

**BILL OF QUANTITIES FOR DRILLING OF PRODUCTION BOREHOLE  
GIKINGI PRIMARY SCHOOL IN OL JORO OROK CONSTITUENCY**

<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Q'ty</b>	<b>Rate Ksh</b>	<b>Amount Ksh</b>
<b>BILL NO. 1: PRELIMINARIES</b>					
1.1	Carry out Environmental Impact Assessment for drilling of borehole at Gikingi Primary School. Submit report in two copies to the Sub-County Water Officer Ol Joro Orok	Item	Lump-sum		<b>200,000.00</b>
1.2	Provide for acquisition of Water Resources Authority borehole drilling authorization and submit the same in two copies to the Sub-County Water Officer.	Item	Lump-sum		<b>150,000.00</b>
<b>BILL NO. 2: DRILLING AND CASING OF BOREHOLE</b>					
2.1	Mobilization and transportation of all plant, drilling rig, construction materials, equipment and personnel to the site; demobilization on completion	Item	Lump Sum		<b>150,000.00</b>
2.2	Drilling of a borehole of minimum diameter 203mm through various types of strata including disposal of excavated materials, taking any remedial measures to overcome caving-in, or over-drilling to accommodate sloughed material and keeping drilling records as specified between ground level and the final depth	M	250	<b>8,000</b>	<b>2,000,000.00</b>
2.3	Supply and install 203 mm internal diameter plain steel casings in the borehole ( <i>provisional</i> )	M	84	<b>5,000</b>	<b>420,000.00</b>
2.4	Ditto but 203mm diameter slotted steel casings with slots of maximum size of 2mm (Torched slots shall <b>not</b> be permitted since they allow ingress of fine sand particles into the borehole compromising both efficiency and life span of the well) ( <i>provisional</i> )	M	166	<b>5,000</b>	<b>830,000.00</b>
2.5	Allow for taking samples of drill cuttings at two (2) metre intervals (Provisional)	No	125	<b>300</b>	<b>37,500.00</b>
2.6	Supply and install into the annular space gravel pack material consisting of naturally graded weathering resistant river quartzite gravel of particle size 2 – 4mm	Tons	12	<b>5,000</b>	<b>60,000.00</b>
2.7	Supply materials and grout between the casing and the borehole top five (5) metres	Item	Lump Sum		<b>45,000.00</b>

2.8	Carry out physical and chemical development of the borehole including inserting and removal of development equipment (At least 4 hours for physical development)	Item	Lump Sum		<b>150,000.00</b>
2.9	Undertake Constant Discharge Test measurement as specified for 24 hours to ascertain borehole yield and draw down until hydraulic equilibrium is achieved	Item	Lump Sum		<b>200,000.00</b>
2.10	Undertake borehole water level observation and recovery measurements until initial water level is recovered	Item	Lump Sum		<b>50,000.00</b>
2.11	Carry out borehole sterilization	Item	Lump Sum		<b>150,000.00</b>
2.11	Install wellhead with a stick-up casing of 0.5m above ground level, well cap serial number and concrete (1:3:6) plinth of dimensions 1.5 x 1.5 x 0.5m thick around the well head	Item	Lump Sum		<b>55,000.00</b>
2.12	Supply of water and drilling fluids for drilling operations and field camp	Item	Lump Sum		<b>120,000.00</b>
2.13	Allow for borehole water sampling for quality analysis in a government approved laboratory (1No. for Bacteriological and 1 No. for Chemical analysis each 2litres). Submit two copies of the report to the Sub-County Water Officer	Item	Lump Sum		<b>20,000.00</b>
2.14	Allow for making good and surface reinstatement at the borehole location as directed by the supervisor	Item	Lump Sum		<b>10,000.00</b>
2.15	Allow for provision of borehole completion record and test pumping data and submit two copies of each to the Sub-County Water Officer	Item	Lump Sum		<b>10,000.00</b>
<b>Sub-Total</b>					
2.16	Add 3% Project Management Costs	%	3		<b>144,000.00</b>
<b>TOTAL 1</b>					<b>4,801,500.00</b>

