NATIONAL AGRICULTURAL VALUE CHAIN DEVELOPMENT PROJECT (NAVCDP)

COUNTY GOVERNMENT OF NYANDARUA

BILL OF QUANTITIES

FOR

THE PROPOSED KINGI DAM PHASE II SMALL SCALE IRRIGATION PROJECT

October 2024

BILLS OF QUANTITIES FOR KINGI DAM PHASE II PROJECT

PREAMBLE

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, 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 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 Bills of Quantities shall, except insofar as it is otherwise provided under the Contract, include all construction machinery & equipment, 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 the other rates and prices entered in the Bills of Quantities.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bills 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 Bills 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 instructions 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.

Grand Summary

	GRAND SUMMARY	
BILL NO.		**AMOUNT (KES)**
1	preliminaries & General Provisions	200,000
2	Pump Chamber/Sump	
3	Rising main pipeline	
4	Tank Tower with 2No. 10m3 tanks	
5	Gravity main pipeline	
6	Sub-main pipelines	
7	Individual connections fittings	
8	Power house	
9	Pump and accessories	
10	Solar Panels and solar structure	
11	Spillway repair	
	Grand Total	

BILL NO. 1: PRELIMINARIES & GENERAL PROVISIONS

Bill No. 1 : PRELIMINARIES & GENERAL PROVISIONS (P&G)						
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**SPEC. REF.**
1.1	**Contractual Requirements**					
1.1.1	Allow for Mobilization and Demobilization	LS	1			
1.2	**Sanitation**					
	The contractor shall provide the necessary latrine for staff and workmen to the requirements and satisfaction of the health authorities and maintain the same in a thorough clean and sanitary condition and pay all conservancy fees during the period of the works and remove when no longer required; Contractor shall provide clean drinking water to the workers throughout the construction phase.	LS	1			Spec. 1.14
1.3	**Cost for Adjudication**					
1.3.1	Allow for provisional sum for adjudication fee	Prov. sum	1	200,000	200,000	
1.3.2	Contractor's mark-up for profit and overheads in respect to Items 1.8.1	%	10%			
1.4	**Signboards**					
1.4.1	Provision, erection and maintenance of project signboards.	No.	2			
1.5	**Marker Posts**					
1.5.1	Supply and fix precast reinforced concrete indicator posts, 750mm long, 50mm thick with blue permanent inscription WP for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	No.	95			Spec. 3.8
1.6	**Costs for ESMP**					
1.6.1	Implement mitigation measures for Environmental and social risks and impacts	LS	1			
	TOTAL CARRIED OVER TO GRAND SUMMARY				**200,000**	

BILL NO. 2: PUMP CHAMBER

2	**BILL NO. 2: PUMP CHAMBER**					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
2.1a	Excavate a pump intake sump 1.3m diameter and 6m deep and cart away	M^3	7			**Spec. 2.6**
2.1b	Excavate a trench 600mm wide by 5m deep by 6m long for water supply pipes to the sump	M^3	18			Spec. 2.6
2.1c	Allow for dewatering (1.1a and 1.1b above)	LS	1			Spec. 2.11
2.1d	Allow for supporting wet soil (1.1a and 1.1b above)	LS	1			Spec. 2.19
2.1e	Supply and fix 6" diameter GI pipes from the dam to the sump, cut screen slots on the pipes along 1m length section within the reservoir, put end cap on the pipe; backfill the pipeline trench.	No	2			Spec. 5.6
2.1f	Supply, deliver to site and fix 900mm diameter culverts in the sump pit	No	6			Spec. 3.8
2.1g	Supply, deliver and fix a 6m high, 250mm diameter HDPE or PVC pipe with screens as pump casing at the center of the 900mm diameter culverts	M	6			Spec. 4.12
2.1h	Supply and carefully pack high quality gravel packing the in the annulus spacing between the culverts and the central 8" diameter pipe in the sump.	M^3	7			
2.1j	Provide materials and cast a VRC C20/25/A cover slab size 1.5x1.5mx0.15m thick reinforced with D10@150mmc/c both ways.	M^3	0.338			Spec. 3.3
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 3: RISING MAIN

