

BILL OF QUANTITIES FOR LARI WENDANI IRRIGATION PROJECT

A. PREAMBLE

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions, Technical Specifications, and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices bid in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional Plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clauses 13.4 and 13.5 of the General Conditions except with respect to DAAB Fees and Expenses for which no instruction will be required from the Engineer.
8. The method of measurement of completed work for payment shall be Admeasurement in accordance with ICE Conditions of Contract measurement clauses.



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UNPRICED BILL OF QUANTITIES FOR LARI WENDANI IRRIGATION SCHEME

	LARI WENDANI IRRIGATION SCHEME	
	GRAND SUMMARY	BoQ
Bill No.	Description	Amount (KSh)
1	Preliminaries and General	
2	Head Works (Intake works)	
3	Sedimentation Basin	
4	Conveyance Pipelines	
5	Main Pipelines	
6	Sub-Main Pipelines	
7	Distribution Pipelines	
8	Plot Hydrants	
	Sub-Total	
	GRAND TOTAL	



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Bill No .1- PRELIMINARY AND GENERALS						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)	Technical Specifications Ref.
1.1	Contractor's Camp					
1.2.1	Provide for establishment, mobilization and demobilization of the Contractor's camp together with all the required equipment	LS	1			Spec. 1.13-1.17
1.2	Signboards					
1.2.1	Supply, Erect and maintain project signboards in accordance with the Specifications.	No.	3			Spec 1.18.8
1.3	Testing of the works & Pipeline System					
1.3.1	Provide for testing of the system upon completion of the irrigation works	LS	1			Spec 5.17
1.3.2	Undertake Water quality tests for the 3 No. Intakes prior to handing over & Carry out Post Hand over Satisfaction Survey	LS	1			Spec 4.1.2
1.4	Cost for Adjudication					
1.4.1	Adjudicator Fees for 5 meetings at the rate of 17,000 per hour for 3.5 Hours per day litigation of legal disputes.	Days	5			
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 2 - INTAKE WORKS						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
2.1	INTAKE WORK WEIR					
	Site Clearance and setting Out					Spec 1.5
2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications and descriptions below;	m ²	400			Spec 2.2
2.2	EXCAVATION					
	To include for all trimming to levels, backfilling with approved selected soil, compacting, disposal of surplus material and reinstatement for Intake weir, wing walls, and intake chamber.					Spec 2.6
2.2.1	In normal soil (material) to a depth not exceeding 1.0 m	m ³	25			Spec 2.11
2.2.2	In loose rock to a depth not exceeding 2.0 m	m ³	12.5			Spec 2.11
2.2.3	E.O for Demolition of existing reinforced concrete structure(s)	m ³	144.00			Spec 2.11
2.2.3	Dust Emission control (community notification, inspections and watering the dusty	Lumpsum	1.00			Spec 7.7.2

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	sections of the excavations to reduce dust)					
2.3	CONCRETE WORKS					
	Provide and place the following concrete including all form work for foot slab, intake and drainage chambers, as well as manhole covers.					Spec 3.2.3
2.3.1	Blinding concrete grade 15/40 - 75 mm thick	m ³	6.0			Spec 3.2.3.2
2.3.2	Reinforced concrete grade 25/20	m ³	90.00			Spec 3.2.3.4
2.3.2	Noise and vibration control (equipment maintenance, earmuffs and other Related PPEs)	Lumpsum	1.00			Spec 7.5
2.3.3	Water pollution prevention (sediment control, wastewater management)	Lumpsum	1.00			Spec 7.7.3
2.4	REINFORCEMENT					
	<i>Provide support and fix the following reinforcement, including all cutting, bending and supports.</i>					
2.4.1	High yield bars	kg	8,100			Spec 3.3
2.5	Weir & Intake chamber Accessories					
2.5.1	Supply and fix in place 1.2mx 1 m GMS trash rack with plates spaced at 150 c/c	No.	1			

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2.5.2	Supply and fix GMS slide/sluiice gates as shown in drawings, for scouring through the weir body and for intake chamber.	LS	3			Spec 4.26.
2.5.3	Supply and fix 38mm dia. G.S. pipe for double guardrails as shown in the drawings. Include for all standards: bends, angles and fixing bolts.	m	20			
2.5.4	Supply and build in concrete wall galvanized iron steps irons staggered at 300mm centers.	LS	1			Spec 4.25
2.6	Inlet Chamber pipework					
	<i>The rates inserted should cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.</i>					
2.6.1	280 mm dia double flanged GI pipe piece 500mm long with paddle flange welded 150mm from plain end.	No.	2			Spec 4.3
2.6.2	DN280mm blank flange	No.	1			Spec 4.3
2.6.3	DN 280 epoxy coated, cement lined steel pipe with socket and spigot	m	18			Spec 4.8.2
2.6.4	280 mm dia sluice valve with long detachable spindle and handwheel	No.	1			Spec 4.13.2

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2.7	Intake Chamber Scour Pipework					
2.7.1	DN100 mm double flanged 500mm long steel spigot with puddle flange welded 150mm from one end.	No.	1			Spec 4.3
2.7.2	100 mm dia double flanged 6m long steel spigot with puddle flange welded.	No.	1			Spec 4.3
2.7.3	DN100 mm sluice valve with long detachable spindle and handwheel	No.	1			Spec 4.13.2
2.8	Access Road to intake					
2.8.1	Allow for construction of access road to the intake site during construction	m	150			
2.9	Upstream Retaining wall					
2.9.1	Allow for construction of 1.5m high, 600mm thick, and 10m long reinforced concrete retaining wall for protection of intake works from boulders along river course.	LS	1			Spec 3.2.3.4
2.10	Concrete Strength Tests					
	Concrete Strength tests (six cubes / test) in accordance with the Specifications.	Lump Sum	10			Spec 3.2.3
2.11	OCCUPATIONAL HEALTH & SAFETY					

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2.11.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the construction of Head Works	Lumpsum	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 3 - SEDIMENTATION BASIN						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
3.1	SITE CLEARANCE AND SETTING OUT (For all 3 No. intakes)					
3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	450			Spec 2.2
	INTAKE 1					
3.2	EXCAVATION					
	To include for all trimming to levels, backfilling with approved selected soil, compacting, disposal of surplus material and reinstatement for sedimentation basin, sluice valve chamber, and water meter chamber.					Spec 2.11
3.2.1	In normal soil (material) to a depth not exceeding 1.0 m	m ³	56.25			Spec 2.11
3.2.2	In loose rock to a depth not exceeding 2.0 m	m ³	5.625			Spec 2.11
3.2.3	E.O. for Items 3.2.1 & 3.2.3 for excavation in rock to a depth not exceeding 2.0 m (provisional)	m ³	5.6			Spec 2.11
2.2.3	Dust Emission control (community notification, inspections and watering the dusty sections of the excavations to reduce dust)	Lumps um	1.00			Spec 7.7.2
3.3	CONCRETE WORKS					
	Provide and place the following concrete including all form work for sedimentation basin & cover slab, 2 No. drainage chambers with manhole covers.					Spec 3.2.3

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3.3.1	Blinding concrete grade 15/40 - 75 mm thick	m ³	1.89			Spec 3.2.3.2
3.3.2	Reinforced concrete grade 25/20 as shown on drawings	m ³	86			Spec 3.2.3.4
3.3.3	Noise and vibration control (equipment maintenance, earmuffs and other Related PPEs)	Lumps um	1			Spec 7.5
3.4	REINFORCEMENT					
	Provide support and fix the following reinforcement, including all cutting, bending and supports.					
3.4.1	High yield bars - T12	kg	7740			Spec 3.3.2
3.5	INLET AND OUTLET PIPEWORKS					
	The rates inserted should cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.					
	Inlet Chamber					
	<i>(Epoxy coated and cement lined steel pipes)</i>					
3.5.1	DN 280mm steel stepped coupling	No.	4			Spec 5.9
3.5.2	Dia 280 mm x 1.0 m length single flanged spigot steel pipe with paddle flange	No.	2			Spec 4.3
3.5.6	DN280 mm sluice valve with long detachable spindle and handwheel	No	1			Spec 4.13.2
3.5.8	DN 100 mm dia double flanged 1.0 m long steel spigot with puddle flange welded.	No.	2			Spec 4.3
3.5.9	100 / 110 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
3.5.9	110 mm HDPE PN6 pipe	m	20			Spec 4.12.1
3.5.10	DN100 mm scour valve with long detachable spindle and handwheel	No	2			Spec 4.13.2

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	INTAKE 2					
3.6	EXCAVATION					
	To include for all trimming to levels, backfilling with approved selected soil, compacting, disposal of surplus material and reinstatement for sedimentation basin, sluice valve chamber, and water meter chamber.					Spec 2.11
3.6.1	In normal soil (material) to a depth not exceeding 1.0 m	m ³	11.52			Spec 2.6
3.6.2	In loose rock to a depth not exceeding 2.0 m	m ³	1.152			Spec 2.9
3.6.3	E.O. for Items 3.2.1 & 3.2.3 for excavation in rock to a depth not exceeding 2.0 m (provisional)	m ³	1.2			Spec 2.9
3.6.4	Dust Emission control (community notification, inspections and watering the dusty sections of the excavations to reduce dust)	Lumps um	1.00			Spec 7.7.2
3.7	CONCRETE WORKS					
	Provide and place the following concrete including all form work for sedimentation basin & cover slab, 2 No. drainage chambers with manhole covers.					Spec 3.2.3
3.7.1	Blinding concrete grade 15/40 - 75 mm thick	m ³	1			Spec 3.2.3.2
3.7.2	Reinforced concrete grade 25/20 as shown on drawings	m ³	33			Spec 3.2.3.4
3.7.3	Noise and vibration control (equipment maintenance, earmuffs and other Related PPEs)	Lumps um	1.00			Spec 7.5
3.8	REINFORCEMENT					

