



**ATHI WATER WORKS DEVELOPMENT AGENCY
Nairobi**

Republic of Kenya



Financial Cooperation between Kenya
Germany, with Support of KfW Development I



**NAIROBI SATELLITE TOWNS WATER AND SANITATION
DEVELOPMENT PROGRAMME; PHASE 1**

**Construction of Mwhoko Water Supply Project – Lot 4
BMZ No. 2013.6543.6**

TENDER No. AWWDA/KfW/NST /LOT 4/2023

BIDDING DOCUMENTS

SECTION IV: BILLS OF QUANTITIES

May 2023



MWIHOKO WATER SUPPLY PROJECT

AWWDA/KfW/NST /LOT 4/2023

GRAND SUMMARY

Bill No	Description	Amount (KShs)
1	Preliminary and General Items	
2	Ring Mains	
3	Mwihoko A Distributions (DMA 1-4)	
4	Consumer Connections - DMAs 1-4	
5	Solarisation Water Project	
BILL TOTAL		
	Contingencies	10%
Bills Total inclusive of Contingencies CARRIED TO FORM OF BID		

Bill 1 - PRELIMINARY AND GENERAL ITEMS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
Bill No. 1	Preliminary and General Works				
A	GENERAL ITEMS				
	Contractual Requirements				
	Allow for Provision of:				
1A110	Performance Security as per Clause 4.2 of Conditions of Contract.	Item	L.S		
1A120.1	Insurance for Works and Contractor's Equipment as per Clause 18.2 of Conditions of Contract.	Item	L.S		
1A120.2	Insurance for Contractor's Equipment as per Clause 18.2 of Conditions of Contract.	Item	L.S		
1A120.3	Insurance against Injury to Third Party Persons and Damage to Property as per Clause 18.3 of Conditions of Contract.	Item	L.S		
1A120.4	Insurance for Contractor's Personnel as per Clause 18.4 of Conditions of Contract.	Item	L.S		
A2	GENERAL REQUIREMENTS				
A2.11	Establishment/Renting of offices for the Engineer's staff to Engineer's requirements. Include for supply of office furniture, computers and office accessories	PC Sum			2,400,000
A2.12	Maintenance of Engineer's office	PC Sum			1,200,000
A2.13	Provide provisional Sum of Kshs 1,500,000 for rent of Accommodation for Resident Engineer and one (1) Assistant Resident Engineers to the approval of the Project Manager as detailed in the specifications for 12 months; the amount to be expended on a monthly basis.	PC Sum			1,500,000
A2.14	Provisional Sum of Kshs 1,000,000 for provision of communication facilities and services (telephone, email, fax, postal, courier services, etc.) for the Project / Site Offices and the Supervision Staff.	PC Sum			1,000,000
A2.15	Provide one four wheel drive double cab pick-up vehicle of not less than 2800cc capacity (Ownership to revert to employer after the contract). Allow for insurances, road licences	PC Sum			6,000,000
A2.16	Maintenance of project vehicles (fuelling, servicing, all parts replacement and attendance by drivers)	PC Sum			1,200,000
A2.17	Allow cost for community sensitization & mobilization	Sum			2,000,000
	Contractor's overheads and profits for items A2.11, A2.12, A2.13, A2.14, A2.15, A2.16, A2.17	%		10	1,530,000
A2.18	Allow for establishment of the contractor's yard, offices, and stores necessary to carry out the works	Item	L.S		
A2.19	Provide erect and maintain 2 Sign boards at locations directed by the Engineer	nr	2		
A2.20	Allow for provision of As-Built Drawings in accordance with the Specifications	Item	L.S		
	Resident Engineer's Staff				
	Provide the following Staff for the Resident Engineer's Office. (Note: The Staff to be employed by the Contractor but to be under the exclusive day to day instruction of the Resident Engineer).				
A2.21	Drivers, 1 No	month	12		
A2.22	Office Secretary, 1 No	month	12		
A2.22	Office Assistant, 1 No	month	12		
A2.22	CAD Technician	month	12		
A2.23	Assistant Surveyor	month	12		
A2.24	Contractors overhead and profit items 1A241 - A244.6	%		10%	
PAGE TOTAL CARRIED TO BILL 1 COLLECTION					

BILL 1 - PRELIMINARY AND GENERAL ITEMS

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	Specific Conditions				
A2.24	P.C. Sum for Payments demanded by the Authorities for re-location or crossing of existing services, Road and Railway crossings, etc. Liaison with the relevant Authorities shall be the responsibility of the Contractor for the timely execution of the Works.	Sum	1	1,000,000	1,000,000
A2.25	Contractor's overheads and profits for item 1A7.6 Allow for all specific works related to working along active pipelines and maintaining continuity of water supply and sewer operation including protection of supports etc. of existing pipelines during construction activity.	% Item	1 L.S	10	100,000
A2.26	Allow for any costs associated with compliance with Environmental, Health and Safety Requirements as per the Specifications and as required by Government Agencies and Prevailing Legislation.	Month	12		
PAGE TOTAL CARRIED TO BILL 1 COLLECTION					

BILL 1 - PRELIMINARY AND GENERAL ITEMS

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	BILL 1 Collection Page				
	Total Page 1				
	Total Page 2				
BILL 1 COLLECTION CARRIED TO GRAND SUMMARY					