3	BILL NO. 3: RISING MAIN					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**S[pec. Ref.**
3.1a	Supply and deliver to site 90mm diameter HDPE PN16 pipes	M	2000			Specs. 4.12, 5.2, 5.6, 5.7.1
3.1b	Supply and deliver to site 90mm diameter HDPE PN12.5 pipes	M	1100			
3.1a	Supply and deliver to site 90mm diameter HDPE PN 10 pipes	M	400			
3.2	Excavate trench 500mm deep for (3.1) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	3500			Spec..2.9
3.3	Excavate extra-over trench in rock (yellow murram)	M	188			
3.4	Allow for fusion jointing	No	34			Spec. 4.12
3.5	Provide materials and construct valve chambers size 1.2 x 1.2 x 1 m internal measurements using 6"x9" natural stones, plastered internally and having reinforced concrete cover C25/20A, mix 1:2:4. Use D10@150C/C both ways cover 50mm thick.	No	1			Spec. 4.24
3.6	Supply and fix non-return valve 90mm diameter	No	1			Spec. 4.16
3.7	Provide materials and construct valve chambers size 0.75 x 0.75 x 1 m internal measurements using 6"x9" natural stones, plastered internally and having reinforced concrete cover C25/20A, mix 1:2:4. Use D10@150C/C both ways cover 50mm thick.	No	3			Spec. 4.24
3.8	Supply and fix male adaptor 90x3"	No	2			Spec. 4.12
3.9	Supply and fix 3" diameter GI nipples	No	3			Spec. 4.7
3 .10	Supply and fix 3" diameter WPD flanged water meter PN 16 Class C R160	No	1			Spec. 4.17
3.11	Supply and fix 3" diameter GI elbow	No	3			
3.12	Supply and fix 3" diameter GI PIPE Class B Complete with sockets (allow for cutting and threading) for road crossings	No	21			
3.13	Supply and fix GI flanges 3" diameter complete with bolts, nuts and gaskets	No	21			
3.14	Supply and fix flanged joint with metal flange 90 mm x 3"	No	21			Spec. 4.13
3.15	Supply and fix 90mm diameter washout complete with accessories	No.	2			
3.16	Supply and fix 1" diameter single air relieve valve	No	2			Spec. 4.15
3.17	Supply and fix clamp saddle 90x 1"	No	2			Spec.
3.18	Supply and fix 1" diameter gate valve	No	2			Spec. 4.13
3.19	Supply and fix 1" diameter GI hexagonal nipples	No	4			
3.120	Supply and fix Non-return valve 3" diameter	No	1			Spec. 4.16
3. 21	Supply and fix male HDPE adaptor 90 x 3"	No	2			Spec. 4.12
3.22	Cast mass concrete thrust blocks, 0.15m3 each, (ratio 1:2:4) at sharp bend positions of the pipe	No	4			
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO.4: WATER TOWER

4	BILL NO. 4: WATER TOWER WITH 2No 10,000 LITRES TANKS					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
4.1	**TANK TOWER**					
4.1.1	Supply materials, excavate and construct 6No. 1000mm x 1000mm x 2000mm depth footing each having 4No. anchor bolts (25mm) and cast them into the 300mm thick concrete foundation for the structure's vibrated reinforced concrete class C25/20A at 1:2:4 mixing ratio.	No	6			Spec. 2.6, 3.3
4.1.2	Supply, deliver and erect a 6.5m x 3.5m x 9m high steel tower comprising platform out of H-beams grillage 100mmx150mmx10mm thickness of web, 4mm thick steel plate, 600mm wide perimeter walkway, 40mm by 40mm by 2mm thick by 900mm high SHS hand-railing & tower out of 100 x 100 x 6mm thick columns with 300x300x5mm thick base plates, 75mmx75mmx4mm angle bracings, the standing member of the ladder tube 50mmx50mm SHS, rungs 40mmx40mm, spacing 300mm and ground clear distance of 1000mm to first rung. The cage should be 600mm wide and a radius of 600mm caged cat-ladders with safety hoops, bracings and all connection bolts necessary for erection capable of withholding a 25-ton weight, painted with two coats of aluminum paint. The tower joints must be all bolted. Welded joints will not be accepted. Tower to be constructed as per the provided design drawing.	No.	1			Spec. 6.11
4.1.3	Supply and deliver 2 No. 10,000liters capacity, high quality, strong double layer, ribbed cylindrical plastic tanks, 2.2-2.5m diameter, safely placed on tower (item 2.2) above. Provide pipe work and fix fittings associated to the two tanks as directed by the supervisor.	No	2			
4.1.4	Supply and fix 80mm diameter class B inlet and outlet GI pipes complete with all necessary GI fittings	No.	5			
4.1.5	supply and fix 80mm diameter GI class B pipes as overflow and connect to distribution main line with necessary equal diameter GI fittings	No.	3			
4.1.6	Supply and fix 3" diameter forged brass, PN16, Gate valve complete with the necessary fittings.	No	2			
4.1.7	Provide materials and construct masonry valve chamber 1000mm x 1000mm minimum depth 600mm internal measurement, 50mm thick concrete C15 (ratio 1:3:6) complete with 50mm thick VRC cover C25/20A ratio 1:2:4. Use D10@150C/C both ways,	No	1			Spec. 3.3
4.1.8	Carryout plastic tank pressure-tightness/leakage testing, flush the pipelines and commissioning to the satisfaction of the supervisor	LS	1			
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 5: GRAVITY MAIN

