

BILL OF QUANTITIES FOR CHARIRIK WATER PAN

GRAND SUMMARY

BILL NO.	DESCRIPTION	AMOUNT (KSHS)
Bill No. 1	Preliminaries & general requirements	
Bill No. 2	Earth works and offtake	
Bill No. 3	Auxiliary structures	
Bill No. 4	Construction water trough	
Bill No. 5	Construction of yard tap	
Bill No. 6	Fencing	
Bill No. 7	Pipelines	
Bill No. 8	10m ³ Masonry Sump	
Bill No. 9	100m ³ Masonry Tank	
Bill No. 10	Control Room	
Bill No. 11	Electro-Mechanical Works	
Bill No. 12	Green House (40m x 8m):	
Bill No. 13	Pit Latrines/ Bathrooms	
	Sub-Total- (A)	
	Contingencies	
	Provide 2.5% of Sub-Total (A) for Contingencies	
	<i>N/B: Rates include all taxes unless otherwise stated</i>	
	GRAND TOTAL CARRIED TO FORM OF TENDER	

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	BILL NO. 3- WATER PAN ANCILLARIES				
3.1	Spillway sill & Ripraps				
3.1.1	Allow for excavation and construction of spillway concrete sill 6.0m x 0.6m x 0.3m across the whole span of spillway mouth comprising of Reinforced concrete class 20/20 and including 10mm Re-Bars as per detailed drawing Nr.... And its associated formwork.	m ³	2		
3.1.2	Supply 150mm average size hard boulders, Prepare surface, compaction, build, and joining with mortar 1:3 a 150mm Thick spillway riprap to the satisfaction of the Engineer.	m ²	60		
3.1.3	Allow for placing, compaction and joining with mortar a 150mm riprap on the inlet channel as directed by the engineer and to the design standard.	m ²	200		
3.1.4	Allow for placing, compaction of 150mm riprap on the silt trap wall, base and inlet to the pan buttress wall to the design specification and under supervision of the Engineer.	m ²	60		
3.2	Draw-off system				
3.2.1	Excavate using strictly an excavator a 60m trench from the inside edge of the water pan and to the design levels about 3.5m deep and backfill required by the Engineer so as to allow least dead storage	m ³	210		
3.2.2	Provide for a standard intake tower using perforated OD 150 mm GI pipes with wire mesh screens 3m high using concrete mix of ration 1:2:4 (cement. Sand and Ballast). Provide a dead storage of 0.5m on the pipe.as described in the working drawings	Ls	1		
3.2.3	Provide, lay and connect to intake tower OD 150mm GI pipes including fittings for draw off system under the entire embankment	m	78		
3.2.4	Provide, lay and connect to cattle trough OD 50mm GI pipes including fittings from draw off system	m	30		
3.2.5	<i>Provide and fix the following:</i>				
3.2.6	Sluice valve of OD 150mm	No.	1		
3.2.7	150 mm dia flanged x 50 mm dia Steel Cross	No.	1		
3.2.8	Steel Socket, 150 mm Dia	No.	1		
3.2.9	End Plug, 150mm Dia	No.	1		
3.2.10	Steel Bend, 50mm Dia	No.	1		
3.2.11	Equal Steel Tee, 50mm Dia	No.	1		
3.2.12	Gate Valves (Pegler), 25 mm Dia	No.	2		
3.2.13	Allow for excavate, provide for materials and construct lockable masonry chambers with internal dimensions 1000mm x1000mm x1000 mm as indicated in the drawings and as directed by the Engineer. Rates to include formwork.	No.	1		
3.2.14	Supply and Installation of ring culverts of OD 900mm with concrete surround concrete (class 20/20)	m	24		
	TOTAL BILL NO.3 TOTAL CARRIED OVER TO GRAND SUMMARY				