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	Provide support and fix the following reinforcement, including all cutting, bending and supports.					
3.8.1	High yield bars - T12	kg	2970			Spec 3.3.2
3.9	INLET AND OUTLET PIPEWORKS					
	The rates inserted should cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.					
	Inlet Chamber					
	<i>(Epoxy coated and cement lined steel pipes)</i>					
3.9.1	DN 150mm steel stepped coupling	No.	4			Spec 5.9
3.9.2	Dia 150 mm x 1.0 m length single flanged spigot steel pipe with paddle flange	No.	2			Spec 4.3
3.9.3	DN 50 mm dia single flanged 0.5 m long steel spigot with puddle flange welded.	No.	1			Spec 4.3
3.9.4	DN 50 mm dia single flanged 0.5 m long steel pieces	No.	2			Spec 4.3
3.9.5	DN 50mm flange adaptor	No.	2			
3.9.6	DN150 mm sluice valve with long detachable spindle and handwheel	No	1			Spec 4.13.2
3.9.7	DN 50 mm flanged Scour valve with detachable spindle and handwheel	No	1			Spec 4.13.2
3.9.8	DN 100 mm dia double flanged 1.0 m long steel spigot with puddle flange welded.	No.	1			Spec 4.3
3.9.9	DN100 mm sluice valve with long detachable spindle and handwheel	No	1			Spec 4.13.2
	INTAKE 3					
3.10	EXCAVATION					

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	To include for all trimming to levels, backfilling with approved selected soil, compacting, disposal of surplus material and reinstatement for sedimentation basin, sluice valve chamber, and water meter chamber.					Spec 2.11
3.10.1	In normal soil (material) to a depth not exceeding 1.0 m	m ³	11.52			Spec 2.11
3.10.2	In loose rock to a depth not exceeding 2.0 m	m ³	1.152			Spec 2.11
3.10.3	E.O. for Items 3.2.1 & 3.2.3 for excavation in rock to a depth not exceeding 2.0 m (provisional)	m ³	1.2			Spec 2.11
3.10.3	Dust Emission control (community notification, inspections and watering the dusty sections of the excavations to reduce dust)	Lumps um	1.00			Spec 7.7.2
3.11	CONCRETE WORKS					
	Provide and place the following concrete including all form work for sedimentation basin & cover slab, 2 No. drainage chambers with manhole covers.					Spec 3.2.3
3.11.1	Blinding concrete grade 15/40 - 75 mm thick	m ³	1			Spec 3.2.3.2
3.11.2	Reinforced concrete grade 25/20 as shown on drawings	m ³	33			Spec 3.2.3.4
3.11.1	Noise and vibration control (equipment maintenance, earmuffs and other Related PPEs)	Lumps um	1.00			Spec 7.5
3.11.3	Concrete Strength Tests for Sedimentation Basin					
	Concrete Strength tests (six cubes / test) in accordance with the Specifications.	Lump Sum	10			Spec 3.2.3
3.12	REINFORCEMENT					

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	Provide support and fix the following reinforcement, including all cutting, bending and supports.					
3.12.1	High yield bars - T12	kg	2970			Spec 3.3.2
3.13	INLET AND OUTLET PIPEWORKS					
	The rates inserted should cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.					
	Inlet Chamber					
	<i>(Epoxy coated and cement lined steel pipes)</i>					
3.13.1	DN 125mm steel stepped coupling	No.	4			Spec 5.9
3.13.2	Dia 125 mm x 1.0 m length single flanged spigot steel pipe with paddle flange	No.	2			Spec 4.3
3.13.3	DN 50 mm dia single flanged 0.5 m long steel spigot with puddle flange welded.	No.	1			Spec 4.3
3.13.4	DN 50 mm dia single flanged 0.5 m long steel pieces	No.	2			
3.13.5	DN 50mm flange adaptor	No.	2			
3.13.6	DN125 mm sluice valve with long detachable spindle and handwheel	No	1			Spec 4.13.2
3.13.7	DN 50 mm flanged Scour valve with detachable spindle and handwheel	No	1			Spec 4.13.2
3.13.8	DN 100 mm dia double flanged 1.0 m long steel spigot with puddle flange welded.	No.	1			Spec 4.3
3.13.9	DN100 mm sluice valve with long detachable spindle and handwheel	No	1			Spec 4.13.2
3.14	SLUICE VALVE & WATER METER CHAMBER					

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3.14.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 2400 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers etc as detailed in the drawings.	No.	3			Spec 2.11
3.14.2	Provide, handle, install and test water meter to fit 250 mm steel pipe.	No.	1			Spec 5.17
3.14.3	Provide, handle, install and test water meter to fit 150 mm steel pipe.	No.	1			Spec 5.17
3.14.4	Provide, handle, install and test water meter to fit 125 mm steel pipe.	No.	1			Spec 5.17
3.15	OCCUPATIONAL HEALTH & SAFETY					
3.15.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the construction of the Sedimentation Basins	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 4-1 - Conveyance 1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specification s Ref.
4.1.1	Site Clearance and Setting Out					
4.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	290			Spec 2.2
4.1.1.2	Excavate for include for supply and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	10			Spec 2.1
4.1.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
4.1.2.1	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	232			Spec 2.9
4.1.2.2	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	70			Spec 2.9
4.1.2.3	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	46			Spec 2.9
4.1.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.1.3.1	OD 250 mm HDPE pipes, PN 6	m	290			Spec 4.12.2
4.1.4	BENDS					

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	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
4.1.4.1	OD 250 mm Plain ended 45-degree bend	No.	4			Spec 4.12.2
4.1.5	Junction Chambers					
4.1.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc. as detailed in the drawings.	No.	2			Spec 2.11.
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					Spec 4.12.2
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Sub-Main Pipeline 3 Offtake @ ch 0+020					
4.1.5.2	250/250 mm dia HDPE-U / GI stepped coupling	No.	2			Spec 5.9
4.1.5.3	250 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.1.5.4	250 mm x 125 mm dia all flanged tee	No.	1			Spec 4.3
4.1.5.5	125 mm dia single flanged GI piece (0.5 m long)	No	2			Spec 4.3
4.1.5.6	125 mm dia double flanged sluice valve	No.	1			Spec 4.3
4.1.5.7	250 mm dia double flanged sluice valve	No.	1			Spec 4.3
4.1.5.8	125/140 mm GI / HDPE stepped coupling	No.	1			Spec 5.9
	1 No. Block Chamber for Main Pipelines 1 & 2 Offtakes @ ch 0+290					
4.1.5.9	250/250 mm dia HDPE-U / GI stepped coupling	No.	1			Spec 5.9

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4.1.5.10	250 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.1.5.11	250 mm x200mmx 100 mm dia all flanged tee	No.	1			Spec 4.3
4.1.5.12	100 mm dia single flanged GI piece (0.5 m long)	No.	2			Spec 4.3
4.1.5.13	100 mm dia double flanged sluice valve	No.	1			Spec 4.3
4.1.5.14	100/110 mm GI / HDPE-U stepped coupling	No.	1			Spec 5.9
4.1.5.16	250 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.1.5.17	200 mm dia double flanged sluice valve	No.	1			Spec 4.3
4.1.6	WASHOUTS					
4.1.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Steel fittings to be epoxy coated inside and outside. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					Spec 4.12.2 & 4.8.2
	1No. Washout Fittings at chainages shown in the drawings					
4.1.6.2	250/250 mm dia PVC-U / GI stepped coupling	No.	2			Spec 5.9
4.1.6.3	250 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.1.6.4	250 mm x 50 mm dia level invert scour steel tee all flanged	No.	1			Spec 4.3
4.1.6.5	50 mm flanged gate valve	No.	1			Spec 4.13.1

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4.1.6.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
4.1.6.7	50 / 63 mm dia HDPE / GI adaptor	No.	1			Spec 4.4
4.1.6.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.2
4.1.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
4.1.7	THRUST BLOCKS					
4.1.7.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings.	No.	4			Spec 3.2.3.1
4.1.8	OCCUPATIONAL HEALTH & SAFETY					
4.1.8.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Conveyance Pipeline 1	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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BILL NO. 4 - SUBMAIN PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 4-1 Conveyance 1	
2	Bill No. 4-2 Conveyance 2	
3	Bill No. 4-3 Conveyance 3	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

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Bill No. 4-2 - Mainline 2						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
4.2.1	Site Clearance and Setting Out					
4.2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	180			Spec 2.2
4.1.1.2	Excavate for include for supply and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	10			Spec 2.1
4.2.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
4.2.2.1	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	144			Spec 2.9
4.2.2.2	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	43			Spec 2.9
4.2.2.3	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	29			Spec 2.9
4.2.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.2.3.1	OD 160 mm HDPE pipes, PN 6.0	m	180			Spec 4.12.1
4.2.4	BENDS					