5	BILL NO. 5: GRAVITY MAIN PIPELINE					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
5.1a	Supply and deliver to site 90mm diameter HDPE PN 8 pipes	M	3000			Specs. 4.12, 5.2, 5.6, 5.7.1
5.1b	Excavate trench 700mm deep for (5.1a) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	3000	NA	NA	Spec. 2.9
5.1c	Excavate extra-over trench in rock (yellow murram)	M	188	NA	NA	
5.2	Allow for fusion jointing	No	30			Spec. 4.12
5.3	Supply and fix 3" diameter GI pipes Class B with sockets (allow for cutting and threading) for road crossings	No	22			
5.4	Supply and fix flanged joint with metal flange 90 mm x 3"	No	25			
5.5	Supply and fix GI flanges 3" diameter complete with bolts, nuts and gaskets	No	25			
5.6	Supply and fix HDPE end cap 90mm diameter	No	1			
5.7	Supply and fix GI Union 3" diameter	No.	5			
5.8	Provide materials and construct valve chambers size 0.75 x 0.75 x 0.90m internal measurements using 6"x9" natural stones, 50mm thick concrete floor C15 (mix ratio 1:3:6), plastered internally and having VRC C25/20A, mix ratio 1:2:4. Use D10@150C/C both ways covers 50mm thick.	No	16			Spec. 4.21
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 6: SUB-MAINS

ITEM	DESCRIPTION	UNIT	QNTY	RATE (KES)	AMOUNT (KES)	SPEC. REF.
6.1	Line 1 - Peter Chege Road					
6.1.1a	Supply and deliver to site 32mm diameter HDPE PN 12.5pipes with its coupling	M	1200			Specs. 4.12, 5.2, 5.6, 5.7.1
6.1.1b	Supply and deliver to site 32mm diameter HDPE PN 10 pipes with its coupling	M	600			
6..1.1c	Supply and deliver to the site 50mm diameter HDPE PN 10 pipes	M	1600			
6.1.2	Excavate trench 700mm deep for (6.1 and 6.2) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	3400	NA	NA	Spec. 2.9
6.1.3	Supply and fix 50mm x 50mm PE coupling	No	16			Spec.4.12
6.1.4	Supply and fix clamp saddle 90 mmx 1½"	No	2			
6.1.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.1.6	Supply and fix 50mm male adaptor	No	2			
6.1.7	Supply and fix PN16 forged brass gate valve 1½" diameter with accessories	No	2			Spec. 4.13
6.1.8	Supply and fix HDPE end cap 32mm diameter	No	2			
6.1.9	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
	Subtotal for Line 1 - Peter Chege Road					
6.2	LINE 2 - MWAI ROAD					
6.2.1a	Supply and deliver to site 32mm diameter HDPE PN 12.5pipes with coupling	M	600			Specs. 4.12, 5.2, 5.6, 5.7.1
6.2.1b	Supply and deliver to site 32mm diameter HDPE PN 10 pipes with coupling	M	1400			
6.2.1c	Supply and deliver to site 50mm diameter HDPE PN 10 pipes	M	1400			
6.2.2	Excavate trench 700mm deep for (7.1 and 7.2) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	3400	NA	NA	Spec. 2.9
6.2.3	Supply and fix 50mm x 50mm PE coupling	No	14			Spec.4.12
6.2.4	Supply and fix clamp saddle 90mm x 1½"	No	2			
6.2.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.2.6	Supply and fix 50mm male adaptor	No	2			
6.2.7	Supply and fix PN16 forged brass gate valve 1½" diameter with accessories	No	2			Spec. 4.13
6.2.8	Supply and fix HDPE end cap 32mm diameter	No	2			
6.2.9	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
	Sub-total for Line 2 - Mwai Road					
6.3	LINE 3 - REUBEN ROAD					
6.3.1a	Supply and deliver to site 32mm diameter HDPE PN 12.5pipes with coupling	M	800			Specs. 4.12, 5.2, 5.6, 5.7.1
6.3.1b	Supply and deliver to site 32mm diameter HDPE PN 10 pipes with coupling	M	600			
6.3.1c	Supply and deliver to site 50mm diameter HDPE PN 10 pipes	M	2000			
6.3.2	Excavate trench 700mm deep for (8.1 and 8.2) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	3400	NA	NA	Spec. 2.9
6.3.3	Supply and fix 50mm x 50mm PE coupling	No	20			Spec.4.12
	Supply and fix clamp saddle 90 x 1½"	No	2			
6.3.4	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.3.5	Supply and fix 50mm male adaptor	No	2			