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
	BILL NO.4: CONSTRUCTION OF 10M LONG CATTLE TROUGH				
4.1	Earthworks				
4.1.1	Prepare site by stripping top 150 mm of soil to remove all debris including sand (if any) from site and carting away spoil	m ²	52.00		
4.1.2	Excavate for foundation strip commencing at stripped levels depth not exceeding 1.50m deep	m ³	25.00		
4.1.3	Remove surplus excavated material from site	m ³	15.00		
4.1.4	Backfill around foundation	m ³	10.00		
4.2	Filling				
4.2.1	200 mm thick approved hardcore filling spread, well rammed and compacted in 150mm layers to receive concrete surface bed	m ³	8.00		
4.3	Concrete work				
	<i>Mass Concrete class 15 (1:3:6) with 20mm thick maximum aggregate size in</i>				
4.3.1	50mm blinding layer on hardcore surfaces	m ²	38.00		
	<i>Vibrated reinforced concrete class 25 (1:1.5:3) with 20mm maximum aggregate as described in:</i>				
4.3.2	Strip foundation	m ³	1.50		
4.3.3	75mm thick concrete benching laid to falls and with surface steel trowelled rough (Optional)	m ²	27.00		
4.3.4	100 mm thick floor slab	m ³	2.00		
4.4	Reinforcement				
4.4.1	Mesh fabric reinforcement ref. No. A142 laid in floor slab with minimum 150 mm side allowance	m ²	20.00		
4.5	Finishes				
	<i>Cement and sand mortar (1:3) in:</i>				
4.5.1	12 mm Thick paving to floor with water proof cement (Optional)	m ²	10.00		
4.5.2	15mm thick plaster to internal side of wall with water proof cement	m ²	14.00		
4.5.3	12mm thick plaster to external side of wall	m ²	6.00		
	Sub-Total Carried Over to the Next Page				

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	BILL NO. 6- FENCING	m	550		
6.1	Fence				
6.1.1	Provide and install 100mm by 125mm by 2.70m long Concrete posts so as to rise 2.1m above the grounds spaced at 3m centre to centre	No	200		
6.1.2	Excavation of holes to anchor posts concrete posts	No	200		
6.1.3	Concrete class 1:3:6 for anchoring the posts	m ³	16		
6.1.4	Provide and install 100mm by 125mm by 2.0m long strainer Concrete posts (double struts) spaced at 30m and at all corners and gate	No	10		
6.1.5	Excavation of holes to anchor strainer concrete posts	No	10		
6.1.6	Concrete class 1:3:6 for anchoring the strainer posts	m ³	2		
6.1.7	Supply and fix 6 strands of Barbed wire (barbed wire 16G x 25kg)	m	550		
6.1.8	Supply and fix 16-gauge Chain link (8ft height, Mesh sizes are 50mmx50mm) and provide for anchoring to the ground as shall be directed by supervising Engineer.	m ²	1,375		
6.2	Gate				
6.2.1	Supply and install 4000x2000mm double leave steel grill gate to 300x300mm concrete columns complete with iron mongery (use 50mmx25mmx6mm SHS with 38mmx25mmx6mm vertical members). Provide for epoxy primer paint with 2 coats of final gloss paint	Nr	1		
6.2.2	Provide, cut and place 10mm square twisted steel rebars in gate columns and 600mmx600mm footing	Kg	20		
6.2.3	Ditto 8mm twisted steel rebars as stirrups in column @150mm	Kg	14		
6.3	Mass concrete class C20/25 in:				
6.3.1	Concrete to poles	m ³	4		
6.3.2	300mmx300mm Gate columns	m ³	0.5		
6.4	Formwork to;				
6.4.1	Column edges over 150mm but not exceeding 300 mm girth	m ²	7		
6.5	Finishes				
6.5.1	25mm thick cement: sand (1:4) screed to surfaces with 12mm thick lime steel trowelled smooth finish on columns	m ²	7		
6.5.2	Gloss painting to columns- code provided by Engineer	m ²	6		
	BILL NO. 6 TOTAL CARRIED OVER TO GRAND SUMMARY				

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE Kshs	AMOUNT Kshs
	BILL NO.7- PIPELINES				
7.1	CLASS D: DEMOLITION AND SITE CLEARANCE				
7.1.1	General site clearance along the pipeline alignment.	m ²	500		
	Tree Cutting (Provisional)				
	Cut down trees, grub up roots and cart away to tips				
7.2	CLASS E: EARTHWORKS				
	Note:- Trench width and minimum cover to pipes is as per the Specification. The cost shall include for strutting, shuttering, stabilizing the earth faces of trenches and keeping the trenches free of water from whatever source by pumping or other means and cost of use of selected soil from the excavated material for compaction in bed and surround to backfilling of trenches, etc., all as specified.				
7.2.1	Excavation and backfilling in normal material for HDPE pipes OD 90 mm for depth n.e 1.5 m	m ³	341		
7.2.2	Ditto but for OD 63 mm	m ³	409		
7.2.3	Ditto but for OD 50 mm	m ³	1,747		
7.2.4	E.O for excavation in rock (Provisional)	m ³	125		
7.3	CLASS I: PIPE WORK - PIPES				
	SUPPLY AND PIPE LAYING				
	HDPE PIPES				
	<i>Supply, Transport to site and store in secure place High Density Polyethylene pipes (HDPE) Pipes PE 100 with Butt Fusion Jointing and or Coupling connectors. Include supply of jointing materials.</i>				
7.3.1	OD 90 mm- PN 10 in Trenches	m	650		
7.3.2	OD 90 mm- PN 6 in Trenches	m	100		
7.3.3	OD 63 mm- PN 6 in Trenches	m	900		
7.3.4	OD 50 mm- PN 6 in Trenches	m	3,850		
	Sub-Total Carried Over to the Next Page				

