	BILL OF QUANTITIES : CONSTRUCTION OF 100CUM RC KWA NZELE SUMP	
	Preamble: The rates entered shall include, third party fees, levies, input costs, labour and contractor's overheads and profits.	
	SUMMARY	
S/No	**ITEM DESCRIPTION**	**AMOUNT IN KSHs**
Bill 1	PRELIMINARIES AND GENERAL ITEMS	
Bill 2	INCREASING HEIGHT OF RC SAND DAM WALL	
Bill 3	CONSTRUCTION OF RC 100CU.M INTAKE SUMP	
Bill 4	SOLAR PUMPING SYSTEM	
Bill 5	REHABILITATION OF PUMP HOUSE & STORAGE TANK	
Bill 6	SITE FENCING SOLAR STRUCTURE	
Bill 7	REHABILITATION OF RISING MAIN PIPELINE	
Bill 8	PROVISIONAL SUMS (CONTINGENCIES, VAT, PUBLIC PROCUREMENT LEVY)	
	GRAND TOTAL	

BILL 1.0	PRELIMINARIES AND GENERAL ITEMS				
NO.	ITEM DESCRIPTION	UNIT	QTY	KSHS.	KSHS.
	Mobilization				
1.02	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.	No.	1		
1.03	Allow Ksh. 188,800 for Engineer's technical supervision works and general contract administrative expenses	ITEM	L/S		188,800.00
	TOTAL 1 CARRIED TO SUMMARY PAGE				

BILL 2.0	INCREASING HEIGHT OF RC SAND DAM WALL				
ITEM No	ITEM DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	Supply, deliver the following materials and construct to increase dam height of Kwa Nzele Sand Dam				
2.01	Construct sand dam & raise it by 1.2m wall by use of Vibrated Reinforced Concrete grade 20/25 (1:2:4). Use quarry ballast ½"-3/4" and clean river sand. Sand dam shall be cured for 21 days. Works shall be done as per the working drawing.	M^3	45		
2.02	Reinforcement bars Y12	Kgs	650		
2.03	Reinforcement bars Y10	Kgs	480		
2.04	Sawn formwork for both faces of the concrete wall as;				
2.05	Cypress timber 6"x1"	Rft	600		
2.06	Cypress timber 3"x2"	Rft	300		

2.07	Binding wire	Kg	20		
2.08	Wire Nails assorted	Kg	20		
2.09	Hard core	Tons	40		
2.1	Excavate Vegetable soils 300mm deep	M3	42		
2.11	Hacking on a rock surface, sand dam crest and cleaning	M2	60		
2.12	Provide Forty Thousand Kenya Shillings for materials and on-site geometric positioning of the pipeline and fittings by the client's representative	Item	L/S		40,000.00
2.13	Allow for drilling of anchorage holes on the Vibrated Reinforced Concrete and apply anchorage adhesive foam to hold reinforcement bars tightly	Item	L/S		35,000.00
2.14	Supply, lay, pack and tie 2m* 1m* 1m high gauge gabion boxes at the eroded river bank as shall be instructed by the client's representative. Cost inclusive of aluminium gabion box ties	No	15		
2.15	Supply and pack approved hard core in the gabion boxes above	M^3	30		
2.16	Use vibrated reinforced concrete mix 1:2:4 for grouting along the gabion boxes	M^3	4		
	TOTAL 2 CARRIED TO SUMMARY PAGE				

BILL 3.0	CONSTRUCTION OF RC 100CU.M INTAKE SUMP				
S/NO	**ITEM DESCRIPTION**	**UNIT**	**QTY**	**RATE (KShs.)**	**AMOUNT (KShs.)**
	Excavation volumes				
3.01	Cut to spoil limited to maximum 3000mm deep from g.l. at the reservoir area and remove all vegetable soil to temporary spoil heap.	CM	450		
3.02	E. O for rock formation	CM	60		
3.03	Clear site from loose rocks and soil to create base for concrete slab as shall be directed by the engineer	SM	40		
3.04	Allow for planking and strutting of the pit	ITEM	L/S		30,000.00
3.05	Allow for backfilling to approve levels after Completion of the works.	m^3	180		
	De-watering				
3.06	Allow for de-watering during constriction of the lower levels of the sump tank	ITEM	L/S		50,000.00
	Hardcore filling				
3.07	300mm thick approved hardcore filling compacted in layers not exceeding 150mm thickto make up levels	m^3	15		
	Concrete work				
3.08	Construct square, 6.00 m x 6.00 m (internal measurements) vibrated concrete ring, as the sump footing. Use concrete class 20/20 (1:2:4). The footing shall be on firm ground as shall be approved by site Engineer. Footing section shall be 400 mm x 250 mm.	m^3	4		

