simulation, controller simulations, Simulation of I/O modules, Hart / PROFIBUS Devices, field bus device simulation/calibration and Process Modeling software and interface with data and process dual F.O LAN including required hardware and software with original License.	Item	1						
3.5	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes.	Nos	2						
3.6	Industrial type Ergonomic operator consoles and Control console desk to monitor&control of Reservoir including digital indicators, bargraph indicators, LED lamps, Push buttons, Selector Keys, engraved mimic flow diagrams and alarm annunciator widows, etc.. fully hardwired logics. The control room arrangement ergonomic study & designed to be done by the Specialists. The console desk including size, color and materials should be as per MEW Engineer Instruction. Price Break down to be submitted for each item as per dwg. along with tender bid.	Item	1						
3.7	Hot/standby Fail-safe fault tolerant DCS Controller with enclosure including, dual redundant PSUs, CPUs, analogue & digital I/O modules, Communication modules, etc.. and 15"LED /HMI touch screen Industrial PC system with cabinet and inter-connect to redundant F.O LAN and Field device via. Field marshalling system. Note. The OEM shall determine the required no. of DCS controller (but not less than the qty as specified in the BOQ) based on the I/O signals with 50% spare capacity in each controller.	Sets	2						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD
3.8	Dual Redundant fiber optic TCP/IP <u>LAN</u> with distributed server architecture complete with required network accessories including redundant optical gigabit managed Ethernet network switches, routers (as per IEEE 802.3z Ethernet std), cable and accessories, to communicate with WAN remote control centre's at P18&E14, NRCC and NCC(Shuwaikh) via. redundant fiber optic cables as a failsafe fault tolerant redundant ring network and Microwave radio system, as per spec and drawings.	Item	1					
3.9	<u>Field Marshalling and interposing cabinet (FTA)</u> to accommodate the complete signals. which includes isolated redundant field power supply units, fused terminals, circuit breakers with ELCBs, interposing relays (all digital signals), signal splitter/barrier (for all analogue signals), earth/shield bus bars, inter-connection cables to redundant DCS IO system cabinet, Mimic Panels, electrical equipments, field instrument, etc.. and fully hardwired logics.	Item	1					
3.10	Integrate, modify and configure the Electrical system, HVAC system, Fire alarm system monitoring and control signals into redundant DCS system, including HMI workstations, mimics, alarms, SOE, event, trends, Report and logics etc. for monitoring and control of Electrical power distribution (SLD) system as per specification. (Refer more details into Electrical Spec, dwg and BoQs)	Item	1					
3.11	Necessary control room furniture's including suspension cushions high back chair (3 Nos) for each operator work stations and control consol, steel file cabinets (1) for storage of A1/A3 size drawings and documents, etc... to be provided as per MEW Engineer instructions.	Item	1					
3.12	Required civil modifications to renovate the existing control room including aluminium wall patricians upto ceiling for DLP Screens and panel room, and required modification to install control panels, including cable trench, ducts, painting, etc..to re-arrange the new and existing equipments as per the ergonomic study by the Specialists.	Item	1					
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	<u>Rehabilitation of existing Mutla Low WDC - Field Instrumentations</u>								
	Design, Supply, Install, Calibrate, Cabling, Hook-up, Configure, Test and Commission of field instruments with latest technology as per spec and drawings for the followings items... the price includes instrument stanchion, tapping, SS316L hookup impulse tubes, fillings, valves, and SS316L cable trays, covers, conduit with fitting accessories for the following..								
3.13	Pressure Transmitter. (PIT) smart with Hart protocol having local LCD display, mounting accessories, SS316L manifold and hook materials, as per spec.	Nos.	2						
3.14	Remote Mount Temperature Transmitter (TIT), Duplex Pt100/RTD with thermo well, as per specifications.	Nos.	2						
3.15	Non-contact type radar Level transmitter (install on the roof of the reservoir inside GRP IHB), having smart type with Hart Protocol, LCD volume display, datalogger, mounting accessories.	Nos.	20						
3.16	Non-contact radar level transmitter having Wireless HART, with extended antenna, recharable battery (min.10years,1 sec.scan rate at 80°C ambient), using the IEEE 802.15.4/ISA 100.11a std, radio operating at 2.4GHz, with fault tolerant redundant wireless gateway and integrate with the host DCS control system through Modbus TCP/IP connection, or HART port, and Modbus serial connection. which covers integration, device diagnostics, security and standardization on HART IP.	Nos	10						
	The network range to be extended to cover the wireless device as fault tolerant mesh network /redundant communication routes to provide the crucial 99.99% reliability								
3.17	Chamber flood level switches with IP68 SS316L Junction Box and cable Gland.	Nos.	42						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
3.18	Electrical Actuators (retrofit- modify and install on the existing sluice and butterfly Manual valves), as per specifications.	Nos.	42						
3.19	Pressure Gauge with SS316L Hookup materials, two way manifold and 2" pipe mounting accessories.	Nos.	2						
3.20	Differential Pressure Gauge with SS316L Hookup materials, five way manifold and 2" pipe mounting accessories.	No	1						
3.21	Electromagnetic flow meter, complete with sensor and remote mounted transmitter, as per spec. (replacement of existing flow meter with new, including the required modifications)								
3.21.1	Ditto..Ø600mm,PN16, flange Drilling as per existing piping.	Nos	4						
	Note. This price includes new flanged piping spools engineering and fabrications to match for new flow meter flange-to- flange dimensions.								
3.22	Design, Supply, Install of field Junction Boxes (GRP) with all accessories such as double compression type cable glands (SS316L), plugs, earth tags, shroud, nuts, bolts, with mounting accessories including 30% spare terminals, etc.. as per spec. and dwg. for the followings...								
3.22.1	Ditto...JB for Analogue (JBA), min size. 600x600x450mm	Nos.	11						
3.22.2	Ditto...JB for Digital Signals (JBD), min size. 800x800x450mm	Nos.	11						
3.22.3	Ditto...JB for Control Signals (JBC) min size. 1200x800x450mm	Nos.	11						
3.22.4	Ditto...JB for Electrical Signals (JBE) min size. 1200x800x450mm	Nos.	11						
3.23	Supply, install customized Portable ISO furnished GRP container/shelter, size 2.0mtr (L) x 1.5 mtr (W) x 2.5 mtr (H), With Patricians. The cabinet shall supply furnished ceilings, floors, Sliding windows, double doors, with heat insulation, filters, louvers, etc.. to protect heat, humidity, moisture and proper ventilation. The cabinet shall be provide with necessary accessories such as Power socket, split a/c, Fluorescent lighting, Wall mounted J-box, intercom phone to control room, door limit switches, temperature switches (hardwired to DCS), Stainless steel trays, R.C foundation, mounting frame with installation accessories, etc.. Install the location as shown on the drawings.	Nos.	11						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
3.24	Supply and lay of U-PVC cable duct with all accessories, including trench excavation, compaction with screen sand, backfilling, and steel wired warning tape, polyethylene cable tiles, draw pits, route marker, etc. as per dwg and spec								
3.24.1	Ditto.. U-PVC cable duct 2" (50mm) OD, 3.0mm WT	Mtr	500						
3.24.2	Ditto.. U-PVC cable duct 4" (110mm) OD, 4.5mm WT	Mtr	6,000						
3.24.3	Ditto.. U-PVC cable duct 10" (250mm) OD, 6.0mm WT	Mtr	3,000						
3.25	Design, supply, lay, terminate the following I&C cables, as per the specifications and drawings. <u>Instrument and actuator communication Cable</u>								
3.25.1	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V	Mtr	10,000						
3.25.2	Ditto..1pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V for Profibus Dp cable, as per std.	Mtr	6,000						
3.25.3	Ditto..15pairx1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,indi&overall screened shielded, twisted Pair with aluminum foil, Rating 300/500V <u>Control Cable -for MOV and Electrical Signals</u>	Mtr	3,800						
3.25.4	Ditto..19corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC, 300/500V	Mtr	7,200						
3.25.5	Ditto..60corex2.5mm ² ,CU/XLPE/PVC/GSWA/PVC, 300/500V	Mtr	5,000						
3.25.6	Ditto..70corex1.5mm ² ,CU/XLPE/PVC/GSWA/PVC,Rating 300/500V, for MOV and Electrical Signals	Mtr	2,500						
3.26	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	<u>Subiya (E20) WDC</u>								
	<u>Rehabilitation of existing Subhiya SCADA and Telemetry system.</u>								
4.0	Site Survey, Engineering, Supply, integrated factory acceptance test (IFAT), transport to site, Installation, Cabling, Configuration, integration with existing system, commissioning, SAT, training, maintenance and guarantee of Distributed Control system at Subiya (E20) WDC, Local Control centre & Remote control centre's from Mutlaa High and National Control Centre Shuwaikh for the following. The price includes to dismantle of existing control room equipments and transport to MEW store. The scope includes to replacement of existing SCADA HMI equipments which includes Operator work stations, servers, access server, network switches, etc.. And providing the latest updated new DCS system HMI including new OWS, servers, gigabit Ethernet switches, printers, large screen stn. etc.. and integrate with existing PLCs/RTUs, Mimic, LCPs and Switch gear. The existing HMI graphics, alarm, SOE, report to be transferred to the new DCS HMI system, according to MEW Engineer instructions.								
4.1	Industrial type Process <u>Operator Work Stations</u> (OWS) with 24" dual head full HD LED Display Monitor, which includes dual HDMI inputs, Industrial functional keyboard, mouse, etc..including supply & install of ergonomic operator consoles. The OWS shall be latest model & configurations from OEM at the time of approval. The OWS shall integrate with DCS server via. redundant F.O TCP/IP Ethernet LAN (1000mbps) and configure the existing Process mimics, alarm, events, trends, SOE, reports including status of controllers, IO mapping, LAN & WAN communications etc.. as per MEW Engineer instructions.		Nos	3					
4.2	<u>Display Wall, Controller and related Software for Process and Video surveillance system</u> 4nos (2x2) of <u>70" DLP with large screen station</u> with redundant Display wall controller and required hardware and Control room Management software configuration to display the Complete Process plant signals and video surveillance system for the operations and visualize the real-time content. The software should be unlimited possibilities to control and manage displays sources and data to be available over the network and other work stations. The complete system should be latest (full HD, solid state (LED) illumination with rear projection, redundant LED-lit, and latest at the time of approval.		Item	1					
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4.3	Dual redundant fault tolerant DCS Server with enclosure including rack console (15" LED) Monitor, hardware & software with long term (min.3 years) data logging storage archive, historian, alarms, events, reports, Alarm management system, I/O's and OPC, etc.. to connect and configure into HMI device, DCS controllers, Engineering Stn, large screen stn, etc.. via. dual redundant F.O Ethernet TCP/IP LAN. Including the original software License.	Set	1						
4.4	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes.	Nos	2						
4.5	Modify and integrate with existing redundant PLCs/RTUs to communicate with new DCS system, which includes transfer all the existing SCADA logics and HMI graphics, SOE, alarms, reports, etc...into new DCS or provide Hot/standby Fail-safe fault tolerant DCS Controller with enclosure including, dual redundant PSUs, CPUs, analogue & digital I/O modules, Communication modules, etc.. and 15"LED /HMI touch screen Industrial PC system with cabinet and inter-connect to redundant F.O LAN and Field device via. Field marshalling system.	LS	LS						
4.6	Dual Redundant fiber optic TCP/IP LAN with distributed server architecture complete with required network accessories including redundant optical gigabit managed Ethernet network switches, routers (as per IEEE 802.3z Ethernet std), cable and accessories, to communicate with WAN remote control centre's at MH WDC, Subiya Desal and NCC(Shuwaikh) via. redundant fiber optic cables as a failsafe fault tolerant redundant ring network and Microwave radio system, as per spec and drawings.	Item	1						
4.7	Necessary control room furniture's including suspension cushions high back chair (4 Nos) for each operator work stations and control consol, steel file cabinets (1) for storage of A1/A3 size drawings and documents, etc... to be provided as per MEW Engineer instructions.	Item	1						
4.8	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
			<u>Jahara (D20) Water Towers</u>						
5	<p>The existing system at Jahara D20 stn are Siemens based S7-400H/ PCS7 DCS system are new and installed in the year of 2013. The scope of OEM/contractor to modify and integrate with existing DCS system to transfer the complete data base signals to the Mutla High WDC new DCS system, via. redundant F.O.Cable and MW Radio system for monitoring and control.</p> <p>The scope includes to integrate the Mutla High F.W and B.W Reservoir outlet flows, pressure, levels, valve status and pipeline leak alarm signals into existing D20 DCS system, which includes servers, Operator work stations, large screen stn, SOE and reports, etc, including license up gradation(if required).</p>	Item	1						
			<u>Jahara (D8) Water Towers</u>						
6	<p>The existing system at Jahara D8 stn are Siemens based S7-400H/ PCS7 DCS system are new and installed in the year of 2013. The scope of OEM/contractor to modify and integrate with existing DCS system to transfer the complete data base signals to the Mutla High /Low WDC new DCS system, via. redundant F.O.Cable and MW Radio system.</p>	Item	1						
			<u>Jahara (P18) Pumping stations</u>						
7	<p>The existing system at Jahara P18 stn are Siemens based S7-400H/ PCS7 DCS system are new and installed in the year of 2013. The scope of OEM/contractor to modify and integrate with existing DCS system to transfer the complete data base signals to the Mutla Low /High WDC new DCS system, via. redundant F.O.Cable and MW Radio system.</p> <p>The scope includes to configure the Mutla Low WDC outlet flows, Pressure, levels and valve status signals into existing P18 DCS system, which includes servers, Operator work stations, large screen stn, SOE and reports, including license up gradation(if required).</p> <p>Note. The integration / modification into the existing DCS system at D20, D8, P18 to be done by OEM.</p>	Item	1						
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		Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
8	<p align="center"><u>Doha- RO/DW Discharge Flowmeter Chamber</u></p> <p>Site Survey, Engineering, Supply, IFAT, transport to site, Installation, Cabling, Configuration, integration, commissioning, SAT, training, maintenance and guarantee of Process control Units at Doha RO/DW Discharge FM chamber control room for local monitoring and integrate with remote control centre at Mutlaa High, NRCC (Doha) and National Control Centre at Shuwaikh, via. F.O.Cable for the following items;</p> <p>Remote terminal unit (RTU) having redundant CPUs, PSUs, redundant I/O modules, communication modules, redundant managed Ethernet ring core network switches, redundant Isolated power supply units, etc.. With built-in 15" Industrial PC HMI touch screen monitor and enclosure with all accessories, to interconnect with field instruments via. FMC/Relay cabinet provided under RO Pipeline contract.</p> <p>Note:- The RTU shall be Vandal proof and tampering protection with Rugged Robust military grade construction to operate in extreme climates conditions such as high temperature (+85 °C), dust, sand storm, humidity, smoke, fog, rain, including all accessories such as Processor, PSU, I/O module, communication modules, Ethernet switches, etc..installed in the cabinet.</p>	Item	1						
9	<p align="center"><u>Northern Region Control Centre (Doha)</u></p> <p>Site Survey, Engineering, Supply, integrated factory acceptance test (IFAT), Installation, Cabling, Configuration, commissioning, training, maintenance and guarantee of Distributed Control system at NRCC to integrate with Mutla High to transfer/configure the data base signals into NRCC and NCC via. FOC and MW Radio system, the price includes for the following;</p>								
9.1	Industrial type Process Operator Work Stations (OWS) with 24" dual head full HD LED Display Monitor, will all accessories install on the new ergonomic operator consoles, and integrate/configure into LAN as per MEW Engineer instructions.	Item	1						
9.2	Two monochrome laser Printers and one color laser printer together with a printer console desk shall be installed at the control room to print alarm, SOE events of the plant processes.	Item	1						
9.3	Redundant fault tolerant Archive Server and network accessories including redundant managed gigabit Ethernet switches, routers, cables etc.. for LAN and to communicate with WAN remote sites at Mutla High and NCC Shuwaikh.	Item	1						
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				KD	Fils	KD	Fils
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	<u>National Control Centre at Shuwaikh</u>						
10	Integration with existing DCS HMI system including configuration of NR site signals into existing OWS, Servers, large screen stn, SOE, reports, etc.. via. redundant F.O.Cable and MW Radio system.	Item	1				
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Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	Unit Price		Total Amount			
		KD	Fils	KD	Fils		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	<u>COLLECTION SHEET</u>						
	<i>Total from Page No. 1</i>						
	<i>Total from Page No. 2</i>						
	<i>Total from Page No. 3</i>						
	<i>Total from Page No. 4</i>						
	<i>Total from Page No. 5</i>						
	<i>Total from Page No. 6</i>						
	<i>Total from Page No. 7</i>						
	<i>Total from Page No. 8</i>						
	<i>Total from Page No. 9</i>						
	<i>Total from Page No. 10</i>						
	<i>Total from Page No. 11</i>						
	<i>Total from Page No. 12</i>						
	<i>Total from Page No. 13</i>						
	<i>Total from Page No. 14</i>						
	<i>Total from Page No. 15</i>						
	<i>Total from Page No. 16</i>						
	<i>Total from Page No. 17</i>						
	<i>Total from Page No. 18</i>						
	<i>Total from Page No. 19</i>						
	<i>Total from Page No. 20</i>						
	<i>Total from Page No. 21</i>						
	<i>Total from Page No. 22</i>						
	<i>Total from Page No. 23</i>						
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			E14,E15,E20,D20,D14,D16,D8,P18,RO		Unit Price	Total Amount
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at <u>Mutla High (E14)- Jahara (D20) Water Towers - Saad Al-Abdullah (D14) Water Towers - Jahara (D8) Water Towers, Jahara (P18) Pumping stations, Mutla Low (E15) WDC, Doha RO FM chamber, Subiya (E20)- Monitored at each LCC and Remote control centre at Mutla High, NRCC (Doha) and NCC (Shuwaikh).</u> <u>Mutla High (E14) Water Distribution Complex</u>						
1.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/E14/I/06 To 09)	Nos	59				
1.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	15				
1.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	9				
1.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	7				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			E14,E15,E20,D20,D14,D16,D8,P18,RO		Unit Price	Total Amount
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	65				
1.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	65				
1.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions <u>Local Control Centre at Mutla High WDC</u> Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at <u>Mutla High (E14) and integrate with Jahara (D20) Water Towers - Saad Al Abdullah (D14) Water Towers - Jahara (D8) Water Towers - Jahara (P18) Pumping stations, Mutla Low (E15) WDC, Doha RO FM chamber, Subiya (E20) and Remote control centre at NRCC (Doha) and NCC (Shuwaikh) for monitoring and control.</u>	Mtr	24,300				
1.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialable from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
1.9	1X2 nos of 70" LED large screen station having full HD, solid state (LED) illumination with rear projection, (LED-lit rear project technology) in curve shape, redundant display wall controller,KVM switch, rack console monitor, enclosure, etc.. with required hardware and control room management software configuration to monitor & control the complete video surveillance System IP network cameras from LAN and WAN in HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	Nos	1				
1.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
1.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
1.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			E14,E15,E20,D20,D14,D16,D8,P18,RO		Unit Price	Total Amount
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Mutla Low (E15) Water Distribution Complex</u>							
2.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at <u>Mutla Low / Medium (E15) WDC and integrate with Mutla High LCC and Remote control centre's at NRCC (Doha) and NCC (Shuwaikh) for monitoring and control.</u>						
2.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/E15/I/06)	Nos	23				
2.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	6				
2.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	2				
2.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			E14,E15,E20,D20,D14,D16,D8,P18,RO		Unit Price	Total Amount
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	29				
2.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	29				
2.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	5,400				
2.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	No	1				
2.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
2.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
2.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Jahara (P18) Pumping Stations</u>							
3.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Jahara (P18) Pumping stations and integrate with Mutla Low/ High LCC and Remote control centre's at NRCC (Doha) and NCC (Shuwaikh) for monitoring and control.						
3.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/P18/I/04)	Nos	15				
3.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	1				
3.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	2				
