

**ADDENDUM BQ**

**BILL OF QUANTITY  
FOR  
RASINI WATER PROJECT  
(FAZA)**

**BILL (A) – CONSTRUCTION OF 14.968KM PIPELINE**

<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount (Kshs.)</b>
1.0	<p><b><u>Clearing of pipeline route</u></b> Clear pipeline route of bushes, undergrowth, trees, debris and rubbish and dispose. Width of clearance to be 2.0m to accommodate for access road and trench and excavation of materials.</p> <p><b><u>Excavation</u></b></p>	M	14,968		
1.1	Excavate for pipe trench to a depth not exceeding 1000mm for 80mm diameter Pvc pipes, prepare bed on completion of excavation.	M	1,380		
1.2	Excavate for pipe trench to a depth not exceeding 1000mm for 50mm diameter Pvc pipes class D, prepare bed on completion of excavation.	M	1,900		
1.3	Excavate for pipe trench to a depth not exceeding 1000mm for 25mm diameter Pvc pipes class D, prepare bed on completion of excavation.	M	528		
1.4	Excavate for pipe trench to a depth not exceeding 1000mm for 20mm diameter Pvc pipes class D, prepare bed on completion of excavation.	M	7,866		
1.5	Excavate for pipe trench to a depth not exceeding 1000mm for 20mm diameter PPR pipes; prepare bed on completion of excavation.	M	3,294		
	<b><i>SUB-TOTAL</i></b>				

Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
1.6	<b><u>Laying and jointing of pvc pipes.</u></b> Distribute, lay and joint 80mm diameter Pvc pipes class D in trench including making provisions for appurtenances and pipe fittings as per specifications.	M	1,380		
1.7	Distribute, lay and joint 50mm diameter Pvc pipes class D in trench including making provisions for appurtenances and pipe fittings as per specifications.	M	1,900		
1.8	Distribute, lay and joint 25mm diameter Pvc pipes class D in trench including making provisions for appurtenances and pipe fittings as per specifications.	M	528		
1.9	Distribute, lay and joint 20mm diameter Pvc pipes class D in trench including making provisions for appurtenances and pipe fittings as per specifications.	M	7,866		
2.0	Distribute, lay and joint 20mm diameter PPR pipes for meter installation.	M	3,294		
2.1	<b><u>Backfilling</u></b> Backfill trench using well selected excavated material after laying and jointing the 100mm, 80mm, 50mm, 25mm and 20mm PVC and PPR pipes.	M	14,968		
	<b><i>SUB-TOTAL</i></b>				

Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
2.2	<b><u>Installation of 549 Consumer Water Meters</u></b> Distribute and install 549 No. of 15mm Kent Water Meters as directed by the Engineer.	No.	549		
2.3	<b><u>Construction of valve chambers</u></b> Construct standard reinforced concrete valve chambers. Include for hardcore fill, boxing out for manhole and fixing of 1No. MS manhole cover and frame light duty 600x 450mm for water master meters, air valves and washout.	No.	8		
2.4	<b><u>Pressure Testing &amp; Disinfection.</u></b> Allow for carrying out pressure testing on pipeline.	M	3,808		
2.5	<b><u>Installation of Air Valves, Wash out and Water Master Meters.</u></b> Install rising air valves wash out and water master meters and connect to pipeline as instructed on site.	No.	8		

	<b><i>SUB-TOTAL</i></b>				
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Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
	<b><u>Installation of air valves, wash out and water meters.</u></b>				
2.6	Provide and install 2" water meters at inter connection of the 80mm diameter PVC Pipeline.	No.	15		
	<b><u>Construction of interconnection chambers.</u></b>				
2.7	Supply all materials, construct chambers for interconnection of the gravity main of 80mm diameter and the extension distribution mains of 50mm	No.	8		
2.8	Install and connect to pipeline sluice valve and all other fittings.	No.	2		
	<b><u>Miscellaneous</u></b>				
2.9	Provide concrete class 15 include for the required formwork and additional excavation for anchor blocks and surrounding of pipeline as directed by the Engineer (Provisional).	No.	4		
	<b><u>Mark post</u></b>				
3.0	Provide, lay and fix in place and paint pre-cast reinforced concrete marker posts along the pipeline at 200m interval, the posts to be with letter 100mm, 80mm and 50mm posts be painted blue. The size to be 75mm x100mm x 150mm long.	No.	25		