6.3.6	Supply and fix PN16 forged brass gate valve 1½"" diameter with accessories	No	2			Spec. 4.13
6.3.7	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
6.3.8	Supply and fix HDPE end cap 32mm diameter	No	2			
	Sub-total for Line 3 - Reuben Road					
6.4	LINE 4 - BEND AT KIANDEGE					
6.4.1	Supply and deliver to the site 50 mm diameter HDPE PN 10 pipes with couplings	M	1000			Specs. 4.12, 5.2, 5.6, 5.7.1
6.4.2	Excavate trench 700mm deep for (9.1) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	1000	NA	NA	Spec. 2.9
6.4.3	Supply and fix 50mm x 50mm PE coupling	No	10			Spec.4.12
6.4.4	Supply and fix clamp saddle 90 x 1½"	No	2			
6.4.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.4.6	Supply and fix 50mm male adaptor	No	2			
6.4.7	Supply and fix PN16 forged the brass gate valve 1½" diameter with accessories	No	2			Spec. 4.13
6.4.8	Supply and fix HDPE end cap 50 mm diameter	No	2			
	Sub-total for Line 4 - Bend at Kiandege					
6.5	Line 5 - Thiari Road					
6.5.1a	Supply and deliver to site 32 mm diameter HDPE PN12.5 pipes with coupling	M	200			Specs. 4.12, 5.2, 5.6, 5.7.1
6.5.1b	Supply and deliver to site 32mm diameter HDPE PN10 pipes with coupling	M	1400			
6.5.1c	Supply and deliver to site 50mm diameter HDPE PN8 pipes	M	1800			
6.5.2	Excavate trench 700mm deep for 6.5.1 above, lay the pipes and backfill to the satisfaction of the supervisor.	M	3400	NA	NA	Spec. 2.9
6.5.3	Supply and fix 50mm x 50mm PE coupling	No	18			Spec.4.12
6.5.4	Supply and fix clamp saddle 90 x 1½"	No	2			
6.5.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.5.6	Supply and fix 50mm male adaptor	No	2			
6.5.7	Supply and fix PN16 forged brass gate valve 1½" diameter with accessories	No	2			Spec. 4.13
6.5.8	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
6.5.9	Supply and fix HDPE end cap 32mm diameter	No	2			
	Sub-total for Line 5 - Thiari Road					
6.6	LINE 6 - WAKAHIRO ROAD					
6.6.1	Supply and deliver to site 50mm diameter HDPE PN 8 pipes	M	1400			Specs. 4.12, 5.2, 5.6, 5.7.1
6.6.2	Excavate trench 700mm deep for (6.6.1) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	1400	NA	NA	Spec. 2.9
6.6.3	Supply and fix 50mm x 50mm PE coupling	No	14			Spec.4.12
6.6.4	Supply and fix clamp saddle 90 x 1½"	No	2			
6.6.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.6.6	Supply and fix 50mm male adaptor	No	2			
6.6.7	Supply and fix PN16 forged brass gate valve 1½" diameter with accessories	No	2			Spec. 4.13
6.6.8	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
6.6.9	Supply and fix HDPE end cap 32mm diameter	No	2			
	Sub-total for Line 6 - Wakahiro Road					
6.7	Line 7 – Josiah Road					