3.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
3.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	16				
3.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	16				
3.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	3,200				
3.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (100Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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		Item	Descriptions	Unit	Q'ty	KD	Fils
3.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	No	1				
3.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
3.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
3.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Jahara (D8) Water Towers</u>							
4.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Jahara (D8) Water Towers and <u>integrate with Jahra (P18) Pumping stn. D20 and Mutla High LCC and Remote control centre's at NRCC (Doha) and NCC (Shuwaikh) for monitoring and control.</u>						
4.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/D8/I/04)	Nos	9				
4.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	1				
4.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
4.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
				KD	Fils	KD	Fils
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	10				
4.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	10				
4.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	2,200				
4.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	No	1				
4.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
4.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
4.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Jahara (D20) Water Towers</u>							
5.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Jahara (D20) Water Towers and <u>integrate with Mutla High LCC and Remote control centre's at NRCC (Doha) and NCC (Shuwaikh) for monitoring and control.</u>						
5.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/D20/I/04)	Nos	14				
5.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	2				
5.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
5.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system					
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils		
5.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	16						
5.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	16						
5.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	2,200						
5.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2						
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
5.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	Nos	1				
5.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
5.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
5.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Saad Al-Abdullah (D14) Water Towers</u>							
6.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Saad Al-Abdullah (D14) Water Towers and <u>integrate with Mutla High LCC and Remote control centre's at NRCC (Doha) and NCC (Shuwaikh) for monitoring and control.</u>						
6.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/D14/I/07)	Nos	10				
6.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	1				
6.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
6.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
6.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	11					
6.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	11					
6.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	2,200					
6.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2					
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
6.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	Nos	1				
6.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 15" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
6.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
6.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Jaleeb Al Shoukh (D16) Water Towers</u>							
7.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Jaleeb Al Shoukh (D16) Water Towers and <u>integrate with West Funitees and NCC (Shuwaikh) for monitoring and control.</u>						
7.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/D16/I/08)	Nos	7				
7.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	2				
7.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
7.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
7.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	10				
7.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	10				
7.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	2,200				
7.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
7.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	Nos	1				
7.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
7.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
7.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Doha RO/DW Discharge valve/FM chamber</u>							
8.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at <u>Doha RO Discharge chamber</u> and <u>integrate</u> with Mutla High and NRCC for monitoring and control.						
8.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	2				
8.2	Redundant Optical Managed gigabit Ethernet switches/Routers for LAN and to communicate WAN as a fault tolerant ring network to Mutla High control centre	Nos	2				
8.3	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Subiya (E20) WDC</u>							
9.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Subiya (E20) WDC (Replacing the existing analogue camera) and <u>integrate with Mutla High and NCC (Shuwaikh) for monitoring and control.</u> Note. The existing Camera Poles and Power cable shall be re-utilised to install the new IP network cameras. The existing equipments shall be dismantle handedover to MEW stores as per MEW Engineer instructions						
9.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..(Refer drawing: WPD/6397/E20/I/04)	Nos	11				
9.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	1				
9.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	2				
9.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	2				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	E14,E15,E20,D20,D14,D16,D8,P18,RO		Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
9.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundaation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	12				
9.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	12				
9.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	3,100				
9.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
9.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	No	1				
9.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
9.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
9.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Subiya (E20) Chemical Plant</u>							
10.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Subiya (E20) Chemical Plant including Chlorination system, Blending system, Lab, Analyser, control and electrical switchgear room, etc.. and <u>integrate with Mutla High chemcial control centre, CNCC-Chemcial National Control Centre (Shuwaikh) and existing (Axis) CCTV system at CNRCC/Doha for monitoring and control.</u>						
10.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	10				
10.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	2				
10.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	2				
10.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	1				
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				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
10.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	6					
10.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	6					
10.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored. Note. The Bidder shall refer the Site General Layout drawing, as a guideline. However the actual locations of cameras and cable route to be determine according to detailed survey and engineering to cover the entire complex and buildings. The quantity shall be re-measured as per site conditions	Mtr	1,200					
10.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2					
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
10.9	70" LED display monitor, smart HDTV ultra-slim narrow, crystal clear LED-lit picture, having full HD, with all required wall mounting accessories, to monitor & control the complete video surveillance System IP network cameras over LAN and WAN in full HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	Nos	1				
10.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	No	1				
10.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1				
10.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Mutla High (E14) Chemical Plant</u>							
11.0	Design, Supply, Install, Test, Commission and Maintenance of IP based Video surveillance security system at Mutla (E14) High Chemical Plant-I,II,III including Chlorination system, Lab, Analyser, control and electrical switchgear room, etc.. and <u>integrate with Mutla High chemical control centre, CNCC-Chemical National Control Centre (Shuwaikh) and existing (Axis) CCTV system at CNRCC/Doha for monitoring and control.</u>						
11.1	Perimeter security Outdoor Day/Night full HD Fixed Bullet type IP network Camera with high-intensity infrared (LEDs) which includes enclosures, powerful lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	27				
11.2	Outdoor PTZ HD Dome Network IP Camera with high-intensity infrared (LEDs) which includes enclosures, long range optical /zoom lenses, redundant power supplies, built-in dual SFP or High PoE ports, media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets, cables, etc.. Vandal proof and tampering protection with Rugged Robust constructions to operate in extreme climates conditions such as high temperature (+75 °C), dust, sand storm, humidity, smoke, fog, rain, light foliage and total darkness etc..	Nos	6				
11.3	Indoor type Fixed HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports OR f.o media convertor cum gigabit ring network switch having 4 xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	10				
11.4	Indoor type PTZ (pan-tilt-zoom/360°) camera HDTV IP network Dome camera which includes enclosures, powerful lenses, redundant power supplies, built-in High PoE ports, OR f.o media convertor cum gigabit ring network switch having 4xSFP, 2xPoE port, SD/SDHC/SCXC memory card, mounting brackets to install inside a/c building, cables, etc.. to operates in all weather conditions.	Nos	6				
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				KD	Fils	KD	Fils
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
11.5	Hot Dip Galvanized steel camera Pole (min. 6 mtr, no deflection during heady 50 m/s wind speed) including R.C Foundation, ss316 Bolt Nuts, Base Plate, sleeves, camera mounting accessories.	Nos	6				
11.6	GRP Junction Box (min size. 400x400x250mm /IP65) with sun shade, install at each camera pole including cable glands (ss316L, double compression type), shrouds, earth tags, f.o splicing tray, earthing busbar, terminal block, power isolator, redundant power supply units, PoE switches and terminate power, fiber, and earthing cables. Note. The electrical equipments installed inside GRP JB to be rated to ambient of +75°C	Nos	6				
11.7	Supply, lay, splice, test and commission of 4 core single mode high quality Fiber Optic cable having two loose tube, FRP, Ripcord, UV rated HDPE sheath, anti corrugated steel tape armored.	Mtr	1,200				
11.8	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model avialble from OEM at the time of approval. Note. One no. Operator Work Station with Ergonomic Operator consoles desk to be located at Guard room including intercomm to control room	Nos	2				
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SECTION 6		BILL OF QUANTITY NO. 5.3		Video Surveillance Security (CCTV) system				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)			Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
11.9	2nos x 70" DLP large screen station having full HD, solid state (LED) illumination with rear projection, (LED-lit rear project technology) in curve shape, redundant display wall controller,KVM switch, rack console monitor, enclosure, etc.. with required hardware and control room management software configuration to monitor & control the complete video surveillance System IP network cameras from LAN and WAN in HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations.,	NO	1					
11.10	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion. Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	NO	1					
11.11	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and core ring networks switches to communicate with network IP cameras (min. 10 ip multicast ring network switches, the bandwidth speed on each ring network not less than 1gbps). f.o patch panels, etc.. and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to remote control centre (as listed above)	No	1					
11.12	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1					
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
<u>Chemical Northern Region (CNRCC) Control Centre</u>							
12.0	Intergration of IP Based video surveillance system at Subhiya Chemical, Mutlaa High Chemical and CNCCC (Chemical National Control Centre) for monitoring and control						
12.1	Industrial type client operator work stations (OWS) with 24" dual head full HD LED Display/Monitor, with highest configurations in terms of processor speed, memory, hard drives, including required accessories such as keyboard, mouse, Joystick (PTZ) Controller, network (1000Base-T) adapter, Graphics, video (HDMI) and sound cards, multiple window, raid support, operating system, antivirus, etc.. latest model available from OEM at the time of approval.	Nos	2				
12.2	2nos x 70" DLP large screen station having full HD, solid state (LED) illumination with rear projection, (LED-lit rear project technology) in curve shape, redundant display wall controller,KVM switch, rack console monitor, enclosure, etc.. with required hardware and control room management software configuration to monitor & control the complete video surveillance System IP network cameras from LAN and WAN in HD stream live views in full resolution including full triplex operation to allow for simultaneous live or playback viewing and recording operations., Note. 1) The system to be designed in live views of all camera's in HD stream with full resolutions in 25fps directly from the IP LAN / WAN networks including full triplex operations to allow for simultaneous live or playback viewing of recorded operations. 2) The no. of windows per operator monitor screen to be designed to capturing the image of a person and identify the Facial Recognition 3) The complete wells and reservoirs camera's images including intruder alarms to be displayed into the monitors.	Nos	1				
12.3	Redundant Network video recorder (NVR with NVMS software), cabinet, KVM switch, 17" rack console monitor with internal storage to record all cameras in full HD resolutions with 25fps for 60 days . NVR shall have full triplex operations to allow for simultaneous live, Playback viewing and recording operations in full HD resolutions. Note. the storage shall provide 50% spare capacity for future expansion.	No	1				
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Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
12.4	Redundant Optical Ethernet TCP/IP LAN with distributed network architecture including redundant Managed gigabit Ethernet switches (to integrate with NVRs, client work stations, large screen stations, joystick, printers, HMI device) and WAN routers, switches, firewall to communicate with fault tolerant WAN ring to Subhiya Chemical, Mutla High Chemical and Chemical National Control Centre(CNCC) Shuwaikh	Item	1				
12.5	Any additional items are required, as specified in the Spec or drawings, not in BOQs, but required to complete & operate the CCTV complete System, as per MEW engineer satisfaction. (If any items are required, the details to be submitted along with tender bid)	Item	1				
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		Item	Descriptions	Unit	Q'ty	KD	Fils
<u>COLLECTION SHEET</u>							
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SECTION 6		BILL OF QUANTITY NO. 5.4			Telecommunication System			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	WAN-F.O.C and MW Radio sys		Unit Price		Total Amount		
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD
Fiber Optic Cable Communication System:-								
1.00	Site survey, supply, lay, splice, test and commission of single mode Optical Fiber Cable for the following sites to transfer the DCS data, Video surveillance, VoIP through WAN to remote control centres, the price includes cable trench excavation, disposal of surplus materials, compaction with Screen Sand and Back filling, including supply & install of steel wire warning tape, polyethylene cable tiles, warning tape, draw pits, marker post, splicing kit (IP68) and accessories etc.. and suitable for outdoor installation in direct buried in compliance ITU-T-G-652D, IEC 60794.1.1 and BS 7718 standard. Single Mode Fibers are designed to provide very low attenuation co-efficient, Low Polarization Mode Dispersion values (PMD), high bandwidth and long term reliability and operate at terabit high transmission rates, suitable for direct buried in more corrosive environmental and low resistivity soil.							
1.1	Ditto... 48 cores SM fibers, having 8 loose tube/6 fiber per tube, triple UV resistance HDPE sheath (2.0/1.8/1.4mm thick), double anti corrugated steel tape armored, FRP, aramide strength yarns, ripcords, water blocking tape, core wrapping, filler, gel filled tubes, etc.. <u>Mutla High (E14) WDC - Jahara (D20) Water Towers - Jahara (E16) Brackish Water Reservoir WDC- Saad Al-Abdullah (D15) Water Towers - Sulabiya Ground Water Control Centre -Jaleeb Al Shuyoukh (D16) water towers- West Funitees WDC</u>	Mtr	98000					
1.2	Ditto... 12 cores SM fibers, having 3 loose tube/4 fiber per tube, triple UV resistance HDPE sheath (2.0/1.8/1.4mm thick), double anti corrugated steel tape armored, FRP, aramide strength yarns, ripcords, water blocking tape, core wrapping, filler, gel filled tubes, etc.. between	Mtr	80000					
1.2.1	Mutla High (E14) WDC -to- Subiya (E20) WDC							
1.2.2	Jahara (D20) Water Towers -to- Saad Al-Abdullah (D15) Water Towers Note. Item 1.1 & 1.2, the redundant OFC cables shall be laid between both sides of the existing water pipeline reservation area for the following sites and terminate into ODF panels. The contractors responsibility to obtained the necessary approval for the reservation/construction works from concerned authority.							
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SECTION 6 BILL OF QUANTITY NO. 5.4				Telecommunication System				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	WAN-F.O.C and MW Radio sys		Unit Price		Total Amount		
		Item	Descriptions	Unit	Q'ty	KD	Fils	KD
2.0	Design, Supply, Install of fiber (ODF) optical distribution frame patch panel with 30% spare ports for the following sites which includes supply of splice tray, optical terminations, ST-FC connectors, cable glands, tags, GRP enclosure and mounting accessories, to interconnect into DCS, Video Surveillance and VoIP system via. LANs <u>Mutla High (E14)- Jahara (D20) Water Towers - Jahara (E16) Brackish Water Reservoir WDC- Saad Al-Abdullah (D15) Water Towers - Sulabiya Ground Water Control Centre - Jaleeb Al Shuyoukh (D16) water towers- West Funitees WDC and Subiya (E20) WDC -</u>	Nos	8					
3.0	Supply and Laying of HDPE cable duct Ø162mm OD, 6.3mm Wall thickness with all accessories, including trench excavation, compaction with screen sand, backfilling, steel wired warning tape, polyethylene cable tiles, draw pits, route marker, etc. as per dwg and spec. (Note:- Price break down for supply of materials and installation to be submitted along with tender bid)	Mtr	2,500					
4.0	Microtunnelling or direct pipe jacking Jacking for HDPE cable duct under the road crossing and pipeline crossing with all necessary accessories. <u>Microwave Radio Communication System:-</u>	Mtr	2,500					
5.0	Site Survey, Engineering, Supply, transport to site, Installation, Cabling, Configuration, integrated factory acceptance test (IFAT), commissioning, SAT, training, maintenance and guarantee of Telecommunication System between the following sites local control centre's and to remote control centre. Intergrate with LANs to WANs. Dwg no. WPD/6397/I/05 & 06 the price includes site survey and study of M.W Radio signal Propagation including Multi Path availability calculations, reflection analyses, frequency interference, antenna gains etc., to make as a failesafe and fault tolerant ring network topology between the sites. Microwave radio system includes IDU, ODU, Parabola Dish antenna with space diversity, full duplex, surge protector, connectors, cabinets, fiber optic cables, lightening protection and aviation lights with required mounting accessories, etc.. Which includes to integrate with local DCS system via. dual F.O. LAN.							
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SECTION 6		BILL OF QUANTITY NO. 5.4		Telecommunication System			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	WAN-F.O.C and MW Radio sys		Unit Price		Total Amount	
		Item	Descriptions	Unit	Q'ty	KD	Fils
5.1	Ditto.. Install at Mutla High WDC to communicate with E20, D14, D20, D8, P18, E15, E13, Doha	Nos	8				
5.2	Ditto.. Install at D14 to communicate with Mutla High WDC	No	1				
5.3	Ditto..Install at D20 to communicate with Mutla High WDC	No	1				
5.4	Ditto.. Install at D8 to communicate with Mutla High WDC	No	1				
5.5	Ditto.. Install at P18 to communicate with Mutla High WDC	No	1				
5.6	Ditto.. Install at E15 to communicate with Mutla High WDC	No	1				
5.7	Ditto.. Install at E20 to communicate with Mutla High WDC & NCC Shuwaik	Nos	2				
5.8	Ditto.. Install at D16 to communicate with West Funitees	Nos	1				
5.9	Ditto.. Install at NRCC to communicate with Mutla High	Nos	1				
5.10	Ditto.. Install at NCC Shuwaik to communicate with E20 Subhiya	Nos	1				
5.11	Ditto.. Modify the existing MW Radio system at Doha to route the data, video, VoIP from Doha to NCC shwaikh	Item	1				
5.12	Ditto.. Modify the existing MW Radio system at West Funitees to route the data, video, VoIP from Mutla High to NCC shuwaikh Via West Funitees	Item	1				
5.13	Ditto.. Modify the existing MW Radio system at NCC Shuwaik to route the data, video, VoIP from NCC to Mutla High Via West Funitees and Doha WDC	Item	1				
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SECTION 6		BILL OF QUANTITY NO. 5.4			Telecommunication System			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE II)	WAN-F.O.C and MW Radio sys		Unit Price		Total Amount		
		Unit	Q'ty	KD	Fils	KD	Fils	
<u>COLLECTION SHEET</u>								
<i>Total from Page No. 1</i>								
<i>Total from Page No. 2</i>								
<i>Total from Page No. 3</i>								
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Tenderer's Initial & Stamp

