

BILL OF QUANTITIES FOR THE PROPOSED WATER DISTRIBUTION FOR NDUKUMA EARTH DAM

The rates entered shall include, third party fees, levies, input costs, labour and contractor's overheads and profits.

Item	Item Description	Unit	Quantity	Unit Rate	Amount
BILL 1:	PRELIMINARY & GENERAL ITEMS				
1.1	Publicity Sign Board				
1.1	Fabricate erect and maintain public sign post, well supported to detail as provided in the drawing and as instructed by the project manager.	No	1		
	<i>Total carried from Bill 1 to Main summary page</i>				
BILL	2) 100 M³ MASONRY TANK				
NO	Item Description	Unit	Quantity	Unit Rate	Amount
2.1	EXCAVATIONS				
2.2	Strip top soil 200mm from g.l. over area of tank and remove all vegetable soil to temporary spoil heap.	CM	9		
2.3	Excavate from stripped level over the tank site to depth n.e. 1.5m deep and dispose soil as directed	CM	68		
2.4	Excavation to depth n.e 3.5 m and dispose soil as directed	CM	68		
2.5	Extra over items 3 for excavating in rock	CM	7		
2.6	Allow for keeping all excavation free from general waters	Item	1		
2.7	Construct a foundation skin wall using natural stone to G.L. Use 300mm thick naturally dressed quarry stone	SM	22		
2.8	Allow for backfilling to approve levels after Completion of the works.	CM	50		
2.9	HARDCORE				
2.1	Provide, place and compact hardcore of approved quality 250mm thick to make up levels to G.L	CM	35		
2.11	MURRUM - 50mm approved murrum filling consolidated in layers to make up levels	CM	4		
2.12	Anti-Termite Treatment for Foundation/to hardcore surface applied in accordance with manufacturer's instructions.	SM	37		
2.13	Damp proof Membrane 1000 gauge black polythene sheet	SM	37		

Item	Item Description	Unit	Quantity	Unit Rate	Amount
2.14	Provided handle, cut, bend and fix the Sump reinforcement bars as stated in the bending schedule or as directed by the Engineer				
2.15	8 mm twisted mild steel bars	KG	10		
2.16	Provided handle, cut, bend and fix the Floor reinforcement bars as stated in the bending schedule or as directed by the Engineer				
2.17	D12 mm reinforcement bars	KG	315		
2.18	D10 mm reinforcement bars	KG	429		
2.19	Provide place, handle, mix (using a concrete mixer) and vibrate as directed by the Engineer				
2.2	Mass concrete mix 1:4:8: in 50mm thick blinding to hardcore	CM	2		
2.21	Vibrated reinforced concrete mix 1:2:4 in 200 mm thick for floor slab. Use water proof cement (Pudlo) 8 kg per 1 m ³ concrete equal to 1 kg per 50 kg cement	CM	8		
2.22	WALLING				
2.23	Provide, handle and fix 25 X 25 mm bondex joint as per Drawing	M	21		
2.24	300mm thick dressed quarry stone walling curved on plan radius 3300 mm Height 1715 m joint using 1:3 mortar waterproofed to 1 kg per 50 kg cement	SM	36		
2.25	225mm thick dressed quarry stone walling curved on plan radius 3300mm joint using 1:3 mortar waterproofed to 1 kg per 50 kg cement	SM	46		
2.26	REINFORCEMENT BARS				
2.27	Provided handle, cut, bend and fix the wall reinforcement bars as stated in the bending schedule or as directed by the Engineer				
2.28	10mm deformed steel bars	KG	572		
2.29	8 mm deformed steel bars	KG	280		
2.3	REINFORCEMENT BARS				
2.31	Provided handle, cut, bend and fix the Roof reinforcement bars as stated in the bending schedule or as directed by the Engineer				
2.32	16 mm twisted mild steel bars	KG	584		
2.33	12 mm twisted mild steel bars	KG	340		
2.34	10mm twisted mild steel bars	KG	58		