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	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
4.2.4.1	OD 160 mm Plain ended 45-degree bend	No.	1			Spec 4.12.2
4.2.5	Junction Chambers					
4.2.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 2.11
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					Spec 4.12.2
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Sub-Main Pipeline 4 Offtake @ ch 0+180					
4.2.5.2	160/150 mm dia PVC-U / GI stepped coupling	No.	3			Spec 5.9
4.2.5.3	150 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.2.5.4	150 mm dia double flanged sluice valve	No.	1			
4.2.7	THRUST BLOCKS					
4.2.7.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	1			Spec 3.2.3.1
4.2.8	OCCUPATIONAL HEALTH & SAFETY					

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4.2.8.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Mainline 2	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 4-3 - Mainline 3						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
4.3.1	Site Clearance and Setting Out					
4.3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	280			Spec 2.2
4.1.1.2	Excavate for include for supply and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	10			Spec 2.1
4.3.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
4.3.2.1	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	224			Spec 2.9
4.3.2.2	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	67			Spec 2.9
4.3.2.3	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	45			Spec 2.9
4.3.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.3.3.1	OD 125 mm HDPE pipes, PN 6	m	280			Spec 4.12.1

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4.3.4	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
4.3.4.1	OD 125 mm Plain ended 45-degree bend	No.	11			Spec 4.12.2
4.3.5	Junction Chambers					
4.3.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm. Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 2.11
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					Spec 4.12.2
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Main Pipeline 5 Offtake @ ch 0+280					
4.3.5.2	125/125 mm dia HDPE-U / GI stepped coupling	No.	1			Spec 5.9
4.3.5.3	125 mm dia single flanged GI pipe (0.5 m long)	No.	1			Spec 4.3
4.3.5.4	OD 125 x 100 mm flanged reducer	No.	1			Spec 4.3
4.3.5.5	100 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.3.5.6	100 mm dia double flanged sluice valve	No.	1			
4.3.5.7	100/110 mm GI / HDPE-U stepped coupling	No.	1			Spec 5.9
4.3.6	WASHOUTS					

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4.3.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Steel fittings to be epoxy coated inside and outside. Rates shall include for completion and pipe protection at all pipe joints as specified in drawings</i>					Spec 4.12.2 & 4.8.2
	1No. Washout Fittings at chainages shown in the drawings					
4.3.6.2	125/125 mm dia HDPE-U / GI stepped coupling	No.	2			Spec 5.9
4.3.6.3	125 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.3.6.4	125 mm x 50 mm dia level invert scour steel tee all flanged	No.	1			Spec 4.3
4.3.6.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.3.6.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
4.3.6.7	50 / 63 mm dia uPVC / GI adaptor	No.	1			Spec 4.4
4.3.6.8	63 mm HDPE PN8 pipe	m	6			Spec 4.12.1
4.3.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
4.3.7	THRUST BLOCKS					
4.3.7.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings.	No.	1			Spec 3.2.3.1

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4.3.8	OCCUPATIONAL HEALTH & SAFETY					
4.3.8.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Mainline 3	Lump sum	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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BILL NO. 5 - SUBMAIN PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 5.1 Main Pipeline 1 (MP 1)	
2	Bill No. 5.2 Main Pipeline 2 (MP 2)	
3	Bill No. 5.3 Main Pipeline 3 (MP 3)	
4	Bill No. 5.4 Main Pipeline 4 (MP 4)	
5	Bill No. 5.5 Main Pipeline 5 (MP 5)	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

UNPRICED BILL OF QUANTITIES FOR LARI WENDANI IRRIGATION SCHEME

Bill No. 5.1 -Main Pipeline 1 (MP 1)						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.1.1	Site clearance, Excavation and Backfilling					
5.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	5128			Spec 2.2
5.1.1.2	Excavate for include for supply and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	10			Spec 2.1
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
5.1.1.3	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	3,077			Spec 2.9
5.1.1.4	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	154			Spec 2.9
5.1.1.5	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	154			Spec 2.9
5.1.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.1.2.1	DN 250 mm HDPE pipes, PN 6	m	1,240			Spec 4.12.1

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5.1.2.2	DN 200 mm HDPE pipes, PN 6	m	800			Spec 4.12.1
5.1.2.3	DN 200 mm HDPE pipes, PN 8	m	820			Spec 4.12.1
5.1.2.4	DN 200 mm HDPE pipes, PN 10	m	700			Spec 4.12.1
5.1.2.5	DN 140 mm HDPE pipes, PN 6	m	860			Spec 4.12.1
5.1.2.6	DN 125 mm HDPE pipes, PN 6	m	708			Spec 4.12.1
5.1.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
5.1.3.1	OD 200 mm Plain ended 90-degree bend	No.	1			
5.1.3.2	OD 200 mm Plain ended 45-degree bend	No.	2			
5.1.3.3	OD 20 mm Plain ended 22.5-degree bend	No.	3			
5.1.3.4	OD 200 mm Plain ended 90-degree bend	No.	1			
5.1.3.5	OD 200 mm Plain ended 45-degree bend	No.	2			
5.1.3.6	OD 200 mm Plain ended 22.5-degree bend	No.	3			
5.1.3.7	OD 140 mm Plain ended 90-degree bend	No.	1			
5.1.3.8	OD 140 mm Plain ended 45-degree bend	No.	2			
5.1.3.9	OD 140 mm Plain ended 22.5-degree bend	No.	3			
5.1.4	Junction Chambers					
5.1.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust	No.	12			

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	blocks, pipe supports, inspection covers, etc as detailed in the drawings.					
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers) & PRV chambers.					Spec 4.12.2
	Rates shall include for completing all pipe joints as specified in the detailed drawings.					
	3 No. Chambers for Submain Pipelines SMP1-1, SMP1-2, & SMP1-4 Offtakes on OD200mm section @ ch 0+080, ch 0+420, & ch 1+160					
5.1.4.2	200/200 mm dia VJ stepped coupling	No	6			Spec 5.9
5.1.4.3	200 mm, 0.5m long threaded steel pipe	No	9			Spec 5.8
5.1.4.4	200 x 50 mm all flanged steel tee	No	3			
5.1.4.5	200 mm dia double flanged sluice valve	No.	3			Spec 4.3
5.1.4.6	50 mm dia GI Nipple	No	3			
5.1.4.7	50 mm dia gate valve	No	3			Spec 4.13.1
5.1.4.8	50 mm dia GI union	No	3			
5.1.4.9	50 mm, 0.5m long threaded steel pipe	No	6			Spec 5.8
5.1.4.10	50 / 63 mm dia GI / HDPE adaptor	No.	3			Spec 4.4
	1 No. Chamber for Sub-Main Pipeline SMP1-3 Offtake on OD200mm section @ ch 0+640					
5.1.4.11	200/200 mm dia VJ stepped coupling	No	2			Spec 5.9
5.1.4.12	200 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8
5.1.4.13	200 x 65 mm all flanged steel tee	No	1			Spec 4.3
5.1.4.14	200 mm dia double flanged sluice valve	No.	1			Spec 4.3

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5.1.4.15	65 mm dia GI Nipple	No	1			
5.1.4.16	65 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.17	65 mm dia GI union	No	1			
5.1.4.18	65 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.1.4.19	65/75 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Sub-Main Pipeline SP1-5 Offtake on OD200mm section @ ch 1+240					
5.1.4.20	200/200 mm dia VJ stepped coupling	No	2			Spec 5.9
5.1.4.21	200 mm, 0.5m long threaded steel pipe	No	3			Spec 5.8
5.1.4.22	200 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.1.4.23	200 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.24	50 mm dia GI Nipple	No	1			
5.1.4.25	50 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.26	50 mm dia GI union	No	1			
5.1.4.27	50 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8
5.1.4.28	50 / 63 mm dia GI / HDPE adaptor	No.	1			Spec 4.4
	1 No. Chamber for Submain Pipeline SMP1-6 & SMP1-7 Offtakes on OD200mm section @ ch 2+360					
5.1.4.29	200/200 mm dia HDPE-U / GI stepped coupling	No	2			Spec 5.9
5.1.4.30	200 mm dia single flanged GI pipe (0.5 m long)	No	4			Spec 4.3
5.1.4.31	200 x 80 mm all flanged steel tee	No	1			Spec 4.3

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5.1.4.32	200 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.1.4.33	200 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.34	80 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.35	80 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8
5.1.4.36	80 / 90 mm dia VJ stepped coupling	No.	1			Spec 5.9
5.1.4.37	50 mm dia GI Nipple	No	1			
5.1.4.38	50 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.39	50 mm dia GI union	No	1			
5.1.4.40	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.1.4.41	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	2 No. Chambers for Sub-Mainline Pipelines SMP1-8 & SMP1-9 Offtakes on OD200mm section @ ch 3+300 & ch 3+360					
5.1.4.42	200/200 mm dia HDPE-U / GI stepped coupling	No	4			Spec 5.9
5.1.4.43	200 mm dia single flanged GI pipe (0.5 m long)	No	6			Spec 4.3
5.1.4.44	200 x 40 mm all flanged steel tee	No	1			Spec 4.3
5.1.4.45	200 x 65 mm all flanged steel tee	No	1			Spec 4.3
5.1.4.46	200 mm dia double flanged sluice valve	No.	2			Spec 4.3
5.1.4.47	40 mm dia GI Nipple	No	1			
5.1.4.48	40 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.49	40 mm dia GI union	No	1			
5.1.4.50	40 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8

