

**PROJECT – KAPSOWAR COMMUNITY WATER SUPPLY PROJECT.17-18FY**

**INTAKE AUGUMENTATION, CONSTRUCTION OF CFU,PIPE LAYING OF GRAVITY MAIN AND DISTRIBUTION MAIN.**

Kapsowar community water project is located in Embongosir River Which emanates from Kipkunur forest in Kapsowar ward of Marakwet West Sub County. The proposed site can be accessed through Kapsowar-Kapchesewes Road.

**KAPSOWAR WARD**

The Contractor is advised to visit the site and familiarize himself/herself with site conditions prior to bidding.

**BILL OF QUANTITIES**

**KAPSOWAR WATER SUPPLY AUGUMENTATON**

<b>A</b>	<b>INTAKE IMPROVEMENT.</b>				
<b>Item</b>	<b>Description</b>	<b>Qty</b>	<b>Unit</b>	<b>Rate Kshs.</b>	<b>Amount Kshs.</b>
	<b><u>PRELIMINARIES</u></b>				
1.1	Prepare and install project sign board as specified.	1	N0		
1.2	Allow for a provisional sum of Ksh 400,000 (Five hundred thousand) for transportation of materials and equipment.	item	Item		
1.3	Allow a provisional sum of Ksh 100,000(Kenya shillings one hundred thousand only) for diversion/control of the water flow to allow construction to take place.	item	Item		
2.1	<b><u>SUBTOTAL</u></b>				
	<b><u>EARTH WORKS</u></b>	200	M <sup>2</sup>		
2.2	Clear site, within the existing reservoir of shrubs and dispose off .				
	Using appropriate means/method excavate in soft muddy soil to remove the silt within the reservoir and dispose off as directed.	500	M <sup>3</sup>		
2.3	Excavate river bank in normal soil to take wing walls, abutments, rip rap, key, aprons and cut off walls n.e 1.5m deep.	150	M <sup>3</sup>		
2.4	<b><u>CONCRETE/REINFORCEMENTS</u></b>	100	M <sup>2</sup>		

2.5	Sawn timber framework as described to sides of the weir body and wing walls.	350	Kg		
2.6	High yield square twisted bar to BS 4461, 12mm $\phi$ in wing walls				
2.7	Hack the existing plaster work on the down stream of the weir body, top of the wing wall and spillway, to expose the existing reinforcement. Provide and fix additional 12mm $\phi$ bars as will be directed.	600	Kg		
2.8	Provide and place and vibrate 1:2:4 concrete as described to the wing wall, weir body, head wall and foundation base.	30	M <sup>3</sup>		
2.9	20mm thick cement and sand plaster including water proof cement (1:1:3)	40	M <sup>2</sup>		
2.10	Provide and fix 150mm $\phi$ G.I pipe class B for the extension of the scour pipe.	1	M		
2.11	Provide and fix sluice valve 150mm $\phi$ to the scour pipe including heavy duty flanges, bolts and nuts	1	M		
2.12	Provide and place 1:2:4 reinforced concrete including 12mm $\phi$ reinforcement bars as described to the silt traps across the river.	3	M <sup>3</sup>		
2.13	200mm stone pitching on the sides of the resultant reservoir, hand placed on the crushed stones, joined, sealed and flush with 1:2 mortar.	120	M <sup>2</sup>		
	Provide and fix double swing steel gate 3000mm by 2000mm high, fabricated in 25mm SHS placed at 150mm C/C both ways, 75mm $\times$ 25mm RHS framing and 100mm black pipe pillars, rate to include locking device, padlock and painting	1	No		
	Allow for a provisional sum of Ksh				
	<b>TOTAL</b>				

