THWAKE WATER PROJECT PHASE 1 - PUMPING, SOLARIZATION, & STORAGE					
TULIMANI WARD, MBOONI SUB-COUNTY, MAKUENI COUNTY					
FY2025-2026					
NB: Rates and prices inserted by Contractor in the BoQ shall include value of the work described under the item and shall cover all over heads charges, profits, and applicable taxes. Contract to be paid as per actual works done.					
BILL No. 1 Preliminaries					
ITEM	**ITEM DESCRIPTION**	**UNIT**	**QTY**	**RATE**	**AMOUNT**
				(KShs.)	(KShs.)
1.1	Fabricate erect and maintain public sign post 1200x1200x1.5mm metal sheet, 1500mm above ground level. It should be anchored 600mm deep motorised in mass concrete and well supported with 50x25mm RHS frame to detail as provided in the drawing and as instructed by the project manager.	Item	1		
1.2	Allow Ksh.40,000 for initiating and facilitating water quality testing and submission of the test results to the department's representative	Item	1		
1.3	Allow Kshs. 210,000 for Technical Supervision to be expended as directed by the departmental chief officer	Item	1		
Bill 1 Total carried to Summary					
Bill 2: Solar flood light & CCTV at Thwake Pumping station					
2.2	Supply and install a 4G/5G Solar CCTV Camera with 2/3no. Cameras with 360 degree swirl, a SIM card, night vision, motion detection, and multi-user remote access, c/w a 5m high pole, solar panel, and include for concrete footing	Item	1		
2.3	Supply and install a double sided solar floodlight, 100W LED c/w solar panels on the 5m pole and include for concrete footing	Item	1		
	Bill 2 total carried to Summary				
	BILL 3: PIPELINES				
3A	**Rising Main**				
	CLASS D: DEMOLITION AND SITE CLEARANCE				
	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				
3.1	*General clearence*				
3.1.1	Provide thirty thousand shillings for materials and on-site geometric positioning of all pipelines and fittings by the client's representative	Item			

3.1.2	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	m	3,312		
3.2	CLASS I: PIPEWORK - PIPES				
	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 butt 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.				
3.2.1	PN25 OD75mm HDPE PE100 ISO4427 -Rising main, strictly butt fused	m	300		
3.2.1	PN20 OD75mm HDPE PE100 ISO4427 -Rising main, strictly butt fused	m	300		
3.2.1	PN16 OD75mm HDPE PE100 ISO4427 -Rising main, strictly butt fused	m	300		
3.2.2	PN12.5 OD75mm HDPE PE100 ISO4427 - Rising main, strictly butt fused	m	800		
3.2.2	PN10 OD75mm HDPE PE100 ISO4427 - Rising main, strictly butt fused	m	700		
3.2.5	PN10 OD63mm HDPE PE100 ISO4427 - Kwa Masio Masonry Tank to Uvaani dispensary (300m) & from ABC Ivumbuni to road water point (500)	m	800		
3.2.8	2.5" GI Class B inclusive of connectors and adopters	m	100		
3.2.9	2" GI Class B inclusive of connectors and adopters	m	12		
3.3	CLASS J: PIPEWORK - FITTINGS AND VALVES				
	The rate quoted is for provision and fixing inclusive of all allied materials				
3.3.1	Bends				
3.3.1.1	Allow for assorted HDPE bends as shall be approved	item			
3.3.2	Junctions and branches				
	Supply and install GI/HDPE tees and reducers as instructed complete with all the necessary accessories for airvalves, washouts, and distribution				
3.3.2.2	2.5"x2.5"	nr	2		
3.3.2.2	2"x2"	nr	8		
3.3.2.2	2.5"x1.5"	nr	4		
3.3.3	Airvalves				

	Supply and install anti-shock/ anti-surge Metallic Air Valves approved with threaded or flanged base , c/w isolating valve, including tees and reducers for connecting Airvalve				
3.3.3.1	DN40 for rising main	nr	2		
3.3.4	Sluice/Gate Valves				
	Supply and install GI sluice/gate valves threaded or flanged as shall be instructed and approved for Washouts & Tees				
3.3.4.1	2.5" - Rising main W/O & tank	nr	2		
3.3.4.2	2" - Distribution W/O & Tee controls	nr	3		
3.3.5	Water meters				
	Supply and install approved GI threaded or flanged water meters inclusive of allied adoptors and jointing materials as instructed by the engineer				
3.3.5.1	2.5" - rising	nr	3		
3.3.5.1	2" - Distribution lines	nr	2		
3.3.5	Non-return valves				
	Supply and install approved threaded or flanged GI flap-type non-return valves inclusive of allied adoptors and jointing materials, as instructed and approved by the engineer				
3.3.5.3	2.5"	nr	2		
3.4	CLASS K: PIPEWORK - MANHOLES AND PIPEWORK ANCILLARIES				
	The rate quoted is for chambers, culverts, crossings and reinstatements and other ancilleries as specified.				
3.4.1	Air Valve/Washout/Sluice Valve Chambers				
3.4.1.1	Construct 900mm by 900mm masonry valve chamber. Depth not exceeding 1m, all in accordance with details shown on drawings and as per engineer's instructions. Include for provision and fixing of cast iron step irons and heavy duty rectangular mild steel frame with locking devices as per details on drawing	nr	4.00		
3.4.1.2	Construct 400mm by 400mm masonry valve chamber. Depth not exceeding 1m, all in accordance with details shown on drawings and as per engineer's instructions. Include for provision and fixing of cast iron step irons and heavy duty rectangular mild steel frame with locking devices as per details on drawing	nr	5.00		
3.4.2	Marker Posts				