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5.1.4.51	40 / 50 mm dia VJ stepped coupling	No.	1			Spec 5.9
5.1.4.52	65 mm dia GI Nipple	No	1			
5.1.4.53	65 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.54	65 mm dia GI union	No	1			
5.1.4.55	65 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.1.4.56	65/75 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Sub-Main Pipeline SMP1-10 Offtake on OD140mm section @ ch 4+260					
5.1.4.57	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 5.9
5.1.4.58	125 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
5.1.4.59	125 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.1.4.60	125 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.61	50 mm dia GI Nipple	No	1			
5.1.4.62	50 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.63	50 mm dia GI union	No	1			
5.1.4.64	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.1.4.65	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Submain Pipelines SMP1-11 & SMP1-12 Offtakes on OD125mm section @ ch 4+460					
5.1.4.66	125 / 125 mm dia V/J stepped couplings	No.	2			Spec 5.9
5.1.4.67	125 mm dia single flanged steel spigot (0.5 m long)	No.	4			Spec 4.3

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5.1.4.68	125 x 50 mm all flanged steel tee	No.	1			Spec 4.3
5.1.4.69	125 x 80 mm all flanged steel tee	No.	1			Spec 4.3
5.1.4.70	125 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.71	80 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.72	80 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8
5.1.4.73	80 / 90 mm dia VJ stepped coupling	No.	1			Spec 5.9
5.1.4.74	50 mm dia GI Nipple	No	1			
5.1.4.75	50 mm dia gate valve	No	1			Spec 4.13.1
5.1.4.76	50 mm dia GI union	No	1			
5.1.4.77	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.1.4.78	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	2 No. Chambers for Sub-Mainline Pipelines SMP1-13 & SMP1-14 Offtakes on OD125mm section @ ch 5+020 & 5+128					
5.1.4.79	125 / 125 mm dia V/J stepped couplings	No.	3			Spec 5.9
5.1.4.80	125 mm dia single flanged steel spigot (0.5 m long)	No.	4			Spec 4.3
5.1.4.81	125 x 65 mm all flanged steel tee	No.	1			Spec 4.3
5.1.4.82	125 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.1.4.83	65 mm dia GI Nipple	No	2			
5.1.4.84	65 mm dia gate valve	No	2			Spec 4.13.1
5.1.4.85	65 mm dia GI union	No	2			
5.1.4.86	65 mm dia 0.5m long single flanged GI piece	No	4			Spec 4.3

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5.1.4.87	65/75 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.1.4.88	OD 125 x 65 mm flanged reducer	No.	1			Spec 4.3
5.1.5	PLOT OFFTAKE FITTINGS					
5.1.5.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	1			Spec 4.12.2
5.1.6	AIR VALVES					
5.1.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					Spec 4.12.2
	2 No. Single Air Valves (SAVs)					
5.1.6.2	200/200 mm dia VJ stepped coupling	No	4			Spec 5.9
5.1.6.3	200 mm, 0.5m long threaded steel pipe	No	4			Spec 5.8
5.1.6.4	200 x 50 mm double flanged steel tee	No.	2			Spec 4.3
5.1.6.5	50 mm x 400mm long double flanged steel piece	No.	2			Spec 4.3
5.1.6.6	50 mm flanged gate valve	No.	2			Spec 4.13.1
5.1.6.7	50 mm dia Single orifice air valve	No.	2			Spec 4.15
5.1.7	WASHOUTS					
5.1.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 1000 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

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	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					Spec 4.12.2
	1 No. Washout Fittings at chainages shown in the drawings					
5.1.7.2	200/200 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.1.7.3	200 mm, 0.5m long threaded steel pipe	No.	2			Spec 5.8
5.1.7.4	200 x 50 mm double flanged steel tee	No.	1			Spec 4.3
5.1.7.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.1.7.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.1.7.7	50 / 63 mm dia HDPE / GI adaptor	No.	1			Spec 4.4
5.1.7.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
5.1.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
5.1.8	PRESSURE REGULATING VALVES					
5.1.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					Spec 4.12.2
	1 No. Pressure Regulator Valve (PRV) at Ch 3+560 m					

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5.1.8.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 5.9
5.1.8.3	125 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.1.8.4	DN 125 flanged gate valves for PRV isolation	No.	1			Spec 4.13.1
5.1.8.5	Provide and install DN 125mm PRV-65	No.	1			Spec 4.18
5.1.9	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	9 No. Minor Road Crossing at Chainages shown in drawings					
5.1.9.1	Volume of Mass Concrete Class 20/20	m ³	14.88			Spec 3.2.3.1
5.1.10	RIVER CROSSINGS FOR PIPES					
	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications below;					Spec 4.12.2
	1 No. River crossings at Chainages in line with drawings.					
5.1.10.1	Excavation for foundation	m ³	2.88			Spec 2.11
5.1.10.2	Provide, place blinding concrete C15	m ³	0.06			Spec 3.2.3.2
5.1.10.3	C25 Concrete to bases and columns	m ³	0.80			Spec 3.2.3.3
5.1.10.4	Provide and fix steel reinforcement	kg	76			Spec 3.2.3.4
5.1.10.5	Provide install flanged DN200mm epoxy coated PN16 steel pipe including fittings and jointing in line with drawings	m	10			Spec 4.3 & Spec 4.8.2

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5.1.11	THRUST BLOCKS					
5.1.11.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings.	No.	18			Spec 3.2.3.1
5.1.12	OCCUPATIONAL HEALTH & SAFETY					
5.1.12.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Main Pipeline 1	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 5.2 - Main Pipeline 2 (MP 2)						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.2.1	Site clearance, Excavation and Backfilling					
5.2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	728.00			Spec 2.2
4.1.1.2	Excavate for include for supply and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	10			Spec 2.1
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
5.2.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	437			Spec 2.9
5.2.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	22			Spec 2.9
5.2.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	22			Spec 2.9
5.2.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.2.2.1	DN 110 mm HDPE pipes, PN 6	m	280			Spec 4.12.1
5.2.2.2	DN 75 mm HDPE pipes, PN 6	m	448			Spec 4.12.1

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5.2.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
5.2.3.1	OD 110 mm Plain ended 45-degree bend	No.	1			
5.2.3.2	OD 110 mm Plain ended 22.5-degree bend	No.	2			
5.2.4	Junction Chambers					
5.2.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	3			Spec 2.9
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers) & PRV chambers.					Spec 4.12.2
	Rates shall include for completing all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Sub-Main Pipelines SMP2-1 Offtake on OD110mm section @ ch 0+020					
5.2.4.2	110 / 100 mm dia VJ stepped coupling	No	2			Spec 5.9
5.2.4.3	100 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
5.2.4.4	100 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.2.4.5	100 mm dia double flanged sluice valve	No.	1			
5.2.4.6	50 mm dia GI Nipple	No	1			
5.2.4.7	50 mm dia gate valve	No	1			Spec 4.13.1
5.2.4.8	50 mm dia GI union	No	1			

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5.2.4.9	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.2.4.10	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Sub-Mainline Pipelines SMP2-2 Offtake on OD75mm section @ ch 0+280					
5.2.4.11	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.2.4.12	65 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
5.2.4.13	65 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.2.4.14	65 mm dia GI Nipple	No	1			
5.2.4.15	65 mm dia gate valve	No	1			Spec 4.13.1
5.2.4.16	65 mm dia GI union	No	1			
5.2.4.17	50 mm dia GI Nipple	No	1			
5.2.4.18	50 mm dia gate valve	No	1			Spec 4.13.1
5.2.4.19	50 mm dia GI union	No	1			
5.2.4.20	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.2.4.21	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chambers for Sub-Main Pipeline SMP2-3 on OD75mm section @ ch 0+728					
5.2.4.22	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.2.4.23	65 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.2.4.24	65 mm dia GI Nipple	No	1			
5.2.4.25	65 mm dia gate valve	No	1			Spec 4.13.1

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5.2.4.26	65 mm dia GI union	No	1			
5.2.5	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage as indicated on drawing					
5.2.5.1	Volume of Mass Concrete Class 20/20	m ³	1.16			Spec 3.2.3.1
5.2.6	THRUST BLOCKS					
5.2.6.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and fittings.	No.	3			Spec 3.2.3.1
5.2.7	OCCUPATIONAL HEALTH & SAFETY					
5.2.7.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Main Pipeline 2	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR LARI WENDANI IRRIGATION SCHEME

Bill No. 5.3 - Main Pipeline 3 (MP 3)						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.3.1	Site clearance, Excavation and Backfilling					
5.3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1907.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
5.3.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	1,144			Spec 2.9
5.3.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	57			Spec 2.9
5.3.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	57			Spec 2.9
5.3.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.3.2.1	DN 140 mm HDPE pipes, PN 6.0	m	460			Spec 4.12.1
5.3.2.2	DN 125 mm HDPE pipes, PN 6.0	m	660			Spec 4.12.1
5.3.2.3	DN 75 mm HDPE pipes, PN 6.0	m	787			Spec 4.12.1
5.3.3	BENDS					
	Supply and install the following HDPE PN16 fittings					