	<b>TOTAL</b>				
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<b>BILL (B) – MATERIALS FOR PIPELINE</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount (Kshs.)</b>
1.	PVC 80mm Diameter pipes class D	No.	230		
2.	PVC 50mm Diameter pipes class D	No.	317		
3.	PVC 25mm Diameter pipes class D	No.	88		
4.	PVC 20mm Diameter pipes class D	No.	1311		
5.	PPR 20mm Diameter pipes class D	No.	1,098		
6.	PVC Tee 80mm Diameter Tee	No.	21		
7.	PVC 80mm Diameter Adaptor (male threaded)	No.	10		
8.	PVC 3" x 2" Reducing socket	No.	31		
9.	G.I. 1 meter pipe Heavy class 3" (one end to be flanged and the other end threaded).	No.	6		
10.	G.I. 2 meter pipe 2" (one end flanged and the other end threaded).	No.	12		
11.	PVC Tee 2"	No.	52		
12.	PVC 2" x 1" Reducing socket	No.	19		
13.	PVC 1" Tee	No.	72		
14.	PVC 1" x 3/4" Reducing socket	No.	145		
15.	PVC 3/4" Tee	No.	320		
16.	PVC 3/4" Adaptor	No.	549		
17.	G.I Tee 3/4"	NO	150		

	<b><i>SUB-TOTAL</i></b>				
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Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
18.	G.I 3" Socket	No.	24		
19.	PVC 1" Adaptor	No.	190		
20.	G.I 3/4" Plain socket	No.	1,098		
21.	G.I 3/4" Elbow	No.	2,196		
22.	G.I 3/4" Bend	No.	1,098		
23.	Water Meter (Kent) 1/2"	No.	549		
24.	G.I 3/4" x 1/2" Reducing Bush	No.	1,647		
25.	Tap (Pegler) 1/2"	No.	549		
26.	Thread seal	No.	2,500		
27.	Solfix cement	LTR.	100		
28.	Sluice valve 3"	No.	3		
29.	Gate valve 2"	No.	8		
30.	Gate valve 1"	No.	6		
31.	Gate valve 3/4"	No.	1,098		
38.	G.I Nipple 3/4"	No.	357		

	<b><i>SUB-TOTAL</i></b>				
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Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
	<b><u>MATERIALS FOR VALVE CHAMBERS.</u></b>				
1.	Water meter 3" (Kent) Flanged	No.	2		
2.	Water meter 2" Flanged	No.	1		
4.	Air valve 2" Female screwed	No.	6		
5.	Gate valve 2" U.K	No.	32		
6.	G.I Nipple 2"	No.	12		
7.	G.I Plain socket 2"	No.	12		
8.	G.I Tee 2"	No.	6		
9.	G.I Tee Flanged 3" (both sides)	No.	3		
10.	G.I Plain socket 3"	No.	6		
11.	PVC Adaptor 3"	No.	6		
13.	G.I Flange 3"(Heavy duty)	No.	6		
15.	Bolts, Nuts and Washers of 16mm Diameter of 3" length	No.	100		
16.	Bolts, Nuts and Washers of 10mm Diameter of 3" length	No.	100		
17.	Gaskets 6mm thickness	Kg	10		



	<b><i>SUB-TOTAL</i></b>				
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Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
18.	PVC Adaptors 2"	No.	76		
20.	Coral Blocks 9" x 9" x 16"	No.	1,200		
21.	Portland Cement	Bag.	72		
22.	Building Sand	Tonne	12		
23.	Ballast	Tonne	6		
24.	Provide for pre-cast reinforced cover for 12No. valve chambers	Lump Sum	1		
25.	Reinforcement (Y10)	M	288		
26.	Binding wire	Kg	6		