	Construct concrete marker posts and install along the water supply pipeline, all in accordance with engineer's instructions and details shown on drawings. (Reinforced concrete 1:2:4(class 20/20, bars D12), as per details on drawing				
3.4.2.1	Pipeline marker post inscribed WL at 500m intervals	nr	8.00		
3.4.2.2	Air valve marker post Inscribed AV	nr	2.00		
3.4.2.3	Washout marker post inscribed WO	nr	3.00		
3.5	CLASS L: PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION				
	Extras to excavation and backfilling in pipe trenches				
3.5.1	Excavation in rock Class A	$_m3$	5.00		
3.5.2	-Ditto- but rock Class B	$_m3$	2.00		
3.5.3	-Ditto- but rock Class C	$_m3$	1.00		
	Note:- Blasting is NOT permitted				
3.6	Class L; PIPEWORK - SUPPORTS AND PROTECTION, ANCILLIARIES TO LAYING AND EXCAVATION				
3.6.1	Construct concrete stools for fitting and thrust blocks and anchor blocks to all bends along the water supply pipeline, all in accordance with details shown on drawings Thrust blocks - RC, Volume 0.2 - 0.5m3	nr	6.00		
3.6.2	Concrete surround to pipe	m	100.00		
	Sub-total for the pipeline carried to summary				
	Bill 4: Pumping System				
	Supply,Deliver, install and test the below pumping installations;				
4.1	Supply,Deliver, install and test a Solar Powered Submersible Multistage Centrifugal Pump Set (Wetend c/w motor) of Duty Point: - 7m3/hour at a Total Head of 230 meters. The pump Efficiency at duty point should be 50-60%. The pump Impellers should be of Stainless Steel. Dayliff DS8-50, 7.5kW 3PH motor or similar approved by the Engineer. Provide Copies of Pump Characteristic/Performance Curves (Brochures). Install as directed by the Supervising Engineer	set	1		

4.2	Supply and Deliver an 11kW AC Solar Pump Control Module (Inverter) (Sunverter SV3/11T, or similar approved by the engineer), Incorporating: - • Detachable Control Interface • 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	No.	1		
4.3	Supply, Deliver and Install on the steel tower, Solar Array System of total output 11280 Watts including high-efficiency tier 1 modules As 700W ×16 panels in 1 string using 6mm sq dc cable and MC4 terminated on both sides to be mounted on the structure	W	11200		
4.4	Supply and install an adaptor Set, 2.5"Ø, stainless steel c/w 2.5" GI riser pipe and 2no. 2.5" Elbows. Cost to include installation materials.	No.	1		
4.5	Supply & install a submersible cable, Double Insulated, round/flat, 6.00mm2 X 4core	m	50		
4.6	Armored Cable, 6.00mm^2 X 4 core	m	50		
4.7	Supply, deliver and install a 6mm^2 1 Core DC cable (black & red) as approved by the supervising engineer	m	50		
4.8	UPVC Conduit, HG, 1”Ø for overhead cabling	No.	5		
4.9	Cable Glands, 25mmL	No.	4		
4.10	Cable Glands, 20mmL	No.	2		
4.11	Splicing Kit, Medium Packet	No.	2		
4.12	Cable Ties, Large Packet, Manila	No.	2		
4.13	Insulating Tapes, Large	No.	20		
4.14	Provide for system earthing using a Copper Earth Rod, 5ft c/w Clamp and lightning arrestor	No.	1		
4.15	Earth Lead Cable, 6mm2 , single	M	50		
4.16	DC PV Disconnect switch 1100 VDC/200A fused isolator	No.	1		
4.17	Master Water Meter, 2.5" c/w Fittings - KMEI, Kent, Baylern, Lorenz or similar approved by the engineer	No.	1		
4.18	Supply & install Fabricated Steel Tower, use square tubes, 3” x 3” x 3mm for solar Array System, minimum 5meters high. Inclusive of control box on solar panel frame c/w with locking devise as approved by the Supervising Engineer.	L/S	1		