BILL 2 - RING MAINS

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p>These works are to be carried out in congested built up areas with limited working space. No wayleave has been arranged for and all the working area shall be organized by the contractor at his own cost. Sections of the pipelines to be laid beside existing active resources (electrical, water, e.t.c) and storm water drain within the project area.</p> <p>Use of bulk excavation machines may not be possible in most of the site. Contractors rates to allow for double haulage of excavated materials or any additional costs for execution of the works.</p> <p>Specific conditions in execution of these Works are deemed to be included in the Contractor's rates.</p> <p>The Contractor will be required to submit Method Statement for execution of works under these specific conditions for approval prior to execution of the works. These include but are not limited to the following:</p> <p><i>i. No blasting will be permitted in these areas</i></p> <p><i>ii. The Contactor to maintain uninterrupted continuity of water supply in existing mains</i></p> <p><i>iii. Pedestrian and vehicular Access to individual shops / plots to be maintained at all times</i></p> <p><i>iv. Safety hoarding, lighting, bands, warning signs, etc. to be maintained at all times.</i></p> <p><i>v. The contractor to ensure uninterrupted flow of water in the existing water lines during connection of proposed lines to the existing water network</i></p> <p>CLASS A: GENERAL ITEMS</p> <p>Specified Requirements</p> <p><u>Testing of works</u></p> <p>Carry out pressure testing, cleansing and sterilising of the pipeline in accordance with clauses 440 and 441 of the specification.</p>				
6A260.2	OD 355	m	1,015		-
6A260.4	OD 560	m	5,826		-
6A260.5	OD 630	m	244		-
6A271	Allow for temporary works for diversion of traffic during construction of pipelines across roads, including sign posting, liaison with Traffic Police Department, Local Authority construction of diversion roads etc. all to the satisfaction of the Engineer. Include provision for maintaining temporary vehicular access to individual plots at all times.	LS	1		-
6A277	Allow for keeping trenches and other excavation free of water which may have entered through ground seepage, rain or by other means as directed by the Engineer.	LS	1		-
6D110	General clearance	ha	1.9		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	Cutting of Trees				
6D210.1	Girth 0.5m - 1.0m	Nr	2		-
6D210.2	Girth 1.0m - 2.0m	Nr	2		-
	CLASS I: PIPEWORK - PIPES				
	<u>Supply, Transport to Site and Store</u>				
	<u>Steel pipes, flanged, for river crossing</u>				
6I43.1	DN 500 <i>High Density Polyethylene Pipes (HDPE) SDR 17 (PN 10) for with Butt Fusion (seamless) Jointing</i>	m	30		-
6I42	OD 225 for washouts	m	120		-
6I43.1	OD 355	m	1,015		-
6I43.3	OD 560	m	5,826		-
6I43.4	OD 630 <u>Include for Excavation, Preparation of Surfaces, Disposal of</u>	m	244		-
6I723	OD 225 in trenches depth 1.5m - 2.0m.	m	50		-
6I724	Ditto but depth 2.0 - 2.5m	m	5		-
6I725	Ditto but depth 2.5 - 3.0m	m	5		-
6I733	OD 355 in trenches depth 1.5m - 2.0m.	m	250		-
6I734	Ditto but depth 2.0 - 2.5m	m	507		-
6I735	Ditto but depth 2.5 - 3.0m	m	258		-
6I432	DN 500 in trenches depth 1.5 - 2.0m.	m	1,456		-
6I433	Ditto but depth 2.0 - 2.5m	m	2,913		-
6I434	Ditto but depth 2.5 - 3.0m	m	1,457		-
6I432	DN 600 in trenches depth 1.5 - 2.0m.	m	61		-
6I433	Ditto but depth 2.0 - 2.5m	m	122		-
6I434	Ditto but depth 2.5 - 3.0m	m	61		-
	CLASS J: PIPEWORK - FITTINGS AND VALVES				
	<u>Rates to include for provision and fixing. Flanges to PN 10 steel unless otherwise stated</u>				
	Bends - Short Radius				
	<u>Plain ended</u>				
	OD 225, 90°	nr	18		-
PAGE TOTAL CARRIED TO COLLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	OD 225, 45°	nr	12		-
6J713	OD 355, 90°	nr	1		-
6J313.1	OD 355, 45°	nr	2		-
6J313.1	OD 560, 90°	nr	1		-
6J313.1	OD 560, 45°	nr	14		-
	<u>Double Flanged</u>				
	Double flanged DN 150 90° elbow	nr	4		-
	Bends - Long Radius				
	<u>Plain ended</u>				-
6J313.1	OD 355, 22.5°	nr	2		-
6J313.1	OD 560, 22.5°	nr	8		-
	Junctions and Branches - Tees & Crosses				-
	DN 300 x 80 all flanged tee	nr	1		-
	DN 300 x 150 all flanged tee	nr	2		-
6J323.4	DN 500 x 150 all flanged tee	nr	2		-
6J323.5	DN 500 x 200 all flanged tee	nr	9		-
6J324.2	DN 600 x 300 all flanged tee	nr	1		-
	High Density Polyethylene Fittings (HDPE) SDR 17 (PN 10) - Tees				-
6J363.1	355 x 90 mm	nr	1		-
	355 x 110 mm	nr	2		-
	355 x 160 mm	nr	1		-
	355 x 225 mm	nr	1		-
6J363.2	355 x 355 mm	nr	2		-
	560 x 225 mm	nr	9		-
	560 x 560 mm	nr	1		-
6J363.3	560 x 560 mm cross	nr	1		-
	Tapers Double Flanged Steel				-
	DN 80 x 50	nr	4		-
	DN 100 x 50	nr	4		-
	DN 150 x 50	nr	4		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	DN 150 x 125	nr	2		-
	DN 200 x 80	nr	9		-
6J332.1	DN 300 x 150	nr	2		-
	DN 300 x 100	nr	1		-
	DN 500 x 100	nr	4		-
	DN 500 x 150	nr	2		-
	Tapers HDPE				
	OD 355 x 90	nr	1		-
	OD 355 x 100	nr	1		-
	OD 560 x 355	nr	1		-
	OD 630 x 560	nr	1		-
	Adaptors				
	<u>Flange adaptors</u>				
6J351.2	DN 50	nr	6		
6J351.3	DN 100	nr	2		
6J351.4	DN 150	nr	4		
6J352.1	DN 200	nr	6		
5J355	DN 600	nr	1		
	Flanged Adapter (STUB END) Complete with metal back up ring				
	90mm DIA	nr	4		
	110mm DIA	nr	5		
	160mm DIA	nr	2		
6J652	225mm DIA	nr	16		
6J653	355mm DIA	nr	8		
	560mm DIA	nr	24		
	630mm DIA	nr	1		
	Straight Specials				
	Flanged spigot pipes				
6J381.2	DN 50mm, 0.4 m long	nr	6		
6J381.3	DN 100mm, 0.5m long	nr	1		
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
6J381.4	DN 150mm, 0.5m long	nr	2		0
6J382	DN 150mm, length n.e. 4m	nr	2		0
	Double Flanged pipe with puddle flange				-
	DN 80, length 1 m	nr	4		-
	DN 100, length 1 m	nr	5		-
	DN 150, length 1 m	nr	6		-
	DN 200, length 1 m	nr	12		-
	DN 300, length 1 m	nr	3		-
5J380	DN 500, length 1 m	nr	6		-
	DN 600, length 1 m	nr	2		-
	Double Flanged pipes				-
	DN 50mm, 0.4 m long	nr	6		-