	<b>MATERIALS TOTAL</b>				
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<b>BILL (C) – CONSTRUCTION OF 50M<sup>3</sup> SUMP TANK</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount (Kshs.)</b>
	<b><u>Site Clearance</u></b>				
1.0	Clear tank site of all bushes, scrubs, undergrowth and trees and remove all stumps and roots and dispose.	Lump Sum	1		
1.1	Excavate tank site commencing from 200mm below ground level but not exceeding 1.5m deep.	M <sup>3</sup>	60		
1.2	Ditto 1.5m to 3.0m deep.	M <sup>3</sup>	20		
1.3	Provide, place and compact 200mm thick hardcore as shown on the drawings.	M <sup>2</sup>	40		
1.4	Provide, place 50mm thick blinding 1:3:6 concrete mix on top of hardcore and compact.	M <sup>2</sup>	40		
1.5	Provide, mix and place 250mm thick vibrated reinforced concrete 1:2:4 mix to floor slab. Allow for curing.	M <sup>3</sup>	10		
1.6	Provide, mix and place 1:3 cement sand screed 20mm thick on top of floor slab. Allow for curing.	M <sup>2</sup>	38		
1.7	Provide, place and joint 250mm thick dressed coral stone tank wall in 1:3 cement sand mortar as directed by the engineer.	M <sup>2</sup>	37		
1.8	Provide, prepare and apply 1:3 cement sand plaster of 25mm thick to internal sides of tank wall. Allow for water proof cement and curing.	M <sup>2</sup>	37		

	<b><i>SUB-TOTAL</i></b>				
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Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
1.9	Provide, prepare and apply 1:3 cement sand plaster of 20mm thick to external sides of tank wall. Allow for curing.	M <sup>2</sup>	37		
	<b><u>Reinforcement</u></b>				
2.0	Provide and fix R8 reinforcement bars in horizontal mortar joint of tank wall as shown on drawing.	M	400		
2.1	Provide and fix Y10 reinforcement bars in concrete foundation of tank bottom as shown on drawings directed by engineer.	M	856		
2.2	Provide and fix Y10 reinforcement bars in concrete roof slab of the tank as shown on the drawing.	M	887		
2.3	Provide a ventilation of 100mm diameter using G.I bends on the roof slab of the tank and fix gauge wire as diameter on site.	No	4		
2.4	Provide and fix all the piping system of inlet, outlet, washout and all other necessary fittings of the tank as directed on site.	Lump sum	1		
2.5	Provide materials for construction of valve chamber at inlet and outlet of tank.	No	2		

	<b><i>SUB-TOTAL</i></b>				
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Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	<b><i>Balance Brought Forward</i></b>				
	<b><u>Sundries</u></b>				
2.6	Provide, mix and place reinforced concrete 1:2:4 to column as shown on the drawings. Allow for plastering. The column size to be 200 x 200mm.	No.	2		
2.7	Provide a manhole opening of size 600mm x 600mm on top of roof with a lockable cover.	No.	1		
2.8	Provide, erect and fix Y10 bar on the floor slab for the columns as shown on the drawings.	M	24		

	<b>TOTAL</b>				
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<b>BILL (D) - FABRICATION &amp; INSTALLATION OF 24M ELEVATED TANK</b>					
<b>Item No.</b>	<b>Description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount (Kshs.)</b>
1.0	<b><u>Excavation and earthworks.</u></b> Excavate for foundation to a depth not exceeding 1500mm.	Item	1		
1.2	<b><u>Tank construction.</u></b> Construct a 50m <sup>3</sup> METRIC COLD Pressed Steel Sectional Water Storage Tank of size 5000mm x 5000mm x 2000mm to BS 1564 Part II complete with 1.5mm thick pitched roof cover, Internal & External ladders, Water Level Indicator, Vent Cleats, Stays, Manhole with lockable cover, Glasticord joining compound, galvanized nuts, bolts & washers. Tank painted with 2 coats Bituprime internally & Aluminium paint externally – Plate thickness 4.5mm.	No.	1		
1.3	Provide 15m high Tank tower to BS 449 complete with walk way, hand rail, ladder painted with 2 coat of Aluminium paint.	No.	1		
1.4	Fabricate and erection of structural steel work for 15m steel tower.	Item	1		
1.5	Allow for piping costs and transportation to site.	Item	1		

	<b>TOTAL</b>				
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### BILL (E) – INSTALLATION OF SOLAR PUMPING SYSTEM