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
1.A ₁	<p><u>PROVISIONAL ITEM</u> <u>Under Water Type</u></p> <p>To design, supply, install, test / Commission/ hand-over the complete chlorine dioxide (ClO₂) producing bromate free potable water disinfection system including chemical storage tanks, unloading pump, Dosing pumps, water storage tanks, submerged under water type, chlorine dioxide generators, operation / control and electrical panels.</p> <p>Chlorine dioxide plant should be designed to disinfect maximum water production as follows:</p> <p>Group "A" = 120MIGD Group "C" = 100MIGD Group "B" = 100MIGD Group "D" = 75MIGD</p> <p>at MAX. dosage rate of 0.8mg/l of ClO₂. The plant should be complete with ventilation, air conditioning system, fire detection system, chemical drainage system & safety equipments for required Chlorine dioxide generating plant. The plant should be in accordance with tender specification & drawings, including selection & sizing of equipments, storage tanks, piping, hydraulic calculation, system PID's, Isometric, cross section etc.</p> <p>ClO₂ generating/dosing system and related facilities should be designed to operate /control whole ClO₂ system from local control panels, MAN/AUTO, Local/Remote, MIMIC / DAC system as per tender specifications.</p> <p>Scope of work fully covers requirement of design criteria and specification for treating water production (as mentioned in general scope of work)</p>	Item	LS				
1.A ₂	<p><u>PROVISIONAL ITEM</u> <u>Under Vacuum Type</u></p> <p>To design, supply, install, test / Commission/ hand-over the complete chlorine dioxide (ClO₂) producing bromate free potable water disinfection system including chemical storage tanks, unloading pump, Dosing pumps, water storage tanks, under vacuum type, chlorine dioxide generators, operation / control and electrical panels.</p> <p>Chlorine dioxide plant should be designed to disinfect maximum water production as follows:</p>	Item	LS				
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<p>Group "A" = 120MIGD Group "C" = 100MIGD Group "B" = 100MIGD Group "D" = 75MIGD</p> <p>at MAX. dosage rate of 0.8mg/l of ClO₂. The plant should be complete with ventilation, air conditioning system, fire detection system, chemical drainage system & safety equipments for required Chlorine dioxide generating plant. The plant should be in accordance with tender specification & drawings, including selection & sizing of equipments, storage tanks, piping, hydraulic calculation, system PID's, Isometric, cross section etc.</p> <p>ClO₂ generating/dosing system and related facilities should be designed to operate /control whole ClO₂ system from local control panels, MAN/AUTO, Local/Remote, MIMIC / DAC system as per tender specifications.</p> <p>Scope of work fully covers requirement of design criteria and specification for treating water production (as mentioned in general scope of work)</p>						
1.A ₃	<p>Operation & Control of existing site#1 chlorination plant should be transferred to new chlorine dioxide building (control room) in same terms of operation / control in all respect.</p> <p>Required chlorine dioxide system and existing chlorination plant should be operated / controlled from New ClO₂ building (control room) (Break down for this item is required)</p>	Item	LS				
2	<p><u>Operation & Maintenance of Required ClO₂ Plant:</u> Contractor should operate and maintain the required ClO₂ generating / dosing plant complete with spare parts needed during maintenance for a period of two years(Twenty four) 24 months starting from the date of handing-over to client. Operation of ClO₂ plant will be 24 hours daily on shifts basis (Mor. Afr. Night) each shift should have 2 operators for a period of two years (Twenty four) 24 months as mentioned above. (Break down for this item is required.)</p>	Item	LS				
3	<p><u>Guarantee</u> All supplied and installed materials, equipments& other accessories of the ClO₂ generation /dosing plant should be guaranteed for a period of two years (Twenty Four) 24</p>	Item	LS				
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	months starting from date of handing-over the required plant. Guarantee shall be comprehensive and against any defect arising from defective design materials / equipments or work man ship. Item no 3 includes guarantee period of operation & maintenance for item no 2.						
4	<u>Raw Chemical materials quantities required.</u> a. Sodium chlorite 25% food grade. b. Hydrochloric Acid 32% food grade. For Two years (24 months) Operation period of ClO ₂ generation /dosing system. The amount (quantities) of sodium chlorite 25% & Hydrochloric acid 32% required for maximum dosage rate (0.8 mg/l) of ClO ₂ at maximum water production Group "A" = 120MIGD Group "C" = 100MIGD Group "B" = 100MIGD Group "D" = 75MIGD should be supplied in non-returnable plastic IBC's (Cains) suitable for transferring raw chemicals (HCl & NaClO ₂) via loading pumps to chemical storage tanks, by contractor. (Included in tender).	Item	LS				
5	Spare parts as mentioned in tender specification to be provided.	Item	LS				
6	Dilution water supply from 4Nos of 1200mm dia (R.O potable water) ductile iron pipelines from inlet chamber complete with D.I pipe-work & alternative water supply tie-in. Complete pipe-works with existing motive water line 300mm dia D.I pipeline up to dilution water tanks ClO ₂ generating/dosing units as mentioned in tender specification & drawings.	Item	LS				
7	<u>ClO₂ Generating / Dosing pipe- Works (UPVC/CPVC)</u> All pipe-work required for ClO ₂ generating /dosing system up to ClO ₂ injection points on inlet & outlet lines of reservoirs inside injection/sampling chambers complete in all respect as mentioned tender specifications & drawings.	Item	LS				
8	Chlorine dioxide generating/dosing 8Nos of skids (4 duty/4 standby) for each groups of water production streams complete in all respect as mentioned in tender specifications. (Break down for this item is required.)	Item	LS				
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
9	<u>R.C. trenches, Pump foundation & R.C basements</u> All R.C trenches with removal GI steel covers for ClO ₂ injection /sampling & motive water lines from ClO ₂ unit up to injection points in inlet/outlet lines (R.C chambers) as shown on tender drawings. All civil works required for constructions R.C foundation & basement for pump reagent tanks, water tanks & related system equipments as per tender specifications & drawings.	Item	LS				
10	<u>Dilution Water cooling system for ClO₂ generator (provisional item)</u> Air cooled chiller unit (heat exchange type) required for cooling the dilution water temperature for 50°C to 25°C used in ClO ₂ generator system as per tender specification & drawings (For technical specifications, refer to HVAC tender specification)	Item	LS				
11	<u>Electrical Works</u> To design, Supply Install, test / commission hand-over the required electrical equipments / accessories as mentioned in tender specification.	Item	LS				
12	<u>Instrumentation/Control work</u> To design, supply, install, test/ commission hand-over complete scope of work as mentioned in tender specifications.	Item	LS				
13	<u>Sampling system:</u> Design supply install, test, commission of (1Duty/1standby) sample pumps on RO potable water lines, FW subiya lines, Mutla to west funaitees lines, & Doha to Mutla High, Jahra & Abdaly water lines complete with pumps consisting of inlet for sampling tapping point and out pipelines to analyzer& laboratory sink fittings, drains, vents, suction/discharge motorized valves, flow/pressure switches, isolating valves pressure gauges etc. with all required accessories complete with MAN/AUTO operation from local control panel and remote MIMIC & DAC system as per tender specifications & drawings No. of Pumps inlet RO lines: (Pre/post-sampling) =16Nos Inlet subiya FW lines =12 Nos Outlet C4 west funaitees lines = 12 Nos Inlet/Outlet Mutla High to Jahra - Abdaly& Doha =12Nos	Item	LS				
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
14	<u>ClO₂ analyzer</u> Online ClO ₂ analyzers/monitor/transmitter measuring system complete with sample-Pipe-work for sample probe, pumps, analyzers, and sample sink laboratory taps, flow regulator. Fitting, valves etc. complete scope of work As per tender specification	26No	LS				
15	Design supply, install, test & commission (1 duty /1 standby) sump pump set in RO inlet of (injection, sampling & water take-off) chambers, ClO ₂ generator room & pump room. The complete pumps consisting of discharge pipe-lines to drainage system, pipe-work, fitting valves, float switches with Auto/MAN operation from local control panel and Remote /MIMIC & DAC system as per tender specification.	5 Set	LS				
16	<u>Raw Chemicals (NaClO₂&HCl) and ClO₂ Neutralization drainage system</u> Complete scope of work as mentioned in tender specification	Item	LS				
17	<u>Tie-in work on injection, sampling & motive water take-off points</u>						
a	Tie-in work on sampling injection & motive water take-off point should be complete with material & pipe-work in all respect as mentioned in tender specifications & drawings.	Item	LS				
b	Tie-in work for ClO ₂ injection points in proposed & existing chambers to be completed with valves, pipe-work & related accessories in all respect, as per tender specification						
c	Interlock facility should be provided between existing chlorination and proposed chlorine dioxide system relating injection sequence in lines of "group B" subiya, "Group C" West funaitees & "Group D" Jahra / Abdaly. Complete operation/control for existing chlorine injection & proposed ClO ₂ injections with control/status selection facility for these injections system to be provided with operation /control status in LCP (HMI)/Alarm annunciation, MIMIC/DAC. One water disinfection system should run at a time (existing						
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
18	chlorination or proposed chlorine dioxide injection facility for above mentioned groups of water lines). Water flow signal for inlet & outlet lines of reservoirs should be provided on main LCP /MIMIC /DAC in liter per second including (complete scope of work from field equipments, flow transmitter to control panel) with complete interface to proposed ClO ₂ system	Item	LS				
19	<u>LAB EQUIPMENTS & LAB FURNITURE:</u>						
I)	<u>Specification for Lab Equipments</u>						
A	<u>Conductivity meter (Latest Model)</u> <ul style="list-style-type: none"> - Conductivity instrument with touch control , can measure Conductivity , Total Dissolved Solids and Temperature - Five – ring measuring technique for conductivity measurements - Ideal measurements range = (0.005 to 100 ms/cm - Cell constant = 1 cm-1 - Temperature sensor = pt1000 - With magnetic stirrer - Adapter 4 x B(4mm) / plug N (Connection of conventional conductivity measuring cell) - Standard conductivity solution - The instrument with all accessories and connections which needed for operation and measurements - (The instrument include: Supply, Testing, Installing, commission and operation, consumable and spare parts, maintenance and warranty for 2 years start from the day of operation) <p>Note: The instrument should have factory calibration certificate, manual, C.D or software. Manufacturer should be approved by MEW</p>	2					
B	<u>pH Meter(Latest Model)</u> <ul style="list-style-type: none"> - The instrument with touch control with electrode - iTrode - the built in memory chip allows the storage of such important sensor data as article and serial numbers , calibration data , calibration history , working life and calibration validity period - The instrument also can use as ion meter by ISE - Potential range: -1200 to +1200mV - Temp. Resolution: 0.1 °C - pH range: -13 to + 20 - pH resolution: 0.001 PH 	2					
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
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Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<ul style="list-style-type: none"> - Automatic electrode test - Remote stirrer control with magnetic stirrer - USB connection for printer, sample processors, barcode readers etc., - MSB connection for stirrer, dosing devices - Buffer solution (4,7, 9) each 1 (1000ml) – filling solution if needed for the pH electrode. - The instrument with all accessories and connections which needed for operation and measurements (The instrument include: Supply, Testing, Installing, commission and operation, consumable and spare parts, maintenance and warranty for 2 years start from the day of operation) <p>Note: The instrument should have factory calibration certificate, manual, C.D or software. Manufacturer should be approved by MEW</p>						
C	<p><u>UV-VIS Spectrophotometer (Latest model)</u></p> <ul style="list-style-type: none"> - Optics: Double beam with wavelength range 190 to 1100 nm - Operation mode: transmittance (%), Absorbance and Concentration (Wavelength and time) - Source Lamp: Tungsten (Visible range) Deuterium (UV range) - Wavelength reproducibility:< 0.1 nm - Wavelength resolution: 0.1 nm - Optics: Double beam with wavelength range 190 to 1100 nm - Operation mode: transmittance (%), Absorbance and Concentration (Wavelength and time) - Source Lamp: Tungsten (Visible range) Deuterium (UV range) - Wavelength reproducibility:< 0.1 nm - Wavelength resolution: 0.1 nm - Wavelength Selection: Automated based on method selection - Spectral bandwidth: 2 nm – Scanning speed: 900 nm/min (in 1 nm steps) - Photometric Accuracy: 5 m Abs at 0.0 – 0.5 abs - Photometric Linearity: 0.005 – 2 Abs (≤ 0.01 at ≥ 2 Abs with neutral glass at 546 nm) - Preprogramed Method: ≥ 250 - The System should have RFID Technology (Automatic Avoid Error) - User programs: ≥ 200 	2					
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
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Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
D	<ul style="list-style-type: none"> - Application software: Drinking water analysis, the instrument can measure chlorine dioxide in water with range (0.0 to 1000 mg/l) with different conc. Methods - All chemicals which needed for the chlorine dioxide analysis in water by Chlorophenol Red method range 0.01 – 1.0 mg/l (set / 100) should enough ≥ 2000 test,(Expiration date more than 2 years from date of installing). - The instrument with all accessories and connections which needed for operation and measurements <p>(The instrument include: Supply, Testing, Installing, commission and operation, consumable and spare parts, maintenance and warranty for 2 years start from the day of operation)</p> <p>Note: The instrument should have factory calibration certificate, manual, C.D or software. Manufacturer should be approved by MEW</p> <p><u>Gas Chromatograph (Latest model)</u></p> <p>Fully automated GC with programmable pneumatic control. The oven gives excellent temperature control and fast cool- down times for maximum productivity.</p> <ul style="list-style-type: none"> - The oven provides higher heat – up rates in defined temperature ranges to a maximum of 140 °C / min PSS – Programmable split / split less capillary injector 50 °C TO 500 °C in 1 °C increments - Columns for halo acetic acid analysis, Trihalomethane by (ppt / ppb) with ECD Detector with minimum detectable quantity < 0.05 pgperchloroethylene with argon / methane or nitrogen. - Detection range: Trihalomethane (0.0 to 1 ppm) - Halo acetic acid (0.0 to 1 ppm) - Ling- term battery backup of GC methods, auto-sampler programs, flow and temp. – Calibration data. - Software calibration of oven temp. And carrier gas flow with PPC. - Full instrument control via external computer with high specifications with hp laser jet printer. - Five stored methods and baseline compensation, Power 230 V 50 Hz 	1					
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<ul style="list-style-type: none"> - The instrument with all accessories and connections which needed for operation and measurements (The instrument include: Supply, Testing, Installing, commission and operation, consumable and spare parts, maintenance and warranty for 2 years start from the day of operation) <p>Note: The maintenance should done each 3 months</p> <ul style="list-style-type: none"> - All consumable and spare parts chemicals standard (Expire date more than 2 years from the date of installing) for 2 years should delivered with the instrument - Chemicals and Standard for sample, calibration and testing for measuring (Trihalomethane and halo aceticacids) ≥ 2000 test. for each one - All chemicals for sample preparations and preservatives which needed. - Sample vials with caps for testing samples and standards ≥ 2000 - All consumable and spare parts chemicals standard (Expire date more than 2 years) for 2 years should delivered with the instrument. - Details procedure for detecting the above mentioned elements (Trihalomethane and halo aceticacids) by IC to be submitted with during bidding <p>The instrument should have factory calibration certificate, manual, C.D or software. Manufacturer and spare parts and consumable list should be approved by MEW</p>						
E	<p><u>Ion Chromatograph (Latest model)</u></p> <ul style="list-style-type: none"> - For analysis of anions and cations in water range (ppb / ppm) for analysis especially (bromate , chlorate , chlorite , bromide) for simultaneous analysis of anion and cations for the same sample - Complete ion chromatograph system with two pumps , Degassers , auto-sampler (for not less than 150 sample rack) , Carbon dioxide removal , auto injector , two column , oven , two conductivity detectors , free reagents, column thermostat , leak detection system , Inline filter , inline ultra-filtration , inline eluent production Advance version software (latest version of computer with high specification with LaserJet printer) for data reviewing 	1					
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount		
				KD	Fils	KD	Fils	
	<ul style="list-style-type: none"> - Sample pre-treatment filters. - The instrument with all accessories and connections which needed for operation and measurements <p>(The instrument include: Supply, Testing, Installing, commission and operation, consumable and spare parts, maintenance and warranty for 2 years start from the day of operation)</p> <p>Note: The maintenance should be done each 3 months</p> <ul style="list-style-type: none"> - Chemicals and Standard for calibration and testing for measuring ≥ 2000 test. for anion and cation. - Sample vessels with caps for testing samples and standards ≥ 2000 - All chemicals for preservatives which needed. - All consumable and spare parts chemicals standard (Expire date more than 2 years from the date of installing) for 2 years should delivered with the instrument - Details procedure for detecting the above mentioned elements (bromate, bromide, chlorate, chlorite) by IC to be submitted with during bidding with range detection as below for each : Bromate: 0 - 200 ppb Chlorate: 0- 2000 ppb Chlorite: 0 - 2000 ppb Bromide: 0 - 2 ppm - The Instrument can detect 2 ppb bromate std in presence of 150 ppm from chloride ion - The instrument can detect 5 ppb from chlorate in presence of 500 ppb from bromide. - The instrument should have factory calibration certificate, manual, C.D or software. - Manufacturer and spare parts and consumable list should be approved by MEW 							
F	<p><u>Pocket Colorimeter II Analysis System :</u></p> <p>Chlorine dioxide DPD method (0.05 to 5.00mg/l, with reagent set (100 tests) manual and carrying case. USEPA approval/accepted for drinking water including all spare parts. Additional reagent set (300 tests) on 24 hours basis for a period of 2 years testing and operation of ClO₂ plant.</p>	4	Item	LS				
TOTAL CARRIED TO SUMMARY								