	DN 80mm, to suit air valve	nr	10		-
	DN 100mm, 1 m long	nr	2		-
	DN 150mm, 1 m long	nr	2		-
	Gate Valves - Hand Operated				-
	DN 50mm	nr	12		-
6J811	DN 80mm	nr	10		-
	DN 100mm	nr	4		-
6J812.1	DN 150mm	nr	6		-
6J812.2	DN 200mm	nr	6		-
	Butterfly Valve - Hand Operated				-
5J81	DN 600mm flanged butterfly valve	nr	1		-
	Air Valves				-
6J861.1	DN 80 flanged, double	nr	10		-
	All Flanged Battery Powered Ultrasonic Flow Meter to PN10, complete with accessories - including data logger and transmitter - To EN ISO 4064: 2014, OIML R 49 :2013 and MID 2014/32/EU - Accuracy class 2, minimum R=400				-
3J391.1	DN 50, Q3 25	nr	6		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
7J9.4	DN 100, Q3 63	nr	2		-
7J9.5	DN 150, Q3 250	nr	2		-
	Pressure Release Valve (PRV) - Approved				
5J81.1	DN 50mm flanged PRV MWR2	nr	1		-
5J81.2	DN 125mm flanged PRV MWR1	nr	1		-
	Y-Strainer				
	DN 150mm flanged	nr	2		-
	Blank Flange				
	DN200	nr	4		-
	DN350	nr	3		-
	CLASS K: PIPEWORK - MANHOLES AND PIPEWORK ANCILLARIES				
	Chambers, ducts, culverts, crossings, thrust, anchor blocks, reinstatement and others pipework ancillaries				
	Valve Chambers- Internal Dimensions to fit as detailed on Drawing No. RJ/SD/79A & /79B				
	<u>Note:- Items for Work in this class shall include:-</u>				
	<u>i. Excavation, preparation of surfaces, disposal of surplus excavated material, shoring sides of excavation, backfilling and removal of redundant services.</u>				
	<u>ii. Concrete, Reinforcement, Formwork, Joints and Finishes.</u>				
	<u>iii. Include for supply and fixing of removable precast concrete cover slab, mild steel frame, lifting / opening mechanism, step irons, compacted granular fill, rendering of exposed blockwork etc.</u>				
	<u>iv. Tips for disposal of excavated material or debris to be identified by the Contractor in liaison with the Local Authorities.</u>				
	<u>Air valve Chamber</u>				
6K211.2	Depth 1.5 - 2.0m	nr	10		-
	<u>Washout Chamber</u>				
6K231.2	Type 1, including concrete outfall works depth 1.5 - 2.0 m	nr	6		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<i>Valves Chambers</i>				
K251.1	Provide all materials and construct precast concrete PRV VALVE Chambers on Reinforced Concrete Base, internal dimensions 3000 x 1200mm. Include for supply and fixing of removable precast concrete cover slab, mild steel frame, lifting / opening mechanism, step irons, compacted granular fill, rendering of exposed blockwork etc.;	Nr	2		-
K251.2	Provide all materials and construct precast concrete METER Chambers on Reinforced Concrete Base, internal dimensions 1200 x 1200mm. Include for supply and fixing of removable precast concrete cover slab, mild steel frame, lifting / opening mechanism, step irons, compacted granular fill, rendering of exposed blockwork etc.;	Nr	10		-
	Crossings				
6K632	DN 500 Overcrossing on River Kiu	nr	1		-
6K671	Allow for crossing existing drains and sewers, and reinstate these after construction of the water line has been completed. Pipe bore 300mm-600mm	Nr	5		-
	Micro-tunnelling below bituminous roads				
	<u>Rates quoted shall be deemed to include for costs incurred on traffic control, signage and safety measures during execution of the works.</u>				
6K732.1	DN 300 - 600	m	108		-
	For OD 160 - 225 pipe for future distribution system	m	60		-
6K694	Extra over microtunnelling in rock	m ³	130		-
PAGE TOTAL CARRIED TO COLLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	Reinstatement				
	<u>Breaking up, temporary and permanent reinstatement of murram road (Width of road cutting n.e 2m) with 300mm thick well graded stabilised gravel with 3% cement content base compacted using a 8-10 tonne roller to the satisfaction of the Engineer . Nominal bore n.e. 300mm. Contractor to allow for liason with relevant local authorities and obtaining approval for completed works in his rates.</u>				
6K732.2	DN 300 - 400	m	50		-
6K732.3	DN 500 - 600	m	100		-
	Breaking up temporary and permanent reinstatement of paved footpaths (concrete, cabro, tarmac, etc.).				
6K742	Pipe bore 300 - 400mm	m	800		-
6K742	Pipe bore 500 - 600mm	m	800		-
	Other Pipework Ancillaries				
	<u>Supply and erect precast concrete marker post for the following:-</u>				
6K820.1	Pipeline marker post	nr	24		-
6K820.2	Air valve marker post	nr	6		-
6K820.3	Washout marker post	nr	6		-
6K820.4	Warning tape installed in trenches on top of all the pipes	m	7085		-
	CLASS L: PIPEWORK - SUPPORTS AND PROTECTION, ANCILLARIES TO LAYING AND EXCAVATION				
	<u>Extra to excavation and backfilling</u>				
6L111.1	Extra Over excavation items for excavation in rock Class 'A', blasting not permitted (Provisional)	m ³	500		-
6L111.2	-Ditto- but in rock Class 'B'	m ³	500		-
6L111.3	-Ditto- but in rock Class 'C'	m ³	4000		-
	<u>Pipe Embedment (Bedding, sidefill and initial backfill to minimum 300mm above pipe crown)</u>				
	<u>Imported Approved Granular Material, compacted in 150mm layers</u>				-
L324	For pipes OD 355	m	500		-
L324	For pipes OD 560	m	3,000		-
L324	For pipes OD 630	m	125		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<u>Surrounds</u>				
	<u>Mass concrete Class 15</u>				
6L542.3	OD 355 pipe	m	50		-
6L542.1	OD 560 pipe	m	50		-
6L542.2	OD 630 pipe	m	50		-
	Concrete thrust blocks				
	<u>Mass concrete Class 15</u>				
6L713.6	For OD 355 22.5° bend volume 0.40 m ³	nr	2		-
6L713.5	For OD 355 45° bend volume 0.60 m ³	nr	2		-
6L713.5	For DN 355 90° bend volume 1.48 m ³	nr	2		-
6L713.3	For DN 500 22.5° bend volume 0.75 m ³	nr	8		-
6L713.4	For DN 500 45° bend volume 0.95 m ³	nr	14		-
6L713.5	For DN 500 90° bend volume 2.61 m ³	nr	1		-
	<u>Thrust blocks - RC, Class 20/20 Volume 0.5 - 1.0m³</u>				
6L743	For All junctions and branches	nr	24		-
	<u>Anchor blocks on Kiu River Crossing- RC. Volume n.e 0.1 m³</u>				
6L743	Anchor blocks including metal strap and holddown bolts	nr	3		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