Item No.	Description	Unit	Qty.	Rate	Amount (Kshs.)
	Supply and install a solar pump for pumping water from a 10m deep well to a 15m high 50m <sup>3</sup> water tower. Consider a 45m total head and 50,000 litres daily water requirement.				
1.	Lorentz PU4000 C-SJ8-15pump c/w motor PS4000 4kVA DC pump controller	No.	1		
2.	PV Disconnect switch 440v/40A	No.	1		
3.	Well-probe sensor	No.	1		
4.	Solarworld 85w 12v Solar modules	No.	1		
5.	Solarworld cable dual core	No.	42		
6.	Surge Protector PS4000	M	100		
7.	4mm <sup>2</sup> 4core submersible cable	No.	1		
8.	Cable joint (1.5mm-4mm)	M	100		
9.	Pressure KIT Switch	No.	2		
10.	Dayliff 1½” 3m pipe	No.	1		
11.	Dayliff 1½” adaptor set	No.	7		
12.	Solar support structure	No.	1		
13.	Installation materials	LS.	1		
14.	Installation Labour & Transport	LS.	1		
15.	Fencing chain link and securing the solar	LS.	1		
16.	system and the well.	SM.	5		

	<b>TOTAL</b>				
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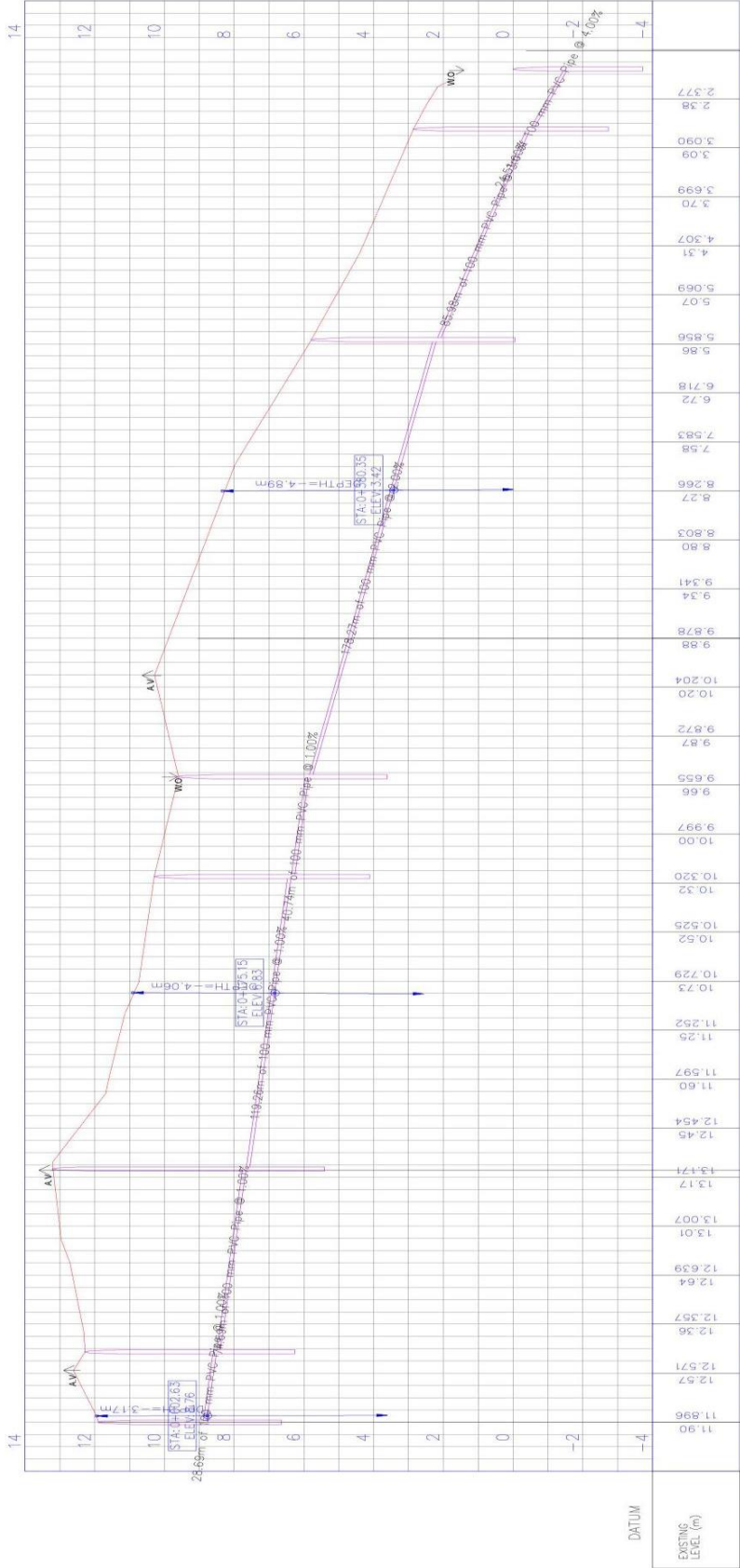
## GENERAL SUMMARY OF BILL OF QUANTITY FOR RASINI VILLAGE