Item	Item Description	Unit	Quantity	Unit Rate	Amount
2.35	8mm twisted mild steel bars	KG	38		
2.36	Plain G.I binding wire,G24, 50Kg roll (For all reinforcement works)	Rolls	2		
2.37	Provide place, handle, mix (using a concrete mixer) and vibrate as directed by the Engineer				
2.38	Vibrated reinforced concrete mix 1:2:4 mix for 200mm thick roof slab. Use water proof cement (Pudlo) 8 kg per 1 m ³ concrete equal to 1 kg per 50 kg cement	CM	8		
2.39	Ditto centre Column radius 300 mm min 4080 mm height	CM	1		
2.4	Ditto in ring beam	CM	1		
2.41	Ditto in cross beam	CM	1.5		
2.42	Vibrated mass concrete 250mm thick surrounded to off take and scour pipes	CM	0.5		
2.43	FORMWORK				
2.44	Sawn timber formwork as per engineer's Specification. Include propping strutting and striking off to:				
2.45	Edges of 200 mm floor slab	SM	5		
2.46	Soffits and sides of 200mm roof slab min 4080 mm high	SM	41		
2.47	Sides of foundation column	SM	1		
2.48	Curved sides of column 300 mm dia. Min height 4080 mm	SM	4		
2.49	Edge of the manhole opening	SM	1		
2.5	INTERNAL AND EXTERNAL FINISHES				
2.51	25 mm thick 1:2 cement sand trowelled hard and smooth screed to floor slab with waterproof cement at 1kg for 1 No.50kg ordinary Portland cement with steel float finish	SM	37		
2.52	25mm thick 1:2 cement sand to interior face of the wall with water proof cement at 1kg for 1No. 50kg of ordinary Portland cement with steel float finish	SM	88		
2.53	20mm thick 1:2 cement sand to exterior face of tank wall	SM	88		
2.54	20mm thick 1:2 cement sand to column with steel float finish	SM	4		
2.55	20mm thick 1:2 cement sand to soffit of roof slab	SM	37		
2.56	20mm ditto to exterior face of roof slab	SM	5		
2.57	MISCELLANEOUS WORKS				

Item	Item Description	Unit	Quantity	Unit Rate	Amount
2.58	Construct and fix a vertical ladder of length of 3.5 M fixed to wall and floor on the internal side of tank	NO	1		
2.59	60mmx600mm cast iron manhole cover complete with frame, locking device and keys	No	1		
2.6	16mm reinforcement bar to be cut bent to terminate at manhole cover as per drawings or as directed by the engineer	M	12		
2.61	OUTLET PIPE:				
2.62	Supply and install G.I 110mm with 90 ⁰ Bend 110mm diameter flanged pipe 6 m long installed through roof slab	M	10		
2.63	INLET PIPE:				
2.64	Supply and install G.I pipe 75 mm with 90 ⁰ Bend	M	6		
2.65	Supply and install G.I 75 mm 6 m lengths	No	2		
2.66	OVERFLOW :				
2.67	Supply and install G.I 110mm with 90 ⁰ Bend 110mm diameter flanged pipe 6 m long, installed through floor slab	NO	1		
2.68	Supply and install 110 mm G.I end cap	NO	1		
2.69	AIRVENT :				
2.7	50 mm GI pipe piece 200mm long threaded	NO	4		
2.71	50 mm GI elbow with mosquito gauze	NO	4		
2.72	50 mm GI nipple	NO	4		
	<i>Sub Total Carried from Bill 2 to Main summary page</i>				

BILL 3) PUMPING SYSTEM					
NO	Item Description	Unit	Quantity	Unit Rate	Amount
3.1	Fabricate a firm rust-free steel stand 300 mm height to hold pump and motor inside the tank	No	1		
3.2	Supply, Deliver and Install a Solar Submersible Multistage Centrifugal Pump and motor Set of Duty Point: - 15 m ³ /hr at a Total Head of 200 meters. The pump efficiency at duty point should not be less than 70%. The pump Impellers should be of Stainless Steel. Provide Copies of Pump Characteristic /Performance Curves (Brochures). Install a pump as approved by the Supervising Engineer	Set	1		