**SUPPLY, INSTALL AND COMMISSION A SOLAR POWERED SUBMERSIBLE PUMP, SOLAR PANELS, PANELS SUPPORT STRUCTURE AND ACCESSORIES AND FENCE BOREHOLE AND SOLAR ASSEMBLY AREA AT GIKINGI PRIMARY SCHOOL IN OL JORO OROK CONSTITUENCY**

No	Description	Unit	Q'ty	Rate Kshs	Amount Kshs
1.0	Pump and solar installation				

1.1	Supply and deliver Dayliff 2" standard 3-metre long draw pipes	No	80	<b>8000</b>	<b>640,000.00</b>
1.2	Supply, deliver and install in borehole a complete Solar Premium Quality submersible pump (Grundfos or Dayliff) capable of delivering 10.2m <sup>3</sup> /hr, against a head of 220m spliced to a 220m long borehole submersible cable and 220m duo core cable inclusive of necessary accessories (sensors)	Item	Lump Sum		<b>850,000.00</b>
1.3	Firmly join the submersible pump to a 2" diameter adaptor set to adapt to the Dayliff pipes in 1.1 above	Item	Lump Sum		<b>80,000.00</b>
1.4	Firmly join the 80No. draw-pipes to the adaptor. Carefully lower the submersible pump with the draw pipes into the 152mm diameter steel cased borehole. Ensure that the submersible cable and sensor cables are properly secured to the draw pipes and that the integrity of the insulation of the cables is safeguarded. <b>NB: The borehole does not have a gantry.</b>	Item	Lump Sum		<b>250,000.00</b>
1.5	Fabricate a 6.8mm thick mild steel plate 6" diameter well head cap painted with one coat of red oxide primer and 2 coats of black gross oil paint with a 2" orifice for outlet pipe and a 1" slot for submersible electrical cable and sensors cable, deliver to site and firmly fix on borehole casing stack to the satisfaction of the supervisor.	Item	Lump Sum		<b>150,000.00</b>
1.6	Provide and fix a 2" union, 2" non-return valve, a 2" master meter and all necessary fittings thereof at well head as directed by the Engineer	Item	Lump-sum		<b>145,000.00</b>
1.7	Supply, deliver and fix on the panel support structure a suitable Hybrid Solar Controller for pump in item (1.2) above in a damp-proof enclosure with external display for current running data such as, input/ output current/ power/voltage, pump speed and temperature. It should also incorporate the following alarm functions, over current, under voltage, over speed, over temperature, reverse polarity, low water level automatic cut off switch. It should have an integrated MPPT (Maximum Power Point Tracking for maximising power use from PV modules. The control unit should incorporate a facility for connecting an over flow automatic control float switch. Allow for PV disconnect switch and all other necessary accessories	Item	Lump Sum		<b>970,000.00</b>
1.8	Supply, deliver and install 39No. 335Watts, 24Volts crystalline PV solar modules to provide a maximum of 11.4Kw output. Allow for underground cables, inter-panel wiring and all necessary accessories. Include lightning arrester	39	NO	45,000	<b>1,755,000.00</b>
1.9	Supply, deliver to site and erect in concrete 1:3:6 surround a Davies and Shirliff galvanised steel ground mount 3metre panel support structure for	Item	Lump Sum		<b>63,000</b>