3.09	Reinforcement bars				
	i) Use Y12 bars, as ring beam reinforcement.	Kgs	152		
	ii) Use Y8 as stir ups @ 250mm c/c.	Kgs	100		
3.1	Construct reinforced concrete pillar at the centre of the sump floor. The pillar shall have a reinforced concrete footing 450mm x 450mm x 250mm. The pillar dimensions shall be 300mm x 300mm in section. Use concrete grade 20/20 (1:2:4). Pilar shall be reinforced with Y12 bars @ 250 mmc/c. Use Y8 Bars as stirups @200 mm c/c.	m3	1		
3.11	Construct water sump. Use the necessary form work. walling shall be of vibrated and reinforced concrete, class 20/20 (1:2:4) and 300 mm thick.	m3	40.00		
	Use reinforcement bars as;				
	i) Use Y12 bars, @ 300 mm c/c cut and bend and placed in two rows.	Kg	1211		
3.12	Roof 100m3 sump by use of vibrated reinforced concrete 1:2:4. class 20/20. Roof slab shall be 225 mm thick.	m3	11		
3.13	Roof slab reinforcement shall be Y 12 @ 200mm	kg	680		
3.14	Ditto Reinforced Concrete Manhole cover, which shall be air tight	m3	0.4		
3.15	Provisional sum of KShs 50,000.00 as cost of formwork	Item	L/S		50,000.00
3.16	Installation of 3" Dia infiltration galleries as instructed by the Engineer	Item	LS		60,000.00

	TOTAL 3 CARRIED TO SUMMARY PAGE				

BILL 4.0	**SOLAR PUMPING SYSTEM**				
4.01	Supply, deliver & install a solar three-phase submersible electric pump with a flow rate of 12 cubic metre per hr at 100 meters Preferably 4SR12/32; 5.5kW 3~ or equivalent approved. The pump impellers and pump shaft should be of Stainless Steel. Provide Copies of Pump Characteristic /Performance Curves (Brochures) for approval. Install and test as directed and approved by the Supervising Engineer	No	1		
4.02	Supply a three phase 5.5kw motor compatible to item above, complete with PD sacrificial anode, Pedrollo or equivalent approved by the Supervising Engineer	No	1		
4.03	Install on the steel tower, Solar Array System of total output 12300 Watts, including high-efficiency tier 1 monocrystalline modules As Jinko 350W panels or equivalent approved in 2 string of 18panels with maximum string voltage VOC ≤850 VDC as approved using 4 mm sq dc cable and MC4 terminated on both sides to be mounted on the structure . **NB**: Supply shall be of 2100Watts only. There are existing panels of 10200W.	W	2100		
4.04	Allow a Provisional Sum of Kenya Shillings Seventy Thousand for anchoring the solar structure on the pump house roof slab, including welding & painting the structure	Item	L/S		70,000.00
4.05	Supply, Deliver & Install an AC/DC Solar inverter Incorporating: - Hybrid Capability with the option of DC solar power, generator or main grid power inputs, patented MPPT fast response, good stability and up to 99% efficiency, rated power 5.5Kkw, 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; Display of dry run sensors and automatic controls (SV3/5.5T) or equivalent as approved by the Supervising Engineer	No	1		