6.7.1	Supply and deliver to site 50mm diameter HDPE PN 8 pipes	M	2200			Specs. 4.12, 5.2, 5.6, 5.7.1
6.72	Excavate trench 700mm deep for (6.7.1) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	2200	NA	NA	Spec. 2.9
6.73	Supply and fix 50mm x 50mm PE coupling	No	22			Spec.4.12
6.7.4	Supply and fix clamp saddle 90 x 1½"	No	2			
6.7.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.7.6	Supply and fix 50mm male adaptor	No	2			
6.7.7	Supply and fix PN16 forged brass gate valve 1½" diameter	No	2			Spec. 4.13
6.7.8	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
6.7.9	Supply and fix HDPE end cap 32mm diameter	No	2			
	Sub-total for Line 7 – Josiah Road					
6.8	LINE 8 - MWANIKI ROAD					
6.8.1	Supply and deliver to site 50mm diameter HDPE PN 8 pipes	M	2500			Specs. 4.12, 5.2, 5.6, 5.7.1
6.8.2	Excavate trench 700mm deep for (6.8.1) above, lay the pipes and backfill to the satisfaction of the supervisor.	M	2500	NA	NA	Spec. 2.9
6.8.3	Supply and fix 50mm x 50mm PE coupling	No	25			Spec.4.12
6.8.4	Supply and fix clamp saddle 90 x 1½"	No	2			
6.8.5	Supply and fix HDPE 50mm PN10 hex-nipple	No	2			
6.8.6	Supply and fix 50mm male adaptor	No	2			
6.8.7	Supply and fix PN16 forged brass gate valve 1½"diameter with accessories	No	2			Spec. 4.13
6.8.8	Supply and fix HDPE reducing coupling 50mm x 32mm diameter	No	2			
6.8.9	Supply and fix HDPE end cap 32mm diameter	No	2			
	Sub-total for line 8					
	Summary of the Sub-Totals					
	Line 1					
	Line 2					
	Line 3					
	Line 4					
	Line 5					
	Line 6					
	Line 7					
	Line 8					
	Grand total for Sub-Mains					

BILL NO. 7: INDIVIDUAL CONNECTIONS

7	**BILL NO. 7: INDIVIDUAL CONNECTIONS**					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
7.1	Supply and fix HDPE Clamp saddle 63mm x ½”	No	200			Spec. 4.12
7.2	Supply and fix ½” diameter hexagonal nipple	No	200			
7.3	Supply and fix ½” diameter gate valve	No	200			
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 8: POWERHOUSE

8	BILL NO. 8: POWER HOUSE					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
8.1	Clear the site of vegetation	M^2	16			
8.2	Excavate foundation trench 600mm wide and 600mm deep and cart away	M^3	3.744			Spec. 2.12
8.3	Place C25/20 reinforced concrete in foundation with 3D10 with ties @ 150c/c 600mm wide and 200mm thick	M^3	1.248			Spec. 3.2
8.4	Construct masonry foundation wall to ground level using 9"x 9" stones	M^2	7.8			Spec. 6.4
8.5	Remove the top soil to a depth of 150mm	M^2	4			Spec. 2.2
8.6	Place hardcore and level	M^3	0.8			Spec.2.15
8.7	Place 50mm thick blinding using a lean mix of 1:4:8	M^2	4			Spec.3.5
8.8	Place damp proof membrane	M^2	10.24			Spec.6.9
8.9	Provide and fix shuttering for floor slab	LM	24			
8.10	Place 100mm thick concrete in floor slab, C15/40/C mix 1:3:6	M^2	10.24			
8.11	Place hessian-based damp proof course	LM	15.2			
8.12	Construct masonry side walls 200mm thick using 9"x 8" stones	M^2	25.15			Spec. 6.4
8.13	Place 100mm thick VRC roof slab C25/20/A, mix 1:2:4 reinforced with D10@150 c/c mesh.	M^2	11.56			Spec. 3.2
8.14	Plaster the interior of the power house with 1:3 cement/sand mortar 12mm thick	M^2	20.8			Spec. 6.7
8.15	Finish the exterior wall surface by putting KEY groves along horizontal masonry wall joints using cement/sand mortar ratio 1:3	M^2	33.28			
8.16	Provide and fix a steel door size 2.1mx0.9m complete with frame and locking devices.	No	1			
8.17	Provide and fix a burglarproof window size 300mm by 450mm fabricated with D12@100 c/c and sheet metal opening component	No	1			
8.18	Place cement: sand floor screed 1:3 thickness 20mm and finish off with a cement grout.	M^2	4			Spec. 6.7
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 9: SUBMERSIBLE PUMP