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
II)	<u>Project: MEW - Mutla Chemical Lab Furniture:</u>						
1)	WALL BENCH (ZONE1 LAB POS 01) Dim: 13090x750x900 mm COMPOSED BY: <u>SPECIAL ITEMS</u> - 1.00X Angle Cover Panel - 1.00X Support <u>SERVICE GALLERY</u> - 2.00X Vertical profiles of services gallery for basic wall frame - 1.00X Vertical profiles of services gallery for additional wall frame - 6.00X Vertical profiles of services gallery for additional wall frame - 1.00X Trunking Splashback PVC for MK sockets - 8.00X Double BS electrical sockets MK for electrical trunking - 9.00X Double data MK for electrical trunking <u>CABINETS</u> - 8.00X Fixed Furniture on plinth, With 4 drawers - 3.00X Fixed Furniture on plinth, With 1 door and 1 internal shelf. - 5.00X Fixed Furniture on plinth, With 1 door and 1 internal shelf. - 1.00X Fixed Furniture on plinth, With 2 doors and one internal shelf - 2.00X Fixed Furniture on plinth for sink, With 2 doors. - 1.00X OVERHEAD CABINET Dim.: 900 mm length x 370 mm depth x 750 mm height 900 mm length. With double glass sliding doors and 1 internal shelf adjustable in height. - 3.00X OVERHEAD CABINET Dim.: 1200 mm length x 370 mm depth x 750 mm height 1200 mm length.	Item	LS				
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<p>With double glass sliding doors and 1 internal shelf adjustable in height.</p> <ul style="list-style-type: none"> - 5.00X OVERHEAD CABINET With double blind doors and 1 internal shelf Dim: 1200 mm length x 390 mm depth x 750 mm height <p><u>SINKS</u></p> <ul style="list-style-type: none"> - 2.00X Polypropylene Sink with one bowl and one drainer on the left. For bench 750 mm depth. - 1.00X DURCON WORKTOP, 19 mm thickness, black color. <p><u>FLUID SERVICES</u></p> <ul style="list-style-type: none"> - 2.00X Single handle mixed water tap for sink - 4.00X Gas tap to be Fixed on worktop - 2.00X Movable laboratory emergency eyewash, deck-mounting single head to be fixed on worktop. <p><u>MISCELANEOUS</u></p> <ul style="list-style-type: none"> - 3.00X Anti-Splash Side Trespa Screen - 1.00X Anti-Splash Side Trespa Screen - 2.00X Anti-Splash Trespa Back Panel <p>2) WALL BENCH (POS 02)</p> <p>Dim.: 3250x750x900 mm</p> <p>COMPOSED BY:</p> <p><u>PROVISIONAL PRODUCTS</u></p> <ul style="list-style-type: none"> - 1.00X Service cover panel, epoxy, with plinth of x mm. Long <p><u>SERVICE GALLERY</u></p> <ul style="list-style-type: none"> - 1.00X Trunking Splashback PVC for MK sockets - 2.00X Double BS electrical sockets MK for electrical trunking - 2.00X Double data MK for electrical trunking <p><u>CABINETS</u></p> <ul style="list-style-type: none"> - 2.00X Fixed Furniture on plinth With 4 drawers - 1.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. 						
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
3)	<ul style="list-style-type: none"> - 1.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. <p><u>WORKTOP AND SPLASHBACK</u></p> <ul style="list-style-type: none"> - 1.00X DURCON WORKTOP, 19 mm thickness, Black Color - For bench 750 mm depth. <p><u>FLUID SERVICES</u></p> <ul style="list-style-type: none"> - 2.00X Gas tap to be Fixed on worktop <p>ISLAND BENCH (POS 03)</p> <p>Dim.: 3690x1500x900 mm</p> <p>COMPOSED BY:</p> <p><u>SPECIAL ITEMS</u></p> <ul style="list-style-type: none"> - 1.00X Gallery on worktop - 1.00X Back Panel for sink <p><u>PROVISIONAL PRODUCTS</u></p> <ul style="list-style-type: none"> - 4.00X Service cover panel, epoxy, with plinth of x mm. Long - 1.00X Side Panel in Epoxy <p><u>SERVICE GALLERY</u></p> <ul style="list-style-type: none"> - 1.00X Vertical profiles of services gallery for basic island frame - 1.00X Vertical profiles of services gallery for additional island frame - 8.00X Shelf of 1200 mm length x 225 mm depth - 1.00X Basic island service drop <p><u>CABINETS</u></p> <ul style="list-style-type: none"> - 2.00X Fixed Furniture on plinth, Mod. MZ6-104. With 4 drawers - 4.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. - 4.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. - 1.00X Fixed Furniture on plinth for sink With 2 doors. <p><u>SINKS</u></p> <ul style="list-style-type: none"> - 1.00X Polypropylene sink with one bowl and two drainers on both sides. 	Item	LS				
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<p><u>WORKTOP AND SPLASHBACK</u></p> <ul style="list-style-type: none"> - 2.00X DURCON WORKTOP, 19 mm thickness, Black Color - For bench 750 mm depth. <p><u>FLUID SERVICES</u></p> <ul style="list-style-type: none"> - 1.00X Single handle mixed water tap for sink - 2.00X Gas tap to be Fixed on worktop, 2 ways 180° - 1.00X Movable laboratory emergency eyewash, deck-mounting single head to be fixed on worktop. <p><u>MISCELANEOUS</u></p> <ul style="list-style-type: none"> - 1.00X Trespa Screen Anti-Splash Mod. VPT-CE-1500 						
4)	<p>ISLAND BENCH (POS04)</p> <p>Dim: 3690x1500x900 mm</p> <p>COMPOSED BY:</p> <p><u>SPECIAL ITEMS</u></p> <ul style="list-style-type: none"> - 1.00X Gallery on worktops - 1.00X Back Panel for Sink <p><u>PROVISIONAL PRODUCTS</u></p> <ul style="list-style-type: none"> - 4.00X Service cover panel, epoxy, with plinth of x mm. Long - 1.00X Side Panel in Epoxy <p><u>SERVICE GALLERY</u></p> <ul style="list-style-type: none"> - 1.00X Vertical profiles of services gallery for basic island frame - 1.00X Vertical profiles of services gallery for additional island frame - 8.00X Shelf of 1200 mm length x 225 mm depth - 1.00X Basic island service drop <p><u>CABINETS</u></p> <ul style="list-style-type: none"> - 2.00X Fixed Furniture on plinth With 4 drawers - 4.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. - 4.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. 	Item	LS				
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<ul style="list-style-type: none"> - 1.00X Fixed Furniture on plinth for sink With 2 doors. <p><u>SINKS</u></p> <ul style="list-style-type: none"> - 1.00X Polypropylene sink with one bowl and two drainers on both sides. <p><u>WORKTOP AND SPLASHBACK</u></p> <ul style="list-style-type: none"> - 2.00X DURCON WORKTOP, 19 mm thickness, Black Color For bench 750 mm depth. <p><u>FLUID SERVICES</u></p> <ul style="list-style-type: none"> - 1.00X Single handle mixed water tap for sink - 2.00X Gas tap to be Fixed on worktop, 2 ways 180° - 1.00X Movable laboratory emergency eyewash, deck-mounting single head to be fixed on worktop. <p><u>MISCELANEOUS</u></p> <ul style="list-style-type: none"> - 1.00X Trespa Screen Anti-Splash Mod. VPT-CE-1500 						
5)	<p>FUME HOOD, Latest Model (POS. 05)</p> <p>Dim: 1500 mm width x 810 mm depth x 2300/2500 mm height</p> <p>COMPOSED BY:</p> <p>Exterior:</p> <ul style="list-style-type: none"> - Fire resistant Fume Hood (classified AS2 according to fire resistance Standard) - Double wall type Fume Hood upper part. - Exterior front column removable for access to fixtures - Exterior side panels of 16 gauge (1,5 mm) in epoxy powder coated finish removable to provide convenient access to service fixtures - Right and Left columns are factory prepared for up to 10 service fixture sand up to 6 electrical receptacles - Area surrounding sash opening angled to create aerodynamic configuration - Exhaust duct collar 250 mm I.D - Two tube florescent light fixture pre-wired to generate 500 Lux minimum on work surface - Fume hood instruction label: attached to a corrosion resistant instruction plate to the fume Hood exterior <p><u>FUME HOOD - accessories</u></p> <ul style="list-style-type: none"> - 1.00X Extraction Fan in Polypropylene,phase, ...V, 	One	Item				
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<p>...Hz of 1HP, 0,55 kw, 1500 r.p.m</p> <ul style="list-style-type: none"> - 1.00X Wall Support for Fan - 1.00X PVC Flexible Duct 250 mm diameter - 1.00X - Upper Closer Panel for Fume Hood - 1.00X Acid and Alkali base cabinets. Dim. 600mm and/or 900mm wide. <ul style="list-style-type: none"> - External case steel epoxy coated. - Interior Polypropylene lining. - Extraction for base cabinet. - 1.00X Upper body of double wall type of fire proof zinc coated steel (1,5mm Thk) with interior lining of high chemical protection ADIPROL® finish and outer wall of steel epoxy powder coated. <ul style="list-style-type: none"> - High fire, heat, flame resistant A2s1d0. - Area surrounding sash opening angled to create aerodynamic configuration and convenient airflow to inside. - Removable lighting cage in case of over pressure in the interior. - Condensation collection system. - Exterior side panels removable to provide convenient access to service fixture. - Right and Left columns are factory prepared for up to 10 service fixtures and up to 6 electrical receptacles. - Two tube fluorescent light fixture pre-wired to generate 500 Lux minimum on work surface. IP65 protection. Exhaust duct collar 250 mm I.D. - 1.00X Dished surface epoxy resin worktop including polypropylene drip cup Sealed to hood lining using a suitable silicone compound. - 1.00X 5 mm (3/16") thick tempered Fixed framed safety glass sash <ul style="list-style-type: none"> - Safety Sash Counter Balance System to retain the full weight of the counter weight in the event of cable breakage - Full length, recessed sash pull integral to the sash frame - Aerodynamic sash opening design 						
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<ul style="list-style-type: none"> - 1.00X Airflow safety control panel (pre-wired) composed by : Exhaust fan switch with pilot light. - Light switch. <ul style="list-style-type: none"> - Flow level light indicator: green-normal airflow, yellow-caution, red-low flow. - Low flow visual and audible alarm. - Internal temperature controller with visual and audible alarm and alert message (fire prevention). - Sash high visual and audible alarm. - Silence reset button. - (Com port) calibration and configuration panel connection. - Indicator display for electrical failure, over opening sash, etc...with alert and/or recommendations digital messages. - SAI system to power outages. - 1.00X Revolving water tap with ceramic head cartridge. - 1.00X Gas tap with ceramic head cartridge. - 1.00X Compressed air tap with ceramic head cartridge. - 1.00X Vacuum tap. Remote controlled service. - 1.00X Fan electrical line protection with switch breaker IIIx380V. - 4.00X Pre-wired 13A British electrical outlets, (included electrical outlets line protection with switch breaker) - 1.00X Extraction connection for storage cabinet (to exhaust system of fume hood). 						
6)	<p>WALL BENCH (POS. 06)</p> <p>Dim: 9940x750x900 mm</p> <p>COMPOSED BY:</p> <p><u>PROVISIONAL PRODUCTS</u></p> <ul style="list-style-type: none"> - 2.00X Service cover panel, epoxy, with plinth of x mm. Long - 2.00X Service cover panel, epoxy, with plinth of x mm. Long <p><u>SERVICE GALLERY</u></p> <ul style="list-style-type: none"> - 1.00X Vertical profiles of services gallery for basic wall frame 	Item	LS				
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<ul style="list-style-type: none"> - 1.00X Vertical profiles of services gallery for basic wall frame - 2.00X Vertical profiles of services gallery for additional wall frame - 1.00X Vertical profiles of services gallery for additional wall frame - 1.00X Trunking Splashback PVC for MK sockets - 5.00X Double BS electrical sockets MK for electrical trunking - 5.00X Double data MK for electrical trunking <p><u>CABINETS</u></p> <ul style="list-style-type: none"> - 4.00X Fixed Furniture on plinth With 4 drawers - 3.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. - 3.00X Fixed Furniture on plinth With 1 door and 1 internal shelf. - 1.00X Fixed Furniture on plinth for sink With 2 doors. - 5.00X OVERHEAD CABINET With 2 Doors and Internal Shelf Dim: 900 mm length x 390 mm depth x 750 mm height 900 mm length. With double blind doors and 1 internal shelf adjustable in height. - 3.00X OVERHEAD CABINET Dim.: 1200 mm length x 370 mm depth x 750 mm height 1200 mm length. With double glass sliding doors and 1 internal shelf adjustable in height. <p><u>SINKS</u></p> <ul style="list-style-type: none"> - 1.00X Polypropylene Sink with one bowl and one drainer on the right. <p><u>WORKTOP AND SPLASHBACK</u></p> <ul style="list-style-type: none"> - 1.00X DURCON WORKTOP, 19 mm thickness, black color. <p><u>FLUID SERVICES</u></p> <ul style="list-style-type: none"> - 1.00X Single handle mixed water tap for sink - 2.00X Gas tap to be Fixed on worktop - 1.00X Movable laboratory emergency eyewash, deck- 						
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	mounting single head to be fixed on worktop. - 1.00X Anti-Splash Side Trespa Screen <u>MISCELANEOUS</u> - 1.00X Anti-Splash Side Trespa Screen 7) WALL BENCH(POS. 07) Dim: 3200x750x720 mm COMPOSED BY: <u>SPECIAL ITEMS</u> - 1.00X Support - Left Side - 1.00X Support - Right Side - 1.00X Angle Cover Panel - 1.00X Support <u>PROVISIONAL PRODUCTS</u> - 2.00X Service cover panel, epoxy, with plinth of x mm. Long <u>FRAMES</u> - 1.00X Ending Panel for wall bench (PVC) <u>SERVICE GALLERY</u> - 1.00X Vertical profiles of services gallery for basic wall frame - 1.00X Trunking Splashback PVC for MK sockets - 2.00X Double BS electrical sockets MK for electrical trunking - 2.00X Double data MK for electrical trunking <u>CABINETS</u> - 1.00X Fixed Furniture on plinth With 1 door and internal shelf. For bench 720mm high - 1.00X Fixed Furniture on plinth With 1 door and internal shelf. For bench 720mm high - 2.00X OVERHEAD CABINET Dim.: 1200 mm length x 370 mm depth x 750 mm height 1200 mm length. With double glass sliding doors and 1 internal shelf adjustable in height.	Item	LS				
	TOTAL CARRIED TO SUMMARY						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.L.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 6 : BILL OF QUANTITIES FOR CHLORINE DIOXIDE PLANT