4.06	Starter pipe, Upvc, 2" Ø	No	1		
4.07	Adaptor Set, 2"Ø	Set	1		
4.08	Electrodes	set	1		
4.09	PV Disconnect Switch 63Amps	No.	1		
4.1	Sensor Cable, Twin, Double Insulated, 0.75mm2	M	40		
4.11	Submersible Cable 2.5 mm 4core	m	40		
4.12	Armored Copper Cable, 2.5mm2 X 4 core	M	30		
4.13	Armored Copper Cable, 1.5mm2 X 2 core	M	30		
4.14	Wiring, Eathing plus lightening arrestor	Item	1		
4.15	Cable Glands, 25mmL	No.	4		
4.16	Cable Glands, 20mmL	No.	2		
4.17	Splicing Kit, Large Packet	No.	1		
4.18	Cable Ties, Large Packet, Manila	No.	1		
4.19	Insulating Tapes, Large	No.	9		
4.2	Supply & Install DC Enclosure	No.	1		
4.21	Copper Earth rod, 5ft c/w clamp	No.	1		
4.22	Earth Lead Cable 6mm2, single	M	15		
4.23	Fabricate & install a stainless steel pump stand of total length of 2.2m made up of 30mm x 30mm square hollow sections, & 3mm thickness with provisions for fastening the pump set	Item	1		
4.24	Allow a Provisional Sum of Kenya Shillings Thirty Five Thousand for Plumbing Works and sundries at the source including fixing delivery pipeline through sump tank wall and anchoring	Item	L/S		35,000.00
4.25	Flanged 80mm Bulk water master meter, Wesan or equivalent approved	No	1		
4.26	Construct 900mm by 900mm master meter chamber. Depth not exceeding 1m, all in accordance with details shown on drawings. Include for provision and fixing of cast iron step and heavy duty rectangular mild steel frame with locking devices as per details on drawing	No	2		
	TOTAL 4 CARRIED TO SUMMARY PAGE				

BILL 5.0	**REHABILITATION OF PUMP HOUSE & STORAGE TANK**				
	DOORS & WINDOWS				
5.01	Fix standard steel purpose made door size 1000 x 2000mm as per the drawings	nr	1		
5.02	Supply and install grill windows 1000 x 1000mm on the existing pump house as guided by the supervising engineer	nr	2		
5.03	Allow a provisional sum of Ksh. Ten thousand for cleaning the Masonry tank	Item	L/S		10,000.00
5.04	Prepare and apply 3 coats emulsion paint to wall surfaces externally as shall be instructed	$_m2$	22.00		
5.05	Ditto but to walls internally	$_m2$	19.00		
5.06	Ditto but to wood surfaces	$_m2$	4.00		
5.07	Branding of pump house & tank as shall be directed, with logos	Item	L/S		15,000.00
	TOTAL 5 CARRIED TO SUMMARY PAGE				
BILL 6.0	**SITE FENCING SOLAR STRUCTURE**				
6.01	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 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	54		
6.02	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		
6.03	Supply & install 100W floodlights at the pump house, JD or an approved equivalent	No.	2		
	TOTAL 6 CARRIED TO SUMMARY PAGE				
BILL 7.0	**REHABILITATION OF RISING MAIN PIPELINE**				
7.01	Rehabilitate, test & commission the existing pipeline to the distribution tank at Emali Model Health centre	Item	L/S		50,000.00
7.02	Allow for assorted connectors and adaptors including plumbing to the storage tank & connection to chlorine doser as shall be approved	Item	L/S		25,000.00

7.03	Supply, install and test a simple in-line point of use disinfection system that uses a compacted calcium hypochlorite chlorine cartridge that releases active chlorine sanitizer into water flow at max flow rate 16 m3/hr. Supply a Klorman inline unit or equivalent as approved by supervising engineer	No	1		
7.04	Supply and deliver compacted calcium hypochlorite chlorine cartridge	No	10		
7.05	3" Non Return Valve	No	1		
	CLASS K: PIPEWORK - MANHOLES AND PIPEWORK ANCILLARIES				
	Marker Posts				
	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				
7.06	Pipeline marker post inscribed AV	nr	2.00		
7.07	Pipeline marker post inscribed WL	nr	3.00		
	Class L; PIPEWORK - SUPPORTS AND PROTECTION, ANCILLIARIES TO LAYING AND EXCAVATION				
7.08	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	3.00		
7.09	Concrete surround to pipe at road crossing	M	30.00		
	TOTAL 7 CARRIED TO SUMMARY PAGE				

BILL 8	PROVISIONAL SUMS	Kshs.
	Contingencies	
	Allow a provisional sum of Kshs. 100,000 for contigencies	100,000.00
	Public Procurement Capacity Building Levy order 2023 which is 0.03% of the total cost before tax (Pursuant to PPRA Circular No. 1 of 2024)	
	ADD VAT (16%)	
	PAGE TOTAL CARRIED TO SUMMARY PAGE	