Item	Item Description	Unit	Quantity	Unit Rate	Amount
3.3	Supply, Deliver & Install a AC solar pump controller for a motor rated power 18.5 KW incorporating: - Settable Min/Max Frequency & open Circuit Voltage, Display of operating Parameters, including frequency, voltage, amperage, input power & pump speed; Display of Historical Data, including Energy generation, maximum power & operating times; Protection against over/under voltage, over current, system overload and module over temperature; Fault detection with error code display; selectable hybrid modes that prioritise solar supply as well as maximise output through optimal blending of both power supplies; Display of dry run sensors and automatic controls. c/w 6 mm ² earthing. Install a sunverter SV3/18T or equivalent as approved by supervising engineer	No	1		
Draw off system				-	-
3.4	Supply, Deliver and Install a Solar Submersible drainage Pump and motor 0.75 KW Set of Duty Point: - 10 m ³ /hr at a Total Head of 15 meters DN 1.5". Install a pump as approved by the Supervising Engineer	No	1		
3.5	Fabricate a firm rust-free floating pontoon using barrels to hold the pump and motor in the dam held in place by a reinforced concrete block tied to stainless steel chain. The block to be positioned at the deepest section of the dam	No	1		
SOLAR SYSTEM FOR PUMP 1					
3.6	Supply, Deliver and Install Fabricated Steel Tower, use square tubes, 4" x 4" x 4mm for Solar Array System, securely anchored in concrete plinth, 0.5m x 0.5m x 1.0m/stand and minimum height - 5 meters high inclination angle 10-15 degrees	Lot	1		

Item	Item Description	Unit	Quantity	Unit Rate	Amount
3.7	Supply, Deliver and Install on the steel tower, Solar Array System of total output 11000Watts including high-efficiency monocrystalline modules of matching properties, with existing modules terminated on both sides to be properly mounted on the structure.	W	11000		
3.8	Supply install, test and commission 10 mm PV Cable Single Core1000VDC Tinnd Copper ; Insulation: XLPO ; Insulation Color: Red and black	M	200		
3.9	Allow for armoured AC cable 10mm sq 4 core submersiible	M	50		
3.1	Allow for installation sundries, Insulating Tapes pvc conduit	No.	1		
3.11	Allow for DC combiner box and PV 1000VDC fuced disconnect with enclosure	No.	1		
3.12	Allow for solar system earthing, including 4ft earth rod, lightening arrestor, 10mm sq earthing cable and treated earth pit	No.	1		
	Solar system for submersible drainage pump				
3.13	Supply, Deliver and Install on the steel tower, Solar Array System of total output 2400Watts including high-efficiency monocrystalline modules of matching properties, with existing modules terminated on both sides to be properly mounted on the structure as directed by the engineer	W	2400		
3.14	Supply install, test and commission 4 mm sq PV Cable Single Core1000VDC Tinnd Copper ; Insulation: XLPO ; Insulation Color: Red and black	M	60		
3.15	Supply, Deliver and Install Fabricated Steel Tower, use square tubes, 4" x 4" x 4mm for Solar Array System, securely anchored in the concrete plinth, 0.5m x 0.5m x 1.0m/stand and minimum height - 5 meters high inclination angle 10-15 degrees include a well-ventilated inverter box with a locking provision, rust- free steel pump stand 300mm to hold the pump and motor inside the dam	LOT	1		