Item	Description	Qty.	Unit	Rate		Amount	
				KD	Fils	KD	Fils
	<p><u>WORKTOP AND SPLASHBACK</u> 1.00X DURCON WORKTOP, 19 mm thickness, Black Color For bench 750 mm depth. 1.00X DURCON WORKTOP, 19 mm thickness, black color.</p>						
8)	<p>GLASS DISPLAY CABINET(POS. 08) Dim: 1200 mm length x 450 mm depth x 2000 mm height Glass sliding doors in upper part and blind doors in lower part. Lock in sliding and blind doors. 1 No.</p>	Item	LS				
9)	<p>8X Swivel Stool(POS. 09)</p>	Item	LS				
10)	<p>1X Emergency Shower / Eye wash stay open valves ABS shower head and bowl, to be fixed on the wall.</p>	Item	LS				
III)	<p>Recommended Spare Parts for Furniture by manufacturer for 2 years period of maintenance (Break down for this item to be submitted)</p> <p><u>NOTES:</u> For any Lump-Sump Item Section-6 B.O.Q. No-1 break down for these to be submitted.</p>						
TOTAL CARRIED TO SUMMARY							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS AND OPERATIONS & MAINTENANCE SECTOR	SECTION-6, BILL OF QUANTITY NO. 6, CHLORINE DIOXIDE PLANT