BOQ ITEM.	DESCRIPTION	AMOUNT (KSHS)
BILL (A)	CONSTRUCTION OF 14.968KM PIPELINE	
BILL (B)	MATERIAL FOR 14.968KM PIPELINE	
BILL (C)	CONSTRUCTION OF 50M <sup>3</sup> SUMP TANK	
BILL (D)	CONSTRUCTION OF 24M ELEVATED TANK	
BILL (E)	INSTALLATION OF SOLAR PUMPING SYSTEM	
	<b><i>SUB-TOTAL</i></b>	
	CONTINGENCY (5%)	
	PROJECT MANAGEMENT FEE	
	BRANDING & COMMISSIONING	
	<b>GRAND TOTAL</b>	

# **PROFILE DRAWINGS FOR RASINI WATER PROJECT**



# Alignment – (4 inch) – (8) PROFILE



CHAMACE (m)	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	0+560																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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Alignment - (3 inch (2)) - (9) PROFILE

NOTES

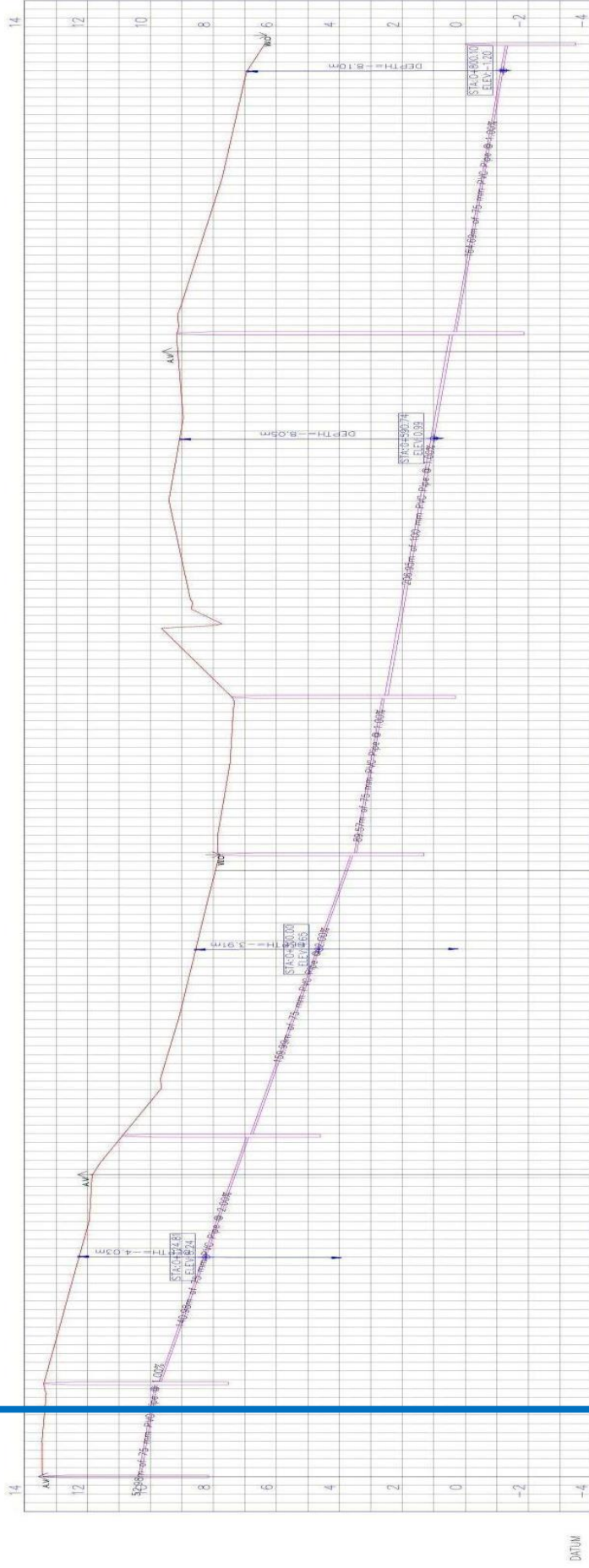
CHAMBER DESCRIPTION

- 0+000 CONTROL POINT 04
- 0+000 AIR VALVE
- 0+173 CONTROL POINT 02
- 0+173 AIR VALVE
- 0+340 CONTROL POINT 08
- 0+345 WASH OUT
- 0+640 CONTROL POINT 00
- 0+640 AIR VALVE
- 0+820 WASH OUT

MINISTRY OF ENVIRONMENT  
AND NATURAL RESOURCES  
GOVERNMENT OF LAOS  
LANU COUNTY

PROJECT: FAZA WARD WATER  
PROJECT  
(LANU EAST SUB COUNTY)

DRAWING TITLE: 3 INCHES  
PRELINE LONGITUDINAL PROFILE



EXISTING LEVEL (m)	CHAMBER (m)	DATE	PIPE	CP# (m)	CP# (m)	CP# (m)
13.386	0+000	0+000	0+000	0+000	0+000	0+000
13.442	0+020	0+020	0+020	0+020	0+020	0+020
13.442	0+040	0+040	0+040	0+040	0+040	0+040
13.386	0+060	0+060	0+060	0+060	0+060	0+060
13.386	0+080	0+080	0+080	0+080	0+080	0+080
13.386	0+100	0+100	0+100	0+100	0+100	0+100
13.386	0+120	0+120	0+120	0+120	0+120	0+120