Bill 2.1 KAHAWA SUKARI MWIHOKO RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	BILL 2 .1 Collection Page				
	Total Page 1				-
	Total Page 2				-
	Total Page 3				-
	Total Page 4				-
	Total Page 5				-
	Total Page 6				-
	Total Page 7				-
	Total Page 8				-
	Total Page 9				-
PAGE TOTAL CARRIED TO SUMMARY PAGE					-

BILL 2.2 MWIHKOKO A RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	CLASS A: GENERAL ITEMS				
	Specified Requirements				
	<u>Testing of works</u>				
	Carry out pressure testing, cleansing and sterilising of the pipeline in accordance with clauses 440 and 441 of the specification.				
6A260.1	OD 355	m	2,062		-
6A260.3	OD 560	m	192		-
6A271	Allow for temporary works for diversion of traffic during construction of pipelines across roads, including sign posting, liaison with Traffic Police Department, Local Authority construction of diversion roads etc. all to the satisfaction of the Engineer. Include provision for maintaining temporary vehicular access to individual plots at all times.	LS	1		-
6A277	Allow for keeping trenches and other excavation free of water which may have entered through ground seepage, rain or by other means as directed by the Engineer.	LS	1		-
	CLASS D:DEMOLITION AND SITE CLEARANCE				
6D110	General clearance	ha	0.7		-
	Cutting of Trees				
	<u>Provide all material and cut trees, girth measured 1m above ground level. Bushes are deemed to be included in Item D110. The disposal of trees shall be decided by the Engineer. Distance of haul not exceeding 5km. The rate to include liaison with the relevant authorities and obtaining permission.</u>				
6D210.1	Girth 0.5m - 1.0m	Nr	5		-
6D210.2	Girth 1.0m - 2.0m	Nr	1		-
	CLASS I: PIPEWORK - PIPES				
	<u>Supply, Transport to Site and Store</u>				
	High Density Polyethylene Pipes (HDPE) SDR 17 (PN 10) for with Butt Fusion (seamless) Jointing				
6I43.3	OD 560	m	192		-
6I73.4	OD 355mm	m	2,062		-
	<u>Transport from Site Store, Lay and Joint Pipes in Trench, Include for Excavation, Preparation of Surfaces, Disposal of Excavated Material, Shoring Sides of Excavation trenches, Backfilling and final Reinstatement.</u>				
6I432	OD 560 in trenches depth 1.5 - 2.0m.	m	48		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

BILL 2.2 MWIHKOKO A RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
6I433	Ditto but depth 2.0 - 2.5m	m	96		-
6I434	Ditto but depth 2.5 - 3.0m	m	48		-
6I732	OD 355 in trenches depth 1.5m - 2.0m.	m	1,000		-
6I733	Ditto but depth 2.0 - 2.5m	m	800		-
6I734	Ditto but depth 2.5 - 3.0m	m	262		-
CLASS J: PIPEWORK - FITTINGS AND VALVES					
<u>Rates to include for provision and fixing. Flanges to PN 10 steel unless otherwise stated</u>					
Bends - Short Radius					
<u>Plain ended</u>					
6J713.2	OD 355, 90°	nr	2		-
	OD 355, 45°	nr	4		-
Bends - Long Radius					
<u>Plain ended</u>					
	OD 355, 22.5°	nr	2		-
CLASS K: PIPEWORK - MANHOLES AND PIPEWORK ANCILLARIES					
Crossings					
Allow for crossing existing drains and sewers, and reinstate these after construction of the water line has been completed.					
6K671	Pipe bore 300 - 900mm	Nr	5		-
Micro-tunnelling below railway and bituminous roads					
<u>Rates quoted shall be deemed to include for costs incurred on traffic control, signage and safety measures during execution of the works.</u>					
6K691	DN 300 - 600 mm	m	20		-
	For OD 160 - 225 pipe for future distribution system	m	20		-
6K694	Extra over microtunnelling in rock	m ³	5		-
Reinstatement					
<u>Breaking up, temporary and permanent reinstatement of murrum road (Width of road cutting n.e 2m) with 300mm thick well graded stabilised gravel with 3% cement content base compacted using a 8-10 tonne roller to the satisfaction of the Engineer. Nominal bore n.e. 300mm. Contractor to allow for liason with relevant local authorities and obtaining approval for completed works in his rates.</u>					
PAGE TOTAL CARRIED TO COLECTION PAGE					-

BILL 2.2 MWIHOKE A RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
6K732	DN 300 - 400 <i>Breaking up temporary and permanent reinstatement of paved footpaths (concrete, cabro, tarmac, etc.).</i>	m	150		-
6K742	Pipe bore 300 - 400mm Other Pipework Ancillaries <u>Supply and erect precast concrete marker post for the following:-</u>	m	150		-
6K820.2	Air valve marker post	nr	2		-
6K820.3	Washout marker post	nr	1		-
6K820.4	Warning tape installed in trenches on top of all the pipes	m	2254		-
CLASS L: PIPEWORK - SUPPORTS AND PROTECTION, ANCILLARIES TO LAYING AND EXCAVATION					
<u>Extra to excavation and backfilling in pipe trenches</u>					
6L111.1	Extra Over excavation items for excavation in rock Class 'A', blasting not permitted (Provisional)	m ³	300		-
6L111.2	-Ditto- but in rock Class 'B'	m ³	300		-
6L111.3	-Ditto- but in rock Class 'C'	m ³	650		-
<u>Pipe Embedment (Bedding, sidefill and initial backfill to minimum 300mm above pipe crown)</u>					
<u>Imported Approved Granular Material, compacted in 150mm layers</u>					
L324	For pipes OD 355	m	1,000		-
L324	For pipes OD 560	m	100		-
<u>Surrounds</u>					
<u>Mass concrete Class 15</u>					
6L542.3	OD 355 pipe	m	10		-
6L542.1	OD 560 pipe	m	10		-
<u>Concrete thrust blocks</u>					
<u>Mass concrete Class 15</u>					
6L713.6	For OD 355 22.5° bend volume 0.40 m ³	nr	2		-
6L713.5	For OD 355 45° bend volume 0.60 m ³	nr	2		-
6L713.5	For DN 355 90° bend volume 1.48 m ³	nr	2		-
<u>Class 20/20 RC. Volume 0.5 - 1.0m³</u>					
6L743	All junctions and branches	nr	5		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

BILL 2.2 MWHIKO A RING MAIN

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	BILL 6.2 Collection Page				
	Total Page 10				-
	Total Page 11				-
	Total Page 12				-
PAGE TOTAL CARRIED TO SUMMARY PAGE					-

BILL 2 SUMMARY PAGE

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	Bill 2 Summary Page				
	Bill No. 2.1 Kahawa Sukari Mwhiko Ring Main				-
	Bill No. 2.2 Mwhiko A Ring Main				-
BILL 2 SUMMARY CARRIED TO GRAND SUMMARY					-