4.19	Provide for the supply and assembly of hardcore and pre-cast reinforced concrete slabs for preparation of a pumping chamber at Thwake sand dam as per drawings and guidance by the supervising engineer	Item	1		
	Bill 4 total carried to summary				
	Bill 5: Water points				
5.1	**Water points**				
5.1.1	Supply all necessary materials and Construct a 1.5m wide×1.5m high tap stand complete with a 1" metered control chamber, water fetching bay & allied 1" PPR pipes for two taps per stand, connection to the tanks and branding as directed by the supervising engineer; ABC Ivumbuni Junction	No	1		
	Subtotal carried to bill 5 total				
5.2	**Plastic Tanks on platforms**				
5.2.1	Supply, Deliver & Install 10,000L Double Laminated Plastic Water Tank at Kiosks , c/w GI Inlet, Outlet & Overflow Fixtures, 2'' dia. c/w constructing a 1m high masonry platform with reinforced concrete slab. Include for water connection to the water points and branding of the tank.	No	1		
	Total for 2no. Tanks on platforms - 2no. For ABC Ivumbuni storage				
	BILL 6 ~ SITE FENCING				
6.1	Supply and install 2.1 m high x 14 gauge chainlink complete with 14 Gauge x 4 strand galvanised plain wired fencing and 2 stands barbed wire at cranked section (430mm) complete with complete with 100 x 125 mm cranked precast concrete posts anchored 600mm deep and at 2.5m centres mortised in mass concrete sorround. Anchor the chainlink with 200x150mm mass concrete class ratio 1:3:6. Inlcude stainer posts at corners and after every 30m	LM	120		
6.2	Construct 3m wide 2.1 m height double leaf opening steel gates clad in high grade mesh wire, anchored on reinforced concrete columns using 4 No. Y10 Rebars each column c/w padlocks	No.	1		
	Amount carried to Summary				
	BILL 8: 50 M³ MASONRY TANK				
	ITEM DESCRIPTION	**UNIT**	**QTY**	**RATE**	**AMOUNT**
				KSHS.	**KSHS.**
8.1	Excavations				
8.1.1	Strip top soil 200mm from g.l. over area of tank and remove all vegetable soil to temporary spoil heap.	CM	10.00		
8.1.2	Excavate from stripped level over the tank site to depth n.e. 3.5m deep and dispose soil as directed	CM	20.00		
8.1.3	Extra over excavation items above for excavating in rock (Rate to include making good)	CM	10.00		

8.1.4	Allow for backfilling to approved levels after Completion of the works.	CM	20.00		
8.1.5	Allow for keeping all excavation free from general waters	Item	L/Sum		
8.1.6	Allow for planking and strutting of the pit	Item	1.00		
8.2	**Levelling and Blinding**				
8.2.1	HARDCORE - Provide, place and compact hardcore of approved quality to make up levels	CM	15.00		
8.2.1	MURRUM - 50mm approved murrum filling consolidated in layers to make up levels	SM	32.00		
8.2.1	Anti-Termite Treatment for Foundation/to hardcore surface applied in accordance with manufacturer's instructions.	SM	32.00		
8.2.1	Damp proof Membrane	SM	32.00		
8.2.1	BLINDING -Provide materials, cement, sand and coarse aggregate and mix concrete,1:4:8,ratio to tank base slab	CM	1.50		
8.3	**FLOOR SLAB**				
8.3.1	CONCRETE -provide concrete,mix1:2:4 and construct 250 mm thick reinforced concrete floor slab as in the provided drawing. Use water proof cement (Pudlo) 8 kg per 1 m^3 concrete	CM	8.00		
8.3.2	Reinforcement for bottom (B1 & B2) and top (T1 & T2) bars at 200 mm C/C spacing for floor slab				
8.3.3	10 mmØ,M.S twisted bars	kg	165.00		
8.3.4	12 mmØ,M.S twisted bars	kg	450.00		
8.3.5	16 mmØ,M.S twisted bars	kg	200.00		
8.3.6	INTERNAL PLASTER - 15mm thick two coat cement sand (1:4) plaster trowelled smooth and comprising 12mm backing and 3mm finishing coat. Use approved water proof cement 0.75kg per 25 kg ordinary portland cement	SM	25.00		
8.3.7	Penetron integral cappilary system water proofing to masonry - Use Bondex (Tar)	SM	25.00		
8.4	**WALLING**				
8.4.1	Provide dressed quarry stone, size 9"×6" and construct underflow and overflow baffle walls as in the provided drawing. Use cement sand 1:3 mortar	SM	50.00		