13.386	0+140	0+140	0+140	0+140	0+140	0+140
13.386	0+160	0+160	0+160	0+160	0+160	0+160
13.386	0+180	0+180	0+180	0+180	0+180	0+180
13.386	0+200	0+200	0+200	0+200	0+200	0+200
13.386	0+220	0+220	0+220	0+220	0+220	0+220
13.386	0+240	0+240	0+240	0+240	0+240	0+240
13.386	0+260	0+260	0+260	0+260	0+260	0+260
13.386	0+280	0+280	0+280	0+280	0+280	0+280
13.386	0+300	0+300	0+300	0+300	0+300	0+300
13.386	0+320	0+320	0+320	0+320	0+320	0+320
13.386	0+340	0+340	0+340	0+340	0+340	0+340
13.386	0+360	0+360	0+360	0+360	0+360	0+360
13.386	0+380	0+380	0+380	0+380	0+380	0+380
13.386	0+400	0+400	0+400	0+400	0+400	0+400
13.386	0+420	0+420	0+420	0+420	0+420	0+420
13.386	0+440	0+440	0+440	0+440	0+440	0+440
13.386	0+460	0+460	0+460	0+460	0+460	0+460
13.386	0+480	0+480	0+480	0+480	0+480	0+480
13.386	0+500	0+500	0+500	0+500	0+500	0+500
13.386	0+520	0+520	0+520	0+520	0+520	0+520
13.386	0+540	0+540	0+540	0+540	0+540	0+540
13.386	0+560	0+560	0+560	0+560	0+560	0+560
13.386	0+580	0+580	0+580	0+580	0+580	0+580
13.386	0+600	0+600	0+600	0+600	0+600	0+600
13.386	0+620	0+620	0+620	0+620	0+620	0+620
13.386	0+640	0+640	0+640	0+640	0+640	0+640
13.386	0+660	0+660	0+660	0+660	0+660	0+660
13.386	0+680	0+680	0+680	0+680	0+680	0+680
13.386	0+700	0+700	0+700	0+700	0+700	0+700
13.386	0+720	0+720	0+720	0+720	0+720	0+720
13.386	0+740	0+740	0+740	0+740	0+740	0+740
13.386	0+760	0+760	0+760	0+760	0+760	0+760
13.386	0+780	0+780	0+780	0+780	0+780	0+780
13.386	0+800	0+800	0+800	0+800	0+800	0+800
13.386	0+820	0+820	0+820	0+820	0+820	0+820