<b>B</b>	<b>CONSTRUCTION OF COMPOSITE FILTRATION UNIT (CFU)</b>				
<b>ITEM NO</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE Kshs</b>	<b>AMOUNT Kshs.</b>
3	<b>Excavation and Backfilling</b> <b>Note:-</b> The rates should include for all strutting, shuttering, stabilizing the excavation and keeping the excavation free from general waters by pumping, piling or other means Excavate for foundation, partly backfill structure after construction and cart away surplus to tips or use as fill on site as directed				
3.1	Depth upto 1.5 m	$m^3$	200		
3.2	Depth between 1.5m to 2m	$m^3$	150		
3.3	(provisional)	$m^3$	20		
3.4	Extra over excavation in rock (provisional) Provide and compact 250mm thick selected hardcore	$m^3$	30		
4	<b>Concrete works</b> Provide, mix and vibrate concrete as directed by the Engineer as follows				
4.1	Concrete class 15 in 50mm blinding layer under base slab	$m^3$	3		
4.2	Concrete mix 1:4:8 in benching to base	$m^3$	12		
4.3	Concrete class 20 to pipe surround	$m^3$	2		
4.4	Vibrated reinforced concrete class 25 to floor slab 150mm thick	$m^3$	6		
4.5	Ditto in suspended beam	$m^3$	0.5		
4.6	Ditto in ring beam	$m^3$	3		
4.7	Concrete class 20 in sedimentation chamber	$m^3$	5		
4.8	Ditto class 20 in filtration chamber	$m^3$	3		
	<b>Subtotal carried forward to summary</b>				
<b>ITEM NO</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>		
5	<b>Steel Reinforcement</b> Provide and fix mild steel reinforcements including bending, propping with spacers and tying as specified.				
5.1		Kg	20		

5.2	6mm Ø	Kg	720		
5.3	8mm Ø	Kg	580		
5.4	10 mm Ø high tensile	Kg	1020		
5.5	12mm Ø high tensile	kg	132		
6	<b>Formwork</b> Provide and fix shuttering including propping, strutting and striking all specified allowing for curvature where necessary				
6.1		$m^2$	10		
6.2	F1 Sides of base slab	$m^2$	16		
6.3	F1 Sides of thickening base slabs for pipes F2 Sides of beams (vertical and horizontal)	$m^2$	8		
7	<b>Walling( the walls to include 1.5m high from the ground)</b>				
7.1	Provide and lay plastic joint in 25mm sealer or approved equivalent between the base slab and the walls of the CFU  Construct stone masonry wall(raked externally) in cement sand ratio 1:2 and with waterproof admixture	$m^2$	30		
7.2	Thickness 225mm	$m^2$	60		
7.3	Ditto 150mm	$m^2$	76		
	<b>Sub -total carried forward to summary</b>				
<b>ITEM NO</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE Kshs</b>	<b>AMOUNT Kshs</b>
	<b>Finishes</b> Provide, handle and apply the following materials as directed.				
8.1	Two layers of 10mm thick water proof plaster using 1:2 cement sand ratio to inside walls	$m^2$	185		
8.2	Apply epoxy paint to internal walls in contact with water	$m^2$	300		
8.3	50mm thick floor screed to sedimentation chambers	$m^2$	100		
8.4	Ditto filtration unit	$m^2$	10		

	<b>Subtotal carried forward to summary</b>				
9	<b>Pipes and Fittings</b> Supply and install the following pipes complete with fittings as shown on the drawing. Rate to include for jointing and making good of the works				
9.1	100 mm GI clear water outlet/Backwash pipe	m	12		
9.2	150mm GI wash/ waste water outlet	m	16		
9.3	pipe	m	12		
9.4	100mm GI raw water inlet pipe				
	100mm GI overflow pipe				
10	<b>Underdrain System</b> Supply, fabricate and underdrain as shown in drawing the following				
	1.7 m long 100mmx150mm channel made up of 3mm thick steel plate				
	1.7m long 3mm thick steel plate (with slots) on top of the 100mmx150mm channel.				
10.1	50mm Ø GI pipes with 5 nozzles 0.5 m long	No	2		
10.2	50mm Ø GI pipes with 7 nozzles 1.3 m long	No	2		
10.3	50mm Ø GI pipes with 9 nozzles 1.7 m long	No	8		
10.4	50mm Ø GI pipes with 9 nozzles 1.7 m long	No	4		
10.5	50mm Ø GI pipes with 1 nozzles 2.1m long	No	4		
10.6	50mm Ø GI pipes with 1 nozzles 2.1m long	No	2		
	<b>Sub total carried forward to summary</b>				
<b>ITEM NO</b>	<b>DESCRIPTION</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate Kshs</b>	<b>Amount Kshs</b>
	<b>Filter Media</b> Supply and place filter material in layers as indicated on drawing	$m^3$			
11.2	Filter sand effective size 0.5mm and uniformity coefficient 1.5	$m^3$	20		
11.3	Coarse sand effective size 1.0mm	$m^3$	2		
11.4	Gravel effective size 2-5mm	$m^3$	0.8		
11.5	Ditto 5-12mm	$m^3$	0.8		
11.6			0.8		