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5.3.3.1	OD 140 mm Plain ended 90-degree bend	No.	3			Spec 4.12.2
5.3.3.2	ON 140 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.3.3.3	OD 140 mm Plain ended 22.5-degree bend	No.	1			Spec 4.12.2
5.3.3.4	OD 125 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.3.3.5	ON 125 mm Plain ended 45-degree bend	No.	1			Spec 4.12.2
5.3.3.6	OD 125 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.3.3.7	OD 75 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.3.3.8	OD 75 mm Plain ended 45-degree bend	No.	1			Spec 4.12.2
5.3.3.9	OD 75 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.3.4	Junction Chambers					
5.3.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	3			Spec 2.11
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers) & PRV chambers.					Spec 4.12.2
	Rates shall include for completing all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Sub-Main Pipelines SMP3-1 Offtake on OD125mm section @ ch 0+460					
5.3.4.2	125 / 125 mm dia VJ stepped coupling	No	2			Spec 5.9
5.3.4.3	125 mm dia single flanged steel spigot (0.5 m long)	No	2			Spec 4.3

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5.3.4.4	125 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.3.4.5	125 mm dia double flanged sluice valve	No.	1			
5.3.4.6	50 mm dia GI Nipple	No	1			
5.3.4.7	50 mm dia gate valve	No	1			Spec 4.13.1
5.3.4.8	50 mm dia GI union	No	1			
5.3.4.9	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.3.4.10	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Sub-Mian Pipelines SMP3-2 Offtake on OD75mm section @ ch 1+120					
5.3.4.11	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.3.4.12	65 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
5.3.4.13	65 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.3.4.14	65 mm dia GI Nipple	No	1			
5.3.4.15	65 mm dia gate valve	No	1			Spec 4.13.1
5.3.4.16	65 mm dia GI union	No	1			
5.3.4.17	50 mm dia GI Nipple	No	1			
5.3.4.18	Spec 4.13.1	No	1			
5.3.4.19	50 mm dia GI union	No	1			
5.3.4.20	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.3.4.21	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9

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	1 No. Chamber for Secondary Pipeline SP3-3 offtake on OD75mm section @ ch 1+907					
5.3.4.22	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.3.4.23	65 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.3.4.24	65 mm dia GI Nipple	No	1			
5.3.4.25	65 mm dia gate valve	No	1			Spec 4.13.1
5.3.4.26	65 mm dia GI union	No	1			
5.3.5	PLOT OFFTAKE FITTINGS					Spec 4.12.2
5.3.5.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	2			Spec 4.12.2
5.3.6	AIR VALVES					
5.3.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.9
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointing as per the specifications.</i>					Spec 4.12.2
	1 No. Single Acting Air Valve (SAV)					
5.3.6.2	125 / 125 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.3.6.3	125 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
5.3.6.4	125 x 50 mm double flanged steel tee	No.	1			Spec 4.3
5.3.6.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
5.3.6.6	50 mm flanged gate valve	No.	1			Spec 4.13.1

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5.3.6.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
5.3.7	WASHOUTS					
5.3.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 1000 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.9
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					Spec 4.12.2
	1 No. Washout Fittings at chainages shown in the drawings					
5.3.7.2	140 / 125 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.3.7.3	125 mm dia 0.5m long single flanged	No.	2			Spec 4.3
5.3.7.4	125 x 50 mm dia Level invert scour tee all flanged	No.	1			Spec 4.3
5.3.7.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.3.7.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.3.7.7	50 / 63 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
5.3.7.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
5.3.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
5.3.8	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation and Backfilling works.					Spec 2.22
	3 No. Minor Road Crossings at Chainage indicated on drawings					

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5.3.8.1	Volume of Mass Concrete Class 20/20	m ³	4.41			Spec 3.2.3.1
5.3.9	RIVER CROSSINGS FOR PIPES					
	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	River crossing at Ch 1+314 on SMP 3 in line with drawings.					
5.3.9.1	Excavation for foundation	m ³	2.69			Spec 2.11
5.3.9.2	Provide, place blinding concrete C15	m ³	0.05			Spec 3.2.3.2
5.3.9.3	C25 Concrete to bases and columns	m ³	0.75			Spec 3.2.3.3
5.3.9.4	Provide and fix steel reinforcement	kg	71			Spec 3.2.3.4
5.3.9.5	Provide install flanged DN65mm PN16 epoxy coated steel pipe including fittings and jointing in line with drawings	m	6			Spec 4.3 & Spec 4.8.2
5.3.10	THRUST BLOCKS					
5.3.10.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	16			Spec 3.2.3.1
5.3.11	OCCUPATIONAL HEALTH & SAFETY					
5.3.11.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Main Pipeline 3	Lumpsum	1			Spec 7.5

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Bill No. 5.4 - Main Pipeline 4 (SMP 4)						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.4.1	Site clearance, Excavation and Backfilling					
5.4.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1118.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
5.4.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	671			Spec 2.9
5.1.4.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	34			Spec 2.9
5.1.4.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	34			Spec 2.9
5.4.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.4.2.1	DN 160 mm HDPE pipes, PN 6	m	420			Spec 4.12.2
5.4.2.2	DN 110 mm HDPE pipes, PN 6	m	698			Spec 4.12.2
5.4.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2

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5.4.3.1	OD 160 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.4.3.2	ON 160 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.4.3.3	OD 160 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.4.3.4	ON 110 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.4.3.5	OD 110 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.4.3.6	OD 110 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.4.4	Junction Chambers					
5.4.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	3			Spec 2.11
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers) & PRV chambers.					Spec 4.12.2
	1 No. Chamber for Sub-Main Pipelines SMP4-1 Offtake on OD160mm section @ ch 0+020					
5.4.4.2	160 / 150 mm dia VJ stepped coupling	No	2			Spec 5.9
5.4.4.3	150 mm, 0.5m long threaded steel pipe	No	3			Spec 5.8
5.4.4.4	150 x 65 mm all flanged steel tee	No	1			
5.4.4.5	150 mm dia double flanged sluice valve	No.	1			Spec 4.3
5.4.4.6	65 mm dia GI Nipple	No	1			
5.4.4.7	65 mm dia gate valve	No	1			Spec 4.13.1
5.4.4.8	65 mm dia GI union	No	1			

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5.4.4.9	65 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.4.4.10	65/75 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Sub-Main Pipelines SMP4-2 Offtake on OD110mm section @ ch 0+420					
5.4.4.11	110 / 100 mm dia VJ stepped coupling	No	3			Spec 5.9
5.4.4.12	100 mm dia 0.5m long single flanged GI piece	No	5			Spec 4.3
5.4.4.13	100 x 100 mm all flanged steel tee	No	1			Spec 4.3
5.4.4.14	100 mm dia double flanged sluice valve	No.	2			
	1 No. Chambers for Sub-Main Pipeline SMP4-3 on OD110mm section @ ch 1+118					
5.4.4.15	110 / 100 mm dia VJ stepped coupling	No.	1			Spec 5.9
5.4.4.16	100 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.4.4.17	100 mm x 65mm Reducer	No	1			
5.4.4.18	65 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.4.4.19	65 mm dia GI Nipple	No	1			
5.4.4.20	65 mm dia gate valve	No	1			Spec 4.13.1
5.4.4.21	65 mm dia GI union	No	1			
5.4.4.22	65/75 mm dia VJ stepped coupling	No.	1			Spec 5.9
5.4.5	AIR VALVES					
5.4.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

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	<i>Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Air Valve (SAV)					
5.4.5.2	160 / 150 mm dia V/J stepped coupling	No.	2			Spec 5.9
5.4.5.3	150mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.4.5.4	150 x 50 mm double flanged steel tee	No.	1			Spec 4.3
5.4.5.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
5.4.5.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.4.5.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
5.4.6	WASHOUTS					
5.4.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 1000 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					
5.4.6.2	160 / 150 mm dia V/J stepped coupling	No.	2			Spec 5.9
5.4.6.3	150mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.4.6.4	150 x 50 mm dia Level invert scour tee all flanged	No.	1			Spec 4.3

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5.4.6.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.4.6.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.4.6.7	50 / 63 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
5.4.6.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
5.4.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
5.4.7	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing No.1 at Chainage indicated on drawings					
5.4.7.1	Volume of Mass Concrete Class 20/20	m ³	1.05			Spec 3.2.3.1
5.4.8	THRUST BLOCKS					
5.4.8.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings.	No.	12			Spec 3.2.3.1
5.4.9	OCCUPATIONAL HEALTH & SAFETY					
5.4.9.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Main Pipeline 4	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 5.5 -Main Pipeline 5 (MP 5)						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.5.1	Site clearance, Excavation and Backfilling					
5.5.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1007			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
5.5.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	604			Spec 2.9
5.5.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	30			Spec 2.9
5.5.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	30			Spec 2.9
5.5.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.5.2.1	DN 110 mm HDPE pipes, PN 6	m	560			Spec 4.12.1
5.5.2.2	DN 75 mm HDPE pipes, PN 6	m	447			Spec 4.12.1
5.5.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2

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5.5.3.1	OD 110 mm Plain ended 90-degree bend	No.	2			
5.5.4	Junction Chambers					
5.5.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	3			Spec 2.11
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers) & PRV chambers.					
	Rates shall include for completing all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Sub-Main Pipelines SMP5-1 Offtake on OD110mm section @ ch 0+020					
5.5.4.2	110 / 100 mm dia VJ stepped coupling	No	3			Spec 5.9
5.5.4.3	100 mm dia 0.5m long single flanged GI piece	No	5			Spec 4.3
5.5.4.4	100 x 100 mm all flanged steel tee	No	1			Spec 4.3
5.5.4.5	100 mm dia double flanged sluice valve	No.	2			
	1 No. Chamber for Sub-Main Pipelines SMP5-2 Offtake on OD75mm section @ ch 0+560					
5.5.4.6	75 / 65 mm dia VJ stepped coupling	No	3			Spec 5.9
5.5.4.7	65 mm dia 0.5m long single flanged GI piece	No	5			Spec 4.3
5.5.4.8	65 x 65 mm all flanged steel tee	No	1			Spec 4.3
5.5.4.9	65 mm dia GI Nipple	No	2			
5.5.4.10	65 mm dia gate valve	No	2			Spec 4.13.1
5.5.4.11	65 mm dia GI union	No	2			