8.4.2	Reinforcement bars for walls				
8.4.3	8 mmØ,M.S twisted bars	KG	350.00		
8.4.4	INTERNAL PLASTER - 15mm thick two coat cement sand (1:4) plaster trowelled smooth and comprising 12mm backing and 3mm finishing cement coat. Use approved water proof cement.	SM	70.00		
8.4.5	EXTERNAL PLASTER - 15mm two coat cement Sand (1:4) render	SM	70.00		
8.4.6	Internal ladder (Use stainless steel GI pipes)	No	1.00		
8.5	**ROOF SLAB**				
8.5.1	CONCRETE -provide concrete,mix1:2:4 and construct concrete roof slab as in the provided drawing. 150mm at the centre and 125 mm at the edges of roof slab. Use water proof cement (Pudlo) 8 kg per 1 m3 concrete equal to 1 kg per 50 kg cement	CM	5.00		
8.5.2	Reinforcement				
8.5.3	10 mmØ,M.S twisted bars	kg	104.00		
8.5.4	12 mmØ,M.S twisted bars	kg	304.00		
8.5.5	16 mmØ,M.S twisted bars	kg	45.00		
8.5.6	Plain G.I binding wire,G24, 50Kg roll (For all reinforcement works)	Rolls	2.00		
8.5.7	INTERNAL PLASTER - 15mm thick two coat cement sand (1:4) plaster trowelled smooth and comprising 12 mm backing and 3mm finishing coat.	SM	25.00		
8.5.8	EXTERNAL PLASTER - 15mm two coat cement Sand (1:4) render	SM	25.00		
8.6	**CENTRE COLUMN & RING BEAM**				
8.6.1	Reinforced concrete mix 1:2:4 to construct a reinforced centre column 300mm by 300 mm and ring beam	CM	1.00		
8.6.2	Reinforcement				
8.6.3	8 mmØ,M.S twisted bars	Kg	15.00		
8.6.4	16 mmØ,M.S twisted bars	Kg	120.00		
8.6.5	Formwork for propping and strutting centre column and ring beam	SM	38.00		

8.7	**FORM WORK**				
8.7.1	Wooden props 2" dia 3m long	No	70.00		
8.7.2	Formwork to soffits and sides n.e. 3.5m high	SM	28.26		
8.7.3	Wire nails *(for all works)				
8.7.4	4"	Kg	5.00		
8.7.5	3"	Kg	6.00		
8.7.6	2"	Kg	2.00		
8.7.7					
8.7.8	Standard Lockable reinforced concrete manhole cover (600x450mm) complete with frame and locking device and pinning lugs to concrete sorround and bedding frame in cement and sand mortar (1:4)	No	1.00		
8.8	**PLUMBING WORKS**				
8.8.1	Supply, deliver and install the following items to form the inlet, breather, and outlet components				
8.8.2	2" dia bend	No	3.00		
8.8.3	2" dia Elbow with mosquito gauze	No	6.00		
8.8.4	2" dia Barrel nipple	No	4.00		
8.8.5	2" dia Union socket	No	4.00		
8.8.6	3" GI Class B, 6m conduit for instalation of scour, inlet, &outlet pipes	No	3.00		
8.8.7	Source supply materials to site and Construct STD ministry valve chambers 900MM X 900MM X 900MM deep with 1:2:4 rc concrete manhole cover of 900mm x 900mm size. The cover to be encased in 25mm angle framing. . Chamber to be of well dressed quarry stone and plastered to finish.	No	2.00		
8.10	Pipe Joining Materials				
8.10.1	Boss white for G.I Pipes	Kg	0.50		
8.10.2	Solvent Cement	Kg	0.50		
8.10.3	Coolant	Lts	1.00		
8.10.4	Sealing thread	Pcs	4.00		

	Sub total for 1no masonry tank carrried to summary				
GRAND SUMMARY					
BILL	**BILL DESCRIPTION**				**AMOUNT (Kshs)**
1	Preliminaries				
2	Bill 2: Solar flood light & CCTV at Thwake Pumping station				
3	BILL 3: PIPELINES				
4	Bill 4: Pumping System				
5	Bill 5: Water points				
6	BILL 6 - SITE FENCING				
7	BILL 8: 50 M3 MASONRY TANK				
	SUB-TOTAL (A)				
	Allow Ksh.75,000 for contingencies to be expended as directed by the project manager				75,000.00
	SUBTOTAL (B)				
	Add 0.03% PPRA CAPACITY BUILDING LEVY				
	Add 16% VAT				
	TOTA CARRIED TO TENDER				