	Ditto 12-20mm Ditto 20-38mm	<i>m3</i>			
12	<b>Miscellaneous Metal works</b>				
12.1	150x200mm epoxy coated mild steel plate(4mm thick) Collection weir	m	5		
12.2	Install handrails and walkways round the perimeter of the filter unit and from the ladder to the filter unit	m	30		
12.3	Construct access ladder to the CFU using 25mm G.I pipes	m	8		
	<b>Subtotal carried forward to summary</b>				
13	<b>Chemical mixing Chamber</b> Allow for construction of mixing chamber with baffle walls to the new CFU	LS	1		
14	<b>Chambers</b>				
14.1	Provide all materials and construct a standard 1.5x1.5m valve chamber. Include for supply and fixing of lockable cover, depth of chamber n.e.	No	2		
14.2	1.5m Ditto but 1.2x1.2m	No	2		
	<b>Sub total carried forward to suary</b>				

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
15.	<b>PRELIMINARIES.</b>				
15.1	Allow for a provisional sum of Ksh 30,000.00 for sign post as directed by the Engineer.	L s			
15.2	Allow for provisional sum of Ksh 100,000.00 for testing and commissioning.	L s			
	<b>Sub total carried forward to summary</b>				
	<b>Total for CFU</b>				

### 10M3 PLASTIC ELEVATED BACK WASH TANK

C	CONSTRUCTION OF BACKWASH UNIT.				
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT.
1.0	Provide 10m3 ROTO PLASTIC TANK and install on a steel tower to be fabricated as shown in the drawing. Rate to include all piping and fittings and painting.	No	1		
	<b>Sub Total carried forward to summary</b>				
	<b>Total for Backwash.</b>				

Item No.	Description	Unit	Quantity	Unit	Amount
D.	<b>Gravity main line</b>				
	<b>Connection to CFU.</b>				
1	Procure, Transport, lay, joint and test 6" Ø GI class B pipes.	m	60		
2	Procure, Transport, lay, joint and test 6" Ø UPVC class D pipes.	m	900		
3	Excavate trench size 0.2 x 0.8m and backfill the same after pipe laying for the above lines	m	960		
4.0	<b>Supply and fix the following fittings as directed by the Engineer</b>				
4.1	6" x 6" GI Flanged Tee Equal	No	2		
4.2	6" x 6" Adaptor	No	6		
4.3	6" Sluice Valve	No	5		
4.4	6" GI Nipples	No	8		
4.5	6" GI Sockets	No	6		
4.6	6" GI Elbows	No	6		
4.7	Provide all materials and construct a standard 1.2m x 1.2m valve chamber. Include for supply and fixing of lockable cover, depth of chamber n.e. 1.5m	No	3		

	<b>Outlet connection from the new tank</b>				
<b>5.0</b>	<b>Supply and fix the following fittings as directed by the Engineer</b>				
5.1	6" Flanged Tee equal	No	1		
5.2	6" Flanged 90° bend	No	1		
5.3	6" x 4" Flanged concentric taper	No	1		
5.4	4" G1 pipes class B	No	2		
5.5	4" drilled Flanges	No	4		
5.6	4" Sluice valve	No	1		
5.7	4" G1 pipe piece 0.6m long and threaded on one side	No	1		
5.8	4" Flanged adaptor	No	1		
5.9	4" x 2" Flanged Tee	No	1		
5.10	2" sluice valve.	No	1		
5.11	2" Flanged Air valve	No	1		
5.12	1.5m x 1.5m valve chamber with a lockable cover	No	1		
5.13	5/8" x 2 1/2" bolts and nuts	No	1		
5.14		-	-	-	-
5.15	Allow for drilling hole 6" diameter through existing valve chamber wall and plaster the same after laying pipe through it.	L/S			
5.16	Allow for repair of tank at Kapchesewes	L/s	L/s		
	<b>Sub Total</b>				