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	1 No. Chambers for Sub-Main Pipeline SMP5-3 Offtake on OD75mm section @ ch 1+007					
5.5.4.12	Spec 5.9	No.	1			Spec 5.9
5.5.4.13	65 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.5.4.14	65 mm x 32 mm Reducer	No	1			
5.5.4.15	32 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.5.4.16	32 mm dia GI Nipple	No	1			
5.5.4.17	32 mm dia gate valve	No	1			Spec 4.13.1
5.5.4.18	32 mm dia GI union	No	1			
5.5.4.19	32 / 40 mm dia GI / HDPE adaptor	No.	1			Spec 4.4
5.5.6	AIR VALVES					
5.5.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe jointing.</i>					
	1 No. Single Air Valve (SAV)					
5.5.6.2	110 / 100 mm dia V/J stepped coupling	No.	2			Spec 5.9
5.5.6.3	100mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.5.6.4	100 x 50 mm double flanged steel tee	No.	1			Spec 4.3
5.5.6.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3

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5.5.6.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.5.6.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
5.5.7	WASHOUTS					
5.5.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 1000 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					
5.5.7.2	110 / 100 mm dia VJ stepped coupling	No.	2			Spec 5.9
5.5.7.3	100 mm dia 0.5m long single flanged	No.	2			Spec 4.3
5.5.7.4	100 x 50 mm dia Level invert scour tee all flanged	No.	1			Spec 4.3
5.5.7.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.5.7.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.5.7.7	50 / 63 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
5.5.7.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
5.5.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
5.5.8	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22

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	1 No. Minor Road Crossing at Chainage indicated on drawings					
5.5.8.1	Volume of Mass Concrete Class 20/20	m ³	1.05			Spec 3.2.3.1
5.5.9	THRUST BLOCKS					
5.5.9.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings.	No.	6			Spec 3.2.3.1
5.5.10	OCCUPATIONAL HEALTH & SAFETY					
5.5.10.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Main Pipeline 5	Lumpsum	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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	Bill No.6 - Sub-Mainlines PIPELINES	
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 6.1: SMP1 Pipelines	
2	Bill No. 6.2: SMP2 Pipelines	
3	Bill No. 6.3: SMP3 Pipelines	
4	Bill No. 6.4: SMP4 Pipelines	
5	Bill No. 6.5: SMP5 Pipelines	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

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Bill No. 6.1 - SMP1 Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.1.1	Site clearance, Excavation and Backfilling					
6.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	9343.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
6.1.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	5,606			Spec 2.9
6.1.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	280			Spec 2.9
6.1.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	168			Spec 2.9
6.1.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.1.2.1	OD 90 mm HDPE, PN 6	m	1140.00			Spec 4.12.2
6.1.2.2	OD 75 mm HDPE, PN 6	m	2779.00			Spec 4.12.2
6.1.2.3	OD 63 mm HDPE, PN 6	m	2527.00			Spec 4.12.2
6.1.2.4	OD 50 mm HDPE, PN 6	m	2490.00			Spec 4.12.2
6.1.2.5	OD 40 mm HDPE, PN 6	m	149.00			Spec 4.12.2

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6.1.2.6	OD 32 mm HDPE, PN 6	m	258.00			Spec 4.12.2
6.1.3	BENDS					
	Supply and install the following HDPE PN16 fittings					
6.1.3.1	OD90 mm Plain ended 90-degree bend	No.	4			Spec 4.12.2
6.1.3.2	OD90 mm Plain ended 45-degree bend	No.	4			Spec 4.12.2
6.1.3.3	OD75 mm Plain ended 90-degree bend	No.	4			Spec 4.12.2
6.1.3.4	OD75 mm Plain ended 45-degree bend	No.	4			Spec 4.12.2
6.1.4	Junction Chambers					
6.1.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm. Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	5			Spec 2.9
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers) & PRV chambers.					
	1 No. Chamber for Distribution Pipeline DP1-3-1 Offtake from SMP 1-3 on OD75mm section @ ch 0+020					
6.1.4.2	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.1.4.3	65 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
6.1.4.4	65 x 50 mm all flanged steel tee	No	1			Spec 4.3
6.1.4.5	65 mm dia GI Nipple	No	1			
6.1.4.6	65 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.7	65 mm dia GI union	No	1			

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6.1.4.8	50 mm dia GI Nipple	No	1			
6.1.4.9	50 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.10	50 mm dia GI union	No	1			
6.1.4.11	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
6.1.4.12	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Distribution Pipeline DP1-6-1 Offtake from SP 1-6 on OD75mm section @ ch 0+960					
6.1.4.13	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.1.4.14	65 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
6.1.4.15	65 x 32 mm all flanged steel tee	No	1			Spec 4.3
6.1.4.16	65 mm dia GI Nipple	No	1			
6.1.4.17	65 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.18	65 mm dia GI union	No	1			
6.1.4.19	32 mm dia GI Nipple	No	1			
6.1.4.20	32 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.21	32 mm dia GI union	No	1			
6.1.4.22	32 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
6.1.4.23	32 / 40 mm dia GI / HDPE adaptor	No.	1			Spec 4.4
	1 No. Chamber for Distribution Pipeline DP1-6-2 Offtake from SP 1-6 on OD50mm section @ ch 1+662					
6.1.4.24	50 / 40 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.1.4.25	40 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3

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6.1.4.26	40 mm dia GI Nipple	No	1			
6.1.4.27	40 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.28	40 mm dia GI union	No	1			
	1 No. Chamber for Distribution Pipeline DP1-12-1 Offtake from SMP 1-12 on OD75mm section @ ch 0+380					
6.1.4.29	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.1.4.30	65 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
6.1.4.31	65 x 50 mm all flanged steel tee	No	1			Spec 4.3
6.1.4.32	65 mm dia GI Nipple	No	1			
6.1.4.33	65 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.34	65 mm dia GI union	No	1			
6.1.4.35	50 mm dia GI Nipple	No	1			
6.1.4.36	50 mm dia gate valve	No	1			Spec 4.13.1
6.1.4.37	50 mm dia GI union	No	1			
6.1.4.38	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
6.1.4.39	50 / 63 mm dia VJ stepped coupling	No.	1			Spec 5.9
	1 No. Chamber for Distribution Pipeline DP1-13-1 Offtake from SMP 1-13 on OD50mm section @ ch 0+380					
6.1.4.40	50 / 40 mm dia GI/HDPE adaptor	No	3			Spec 4.4
6.1.4.41	40 mm dia x 500mm long threaded Steel pipe	No	5			Spec 5.8
6.1.4.42	40 x 40 mm all flanged steel tee	No	1			Spec 4.3

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6.1.4.43	40 mm dia GI Nipple	No	2			
6.1.4.44	40 mm dia gate valve	No	2			Spec 4.13.1
6.1.4.45	40 mm dia GI union	No	2			
6.1.5	PLOT OFFTAKE FITTINGS					
6.1.5.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	126			Spec 4.12.2
6.1.6	AIR VALVES					
6.1.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	4			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					Spec 4.12.2
	2 No. Single Acting Air Valve (SAV) on OD 63mm (SMP1-2 & SMP1-4)					
6.1.6.2	63 / 50 mm dia V/J stepped coupling	No.	4			Spec 5.9
6.1.6.3	50mm, 0.5m long single flanged GI piece	No.	4			Spec 4.3
6.1.6.4	50 x 50 mm double flanged steel tee	No.	2			Spec 4.3
6.1.6.5	50 mm x 400mm long double flanged steel piece	No.	2			Spec 4.3
6.1.6.6	50 mm flanged gate valve	No.	2			Spec 4.13.1
6.1.6.7	50 mm dia Single orifice air valve	No.	2			Spec 4.15
	2 No. Single Acting Air Valve (SAV) on OD 90mm (SP1-6 & SP1-12)					
6.1.6.2	90 / 80 mm dia V/J stepped coupling	No.	4			Spec 5.9

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6.1.6.3	80mm, 0.5m long single flanged GI piece	No.	4			Spec 4.3
6.1.6.4	80 x 50 mm double flanged steel tee	No.	2			Spec 4.3
6.1.6.5	50 mm x 400mm long double flanged steel piece	No.	2			Spec 4.3
6.1.6.6	50 mm flanged gate valve	No.	2			Spec 4.13.1
6.1.6.7	50 mm dia Single orifice air valve	No.	2			
6.1.7	WASHOUTS					
6.1.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 600 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	5			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications below and drawings</i>					Spec 4.12.2
	1 No. W/O on OD 50mm (SP1-11)					
6.1.7.2	50 / 40 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.1.7.3	40 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
6.1.7.4	40 mm x 32mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.1.7.5	32 mm flanged gate valve	No.	1			Spec 4.13.1
6.1.7.6	32 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
6.1.7.7	40 / 32 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
6.1.7.8	40 mm HDPE PN6 pipe	m	6			Spec 4.12.1
6.1.7.9	32mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1