SCALE: AS SHOWN

FAZA TOWN

SON BY: COUNTY  
OFFICER

SON BY: LAWASO  
MANAGING DIRECTOR

CHECKED BY: TECHNICAL MANAGER  
JACOB CHODPHA  
DATE 7-12-2018

DRAWN BY: JK GTAU  
DATE 5-12-2018

SURVEYED BY: JK GTAU  
DATE 13-10-2018

# SUMP TANK DRAWINGS

## FOR

# FAZA WATER & SANITATION PROJECT

NOTES

1. All measurements in (MM) unless otherwise stated.
2. Reinforced concrete to be 1:2:4 mix by volume.
3. Water cement cover over reinforcement min 40mm.
4. Floor and roof slab to be cast in continuous operations.
5. Surface of the concrete must be kept moist for 8days
6. Shuttering for the roof slab to be adjusted so that at the centre it is 30mm above top level of the tank wall.
7. Supporters to remain in place for 28days after concrete has been cast.
8. No deviation or alteration shall be made from this drawing [PLAN] without client prior consent.
9. Contractor shall read and verify dimensions before starting any work.
10. This drawing should be read in conjunction with structural drawing.
11. Foundation depth to be determined on site.
12. Any discrepancy to be notified to the project consultant at once.

CLIENT: LAMU WATER & SEWERAGE CO. LTD.

PROJECT: PROPOSED 50M<sup>3</sup> RASINI SUMP TANK

Checked by: Mr. Jacob M. Chidzipha

Signed by M.D: Mr. Paul K. Wainaina



TITLE: Structural Drawing  
Layout Plan  
(Sheet 1 of 4)



DATE : OCT, 2018 DRG. No.