Item	Item Description	Unit	Quantity	Unit Rate	Amount
3.16	Supply, install and test Ac single-phase solar pump inverter as compatible with the provided pump as directed by the engineer	NO	1		
3.17	Allow for single-phase AC armoured cable 6 mm sq 3 core	M	100		
3.18	Allow for solar system earthing and balance of system	LOT	1		
3.19	Allow for lead acid 100AH 12V starter battery, maintenance free, long lasting with a comprehensive warranty for the generator	NO	1		
3.2	Allow for generator service including filter and oil replacement	Sum	1		
3.21	Insulating Tapes, Large	No.	20		
3.22	Splicing Kit, Medium Packet	No.	2		
3.23	Supply and install 90 mm non return valve flanged type	No	2		
3.24	Supply, install and test a changeover switch	No	1		
3.25	Supply and fix a wooden panel board for fixing the electrical installations	No	1		
3.26	Supply, joint and test 75 mm (2.5") dia. HDPE PN 12.5, ISO 4427. Cost includes adapters 1.5" x 2.5"	LM	100		
3.27	Supply, joint and install 2.5" dia. GI pipe lengths 6 m inclusive of cutting, threading and joining fittings	LM	12		
3.28	Retrieve, diagnose, service and reinstall existing pump and motor. (Applicable if serviceable)	No	1		
	Water treatment				
3.29	Supply and instal chlorine 65 for dozing in the tank	Kgs	200		
	Rehabilitation of pump house				
3.3	Walling above the pump house in preparation of roofing	SM	5		
3.31	Installation of roofing using corrugated iron box sheets	SM	14		
3.32	All Flanged Sluice Valves	-	-		
3.33	Supply and install DN90 PN16 flanged Sluice valves for intake and Y-Tee	No	4		
	Sub Total Carried from Bill 3 to Main summary page				

Item	Item Description	Unit	Quantity	Unit Rate	Amount
BILL 4	PIPELINE				
NO	Item Description	Unit	Quantity	Unit Rate	Amount
	<u>CLASS D: DEMOLITION AND SITE CLEARANCE</u>				
	<i>The rate quoted is for site clearance and demolition along construction wayleave. Rate shall be deemed to include removal of the material, natural and artificial articles, objects and obstructions which are above the original surface and carting away to tips, identified by the contractor in liaison with the Local Authority</i>				
	<u>General clearance</u>				
4.1	Site clear and excavate to pipe invert level 750 mm n.e 1m below existing ground level and backfill/ reinstate to original ground level after testing pipeline, all to the approval of the engineer	LM	3900		
	<u>CLASS I: PIPEWORK - PIPES</u>				
	<i>The rate quoted is for supply and transport to site storage, transport from site storage, excavate, lay and joint pipes complete with all jointing materials and but fusing. The rate is deemed to include excavation, bed lining, installation and backfilling of the pipe trenches. keep trenches and their excavations free of water.</i>				
4.2	PN20 DN90mm HDPE PE100 ISO4427	-	-		
4.3	PN16 DN90mm HDPE PE100 ISO4428	LM	600		
4.4	PN12.5 DN90mm HDPE PE100 ISO4427	LM	3300		
4.5	Class B GI pipes DN 75mm with sockets	LM	24		
4.6	Allow for electrofusion/ buttfusion of the pipes and fittings. Connectors and adaptors NOT PERMITTED in the rising main pipeline	Joints	39		
	<u>CLASS J: PIPEWORK - FITTINGS AND VALVES</u>				
	<i>'The rate quoted is for provision and fixing</i>				
	Bends				
4.7	OD 90mm plain ended, 22.50° and 90°	No	4		
	Junctions and branches				

Item	Item Description	Unit	Quantity	Unit Rate	Amount
4.8	OD 90x50mm plain ended tee to be fused, with flanged branch and valves and all the necessary accessories for airvalves and washouts	No	3		
	Airvalves				
4.9	Supply and install DN50mm anti-shock/ anti-surge double- orifice Air Valves as per the attached technical specifications with flanged base	No	3		
	Mulele - Senda pipeline				
4.1	Site clear and excavate to pipe invert level 600 mm n.e 1m below existing ground level and backfill/ reinstate to original ground level after testing pipeline, all to the approval of the engineer	LM	3100		
	<u>CLASS I: PIPEWORK - PIPES</u>				
	<i>The rate quoted is for supply and transport to site storage, transport from site storage, excavate, lay and joint pipes complete with all jointing materials and but fusing. The rate is deemed to include excavation, bed lining, installation and backfilling of the pipe trenches. keep trenches and ther excavations free of water.</i>				
4.11	PN12.5 DN63mm HDPE PE100 ISO4427	LM	3100		
4.12	Allow for electrofusion/ buttfusion of the pipes and fittings. Connectors and adaptors NOT PERMITTED in the 63 mm pipeline	Joints	31		
	Gate/ Sluice Valves				
4.13	Supply and install DN63 gate valves for Line Valves	No	1		
	Junctions and branches				
4.14	OD 63x50mm plain ended tee to be fused, with flanged branch and valves and all the necessary accessories for airvalves and washouts	No	3		
	Airvalves				