COLLECTION

Item	DESCRIPTION	TOTAL AMOUNT	
		KD	FILS
	Total from Page 1		
	Total from Page 2		
	Total from Page 3		
	Total from Page 4		
	Total from Page 5		
	Total from Page 6		
	Total from Page 7		
	Total from Page 8		
	Total from Page 9		
	Total from Page 10		
	Total from Page 11		
	Total from Page 12		
	Total from Page 13		
	Total from Page 14		
	Total from Page 15		
	Total from Page 16		
	Total from Page 17		
	Total from Page 18		
	Total from Page 19		
	Total from Page 20		
	Total		

SECTION 6		BILL OF QUANTITY NO. 7			ENVIRONMENTAL EFFECT			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE			
					Unit Rate		Total Amount	
Item	Description	Unit	Qty	KD	Fils	KD	Fils	

1	Rate for submission of comprehensive study report about the direct impact of the project on the surrounding environment, through one of the consultant offices approved by the Environmental Public Authority (EPA) to be submitted to MEW for approval, within three months from the date of handing over the site.	LS	LS				
	<u>Provisional Item :</u>						
1.1	Charges for the action towards the direct impact if any found during the comprehensive study on the surrounding environment as mentioned in the above no .1	LS	LS				

TOTAL CARRIED TO COLLECTION PAGE							
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MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS AND OPERATIONS & MAINTENANCE SECTOR	SECTION-6, BILL OF QUANTITY NO.7, ENVIRONMENTAL EFFECT

COLLECTION

Item	DESCRIPTION	TOTAL AMOUNT	
		KD	FILS
	<u>Collection</u>		
	Total from Page 1		
	Total		

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

**CONSTRUCTION AND MAINTENANCE OF 5 NOS.
R.C.GROUND RESERVOIRS(55 MIG EACH) FOR FRESH
WATER AND ANNEXED WORKS AT MUTLA HIGH STAGE –II.**

BILL OF QUANTITY- MECHANICAL SERVICES

- A. HVAC WORKS
- B. WATER SUPPLY
- C. DRAINAGE
- D. FIRE PROTECTION
- E. OVER HEAD CRANE

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Spec sref.	Item	Description	Unit	Qty.	Unit Rate		Total Price	
					KD.	Fils	KD.	Fils
		Supply, installation, maintenance and guarantee as specified.						
3.1	1	Air-cooled packaged chiller complete with all accessories.	Nos.	2				
3.2	2	Chilled water pumps with VFD as specified.	Nos.	2				
3.3	3.	Double skin air handling units with VFD and all accessories as specified and as given in schedule of equipments:-						
	3.1	G AHU –01	No.	1				
	3.2	G AHU – 02	No.	1				
	3.3	G AHU – 03	No.	1				
	3.4	G AHU – 04	No.	1				
	3.5	F AHU –01	No.	1				
	3.6	F AHU – 02	No.	1				
	3.7	AHU – 01	No.	1				
	3.8	AHU – 02	No.	1				
	3.9	AHU – E (weatherproof)	No.	1				
	3.10	F/A – AHU	No.	1				
		Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
4	Chilled water fan coil units	Nos.	8				
5	Mini-Split A/C Units.	Nos.	1				
6	Closed expansion tank (Diaphragm tank).	No.	1				
7	Exhaust and Supply fans as specified: -						
7.1	WEF-01 & 02	Nos.	2				
7.4	REF – 01	No.	1				
7.5	REF – 02	No.	1				
7.6	DEF – 01 &02	Nos.	2				
7.7	DEF – 03	No.	1				
7.8	DEF – 04	No.	1				
7.9	DEF – 05	No.	1				
7.10	DEF – 06	No.	1				
7.10	DSF – 01	No.	1				
7.11	DSF – 02	No.	1				
7.12	DSF – 03	No.	1				
7.13	DSF – 04	No.	1				
8	Design, supply and install automatic chilled water treatment system complete with all accessories and controls.	L.S	L.S				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
9.	Chilled Water Pipes complete with fittings, flanges/unions/couplings of the following sizes: -						
9.1	8" dia.	M	40				
9.2	6" dia.	M	190				
9.3	4" dia.	M	265				
9.4	3" dia.	M	60				
9.5	2.5" dia	M	150				
9.6	2" dia.	M	90				
9.7	1½"dia.	M	20				
9.8	1¼" dia.	M	40				
9.9	1" dia.	M	115				
10	Insulation as specified and 0.6 mm thick aluminium cladding for chilled water pipes including all fittings and valves in the respective lines as given below : -						
10.1	8" dia.	M	40				
10.2	6" dia.	M	190				
10.3	4" dia.	M	265				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1. HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
10.4	3" dia.	M	60				
10.5	2½" dia	M	150				
10.6	2" dia.	M	90				
10.7	1½" dia.	M	20				
10.8	1¼" dia.	M	40				
10.9	1" dia.	M	115				
11	Air Separator 6" dia.	No.	1				
12	Flexible connectors for Pumps and Chillers 6" dia.	Nos.	8				
13	Y-type strainers for pumps 6" dia.	Nos.	2				
14	Y-Type Strainers for A/H Units and FCUS: -						
14.1	2.5" dia.	Nos.	1				
14.2	2" dia.	No.	7				
14.3	1.5" dia.	No.	1				
14.4	1" dia.	No.	8				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
15	DRV Valve with pressure tapplings for flow measurement and balancing: -						
15.1	6" dia	Nos.	4				
	2.5" dia	Nos.	1				
15.5	2" dia.	No.	7				
15.6	1½"dia.	No.	1				
	1" dia (for 8 FCUs)	No.	8				
16	Electronic flow measuring device common for all the DRV valves (to be from the manufacturer of DRV valves).	No.	1				
17	Two-way modulating control valves with actuator (to be supplied by the Building Automation Sub-contractor):-						
17.1	2.5" dia	Nos.	1				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
17.2	2" dia	Nos.	7				
17.3	1.5"dia	Nos.	1				
17.4	1" dia.	Nos.	8				
18	Two-way motorized shut off valves with actuator (to be supplied by the Building Automation Sub-contractor): -						
18.1	6" dia.	Nos.	2				
19.	Two way motorized modulating valve (To be supplied by BAS sub- contractor)						
19.1	6" dia	No.	1				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
20	Check (NR) valves 6" dia.	Nos.	2				
21.	Butterfly / Isolating valves: -						
21.1	6" dia	Nos.	8				
21.2	3" dia	Nos.	5				
21.3	2" dia	Nos.	35				
21.4	1.5" dia	Nos.	5				
21.5	1" dia	Nos.	24				
22	Blank						
23	Blank						
24	¾" dia automatic air vents complete with ¾" dia. Isolating valves.	Nos.	30				
25	Pressure gauges with cocks and piping.	Nos.	26				
26	Thermometers Stem type.	Nos.	22				
27	GI Drain lines with P-Traps for all AHUs, FCUs, Pumps, Chillers, Tanks and all other equipment.	L.S	L.S				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
28	GI ducting complete with fittings and supports.	Kg.	19477				
29	Insulation and cladding as mentioned below: -						
29.1	Insulation 2" thick	M ²	480				
29.2	Insulation 1" thick acoustic lining	M ²	480				
29.3	Aluminum cladding 0.6 mm thick with 2" frame	M ²	524				
29.4	1" thick insulation for ducts in air conditioned areas	M ²	2332				
30	Flexible connectors for all air-handling units (Air side)	L.S	L.S				
33	Demand controlled ventilation system consisting of controller, CO ₂ monitors, motorized dampers (to be supplied and installed by BAS Sub-contractor).	L.S	L.S				
34	Design, supply and installation of smoke ventilation system consisting fans, fire dampers and controls with all accessories to the approval of KFD.	L.S	L.S				
35	VAV Boxes shut off types of various sizes with thermostat and necessary controls.	No s.	12				
36	Square ceiling supply diffusers: -						
36.1	12" x 12"	No s.	47				
36.2	9" x 9"	No s.	42				
36.3	6" x 6"	No s.	25				
36.4	15" x 15"	No.	4				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
37	Supply Jet diffusers: -						
37.1	14" Dia	Nos.	16				
38	Supply Air Register						
38.1	18" x 8"	Nos.	4				
38.2	16" x 10"	Nos.	6				
38.3	18" x 6"	Nos.	2				
38.4	18" x 10"	Nos.	5				
39	Return air grills as mentined below:						
39.1	20" x 12"	No.	8				
39.2	12" x 6"	Nos.	9				
39.3	12" x 8"	No.	1				
39.4	24" x 12"	Nos.	18				
39.5	36" x 24"	Nos.	9				
39.6	20" x 18"	Nos.	24				
39.7	16" x 12"	Nos.	3				
39.8	30" x 6"	Nos.	1				
39.9	12" x 10"	Nos.	16				
39.10	16" x 14"	Nos.	2				
39.11	18" x 12"	Nos.	2				
40	<u>EAG</u>						
40.1	12" x 6"	Nos.	2				
40.2	9" x 6"	Nos.	4				
40.3	6" x 6"	Nos.	6				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
41	D/G (Door Grill)						
41.1	12" x 12"	Nos.	6				
42	<u>Fresh air louver with VCD</u>						
42.1	42" x 60"	Nos.	1				
42.2	54" x 64"	Nos.	1				
42.3	42" x 44"	Nos.	1				
42.4	60" x 52"	Nos.	2				
43	Heavy Duty Sand Louver with VCD						
43.1	60" x 54"	Nos.	1				
43.2	30" x 54"	Nos.	1				
43.3	42" x 66"	Nos.	2				
43.4	42" x 36"	Nos.	1				
43.5	24" x 12"	No.	1				
43.6	24" x 18"	Nos.	4				
44	<u>4" thick metallic Filter</u>						
44.1	42" x 36"	No.	1				
44.2	24" x 12"	No.	1				
44.3	24" x 18"	No.	4				
Total carried to summary Page							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A1.HVAC WORKS – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fil s	KD.	Fil s
45	Sand louver with 4" metallic cleanable filter for transformer room.(4 nos. 1M x1M).	M ²	4				
46	Sand louver (Heavy Duty) with 4" thick metallic cleanable filter for G AHU-03 (24" x 12").	No.	1				
47	Sand louver (Heavy Duty) with 4" thick metallic cleanable filter for G AHU-04 (24" x 18").	No.	1				
48	Sand louver (Heavy Duty) with 4" thick metallic cleanable filter for F/A AHU (42" x 36").	No.	1				
49	Sand louver (Heavy Duty) with 4" thick metallic cleanable filter for AHU-01 (24" x 18").	No.	1				
50	Sand louver (Heavy Duty) with 4" thick metallic cleanable filter for AHU-02 (24" x 18").	No.	1				
51	Sand louver (Heavy Duty) with 4" thick metallic cleanable filter for AHU_E (24"x18").	No.	1				
52	Return air canopy with wire meswh for all AHUs.	M2	10				
53	Fire dampers for the project as required by K.F.D.	L.S	L.S				
54	Fiber glass shade around the chillers to protect the condenser coil from direct sun and to prevent short circuit of condenser discharge air as shown in drawing.	M ²	130				
55	Testing, and balancing of chilled water and air distribution sytems by MEW approved 3 rd party specialist sub-contractor.	L.S	L.S				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