BILL 3 - MWHIKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p>These works are to be carried out in congested built up areas with limited working space. No wayleave has been arranged for and all the working area shall be organized by the contractor at his own cost. Sections of the pipelines to be laid beside existing active resources (electrical, water, etc.) and storm water drain within the project area.</p> <p>Use of Bulk excavation machines may not be possible. Contractors rates to allow for double haulage of excavated materials or any additional costs for execution of the works. Specific conditions in execution of these Works are deemed to be included in the Contractor's rates.</p> <p>The Contractor will be required to submit Method Statement for execution of works under these specific conditions for approval prior to execution of the works. These include but are not limited to the following: <i>i. No blasting will be permitted in these areas</i> <i>ii. The Contractor to maintain uninterrupted continuity of water supply in existing mains</i> <i>iii. Pedestrian and vehicular Access to individual shops / plots to be maintained at all times</i> <i>iv. Safety hoarding, lighting, bands, warning signs, etc. to be maintained at all times.</i> <i>v. The contractor to ensure uninterrupted flow of water in the existing water lines during connection of proposed lines to the existing water network</i></p> <p>CLASS A: GENERAL ITEMS</p> <p>Specified Requirements</p>				
A260.1	Allow for hydrostatic pressure testing as specified for all the pipelines constructed under the contract to the satisfaction of the Engineer.	m	67,696		-
A260.2	Disinfection of Pipelines: flushing with clear water, filling with water containing 0.05g/l calcium hypochlorite, left for 24 hours. This includes supply of necessary equipment, materials, chemicals and water, measurement of residual chlorine, all as specified and safe disposal of disinfecting water to Engineer's approval.	m	67,696		-
A271	Allow for temporary works for diversion of traffic during construction of pipelines across roads, including sign posting, liaison with Traffic Police Department, Local Authority construction of diversion roads etc. all to the satisfaction of the Engineer. Include provision for maintaining temporary vehicular access to individual plots at all times.	LS	1		-
A277	Allow for keeping trenches and other excavation free of water which may have entered through ground seepage, rain or by other means as directed by the Engineer.	LS	1		-
PAGE TOTAL CARRIED TO BILL 3 COLLECTION					-

BILL 3 - MWIHOKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p><u>CLASS D: DEMOLITION AND SITE CLEARANCE</u></p> <p><u>The Employer has no available land to offer for dumping of spoil materials. Identification of and all accruing costs related to securing suitable area of land for dumping is the responsibility of the Contractor. Dumping and spreading is to be done in accordance with existing National Legislation and Local Authority's by-laws.</u></p> <p><u>The Contractor is deemed to have allowed for this aspect of Work in their excavation and cart away to tips rates.</u></p> <p>Site Clearance</p> <p>D110 General clearance along the pipeline alignment. (The Contractor's rate for this item will be deemed to include for clearance of any extra land that he may consider necessary for execution of his Work and reinstatement of hedges and fences etc. removed during construction).</p> <p>Cutting of Trees</p> <p><i>Provide all material and cut trees, girth measured 1m above ground level. Bushes are deemed to be included in Item D110. The disposal of trees shall be decided by the Engineer. Distance of haul not exceeding 5km. The rate to include liaison with the relevant authorities and obtaining permission.</i></p> <p>D210.1 Girth 0.5m - 1.0m</p> <p>D210.2 Girth 1.0m - 2.0m</p> <p>Removal of Tree Stumps</p> <p><i>Allow for removal of stumps and backfilling holes with selected excavated material. Girth measured 1m above ground level. The rate shall also include disposal of stumps to tips identified by the Contractor in liaison with the Local Authority, all to the approval of the Engineer.</i></p> <p>D310 Stump diameter not exceeding 1m</p> <p><u>CLASS I: PIPE WORK - PIPES</u></p> <p>Supply, transport to site and store, transport from site store, lay and joint pipes in trench, include for excavation, preparation of surfaces, disposal of excavated material, shoring sides of excavation trenches, backfilling and final reinstatements.</p>	ha	15		-
		Nr	25		-
		Nr	35		-
		Nr	35		-
PAGE TOTAL CARRIED TO BILL 3 COLLECTION					-

BILL 3 - MWIHOKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<u>High Density Polyethylene Pipes HD-PE 100 SDR 17 - PN 10 . ISO 4427:2007 with Butt Fusion (seamless) Jointing</u>				
I712.1	OD 63 mm in trenches, depth not exceeding 1.5 m	m	55,588		-
I712.2	OD 90 mm in trenches, depth not exceeding 1.5 m	m	8,760		-
I712.3	OD 110 mm in trenches, depth not exceeding 1.5 m	m	2,968		-
I712.4	OD 160 mm in trenches, depth not exceeding 1.5 m	m	380		-
	<u>CLASS J: PIPEWORK - FITTINGS AND VALVES - PN 10</u>				
	<u>Rates to include for provision and fixing. Flanges to PN 16 steel unless otherwise stated. HDPE fittings for butt fusion.</u>				
	<i>Bends - Short Radius</i>				
	<i>Plain ended</i>				
	<i>High Density Polyethylene (HDPE) SDR 17 (PN 10) for with Butt Fusion (seamless) Jointing</i>				
4J314	OD 90, 90°	nr	20		-
4J314	OD 110, 90°	nr	4		-
	End Caps				
4J315	OD 63 mm	Nr	131		-
	Junctions to PN 10 Pressure - HDPE Fittings				
J331.1	OD 63 x 63mm tee	Nr	82		-
J331.2	OD 90 x 63mm tee	Nr	96		-
J331.3	OD 90 x 90mm tee	Nr	9		-
J331.4	OD 110 x 63mm tee	Nr	29		-
J331.5	OD 110 x 90mm tee	Nr	19		-
J331.6	OD 110 x 110mm tee	Nr	2		-
J331.7	OD 160 x 63mm tee	Nr	6		-
J331.8	OD 160 x 90mm tee	Nr	21		-
J331.9	OD 160 x 110mm tee	Nr	1		-
PAGE TOTAL CARRIED TO BILL 3 COLLECTION					-