Item	Item Description	Unit	Quantity	Unit Rate	Amount
4.15	Supply and install DN50mm anti-shock/ anti-surge double- orifice Air Valves as per the attached technical specifications with flanged base	No	3		
	Marker Posts				
	<i>Construct concrete marker posts and install along the water supply pipeline, all in accordance with details shown on drawings. (Reinforced concrete 1:2:4(class 20/20, bars D12), as per details on drawing</i>				
4.16	Pipeline marker post inscribed WL	No	8		
4.17	Air valve marker post Inscribed AV	No	4		
4.18	Sluice Valve marker post inscribed SV	No	4		
	CLASS L: PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION				
	<i>Extras to excavation and backfilling in pipe trenches</i>				
4.19	Excavation in rock Class A	CM	3		
4.2	-Ditto- but rock Class B	CM	3		
4.21	-Ditto- but rock Class C	CM	3		
	<u>Note:-</u> Blasting is NOT permitted				
	<i>Sub Total Carried from Bill 4 to Main summary page</i>				
BILL 5	WATER POINTS				
NO	Item Description	Unit	Quantity	Unit Rate	Amount
5.1	Supply, instal and test 3/4 gate valves in the existing water kiosks	No	16		
5.2	Supply, instal and test 3/4 water meters in the existing water kiosks	No	16		
	<i>Sub Total Carried from Bill 5 to Main summary page</i>				
BILL	6) VALVE CHAMBER				
No.	ITEM DESCRIPTION	UNIT	QTY	RATE	AMOUNT
				KShs.	KShs.
	Supply materials and provide personnel to construct Air Valve/Washout/Sluice Valve Chambers (as in the attached drawing)				

Item	Item Description	Unit	Quantity	Unit Rate	Amount
6.1	Cut the spoil upto 300mm below g.l. over the borehole chamber area and remove all vegetable soil to temporary spoil heap.	M ³	0.5		
6.2	Excavate foundation from stripped level over the borehole chamber site to depth n.e. 0.6m deep 300 mm wide and dispose soil as directed	M ³	1		
6.3	Mass concrete mix 1:4:8: in 50mm concrete slab	M ³	0.5		
6.4	225mm thick dressed quarry stone walling	M ²	5		
6.5	Provide and instal a lockable double steel Cover c/w padlock or a reinforced concrete cover as instructed	No.	1		
6.6	EXTERNAL PLASTER - 20mm thick 1:2 cement sand to exterior face of the valve chamber wall	M ²	4		
	Sub Total for 1 No valve chamber				
	Sub Total Carried from Bill 8 to Main summary page	No.	6		

GRAND SUMMARY PAGE

BILL	BILL DESCRIPTION	AMOUNT
BILL 1	PRELIMINARIES AND GENERAL ITEMS	
BILL 2	100 M3 MASONRY TANK	
BILL 3	PUMPING SYSTEM	
BILL 4	PIPELINE	
BILL 5	WATER POINTS	
BILL 6	VALVE CHAMBER	
	SUB TOTAL	
	CONTIGENCIES	
	ADD KSHS 350,000 FOR CONTIGENCIES TO BE EXPENDED BY PROJECT MANAGER	350,000.00
	TOTAL	

Item	Item Description	Unit	Quantity	Unit Rate	Amount
<p>ADD VAT (16%)</p> <p>TOTAL TAKEN TO FORM OF TENDER</p>					