Item	Description	Unit	Qty	Unit Rate		Total Price	
				KD	Fils	KD	Fils
56	Any other item required but not mentioned above to complete the HVAC system fully operational. State below the details and price. i) ii) iii) iv)	L.S	L.S				
	Total carried to summary Page						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A 2. HVAC WORKS – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
1.	Supply and installation of Packaged A/C Units complete with return air Filters, duct heater and thermostat as specified and as shown in drawing:						
a)	PAC - 01: Electrical and Control building Roof.	No.	1				
b)	PAC - 02:Electrical and Control building Roof.	No.	1				
c)	PAC - 03:Electrical and Control building Roof.	No.	1				
d)	PAC – 04: Electrical and Control Building Roof.	No.	1				
e)	PAC – 05: Substation.	No.	1				
f)	PAC – 06: Reservoir S/S.	No.	1				
2.	Supply and installation of Exhaust Fans duty as indicated in the technical schedules.						
a)	WEF -01 & 02	Nos.	2				
b)	Duct mounted axial fans DEF-01 & 02	Nos.	2				
c)	Roof mounted exhaust fans REF -01	No.	1				
	REF -02	No.	1				
3.	Supply and installation of necessary GI ducting for A/C Units.	Kg.	9500				
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A 2. HVAC WORKS – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
4.	Supply and installation of necessary supply air registers, diffusers, return air grilles, exhaust air grilles and door grilles.						
4.1	Supply Air registers:						
a)	18" x 6"	Nos.	5				
b)	12" x 6"	Nos.	8				
4.2	Square Ceiling diffusers:-						
a)	9" x 9"	Nos.	142				
b)	6" x 6"	Nos.	18				
4.3	Return Air Grilles: -						
a)	36" x 12"	Nos.	4				
b)	24" x 12"	Nos.	4				
4.4	Exhaust Air Grilles: -						
a)	36" x 12"	Nos.	4				
4.5	Door Grille 12"x 12" for toilets and Kitchen	Nos.	10				
5.	2" thick Fiberglass insulation for A/C ducts exposed to outside.	M ²	233				
6.	1" thick Fiberglass insulation for A/C ducts running inside the building.	M ²	1226				
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A 2. HVAC WORKS – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
7.	1" thick accoustic lining for all supply and return A/C ducts exposed to outside.	M ²	233				
8.	22 gauge aluminium sheet cladding for exposed A/C ducting.	M ²	218				
9.	Flexible connection for A/C Units and fans.	L.S	L.S				
10.	Supply and installation and fresh air sand louvers, VCD and Filters: -						
10.1	Sand Louvers with VCD: -						
a)	40" x 40" for TR room	Nos.	4				
b)	24" x 12"	No.	1				
c)	12" x 12"	No.	1				
d)	24" x 18"	Nos.	4				
10.2	Exhaust Louvers						
a)	40" x 40"for TR room	Nos.	2				
10.3	2" thick metallic cleanable filters:						
a)	40" x 40"for TR room	Nos.	4				
10.4	4" thick metallic cleanable filters:						
a)	24" x 18"	No.	4				
b)	24" x 12"	Nos.	1				
c)	12" x 12"	No.	2				
10.5	Sand louver with 2" thick filters for D/G room.	M ²	28				
11.	Provide 2" dia. GI drain pipe with P-Traps for A/C Units.	L.S	L.S				
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

A 2. HVAC WORKS – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
12.	Mini-Split Units MS-01 to MS-07.	Nos.	7				
13.	Electrical works including controls for A/C units, exhaust and Supply fans connecting to the power source.	L.S	L.S				
14.	Temperature control system of rooms served by PAC-04 including but not limited to the following :-						
14.1	Motorised Control dampers.	Nos.	10				
14.2	Motorised bypass damper.	No.	1				
14.3	Temperature sensor and controller for motorised dampers	Nos.	10				
14.4	Pressure sensor and controller for bypass dampers.	No.	1				
14.5	Main board , cabling and all other accessories for the temperature control system.	L.S	L.S				
15.	Builders works including reinforced floating foundations for A/C Units and all exhaust fans, cutting and opening on walls, floors and roof, and sleeves for all openings where ducts and pipes pass through, and making good all openings by sealing and water proofing.	L.S	L.S				
16.	Any other item required, but not mentioned above to complete the A/C works (include below its price). (1) (2) (3)						
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

B.1 WATER SUPPLY – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
1.	Design, supply and install cold and hot water supply system to the approval of the engineer including but not limited to the following: GRP panel type water tank 3x2x2M, complete with SS 316 reinforcement inside, SS 316 internal ladder, GRP manhole cover, 1" dia float valve, fitting, supply overflow, drain and vent connections, external galvanized steel ladder, supports, .. etc.	No.	1				
3.	Packaged potable water booster Set as specified.	No.	1				
4.	Central Water filter as specified.	No.	1				
5.	Central water heater as specified	No.	1				
6.	Hot water circulating pump as specified	No.	1				
7.	Type A water cooler SS body with cooling coil outside storage tank as specified with water filter.	Nos.	2				
8.	Central water heater in chemical building.	Nos.	1				
9.	Water meter 1½" size in filling line.	No.	1				
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

B.1 WATER SUPPLY – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
10.	Conventional drinking water filter British Berkefeld or equal in kitchen.	Nos.	2				
11.	Polybutylene pipes complete with fittings and supports:						
	1) 2" dia	M	75				
	2) 1½" dia	M	25				
	3) 1¼" dia	M	90				
	4) 1" dia	M	260				
	5) ¾" dia	M	110				
	6) ½" dia	M	20				
12.	Bronze Isolating valves:						
	1) 2" dia	Nos.	12				
	2) 1½" dia	Nos.	3				
	3) 1¼" dia	Nos.	6				
	4) 1" dia	Nos.	9				
	5) ¾" dia	Nos.	7				
13.	Bib Cocks ½" dia.	Nos.	55				
14.	Wire braided flexible hose for connection to fixtures.	Nos.	55				
15.	Health faucet ½" dia with hose in each WC	Nos.	10				
16	Emergency shower and eye bath 1" dia with shower tray for chemical building.	Nos.	2				
17.	UnderGround Polybutylene pipes 1½" dia to connect from City main to the filling line of tanks complete with civil works.	M	200				
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
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B.1 WATER SUPPLY – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
18	Insulation of hot water pipes and pipes exposed to sun with 1/2" HT Armaflex insulation or equal.						
	1 1/2" dia	M	60				
	1 1/4" dia	M	10				
	1" dia.	M	130				
	3/4" dia	M	225				
	1/2" dia	M	10				
19	Cladding of insulated pipes in Mechanical room and exposed to outside by 0.6mm thick aluminum sheet.						
a)	2" dia	M	20				
b)	1" dia.	M	10				
c)	3/4" dia	M	10				
19.	All required and necessary electrical works.	L.S	L.S				
20.	All required and necessary builders works including cutting and opening on walls, floor, roof floor, pipes sleeves and sealing the openings.	L.S	L.S				
21.	Any other item required but not mentioned above (state below with price):						
	(1)						
	(2)						
	(3)						
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
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B.2 WATER SUPPLY – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
	Design, supply and install cold and hot water supply system to the approval of the engineer including but not limited to the following:						
1.	GRP panel type water tank 2x2x1M, complete with SS 316 reinforcement inside, SS 316 internal ladder, GRP manhole cover, 1" dia float valve, fitting, supply, overflow, drain and vent connections, tanker filling line, external galvanized steel ladder, supports, .. etc.	No.	1				
2.	Packaged potable water booster Set as specified.	No.	1				
3.	Central Water filter as specified.	No.	1				
4.	Central water heater as specified	No.	1				
5.	Hot water circulating pump as specified	No.	1				
6.	Type A water cooler SS body with cooling coil outside storage tank as specified with water filter.	Nos.	2				
7.	Electric water heater 80 litres in chemical building.	Nos.	1				
8.	Water meter 2" size in filling line.	No.	1				
9.	Conventional drinking water filter British Berkefeld or equal in kitchen.	Nos.	2				
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

B.2 WATER SUPPLY – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
10	Polybutylene pipes complete with fittings and supports:						
	1) 2" dia	M	10				
	2) 1½" dia	M	40				
	3) 1¼" dia.	M	20				
	4) 1" dia	M	75				
	5) ¾" dia	M	144				
11.	Bronze Isolating valves:						
	1) 2" dia	Nos.	2				
	2) 1½" dia	Nos.	12				
	3) 1¼" dia	Nos.	2				
	4) ¾" dia	Nos.	4				
12.	Bib Cocks ½" dia.	Nos.	40				
13.	Wire braided flexible hose for connection to fixtures.	Nos.	40				
14.	Health faucet ½" dia with hose in each WC	Nos.	12				
15	UnderGround HDPE pipes 1" dia to connect from City main to the buildings complete with civil works.	M.	50				
16.	UnderGround HDPE pipes 2" dia to connect from City main to the filling line of tanks complete with civil works.	M	100				
	Total Carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

B.2 WATER SUPPLY – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
17	Insulation of hot water pipes and pipes exposed to sun with ½” HT Armaflex insulation or equal.						
a)	1½” dia	M	20				
b)	1¼” dia.	M	10				
c)	1” dia.	M	30				
d)	¾” dia	M	84				
18	Cladding of insulated pipes in Mechanical room and exposed to outside by 0.6mm thick aluminum sheet.						
a)	1½” dia	M	10				
b)	1¼” dia.	M	15				
c)	1” dia	M	10				
19.	All required and necessary electrical works.	L.S	L.S				
20.	All required and necessary builders works including cutting and opening on walls, floor, roof floor, pipes sleeves and sealing the openings.	L.S	L.S				
21.	Any other item required but not mentioned above (state below with price):						
	(1)						
	(2)						
	(3)						
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

C.1 DRAINAGE- CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
C.	<u>DRAINAGE</u> Design, supply and install internal drain system to the approval of the engineer including but not limited to the following: -						
1.	Wash basin single bowl, counter mounted, complete with mixing valve, 'P'-Trap and other accessories as specified.	Nos.	10				
2.	Asiatic water closet complete with storage cistern, 'P' Trap and other accessories as specified.	Nos.	3				
3.	European water closet with cistern and all accessories as specified.	Nos.	9				
4.	Shower Tray and Fittings	No.	2				
5.	Emergency shower and eye bath in chemical Building.	Nos.	2				
6.	Stainless steel kitchen sink single bowl, complete with mixing valve, trap and other accessories and cabinet as specified.	Nos.	2				
7.	Toilet Paper holder in WC	Nos.	12				
8.	Mirror over wash basin	Nos.	10				
9.	Soap dispenser	Nos.	4				
10.	Paper towel dispenser	Nos.	6				
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

C.1 DRAINAGE- CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
11.	All the necessary and required drain and vent pipe with fittings.						
	a) 2" dia	M	145				
	b) 4" dia	M	250				
	c) 6" dia	M	400				
	d) 8" dia	M	20				
12.	Floor drain 4" dia with 'P' Trap	Nos.	32				
13.	Floor clean-outs 4" dia size	Nos.	5				
14.	Floor clean-out 6" dia size	Nos.	2				
15.	Ground clean-out 6" dia	Nos.	15				
16.	Ground clean out 8" dia	Nos.	2				
17	Roding eye 4" dia.	Nos.	3				
18	Manhole 1Mx1Mx1M with heavy duty cover	Nos.	4				
18.	All builders works connected with all soil and water drainage system including dewatering, excavation and refilling of trenches for the above piping as required.	L.S	L.S				
19.	Any other items required but not included in the above list (State details and include price).						
	(i)						
	(ii)						
	(iii)						
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

C.2 DRAINAGE –OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
	Design, supply and install internal drain system to the approval of the engineer including but not limited to the following: -						
1.	Wash basin single bowl, counter mounted, complete with mixing valve, 'P'-Trap and other accessories as specified.	Nos.	7				
2.	Asiatic water closet complete with storage cistern, 'P' Trap and other accessories as specified.	Nos.	2				
3.	European water closet with cistern and all accessories as specified.	Nos.	8				
4.	Stainless steel kitchen sink single bowl, complete with mixing valve, trap and other accessories and cabinet as specified.	Nos.	2				
5	Toilet Paper holder in WC	Nos.	10				
6.	Mirror over wash basin	Nos.	7				
7.	Soap dispenser	Nos.	3				
8.	Paper towel dispenser	Nos.	3				
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

C.2 DRAINAGE –OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
9.	All the necessary and required drain and vent pipe with fittings.						
	a) 2" dia	M	100				
	b) 4" dia	M	185				
10.	Floor drain 4" dia with 'P' Trap	Nos.	16				
11.	Floor clean-outs 4" dia size	Nos.	3				
12.	Ground clean-out 4" dia	Nos.	2				
13	Vent cowl 2" dia.	Nos.	2				
14	Vent cowl 4" dia.	No	1				
17.	Manhole 1Mx1M, depth 1.5 M with heavy duty manhole cover	No	1				
18.	All builders works connected with all internal drainage system including excavation of pipe trenches and backfilling.	L.S	L.S				
19.	Any other items required but not included in the above list (State details and include price).						
	(i)						
	(ii)						
	(iii)						
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

D.1 FIRE FIGHTING – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
	Design, supply and install comprehensive fire fighting system to requirements and approval of Kuwait Fire Department (KFD). The works shall include, but not limited to the following:-						
1	Main Fire pumps	Nos	2				
2	Jockey pump	No.	1				
3.	GRP Fire tank 10Mx6Mx4M complete with all accessories. For specification of tank, refer to water supply specifications.	No	1				
4.	All required and necessary piping, fittings, vaves, supports etc.	LS	LS				
5.	Sprinkler system for store building	LS	LS				
6	Hose reel cabinet with 1" dia. 30 M. fire hose, 6 Kg. Portable ABC. Dry powder fire extinguisher / CO ₂ Extinguisher and 2 gallons portable water spray extinguisher.	Nos.	6				
7.	External Pillar hydrants and Hose reel cabinets with 2 ¹ / ₂ " hose reel near each pillar hydrant as required	LS	LS				
Total Carried to Summary							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