BILL 3 - MWIHOKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	Tapers to PN 10 Pressure - HDPE SDR 17 (PN 10)				
J331.1	DN 90 x 63mm flanged taper	Nr	14		-
J331.1	DN 110 x 63mm flanged taper	Nr	5		-
J331.2	DN 110 x 90mm flanged taper	Nr	10		-
J331.3	OD 160 x63mm taper	Nr	2		-
J331.3	DN 160 x90mm flanged taper	Nr	1		-
J331.4	DN 160 x 110mm flanged taper	Nr	3		-
	Flange Adaptors to PN 10 pressure - Epoxy Coated Internally and Externally Ferrous Fittings				
J351.1	DN 50mm	Nr	50		-
J351.2	DN 80mm	Nr	48		-
J351.3	DN 100mm	Nr	18		-
J351.4	DN 150mm	Nr	6		-
	Flanged Adapter (Stub End) Complete with Metal Back Up Ring to PN10 pressure				
J681.2	OD 63 mm	Nr	6		-
J681.5	OD 90 mm	Nr	11		-
J681.2	OD 110 mm	Nr	4		-
J681.2	OD 160 mm	Nr	6		-
	Valves to PN 10 pressure - Epoxy Coated Internally and Externally Ferrous Fittings				
	All Flanged Gate Valves - Approved				
J811.1	DN 50	Nr	26		-
J811.2	DN 80	Nr	25		-
J811.3	DN 100	Nr	6		-
J811.4	DN 150	Nr	4		-
PAGE TOTAL CARRIED TO BILL 3 COLLECTION					-

BILL 3 - MWIHOKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	CLASS K: PIPE WORK - CHAMBERS AND PIPE WORK ANCILLARIES				
	<i>Note:- Items for Work in this class shall include:- - Excavation, preparation of surfaces, disposal of surplus excavated material, shoring sides of excavation, backfilling and removal of redundant services. - Concrete, Reinforcement, Formwork, Joints and Finishes. - Tips for disposal of excavated material or debris to be identified by the Contractor in liaison with the Local Authorities.</i>				
K6	Crossings				
K671	Allow for crossing existing drains and sewers, and reinstate these after construction of the water line has been completed. Pipe bore n.e. 300mm	Nr	47		-
K641	Allow for crossing existing hedges, including reinstatement to original state. Nominal bore not exceeding 300mm	nr	38		-
K651	Allow for crossing existing masonry boundary walls, including reinstatement to original state. Nominal bore not exceeding 300mm	nr	13		-
K661	Allow for crossing existing fences (chain link, barbed wire etc.), including reinstatement to original state. Nominal bore not exceeding 300mm	nr	13		-
7K89	<i>Ferrous Pipe Sleeve for drain crossing</i>				
7K89.1	Pipe bore n.e 150 mm	m	337		-
7K89.2	Pipe bore 150 - 250 mm	m	260		-
K7	Reinstatement				
K731	Breaking up, temporary and permanent reinstatement of murrum road (width of road cutting n.e 2m) with 300mm thick well graded stabilised gravel with 3% cement content base compacted using a 8-10 tonne roller to the satisfaction of the Engineer . Nominal bore n.e. 300mm. Contractor to allow for liaison with relevant local authorities and obtaining approval for completed works in his rates.	m	526		-
K42.1	Breaking up temporary and permanent reinstatement of PAVED footpaths (concrete, cabro, tarmac etc.). Pipe bore n.e. 300mm	m	265		-
	Micro-tunneling below and bituminous roads				
	Rates quoted shall be deemed to include for costs incurred on traffic control, signage and safety measures during execution of the works.				
K691	Micro-tunneling Roads	m	192		-
K694	Extra over micro-tunneling in rock	m ³	15		-
K810	Allow for diverting drains or waterways where they might interfere with the construction and reinstate these after construction of the water line has been completed. All waterways to be kept operational during construction.	LS	4		-
4K8	Marker Posts				
K82	Excavate for, supply and fix concrete Marker Posts along the water line route, road crossings, change of direction and valve chambers at locations shown by the Engineer. All in accordance with details given in the standard drawings.	Nr	187		-
PAGE TOTAL CARRIED TO BILL 3 COLLECTION					-

BILL 3 - MWIHOKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
2.2Z321.2	Warning tape installed in trenches on top of all the pipes	m	67,696		-
K87.1	Surface boxes (Cast Iron) for Gate Valves, supply and install all items needed, including spindle, keys, etc. The valves themselves paid separately under items J811	Nr	49		-
K87.2	Mass concrete Class 15 supports for surface boxes and spindles, volume n.e. 0.1 m ³	Nr	49		-
<u>CLASS L: PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION</u>					
Extra over to excavation and backfilling in pipe trenches					
L111.1	Extra Over excavation items for excavation in rock Class 'A', blasting not permitted (Provisional)	m ³	500		-
L111.2	-Ditto- but in rock Class 'B'	m ³	500		-
L111.3	-Ditto- but in rock Class 'C'	m ³	6,000		-
<u>Pipe Embedment (Bedding, sidefill and initial backfill to minimum 300mm above pipe crown)</u>					
<u>Imported Approved Granular Material, compacted in 150mm layers</u>					
L324	For pipes OD n.e 160	m	10,000		-
<i>Mass concrete Class 15</i>					
L544	For pipes OD n.e 160	m	54		-
PAGE TOTAL CARRIED TO BILL 3 COLLECTION					-

BILL 3 - MWHIKO DISTRIBUTION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	COLLECTION SHEET				
	Total Page 1				-
	Total Page 2				-
	Total Page 3				-
	Total Page 4				-
	Total Page 5				-
	Total Page 6				-
BILL 3 COLLECTION CARRIED TO GRAND SUMMARY					-

BILL 4 - CONSUMER CONNECTIONS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
91	TRENCHING, PIPES AND FITTINGS FOR CONSUMER CONNECTIONS <i>The following items combine a variety of works such as earthworks, civil works, supplies, mechanical works for pipe laying, testing, destroying of existing pipes, crossing and reinstatement of other underground communications, etc...All costs are deemed to be included and covered by the unit price!</i> <i>Use of Bulk excavation machines may not be possible. Contractors rates to allow for double haulage of excavated materials or any additional costs for execution of the</i>				
917	<u>Trenching Pipes and Pipe Laying for Consumers Connection</u> Supply and installation of HDPE pipework, including all bends, fittings, specials, warning tapes, testing of pipes as specified, disinfection of pipes; covering also all necessary earthworks such as excavation, backfilling in maximum 30cm layers, bedding, compaction and crossings for other underground infrastructure. The item does not cover T pieces or saddles, as listed below, but includes any additional excavation required for these items. Reinstatement of murrum and concrete will be paid additionally, as below. Pipe trench dimensions, bedding layers etc, in line with the standard drawings and specifications. <u>HD-PE 80 SDR 11, PN 10 or HD-PE 100 SDR 17, PN 10</u>				
91712.1	OD 20	m	6,300		-
91712.2	OD 25	m	3,200		-
91712.3	OD 32	m	4,067		-
91712.4	OD 40	m	300		-
9J6	<u>Pipe saddles or T-pieces</u> Supply and installation of connections to distribution pipe by T-piece or pipe saddles as specified, include for all works and fittings; for distribution pipe diameter:				
9J621.1	OD 63	Nr	920		-
9J621.2	OD 90	Nr	302		-
9J621.3	OD 110	Nr	59		-
9J621.4	OD 160	Nr	104		-
9J621.6	OD 355	Nr	17		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