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	1 No. W/O on OD 63mm (SP1-2)					
6.1.7.2	63 / 50 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.1.7.3	50 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
6.1.7.4	50 mm x 50mm level invert scour GI tee with flanged branch	No.	1			
6.1.7.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
6.1.7.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
6.1.7.7	63 / 50 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
6.1.7.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
6.1.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
	2 No. W/Os on OD 75mm (SP1-6 & 1-12)					
6.1.7.2	75 / 65 mm dia VJ stepped coupling	No.	4			Spec 5.9
6.1.7.3	65 mm dia single flanged GI piece (500mm long)	No.	4			Spec 4.3
6.1.7.4	65 mm x 50mm level invert scour GI tee with flanged branch	No.	2			Spec 4.3
6.1.7.5	50 mm flanged gate valve	No.	2			Spec 4.13.1
6.1.7.6	50 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.1.7.7	63 / 50 mm dia HDPE / GI adaptor	No.	4			Spec 4.4
6.1.7.8	63 mm HDPE PN6 pipe	m	12			Spec 4.12.1
6.1.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	2			Spec 4.16.1
	1 No.W/O on OD 32mm (SP1-10)					

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6.5.6.2	32 / 25 mm dia HDPE adaptor	No.	4			Spec 4.4
6.5.6.3	25 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.5.6.4	25 mm x 25mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.5.6.5	25 mm flanged gate valve	No.	1			Spec 4.13.1
6.5.6.6	25 mm dia x 500mm long threaded Steel pipe	No.	1			Spec 5.8
6.5.6.7	32 mm HDPE PN6 pipe Class B	m	6			Spec 4.12.1
6.5.6.8	25mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
6.1.8	PRESSURE REGULATING VALVES					
6.1.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	10			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications below and drawings</i>					
	3 No. Pressure Regulator Valves (PRVs) for SP1-5, SP1-7, SP1-10					
6.1.8.2	63 / 50 mm dia VJ stepped coupling	No	6			Spec 5.9
6.1.8.3	50 mm, 0.5m long threaded steel pipe	No	6			Spec 5.8
6.1.8.4	DN 50 flanged gate valves for PRV isolation	No.	3			Spec 4.13.1
6.1.8.5	Provide and install DN 50mm (PRV-15 for SP1-5), (PRV-35 for SP1-7), (PRV-25 for SP1-10)	No.	3			Spec 4.18
	3 No. Pressure Regulator Valve (PRV) for SP1-9, SP1-13, SP1-14					

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6.1.8.6	75 / 65 mm dia VJ stepped coupling	No	6			Spec 5.9
6.1.8.7	65mm, 0.5m long single flanged GI piece	No	6			Spec 4.3
6.1.8.8	DN 65 flanged gate valve for PRV isolation	No.	3			Spec 4.13.1
6.1.8.9	Provide and install DN 65mm (PRV-75 for SP1-9), (PRV-35 for SP1-13), (PRV-35 for SP1-14)	No.	3			Spec 4.18
	2 No. Pressure Regulator Valve (PRV) for SP1-6 & 1-12					
6.1.8.10	90 / 80 mm dia VJ stepped coupling	No	4			Spec 5.9
6.1.8.11	80 mm dia x 500mm long threaded Steel pipe	No	4			Spec 5.8
6.1.8.12	DN 80 flanged gate valve for PRV isolation	No.	2			Spec 4.13.1
6.1.8.13	Provide and install DN 80mm (PRV-50 for SP1-6), (PRV-25 for SP1-12)	No.	2			Spec 4.18
	2 No. Pressure Regulator Valve (PRV) for SP1-8, SP1-11					
6.1.8.14	Spec 5.9	No.	4			Spec 5.9
6.1.8.15	40 mm dia single flanged GI piece (500mm long)	No.	4			Spec 4.3
6.1.8.16	DN 40 flanged gate valve for PRV isolation	No.	2			Spec 4.13.1
6.1.8.17	Provide and install DN 40mm (PRV-70 for SP1-8), (PRV-25 for SP1-11)	No.	2			Spec 4.18
6.1.9	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	16 No. Minor Road Crossing at Chainages indicated on drawings					

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6.1.9.1	Volume of Mass Concrete Class 20/20	m ³	16.80			Spec 3.2.3.1
6.1.10	RIVER CROSSINGS FOR PIPES					
	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications below.					
	River crossing on SP1-6 in line with drawings.					
6.1.10.1	Excavation for foundation	m ³	2.69			Spec 2.11
6.1.10.2	Provide, place blinding concrete C15	m ³	0.05			Spec 3.2.3.2
6.1.10.3	C25 Concrete to bases and columns	m ³	0.75			Spec 3.2.3.3
6.1.10.4	Provide and fix steel reinforcement	kg	71			Spec 3.2.3.4
6.1.10.5	Provide install flanged DN80mm PN16 epoxy coated steel pipe including fittings and jointing in line with drawings	m	6			Spec 4.3 Spec 4.8.2
6.1.11	THRUST BLOCKS					
6.1.11.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings.	No.	16			Spec 3.2.3.1
6.1.12	OCCUPATIONAL HEALTH & SAFETY					
6.1.12.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Submain Pipeline 1	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 6.2 - SMP2 SuB-Main Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.2.1	Site clearance, Excavation and Backfilling					
6.2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1268.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
6.2.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	641			Spec 2.9
6.2.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	32			Spec 2.9
6.2.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	19			Spec 2.9
6.2.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.2.2.1	OD 75 mm HDPE, PN 6	m	340.00			Spec 4.12.2
6.2.2.2	OD 63 mm HDPE, PN 6	m	728.00			Spec 4.12.2
	OD 40 mm HDPE, PN 6	m	200.00			Spec 4.12.2
6.1.6	AIR VALVES					

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6.1.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications below;</i>					
	1 No. Single Acting Air Valve (SAV) on OD 63mm (SP2-3)					
6.1.6.2	63 / 50 mm dia V/J stepped coupling	No.	2			
6.1.6.3	50mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.1.6.4	50 x 50 mm double flanged steel tee	No.	1			Spec 4.3
6.1.6.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
6.1.6.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
6.1.6.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
6.1.7	WASHOUTS					
6.1.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 600 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in descriptions and drawings</i>					
	1 No.W/O on OD 63mm (SP2-3)					
6.1.7.2	63 / 50 mm dia VJ stepped coupling	No.	2			Spec 5.9

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6.1.7.3	50 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
6.1.7.4	50 mm x 50mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.1.7.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
6.1.7.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
6.1.7.7	63 / 50 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
6.1.7.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
6.1.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
6.1.8	PRESSURE REGULATING VALVES					
6.1.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in descriptions below and drawings</i>					
	1 No. Pressure Regulator Valves (PRVs) for SP2-3					
6.2.3.2	75 / 65 mm dia VJ stepped coupling	No	2			Spec 5.9
6.2.3.3	65 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8
6.2.3.4	DN 65 flanged gate valve for PRV isolation	No.	1			Spec 4.13.1
6.2.3.5	Provide and install DN 65mm for PRV-20	No.	1			Spec 4.18
6.2.4	PLOT OFFTAKE FITTINGS					

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6.2.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	24			Spec 4.12.2
6.2.5	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainages indicated on drawings					
6.2.5.1	Volume of Mass Concrete Class 20/20	m ³	2.10			Spec 3.2.3.1
6.2.6	OCCUPATIONAL HEALTH & SAFETY					
6.2.6.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Submain Pipeline 2	Lumpsum	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 6.3 - Block 3 Sub-Main Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.3.1	Site clearance, Excavation and Backfilling					
6.3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1486.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
6.3.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	892			Spec 2.9
6.3.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	45			Spec 2.9
6.3.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	27			Spec 2.9
6.3.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.3.2.1	OD 63 mm HDPE, PN 6.0	m	600.00			Spec 4.12.1
6.3.2.1	OD 50 mm HDPE, PN 6.0	m	886.00			Spec 4.12.1
6.3.3	PRESSURE REGULATING VALVES					
6.3.3.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200	No.	1			Spec 2.11

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	mm. Rates to including thrust blocks and pipe supports as shown in the drawings.					
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in the descriptions below and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) for SP3-3					
6.3.3.2	63 / 50 mm dia VJ stepped coupling	No	2			Spec 5.9
6.3.3.3	50 mm, 0.5m long threaded steel pipe	No	2			Spec 5.8
6.3.3.4	DN 50 flanged gate valves for PRV isolation	No.	1			Spec 4.13.1
6.3.3.5	Provide and install DN 50mm (PRV-35)	No.	1			Spec 4.18
6.3.4	PLOT OFFTAKE FITTINGS					Spec 4.12.2
6.3.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD20mm farm offtakes	No.	27			Spec 4.12.2
6.3.5	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage indicated on drawings					
6.3.5.1	Volume of Mass Concrete Class 20/20	m ³	1.05			Spec 3.2.3.1
6.3.6	RIVER CROSSINGS FOR PIPES					
	Provide for rivercrossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all					