D.1 FIRE FIGHTING – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
8	Portable Fire extinguishers mounted on wall brackets in equipment rooms. 6 kg ABC dry powder extinguisher	Nos.	36				
9.	Deluge system for transformers.	LS	LS				
10	Foam system for Diesel generator	LS	LS				
11	HT,LT, Control room, Instrumentation room and all other electrical rooms to be protected by total flooding by any clean agent approved by KFD.	LS	LS				
12	Builders works associated with Fire Fighting system	LS	LS				
13	All electrical works associated	LS	LS				
Total carried to Summary							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

D.1 FIRE FIGHTING – CHEMICAL COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
14.	Any other item required to complete the works, but not mentioned above. Mention below the details with price. (i) (ii) (iii)	LS	LS				
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

D.2 FIRE FIGHTING – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
	Design, supply and install comprehensive fire fighting system to requirements and approval of Kuwait Fire Department (KFD). This BOQ and Fire Fighting tender drawings are for guidance only. The works shall include, but not limited to the following:-						
1	Main Fire pumps	Nos	2				
2	Jockey pump	No.	1				
3.	GRP Fire tank 10Mx6Mx4M complete with all accessories. For specification of tank, refer to water supply specifications.	No	1				
4.	All required and necessary piping, fittings, vaves, supports etc.	LS	LS				
5	Hose reel cabinet with 1" dia. 30 M. fire hose, 6Kg ABC dry powder fire extinguisher / CO ₂ Extinguisher and 2 gallons portable water spray extinguisher.	Nos.	4				
6	External Pillar hydrants as required	Nos.	6				
Total Carried to Summary							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

D.2 FIRE FIGHTING – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
7	Portable Fire extinguishers mounted on wall brackets in equipment rooms. a) 5.5 kg. BCF Fire extinguisher b) 5 Kg. CO ₂ Fire extinguisher	Nos. Nos.	21 5				
8	Sprinkler system as and if required by KFD	LS	LS				
9	Hose reel cabinets with 2 ¹ / ₂ " hose reel near each pillar hydrant	Nos.	6				
10.	Deluge system for transformers.	LS	LS				
11	Foam system for Diesel generator	LS	LS				
12	Instrumentation panel room, Electrical Room and Control room in in Electrical and Control Building to be protected by total flooding by any clean agent approved by KFD.	LS	LS				
13	HT, LT and UPS rooms in Substation Building to be protected by total flooding by any clean agent approved by KFD.	LS	LS				
14	UPS room in DG Building and Electrical room and Control room in Reservoir Substation Building to be protected by total flooding by any clean agent approved by KFD.	LS	LS				
15	Builders works associated with Fire Fighting system.	LS	LS				
16	All electrical works associated	LS	LS				
Total carried to Summary							

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

D.2 FIRE FIGHTING – OPERATION AND MAINTENANCE COMPLEX

Item	Description	Unit	Qty.	Unit Rate		Total Price	
				KD.	Fils	KD.	Fils
17.	Any other item required to complete the works, but not mentioned above. Mention below the details with price. (iv) (v) (vi)	LS	LS				
	Total carried to Summary						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

E . OVERHEAD CRANE (ONLY IN CHEMICAL COMPLEX)

Specs Ref.	Item	Description	Unit	Qty.	Unit Rate		Total Price	
					KD.	Fils	KD.	Fils
M.5.4	1	Design, supply and installation of Electric Overhead travelling crane, Capacity 3 Ton, Span, lift and travel as per Architectural Drawings, including gantry girders (runway beams) and all accessories as specified in store building.	Nos.	2				
	2	Mono rail 0.50 Ton in Pump Room. For span and lift refer to architectural drawings.	No.	1				
	3	All required and necessary electrical works	L.S	L.S				
	4	All required and necessary builders' works.	L.S	L.S				
		TOTAL						

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

COLLECTION FOR BILL NO. 8

NAME OF WORK: MECHANICAL SERVICES

Item	Page	Amount	
		KD.	Fils
A.1 -HVAC	8 - 2		
	8 - 3		
	8 - 4		
	8 - 5		
	8 - 6		
	8 - 7		
	8 - 8		
	8 - 9		
	8 - 10		
	8 - 11		
	8- 12		
	8 - 13		
A.2-HVAC	8 - 14		
	8- 15		
	8 - 16		
	8 - 17		
Total HVAC Works			

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	BOQ NO. 8 – BILL OF QUANTITIES FOR MECHANICAL SERVICES

COLLECTION FOR BILL NO. 8

NAME OF WORK: MECHANICAL SERVICES

Item	Page	Amount	
B1-Water Supply	8-18	KD.	Fils
	8-19		
	8-20		
B2-Water Supply	8-21		
	8-22		
	8-23		
Total Water Supply	Total		
C1- Drainage	8-24		
	8-25		
C2 Drainage	8-26		
	8-27		
Total Drainage	Total		
D1- FF	8-28		
	8-29		
	8-30		
D2-FF	8-31		
	8-32		
	8-33		
Total Fire Fighting	Total		
O/H Crane	8-34		
Total For Mechanical Sevices			

SECTION 6		BILL OF QUANTITY NO. 9		TELECOMMUNICATION TOWER & ROOM			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
COMMUNICATION TOWER ROOM AT MUTLA MEDIUM							
1	EARTH WORKS						
1.1	Excavation & Earth Work in all kinds of soil for foundations upto any depth as indicated in the drawings and specification including dewatering, bracing, shoring for all around basement foundations boundry at any level and all other required areas, protection works excavation support system and disposal of surplus material from site to public dump yard, back filling around footings all complete as per specifications, drawings and approval of the Engineer.	Cu.M	85				
1.2	Backfilling with the approval selected excavated soil or with approved imported soil in layers each layer should be compacted to get the percentage of maximum density(95%) at optimum moisture content according to (ASTMD 1157) with providing for sub-base under reinforced concrete slab on grade as per drawings, Specifications and accordance with the Engineer approval.	Cu.M	60				
2	CONCRETE						
2.1	Plain Concrete						
2.1.1	Cement screed, 50mm thick including leveling, trowelling and sub grading layers.	M ²	30				
2.1.2	Plain concrete of compressive strength 15N/mm ² and thickness 100mm with sulphate resisting cement type (5) including all necessary formwork for blinding bed for column footings and tie beams.	M ²	15				
2.2	Reinforced Concrete						
2.2.1	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for slab on grade 150 mm thick. with hardener on the surface	M ³	5				
2.2.2	Reinforced concrete of compressive strength 30N/mm ² with sulphate resisting cement type (5) including all reinforcement formwork, expansion and construction joints, additives curing etc. as per drawings specification & satisfaction of engineer for tie/ground beams and column necks	M ³	5				
Total Of This Page Carried to Collection							

SECTION 6		BILL OF QUANTITY NO. 9		TELECOMMUNICATION TOWER & ROOM			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-	SCHEDULE					
		Unit Price		Total Amount			
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
2.2.3	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for columns.	M ³	2				
2.2.4	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for roof beams & lintels	M ³	5				
2.2.5	-- Ditto -- but for Parapet wall	M ³	2				
2.2.6	Reinforced concrete of compressive strength 30N/mm ² with ordinary cement including all reinforcement formwork, expansion and construction joints, additives curing etc., as per drawings, specification and satisfaction of engineer for solid slabs (fair face finish).	M ³	5				
3	MASONRY <u>Concrete Unit Masonry</u>						
3.1	Supply and build external double wall of solid sand cement blocks 10cm th, each including insulation 5cm of extruded polystyrene, with 7 cm thick sand lime brick cladding outside with butterfly ties all as per drawings specifications and satisfaction of engineer.	M ²	75				
3.2	Supply and build 7 cm thick sand lime bricks on parapet fair face walls including all materials as per drawings specifications and satisfaction of engineer.	M ²	15				
4	<u>Sheet Water Proofing</u>						
4.1	Built-up roofing comprising of: Minimum 5cm thick light weight concrete. 2cm sand cement screed. One layer of water proofing membrane including laid over roof with primer. 7.5cm rigid extruded polystyrene insulation. Filter fabric layer 40x40x4 cm cement tiles with 10cm strip of crushed gravel	M2	30				
Total Of This Page Carried to Collection							

SECTION 6		BILL OF QUANTITY NO. 9		TELECOMMUNICATION TOWER & ROOM			
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE			
				Unit Price		Total Amount	
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils
4.2	Two coats of bituminous paint for the concrete surface below the ground level.	M ²	15				
5	Polyethylene sheet 300 microne thick, under slab on grade.	M ²	30				
6	<u>Steel Door</u> Provide & erect in position galvanized steel door from steel frame with 3mm thick steel panel, both side clad powder coated including iron mongery, hardware & all materials, workmanship, all complete as per drawings, specifications and approval of engineer SD 1 - Size : 1000 x 2200mm (fire rated 2.0 HR)	No.	1				
7	<u>FINISHES</u> <u>Lathe and Plaster</u>						
7.1	Internal cement plaster for walls	M ²	75				
8	<u>Painting</u>						
8.1	Internal emulsion paint for walls	M ²	75				
8.2	Internal emulsion paint for ceilings	M ²	30				
9	Raised Floor system under structure covered with tiles sizes 600 x 600 mm, 400 mm high with vinyl top finish	M ²	30				
10	<u>COMMUNICATION TOWER</u> Complete design, fabricate, supply and erect in position steel communication tower with all components and foundations. The contractor should get the necessary approval for design, implementation, materials and components from Ministry of Defense, Aviation Authority, K.F.B. and Ministry of Communication. The Tower Specifications as follows: Tower Height (As per signal propagation survey), 4 Legged Self Support Tower, Square Plan, completely hot dipped galvanized, Resist basic wind speed 40 m/sec. , max.deflection (sway) of 0.1 deg. with servicability load case at the top., nut and bolts hot dipped Galvanized Type A325/G8.8, inside climbing ladder with safety cages, work platforms - 2Nos. (as per site survey), rest platforms at every 10 m, wave guide support ladder, One No. Double Obstruction light on the top of the Tower, 4 Nos. Single Obstruction Light Middle of the Tower, Grounding Kit, 5/8" x 8 ft each Ground Rod connects with each one tower leg, Lightning protection system (Less than 2 ohm) and aviation war						
Total Of This Page Carried to Collection							

SECTION 6		BILL OF QUANTITY NO. 9		TELECOMMUNICATION TOWER & ROOM				
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER 55 M.I.G CAPACITY EACH AND ANNEXED WORKS AT MUTLA HIGH (STAGE-			SCHEDULE				
				Unit Price		Total Amount		
Item	Descriptions	Unit	Q'ty	KD	Fils	KD	Fils	
10.1	Telecommunication Tower - Min. 60m height above the water tower at Mutla high and medium,	Nos.	2					
10.2	Telecommunication Tower - Min. 10m height above the water tower at Jahra(D8,D14,D20) and Jleeb al shyoukh (D20)	Nos	4					
11	<p>Allow for any missing Item:</p> <p>Allow for any missing item which in the opinion of the contractor is deemed essential or necessary in technical point of view and nature of works to carry out successful execution of the works and to complete the project but not indicated either in BOQ and/or Drawing. (Refer Section -5, Particular specifications – Clause 5.13.11)</p> <p>Important: - The Contractor must submit a complete detailed breakdown for this item of work with his offer.</p>	L.S	L.S					
Total Of This Page Carried to Collection								

SECTION 6 BILL OF QUANTITY NO. 9 TELECOMMUNICATION TOWER & ROOM							
Subject of this Sub-Bill	CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)				SCHEDULE		
	Unit Rate		Total Amount				
Item	Description	Unit	Qty	KD	Fils	KD	Fils

COLLECTION OF BILL NO. (9)

PAGE NO.	AMOUNT	
	K.D.	FILS
Page number – 01 (Item 1 to 2.2.2)		
Page number – 02 (Item 2.2.3 to 4.1)		
Page number – 03 (Item 4.2 to 10)		
Page number – 04 (Item 10 to 11)		
TOTAL CARRIED TO MAIN SUMMARY		

MINISTRY OF ELECTRICITY & WATER KUWAIT	TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)
WATER PROJECTS SECTOR	MAIN SUMMARY

MAIN SUMMARY

BILL NO.		TENDER TOTAL	
		K.D.	FILS
1	CIVIL WORKS		
2	PIPING WORKS		
3	BUILDING WORKS		
3.1	Operation and Maintenance Complex		
3.1.1	Electrical and Control Building		
3.1.2	Generator Building		
3.1.3	Main Substation Building		
3.1.4	Reservoir Substation Building		
3.2	Chemical Complex		
3.2.1	Chemical Control Building		
3.2.2	Chemical Stores Building		
3.2.3	Substation for Chemical Complex		
3.2.4	Chemical Tanks		
4	ELECTRICAL WORKS		
5	TELEMETRY, INSTRUMENTATION & CONTROL WORKS		
6	CHEMICAL WORKS		
7	ENVIRONMENTAL EFFECT		
8	MECHANICAL SERVICES		
9	TELECOMMUNICATION TOWER AND ROOM		
GRAND TOTAL			
Percentage Of Addition if any(%)			
Percentage Of Reduction if any(%)			
NET GRAND TOTAL			

TENDERER'S INITIAL & STAMP

<p style="text-align: center;">MINISTRY OF ELECTRICITY & WATER KUWAIT</p>	<p style="text-align: center;">TENDER TITLE: CONSTRUCTION AND MAINTENANCE OF 5 NOS. R.C. GROUND RESERVOIRS FOR FRESH WATER, 55 M.I.G CAPACITY EACH, AND ANNEXED WORKS AT MUTLA HIGH (STAGE-II)</p>
<p>WATER PROJECTS SECTOR</p>	<p>MAIN SUMMARY</p>

GRAND TOTAL IN WORDS:

.....

NAME OF TENDERER:

.....

AUTHORIZED SIGNATURE:

DATE:

TENDERER'S INITIAL & STAMP