BILL 4 - CONSUMER CONNECTIONS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
9.3	Underground water meter chambers Supply and installation of underground water meter chambers, including all (mechanical and earth!) works, fittings, tappers, valves and other supplies as per standard drawings. The item also including the water meter installation set with water meter substitution pipe but not the meter itself! The chamber suitable for the following water meter size:				
9K251.1	DN 15	Nr	800		-
9K251.2	DN 20	Nr	400		-
9K251.3	DN 25	Nr	200		-
9.4	Water meters Supply and installation of water meters, to EN ISO 4064: 2014, OIML R 49 :2013 and MID 2014/32/EU. Accuracy class 2. Minimum R=160				
6K651	DN15	Nr	800		-
	DN20	Nr	400		-
	DN25	Nr	200		-
9K6	Crossings Allow for crossing existing boundary walls, including reinstatement to original state. Nominal bore not exceeding 200mm (Provisional)				
9K651		Nr	87		-
	Allow for crossing existing fences (chain link, barbed wire etc.), including reinstatement to original state. Nominal bore n.e. 200mm (Provisional)				
9K661		Nr	673		-
	Allow for crossing existing drains and sewers, and reinstate these after construction of sewer has been completed. Pipe inside diameter n.e. 200mm (Provisional).				
9K671		Nr	173		-
9K7	Reinstatement Breaking up, temporary and permanent reinstatement of murrum road (Width of road cutting n.e 2m) with 300mm thick well graded stabilised gravel with 3% cement content base compacted using a 8-10 tonne roller to the satisfaction of the Engineer . Contractor to allow for liason with relevant local authorities and obtaining approval for completed works in his rates.				
9K732		m	3,000		-
	Breaking up, temporary and permanent reinstatement of concrete pavements (width of cutting n.e 1.0 m) with 300mm thick well graded stabilised gravel compacted and concrete layer and finishing to match. Nominal bore n.e 65 mm				
9K732		m	300		-
	Mass concrete Class 15 supports for meter chambers, volume 0.05 m3				
		Nr	1,400		-
PAGE TOTAL CARRIED TO COLECTION PAGE					-

BILL 4 - CONSUMER CONNECTIONS

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	BILL 9 Collection Page				
	Total Page 1				-
	Total Page 2				-
BILL 4 COLLECTION CARRIED TO GRAND SUMMARY					-

Photovoltaic System for Solarization of Wellfields
WATER SOLARIZATION PROJECT

(Installation of solar pumping systems)

BILL NO.1: Solarization of boreholes 11kw

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p>NOTES: The following works in installation of solar pumping equipment, including supply of all materials and necessary works for placing, erecting, completion, testing and commissioning.</p> <p>Civil Works These shall include clearing of bushes at the selected site for solar support structure, cutting down/ pruning of trees as deemed necessary in consultation with the works supervisor, excavation of foundation pits (depth to be D.O.S to engineer's approval), backfilling, carting away of surplus material and making clean of the site after completion</p> <p>Concrete works All foundation concrete to be minimum Class 25/20 (1:1.5:3). Sufficient curing to be achieved to engineer's approval.</p> <p>Steel works The solar support structure to consist of SHS columns, angle bracings and fixtures necessary for erection. The structure is to be of galvanised steel or to be painted with one coat of grey oxide primer and one coat of Silver aluminium paint.</p>				
1.1	Supply and install a Inverter/Controller; 11kW, 500-600VDC for borehole A	Nr	1		
1.2	Supply and install Monocrystalline Solar PV Modules, 330W	Nr	100		
1.3	Supply and install PV Combiner Box	Nr	1		
1.4	Supply and install PV Disconnect Switch 1000/AC	Nr	1		
1.5	Supply and install Low Level Control- Well probe sensor	Nr	1		
	Accessories				
1.6	Supply and install 1.5mm ² , 2-core, Armored cable (Level Sensor)	m	50		
1.7	Supply and install 1.5mm ² , 2-core, Armored cable (Float Switch)	m	50		
1.8	Supply and install 2.5mm ² , Twin	m	50		
1.9	Supply and install 6mm ² , Twin flat Cable	m	50		
1.10	Supply and install 10mm ² , Copper Earth cable	m	50		
1.11	Supply and install 10mm ² , 4-core Armored Cable	m	50		
1.12	Supply and install Londex dual core Electrode cable (Level Sensor)	m	250		
1.13	Supply and install an Earth rod C/W Clamp	Nr	1		
	Solar Structure & Accessories				
1.14	Supply materials, fabricate and install a steel structure, 5m high, to support the 100 solar panels to Engineer's approval.	sum	1	500,000	500,000.00
1.15	Allow sum for Installation sundries	sum	1	65,000	65,000.00
1.16	Allow sum for construction of security fencing and security lighting	sum	1	300,000	300,000.00
Total Bill Item for 1 No. Borehole					
Total Bill No.1 Carried to Summary Page for 1 No. Boreholes					

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WATER SOLARIZATION PROJECT

(Installation of solar pumping systems)

BILL NO.2: BOREHOLE (15KW)

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p>NOTES: The following works in installation of solar pumping equipment, including supply of all materials and necessary works for placing, erecting, completion, testing and commissioning.</p> <p>Civil Works These shall include clearing of bushes at the selected site for solar support structure, cutting down/ pruning of trees as deemed necessary in consultation with the works supervisor, excavation of foundation pits (depth to be D.O.S to engineer's approval), backfilling, carting away of surplus material and making clean of the site after completion</p> <p>Concrete works All foundation concrete to be minimum Class 25/20 (1:1.5:3). Sufficient curing to be achieved to engineer's approval.</p> <p>Steel works The solar support structure to consist of SHS columns, angle bracings and fixtures necessary for erection. The structure is to be of galvanised steel or to be painted with one coat of grey oxide primer and one coat of Silver aluminium paint.</p>				
2.1	Supply and install a Inverter/Controller; 15kW, 500-600VDC	Nr	1		
2.2	Supply and install Monocrystalline Solar PV Modules, 330W	Nr	100		
2.3	Supply and install PV Combiner Box	Nr	1		
2.4	Supply and install PV Disconnect Switch 1000/AC	Nr	1		
2.5	Supply and install Low Level Control- Well probe sensor	Nr	1		
	Accessories				
2.6	Supply and install 1.5mm ² , 2-core, Armored cable (Level Sensor)	m	50		
2.7	Supply and install 1.5mm ² , 2-core, Armored cable (Float Switch)	m	50		
2.8	Supply and install 2.5mm ² , Twin	m	50		
2.9	Supply and install 6mm ² , Twin flat Cable	m	50		
2.10	Supply and install 10mm ² , Copper Earth cable	m	50		
2.11	Supply and install 10mm ² , 4-core Armored Cable	m	50		
2.12	Supply and install Londex dual core Electrode cable (Level Sensor)	m	250		
2.13	Supply and install an Earth rod C/W Clamp	Nr	1		
	Solar Structure & Accessories				
2.14	Supply materials, fabricate and install a steel structure, 5m high, to support the 100 solar panels to Engineer's approval.	sum	1	500,000	500,000.00
2.15	Allow sum for Installation sundries	sum	1	65,000	65,000.00
2.16	Allow sum for construction of security fencing and security lighting	sum	1	300,000	300,000.00
Total Bill Item for 1 No. Borehole					
Total Bill No.2 Carried to Summary Page for 3 No Boreholes					