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	jointing materials and other fittings as per the descriptions below;					
	River crossing on SP3-2 in line with drawings.					
6.3.6.1	Excavation for foundation	m ³	2.69			Spec 2.11
6.3.6.2	Provide, place blinding concrete C15	m ³	0.05			Spec 3.2.3.2
6.3.6.3	C25 Concrete to bases and columns	m ³	0.75			Spec 3.2.3.3
6.3.6.4	Provide and fix steel reinforcement	kg	71			Spec 3.2.3.4
6.3.6.5	Provide install flanged DN40mm PN16 epoxy coated steel pipe including fittings and jointing in line with drawings	m	6			Spec 4.3 & Spec 4.8.2
6.3.7	OCCUPATIONAL HEALTH & SAFETY					
6.3.7.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Submain Pipeline 3	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 6.4 - SMP4 Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.4.1	Site clearance, Excavation and Backfilling					
6.4.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1653.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
6.4.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	992			Spec 2.9
6.4.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	50			Spec 2.9
6.4.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	30			Spec 2.9
6.4.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
	OD 110 mm HDPE, PN 6	m	300.00			Spec 4.12.1
6.4.2.1	OD 75 mm HDPE, PN 6	m	725.00			Spec 4.12.1
6.4.2.2	OD 63 mm HDPE, PN 6	m	340.00			Spec 4.12.1
6.4.2.3	OD 50 mm HDPE, PN 6	m	288.00			Spec 4.12.1
6.4.3	BENDS					

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	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
6.4.3.1	OD110 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
6.4.3.2	OD110 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
6.4.3.3	OD110 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
6.4.4	PLOT OFFTAKE FITTINGS					
6.4.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	33			Spec 4.12.2
6.4.5	AIR VALVES					
6.4.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications below;</i>					
	1 No. Single Acting Air Valve (SAV) on OD 63mm for SP4-3					
6.4.5.2	63 / 50 mm dia V/J stepped coupling	No.	2			Spec 5.9
6.4.5.3	50mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.4.5.4	50 x 50 mm double flanged steel tee	No.	1			Spec 4.3
6.4.5.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
6.4.5.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
6.4.5.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
6.4.6	WASHOUTS					

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6.4.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 600 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications below and drawings</i>					
	1 No.W/O on OD 63mm (SP4-3)					
6.4.6.2	63 / 50 mm dia VJ stepped coupling	No.	2			Spec 5.9
6.4.6.3	50 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
6.4.6.4	50 mm x 50mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.4.6.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
6.4.6.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
6.4.6.7	63 / 50 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
6.4.6.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
6.4.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.12.1
6.4.8	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	4 No. Minor Road Crossing at Chainage indicated on drawings					
6.4.8.1	Volume of Mass Concrete Class 20/20	m ³	4.20			Spec 3.2.3.1

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6.4.9	THRUST BLOCKS					
6.4.9.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the descriptions.	No.	6			Spec 3.2.3.1
6.4.10	OCCUPATIONAL HEALTH & SAFETY					
6.4.10.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Submain Pipeline 4	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 6.5 - SMP5 Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.5.1	Site clearance, Excavation and Backfilling					
6.5.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1209.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
6.5.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	725			Spec 2.9
6.5.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	36			Spec 2.9
6.5.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	22			Spec 2.9
6.5.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.5.2.2	OD 110 mm HDPE, PN 6.0	m	440.00			Spec 4.12.1
6.5.2.3	OD 75 mm HDPE, PN 6.0	m	389.00			Spec 4.12.1
6.5.2.4	OD 40 mm HDPE, PN 6.0	m	380.00			Spec 4.12.1
6.5.3	BENDS					

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	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
6.5.3.1	OD110 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
6.5.3.2	OD110 mm Plain ended 45-degree bend	No.	1			Spec 4.12.2
6.5.3.3	OD110 mm Plain ended 22.5-degree bend	No.	1			Spec 4.12.2
6.5.4	PLOT OFFTAKE FITTINGS					
6.5.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	16			Spec 4.12.2
6.5.5	AIR VALVES					
6.5.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications below;</i>					
	1 No. Single Acting Air Valve (SAV) along SMP5-3					
6.5.5.2	40 / 32 mm dia HDPE adaptor	No.	2			Spec 4.4
6.5.5.3	32 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.5.5.4	32 mm x 25 mm dia GI tee threaded	No.	1			Spec 5.8
6.5.5.5	25 mm dia x 500mm long threaded Steel pipe	No.	1			Spec 5.8
6.5.5.6	25 mm flanged gate valve	No.	1			Spec 4.13.1
6.5.5.7	25 mm single orifice air valve	No.	1			Spec 4.15
6.5.6	WASHOUTS					

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6.5.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 1000 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications below and drawings.</i>					
	1 No.W/O on OD 40mm HDPE pipe along SMP5-3					
6.5.6.2	40 / 32 mm dia HDPE adaptor	No.	2			Spec 4.4
6.5.6.3	32 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.5.6.4	32 mm x 25mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.5.6.5	25 mm flanged gate valve	No.	1			Spec 4.13.1
6.5.6.6	25 mm dia x 500mm long threaded Steel pipe	No.	1			Spec 5.8
6.5.6.7	32 mm HDPE PN 6 pipe	m	6			Spec 4.12.1
6.5.6.8	25mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
6.5.8	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainage indicated on drawings					
6.5.8.1	Volume of Mass Concrete Class 20/20	m ³	2.10			Spec 3.2.3.1
6.5.9	THRUST BLOCKS					

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6.5.9.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the description.	No.	3			Spec 3.2.3.1
6.5.10	OCCUPATIONAL HEALTH & SAFETY					
6.5.10.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Submain Pipeline 5	Lumps um	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No.7 - DISTRIBUTION PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 7.1: SMP1 Distribution Pipeline	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

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Bill No. 7.1 - SMP1 Distribution Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
7.1.1	Site clearance, Excavation and Backfilling					
7.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1632.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					Spec 2.9
7.1.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	979			Spec 2.9
7.1.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	29			Spec 2.9
7.1.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	29			Spec 2.9
7.1.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
7.1.2.1	OD 63 mm HDPE, PN 6.0	m	591.00			Spec 4.12.1
7.1.2.2	OD 50 mm HDPE, PN 6.0	m	621.00			Spec 4.12.1
7.1.2.3	OD 40 mm HDPE, PN 6.0	m	420.00			Spec 4.12.1
7.1.3	PLOT OFFTAKE FITTINGS					Spec 4.12.2
7.1.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	21			Spec 4.12.2

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7.1.4	AIR VALVES					
7.1.4.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 600 x 600 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV) along DP1-3-1					
7.1.4.2	63 / 50 mm dia V/J stepped coupling	No.	2			Spec 5.9
7.1.4.3	50mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
7.1.4.4	50 x 50 mm double flanged steel tee	No.	1			Spec 4.3
7.1.4.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
7.1.4.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
7.1.4.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
	1 No. Single Acting Air Valve (SAV) along DP1-6-2					
7.1.4.8	50 / 40 mm dia V/J stepped coupling	No.	2			Spec 5.9
7.1.4.9	40mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
7.1.4.10	40 x 32 mm double flanged steel tee	No.	1			Spec 4.3
7.1.4.11	32 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
7.1.4.12	32 mm flanged gate valve	No.	1			Spec 4.13.1
7.1.4.13	32 mm dia Single orifice air valve	No.	1			Spec 4.15
7.1.5	WASHOUTS					

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7.1.5.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 600 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications below and drawings.</i>					
	1 No. W/O on OD 63mm DP1-3-1					
7.1.5.2	63 / 50 mm dia VJ stepped coupling	No.	2			Spec 5.9
7.1.5.3	50 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
7.1.5.4	50 mm x 50mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
7.1.5.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
7.1.5.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
7.1.5.7	63 / 50 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
7.1.5.8	63 mm HDPE PN 6 pipe	m	6			Spec 4.12.1
7.1.5.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
	1 No. W/O on OD 50mm DP1-6-2					
7.1.5.10	50 / 40 mm dia VJ stepped coupling	No.	2			Spec 5.9
7.1.5.11	40 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
7.1.5.12	40 mm x 32mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
7.1.5.13	32 mm flanged gate valve	No.	1			Spec 4.13.1
7.1.5.14	32 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
7.1.5.15	40 / 32 mm dia HDPE / GI adaptor	No.	2			Spec 4.4

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7.1.5.16	40 mm HDPE PN 6 pipe	m	6			Spec 4.12.1
7.1.5.17	32mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
7.1.6	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	4 No. Minor Road Crossing at Chainage indicated on drawings					
7.1.6.1	Volume of Mass Concrete Class 20/20	m ³	4.20			Spec 3.2.3.1
7.1.7	OCCUPATIONAL HEALTH & SAFETY					
7.1.7.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Submain Pipeline 5	Lumpsu m	1			Spec 7.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

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Bill No. 8 - Plot Hydrants						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
	Scheme Plots	No.	250			
8.1	Plot Hydrants					
8.1.1	25 mm dia HDPE/GI adaptor	No.	500			Spec 4.4
8.1.2	25 mm dia GI elbow	No.	1000			Spec 4.12.2
8.1.3	25 mm dia GI straight threaded on both sides 1000 mm long	No.	500			Spec 5.8
8.1.4	25 mm dia GI nipple	No.	1250			
8.1.5	25 mm dia gate valve	No.	250			Spec 4.13.1
8.1.6	25mm dia flow limiter	No	250			
8.1.7	25x 20 mm dia GI tee	No.	250			
8.1.8	25/20 mm dia plug	No.	250			
8.1.9	25mm dia GI union	No.	250			
	TOTAL CARRIED OVER TO COLLECTION SHEET					