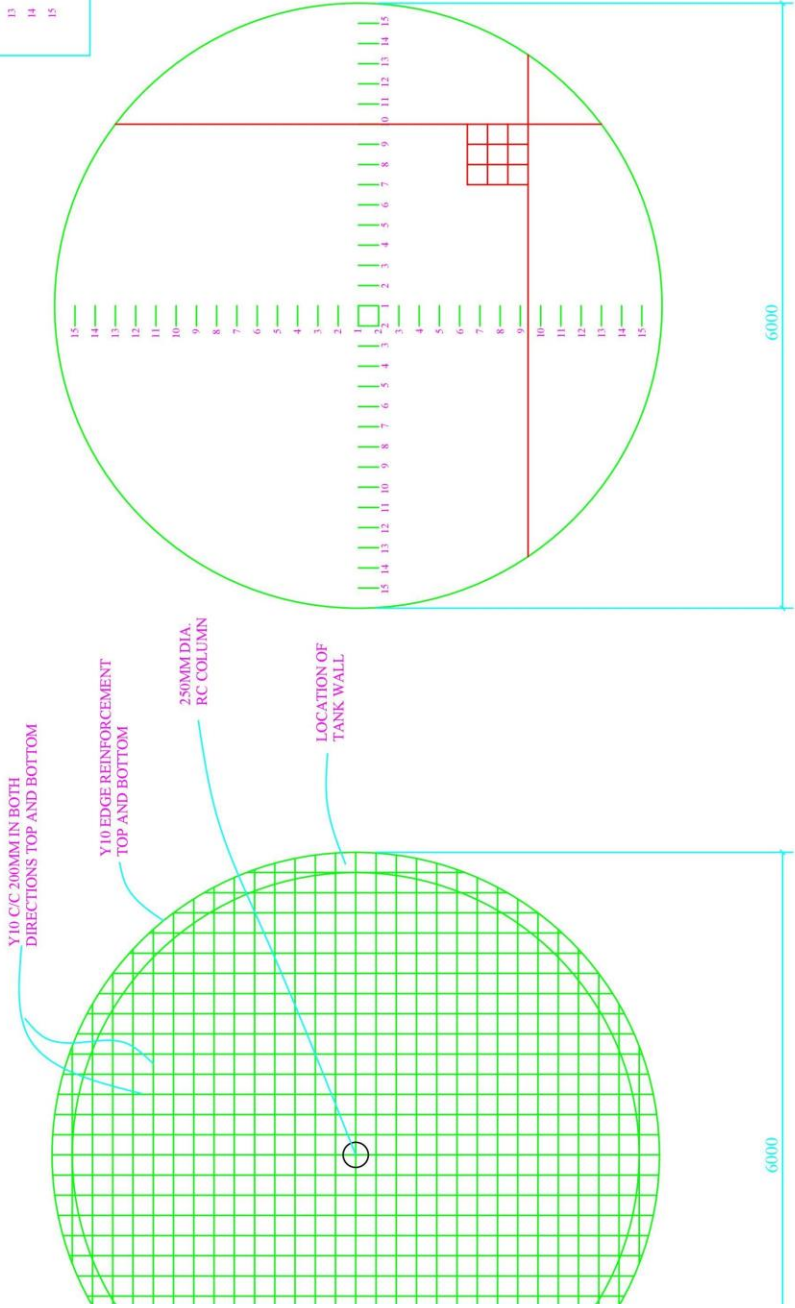
SCALE: A5 SHOWN

DESIGN BY: D.M Baya 0725801208



REINFORCEMENT SCHEDULE			
REF	CUT LENGTH (mm)	TOTAL LENGTH (m)	SKETCH OF SHAPE
	8300	16.6	
	8289.99	33.2	
	8259.9	33.0	
	8209.49	32.8	
	8138.37	32.6	
	8045.97	32.2	
	7931.51	31.7	
	7794	31.2	
	7632.12	30.5	
	7444.23	29.8	
	7238.2	28.9	
	6981.32	27.9	
	6790	26.8	
	6379.47	25.5	
	6013.14	24.1	
	5591.5	22.4	
	5100	20.4	
	4514.26	18.1	
	3787.12	15.1	
	2798	11.2	
			<u>521.443(10)</u>

BAR BENDING SCHEDULE					SKETCH OF SHAPE
BAR MARK	NO IN EACH	LENGTH OF EACH (mm)	CUT LENGTH (mm)	TOTAL LENGTH (m)	
1	2	6000	6500	12.6	
2	4	5986.65	6286.65	25.1	
3	4	5946.43	6246.43	25.0	
4	4	5878.78	6178.78	24.7	
5	4	5782.73	6082.73	24.3	
6	4	5656.85	5956.85	23.8	
7	4	5499.09	5799.09	23.2	
8	4	5306.6	5606.6	22.4	
9	4	5075.43	5375.43	21.5	
10	4	4800	5100	20.4	
11	4	4472.14	4772.14	19.1	
12	4	4079.22	4379.22	17.5	
13	4	3600	3900	15.6	
14	4	2993.33	3293.33	13.2	
15	4	2154.07	2454.07	9.8	
				208.3 (25710)	



PLAN OF TOP SLAB Scale 1:50

PLAN OF TOP SLAB Scale 1:50

CLIENT:  
LAMU WATER & SEWERAGE CO. LTD.

PROJECT:  
PROPOSED 50M<sup>3</sup> RASINI  
SUMP TANK

Checked by:  
Mr. Jacob M. Chidzipha

Signed by M.D.:  
Mr. Paul K. Wainaina

TITLE:  
Structural Drawing  
Layout Plan  
(Sheet 3 of 4)

DATE : OCT, 2018 DRG. No.

SCALE: AS SHOWN

DESIGN BY: D.M Baya 0723801208

CLIENT:  
LAMU WATER & SEWERAGE CO. LTD.

PROJECT:  
PROPOSED 50M<sup>3</sup> RASINI  
SUMP TANK

Checked by:  
Mr. Jacob M. Chidzipha

Signed by M.D.:  
Mr. Paul K. Wainaina

TITLE:  
Structural Drawing  
Layout Plan  
(Sheet 2 of 4)

DATE : OCT, 2018 DRG. No.

SCALE: AS SHOWN

DESIGN BY: D.M Baya 0723801208