WATER SOLARIZATION PROJECT

(Installation of solar pumping systems)

BILL NO.3: BOREHOLE (20kw)

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p>NOTES:</p> <p>The following works in installation of solar pumping equipment, including supply of all materials and necessary works for placing, erecting, completion, testing and</p> <p>Civil Works These shall include clearing of bushes at the selected site for solar support structure, cutting down/ pruning of trees as deemed necessary in consultation with the works supervisor, excavation of foundation pits (depth to be D.O.S to engineer's approval), backfilling, carting away of surplus material and making clean of the site after completion</p> <p>Concrete works All foundation concrete to be minimum Class 25/20 (1:1.5:3). Sufficient curing to be achieved to engineer's approval.</p> <p>Steel works The solar support structure to consist of SHS columns, angle bracings and fixtures necessary for erection. The structure is to be of galvanised steel or to be painted with one coat of grey oxide primer and one coat of Silver aluminium paint. Construction drawings shall have to approved before commencement of works.</p>				
3.1	Supply and install a Inverter/Controller; 20kW, 500-600VDC	Nr	1		
3.2	Supply and install Monocrystalline Solar PV Modules, 330W	Nr	100		
3.3	Supply and install PV Combiner Box	Nr	1		
3.4	Supply and install PV Disconnect Switch 1000/AC	Nr	1		
3.5	Supply and install Low Level Control- Well probe sensor	Nr	1		
	Accessories				
3.6	Supply and install 1.5mm ² , 2-core, Armored cable (Level Sensor)	m	50		
3.7	Supply and install 1.5mm ² , 2-core, Armored cable (Float Switch)	m	50		
3.8	Supply and install 2.5mm ² , Twin	m	50		
3.9	Supply and install 6mm ² , Twin flat Cable	m	50		
3.10	Supply and install 10mm ² , Copper Earth cable	m	50		
3.11	Supply and install 10mm ² , 4-core Armored Cable	m	50		
3.12	Supply and install Londex dual core Electrode cable (Level Sensor)	m	250		
3.13	Supply and install an Earth rod C/W Clamp	Nr	1		
	Solar Structure & Accessories				
3.14	Supply materials, fabricate and install a steel structure, 5m high, to support the 100 solar panels to Engineer's approval.	sum	1	500,000	500,000.00
3.15	Allow sum for construction of security fencing and security lighting	sum	1	300,000	300,000.00
Total Bill Item for 1 No. Borehole					
Total Bill No.3 Carried to Summary Page for 5 No boreholes					

WATER SOLARIZATION PROJECT

(Installation of solar pumping systems)

BILL NO.4: BOREHOLE 25kw

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
	<p>NOTES:</p> <p>The following works in installation of solar pumping equipment including supply of all materials and necessary works for placing, erecting, completion, testing and</p> <p>Civil Works</p> <p>These shall include clearing of bushes at the selected site for solar support structure, cutting down/ pruning of trees as deemed necessary in consultation with the works supervisor, excavation of foundation pits (depth to be D.O.S to engineer's approval), backfilling, carting away of surplus material and making clean of the site after completion</p> <p>Concrete works</p> <p>All foundation concrete to be minimum Class 25/20 (1:1.5:3). Sufficient curing to be achieved to engineer's approval.</p> <p>Steel works</p> <p>The solar support structure to consist of SHS columns, angle bracings and fixtures necessary for erection. The structure is to be of galvanised steel or to be painted with one coat of grey oxide primer and one coat of Silver aluminium paint. Construction drawings shall have to approved before commencement of works.</p>				
4.1	Supply and install a Inverter/Controller; 25kW, 500-600VDC	Nr	1		
4.2	Supply and install Monocrystalline Solar PV Modules, 330W	Nr	100		
4.3	Supply and install PV Combiner Box	Nr	1		
4.4	Supply and install PV Disconnect Switch 1000/AC	Nr	1		
4.5	Supply and install Low Level Control- Well probe sensor	Nr	1		
	Accessories				
4.6	Supply and install 1.5mm ² , 2-core, Armored cable (Level Sensor)	m	50		
4.7	Supply and install 1.5mm ² , 2-core, Armored cable (Float Switch)	m	50		
4.8	Supply and install 2.5mm ² , Twin	m	50		
4.9	Supply and install 6mm ² , Twin flat Cable	m	50		
4.10	Supply and install 10mm ² , Copper Earth cable	m	50		
4.11	Supply and install 10mm ² , 4-core Armored Cable	m	50		
4.12	Supply and install Londex dual core Electrode cable (Level Sensor)	m	250		
4.13	Supply and install an Earth rod C/W Clamp	Nr	1		
	Solar Structure & Accessories				
4.14	Supply materials, fabricate and install a steel structure, 5m high, to support the 100 solar panels to Engineer's approval.	sum	1	500,000	500,000.00
4.16	Allow sum for Installation sundries	sum	1	65,000	65,000.00
4.17	Allow sum for construction of security fencing and security lighting	sum	1	300,000	300,000.00
4.18	Allow sum 4,000,000 for supply and installation of solar accessories and electrical equipments, training on operations and maintenance as well capacity building and knowledge transfer as directed by the Engineer	sum	1		4,000,000.00
Total Bill Item for 1 No. Borehole					
Total Bill No.4 Carried to Summary Page for 1 No. Borehole					

(Installation of solar pumping systems)

GRAND SUMMARY

ITEM	DESCRIPTION	UNIT	QTY	RATE (KShs)	AMOUNT (KShs)
1.0	Borehole 11kw 1 no				
2.0	Borehole 15kw 3no				
3.0	Borehole 20kw 5 no				
4.0	Borehole 25kw 1 no				
	Bill Total (Exclusive VAT)				
	Add 16% VAT				
	Bill Total (Inclusive VAT)				