	mounting the solar panels (minimum depth 600mm below ground level)				
<b>SUB-TOTAL 1</b>					<b>4,903,000.00</b>
<b>2.0</b>	<b>Fencing</b>				
2.1	Supply 1:2:4 properly vibrated concrete posts with maximum aggregate size of ½” (free from honey combs 2500mm long with a cross section of 150mmx150mm at the base and 100mmx100mm at the top reinforced with D8 deformed bars with a concrete cover of 25mm, firmly fixed in 600mm deep holes with 1:3:6 concrete surround. Provide for holes through the posts to pass 5 strands of barbed wire placed at 300mm apart	No.	24	4,000	<b>96,000.00</b>
2.2	Excavate pits of 200mm diameter and 600mm deep to accommodate the posts	No.	34	100	<b>3,400.00</b>
2.3	Supply, handle and fix strands of heavy gauge barbed wire through the holes in the posts to support the chain link	Roll	3	7,500	<b>22,500.00</b>
2.4	Supply, handle and fix 6ft high heavy gauge chain link	Roll	7	4,500	<b>31,500.00</b>
2.5	Supply, cut and handle binding wire to fasten the chain link to the barbed wire	Roll	1	5,000	<b>5,000.00</b>
2.6	Supply materials, handle, place and vibrate reinforced concrete mix 1:2:4 with deformed D12 bar to construct 2No. 300mm x 300mm x3100mm high columns to accommodate gate. Allow for necessary formwork	Item	L/s		<b>40,000.00</b>
2.7	Supply materials, handle, cut, bend and weld to construct a gate with mild steel sheet 16 gauge welded on steel hollow square section 50mm x 50mm x 4mm thick, 3500mm wide x 2500mm high hinged to the columns	Item	L/s		<b>52,000.00</b>
<b>SUB-TOTAL 2</b>					<b>250,400.00</b>
	<b>Tower</b>				
3.1	The steel tower will be designed to support its own weight as well as the load of 10,000litres plastic water tank when fully loaded with water 6m above the ground level, The tower will be anchored to the ground in reinforced concrete. It will be made of I sections for main beams and sub main beams, rolled steel angles for bracings, MS flat bars and round bars for cat ladder, stiffener plates and rolled steel angles for horizontal and vertical bracings.  The entire structure will be painted with one coat primer and 2 coats of aluminium paint.	Item	Lump sum		<b>240,000.00</b>
3.2	Supply, deliver and install 10,000 litres plastic water tank on to the steel tower				<b>85,000.00</b>

<b>SUBTOTAL 3</b>					<b>325,000.00</b>
	<b>DISTRIBUTION OF WATER</b>				
<b>4.1</b>	<b>EXCAVATION:</b> To include for all trimming to levels backfilling with approved selected spoil, compacting, disposal of surplus material and reinstatement.	Item	Lump sum		<b>20,000.00</b>
<b>4.2</b>	Excavate 400mm wide and not less than 600mm deep trench from the borehole to the proposed water kiosk as directed on site by the site supervisor.	Item	Lump sum		<b>28,000.00</b>
	<b>HDPE PIPEWORK.</b>				
<b>4.3</b>	Provide, lay, join and test the following: - Flexible spigot and socket pipes and fittings with rates to include all jointing material cutting and wastage.				<b>30,000.00</b>
<b>4.4</b>	Supply, Lay, and Join, Test and Backfill 40mm Ø HDPE- 16 bars pipeline from the borehole to Gikingi secondary school and Gikingi Primary School as directed on site by the site supervisor.	<b>500</b>	<b>M</b>	<b>3000</b>	<b>150,000.00</b>
<b>(DISTRIBUTION OF WATER) SUB TOTAL 4</b>					<b>228,000.00</b>
<b>(ERECTION OF 10,000 LITRES WATER TANK) SUB TOTAL 3</b>					<b>325,000.00</b>
<b>(ERECTION OF A HIGH GAUGE CHAINLINK FENCE)SUB TOTAL 2</b>					<b>250,400.00</b>
<b>(EQUIPPING OF A BOREHOLE)SUB TOTAL 1</b>					<b>4,903,000.00</b>
<b>DRILLING OF BORE HOLE</b>					<b>4,801,500.00</b>
<b>TOTAL FOR DRILLING AND EQUIPPING OF A BOREHOLE AT GIKINGI PRIMARY SCHOOL</b>					<b>10,507,900.00</b>