9	**BILL NO. 9: SUBMERSIBLE PUMP**					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
9.1	Supply, deliver to site, install, test and commission a solar power-driven submersible pump capable of pumping 25m^3/h against a head of 215m complete with control panel, inverter, and all the necessary cables and accessories. The inverter should enable use of electricity in the absence of sunshine.	LS	1			Spec. 7.1.9
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 10: SOLAR PANELS AND STEEL SOLAR SUPPORT STRUCTURE

10	BILL NO. 10: SOLAR PANELS AND SOLAR STRUCTURE					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
10.1	Supply, deliver to site and erect in a 600x600x600 deep concrete 1:3:6 surround a 6m high above ground level mild steel solar support structure with 100mm x 100mm x 4mm SHS steel columns spaced at not more than 2.4m with its top configured to exactly accommodate 90no 330W solar panels. The rafters shall be 75x50x3mm RHS and purlins shall be 40x40x4mm steel double angle lines. Apply 2 coats of red-oxide primer and 2 coats of aluminum paint to all metal sections of the structure. The solar panels support structure to constructed as per the design drawing.	LS	1			Spec. 2.5 and 6.11
10.2	Supply, deliver to site and fix monocrystalline 330W panels in 6No rows.	No	90			Spec. 7.1.10
10.3	Supply and install 22KW hybrid inverter in the power house to receive power from the solar panels and supply it to the submersible pump. Connect appropriately the solar panels, inverter and the submersible pump with all the necessary cables, suitable MCCB and other accessories, test and commission the pumping system.	No	1			Spec. 7.1.11
10.4	Supply deliver and install a 4-core, 10mm^2 drop cable from the solar panels to the control panel and a similar size underground cable from the control panel to the submersible pump	LM	74			Spec. 7.1.12
10.5	Supply, deliver and install solar powered flood lights, 100W, 1000Lumens, complete with LiFe PO4 battery, IP65/IP66 ratings, 12+hour runtime with 9m, min. 75mm diameter tall galvanized steel stand pole	No.	8			Spec. 7.1
	TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL NO. 11: SPILLWAY REHABILITATION

11	**BILL NO. 11: SPILLWAY REPAIR**					
ITEM	**DESCRIPTION**	**UNIT**	**QNTY**	**RATE (KES)**	**AMOUNT (KES)**	**Spec. Ref.**
11.1	Site clearance and removal of debris in the trench area	M^2	35			Spec. 2.2
11.2	Excavation and shaping of existing trench to profile (5m × 7m × 1.5m)	M^3	52.5			Spec. 2.6
11.3	Compaction of the trench base and side slopes	M^2	64			
11.4	Supply and place hardcore sub-base (150mm thick)	M^3	5.25			Spec. 2.30
11.5	Supply and place durable 300 GSM non-woven geotextile filter layer (2.9x70m)	M^2	35			
11.6	Supply and place hand-packed riprap stones (200–300mm size)	M^3	14			
11.7	Grouting of riprap with sand-cement slurry	M^3	2			
11.8	Stone pitching for wing walls or apron extension	M^2	10			
11.9	Disposal of surplus excavated material off-site	M^3	30			
11.10	Allow for miscellaneous works, and tools	LS	1			
	TOTAL CARRIED OVER TO GRAND SUMMARY					