<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate</b>	<b>Amount</b>
<b>E</b>	<b>Distribution from East Corner to Cheptobot</b>				
1	Supply and lay, joint and test 1" upvc pipes class D	No	100		
2	Supply and lay, joint and test 1" G.I pipes class B	No	6		
3	<b>Supply and fix the following fittings:</b>				

3.1	1" G.I plain sockets	No	8		
3.2	1" GI Elbows	No	4		
3.3	1" valve sockets	No	4		
3.4	1" Pegler gate valve UK	No	1		
4	Excavate trench size 0.2x0.8m and backfill the same after pipe laying for the above lines	m	360		
	<b>Sub Total</b>				
<b>F</b>	<b>Distribution from police station to Ngorgoroi existing water tank.</b>				
1	Supply and lay, join and 2" G.I pipes class B	m	300		
2	<b>Supply and fix the following fittings:</b>				
2.1	2" G.I plain sockets	No	8		
2.2	2" valve sockets	No	4		
2.3	2" Pegler gate valve UK	No	1		
2.3	2" GI Nipple	No	4		
2.4	2" GI union	No	4		
	<b>Sub Total</b>				
<b>G</b>	<b>Distribution to Kambiswahili</b>				
1	Supply and lay 2" upvc pipes class D	m	600		
2	Supply and lay 2" G.I pipes class B	m	60		
3	<b>Supply and fix the following fittings:</b>				
3.1	2" GI Nipple	No	4		
3.2	2" Pegler gate valve UK	No	1		
3.3	2" GI union	No	1		
3.4	2" valve sockets	No	10		
3.5	2" GI Plugs	No	4		
3.6	2" GI Equal Tees	No	4		
4	Excavate trench size 0.2x0.8m and backfill the same after pipe laying for the above lines	m	600		
	<b>Sub Total</b>				
<b>H</b>	<b>Distribution from Ngorgoroi tank –to Kwa Hassan.</b>				
1	Supply and lay 2" upvc pipes class D	m	1200		
2	Supply and lay 2" G.I pipes class B	m	120		
3	<b>Supply and fix the following fittings:</b>				
3.1	2" GI Nipple	No	4		
3.2	2" Pegler gate valve UK	No	2		
3.3	2" GI union	No	1		

3.4	2" valve sockets	No	10		
3.5	2" GI Plugs	No	4		
3.6	2" GI Equal Tees	No	4		
4	Excavate trench size 0.2x0.8m and backfill the same after pipe laying for the above lines	m	1,320		
	<b>Sub Total</b>				
<b>J</b>	<b>Distribution to Kiplabai</b>				
1	Supply and lay 2" upvc pipes class D	m	1920		
2	Supply and lay 2" G.I pipes class B	m	120		
<b>3</b>	<b>Supply and fix the following fittings:</b>				
3.1	2" tee equal G.I	No	1		
3.2	2" GI Elbows	No	4		
3.3	2" nipples	No	4		
3.4	2" pegler gate valves UK	No	2		
3.5	2" unions	No	6		
3.6	2" valve sockets	No	10		
3.7	2" GI bend	No	3		
3.8	2" GI Plug	No	1		
4	Allow for erection of pillars along the pipeline	No	3		
5	Allow for repair of tank at Kiplabai	L/s	L/s		
6	Excavate trench size 0.2x0.8m and backfill the same after pipe laying for the above lines	m	2040		
	<b>Sub Total</b>				
	<b>Total</b>				
	Add Engineers Supervision				95,625
	<b>Grand Total to be carried to form of tender.</b>				