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ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE Kshs	AMOUNT Kshs
	Sub-Total Brought Overfrom the previous Page				
7.4	CLASS J: PIPE WORK - FITTINGS AND VALVES				
	<i>Supply, Transport to site and store in secure place. Include supply of jointing materials, bolts, nuts, gaskets etc. as applicable as required by specifications and details on drawings. Transport from Site Store, Install, Test and Commission Ferrous pipe Fittings - Epoxy coated externally and cement mortar lined internally or Approved equivalent</i>				
7.4.1	Bends, OD 63 mm-PN 16				
7.4.1.1	90° bend	Nr	1		
7.4.1.2	45° bend	Nr	1		
7.4.2	PE BUTT FUSION FITTINGS				
	Bends to HDPE PE 100 PN16, OD 50 mm				
7.4.2.1	90° bend (Provisional)	Nr	2		
7.4.2.2	45° bend	Nr	2		
7.5	CLASS K: PIPE WORK - CHAMBERS AND PIPE WORK ANCILLARIES				
	Note:- Items for work in this class shall include:- - Excavation, preparation of surfaces, disposal of 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 Authority.				
7.5.1	WASHOUTS				
7.5.1.1	Excavate for, provide all materials and construct complete Lockable inspection valve chambers of internal dimensions 750 x 750 x 1000 mm. Rates to including thrust blocks, step irons, pipe supports and covers as shown in the drawings.	Nr	1		
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings, valves and specials. Special rates shall include for completing all pipe joints as specified in the drawings</i>				
	Sub-Total Carried Over to the Next Page				

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	BILL 8: 10m³ SUMP				
8.1	CLASS D: DEMOLITION AND SITE CLEARANCE				
	All materials arising from Demolition and site clearance unless otherwise stated shall remain the property of the employer and reusable items to be stored at the employer's depot. Rates to include disposal to tip as directed				
8.1.1	General clearance; removal of all bushes, grass and shrubs etc. haul distance n.e. 1km	m ²	16.0		
8.2	CLASS E: EARTHWORKS				
	<i>Excavation shall include for strutting, shuttering, stabilising excavated surfaces and keeping excavations free of water by bailing out, pumping or other means and preparation of the excavated surfaces Excavation for foundations</i>				
8.2.1	Topsoil; maximum depth n.e. 0.3m	m ³	5		
8.2.2	Materials other than topsoil, rock or artificial hard material maximum depth 0.3m - 1m	m ³	10		
8.2.3	Materials other than topsoil, rock or artificial hard material maximum depth 1m - 2.5m	m ³	15		
8.2.4	Rock material, maximum depth 2-2.5m (Provisional)	m ³	10		
	Excavation ancillaries Preparation of excavated surfaces				
8.2.5	Materials other than topsoil or rock surface				
8.2.6	Rock surface	m ²	16		
	Disposal of excavated material				
8.2.7	Approved material shall be retained for backfilling and unsuitable material shall be disposed to tip as directed by the Engineer Topsoil distance of haul n.e. 1km	m ²	20		
8.2.8	Material other than topsoil or rock distance of haul n.e 1km	m ³	4		
	Sub-Total Carried Over to the Next Page				

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	Sub-Total Brought Overfrom the previous Page				
8.3	CLASS F: IN SITU CONCRETE				
	Provision of concrete: Provide materials and mix concrete to the specified class, place, vibrate and cure; cement to BS 12 or BS 146				
8.3.1	Design mix; Grade C15; 20mm aggregate	m ²	8		
8.3.2	Design mix; Grade C25; 20mm aggregate	m ³	6		
8.4	CLASS G: CONCRETE ANCILLARIES				
	Dimensions as per details on Drawings of specific structural Formwork: Rough finish; Plane vertical				
8.4.1	External sides of ground slab width > 0.4 < 1.22	m ²	10		
8.4.2	External sides of roof slab width > 0.2 < 0.4m	m ²	4		
	Formwork: Rough finish; Plane horizontal				
8.4.3	Soffit of suspended slab; width exceeding 1.22m	m ²	12		
	Reinforcement; plain round steel bars to BS4449				
	Rate to include for cutting, bending, supporting, tying and securing reinforcement				
8.4.4	Nominal size 6 mm	Kgs.	110		
8.4.5	Nominal size 8 mm	Kgs.	200		
	Reinforcement; High yield steel bars to BS 4449				
	Rate to include for cutting, bending, supporting tying and securing reinforcement				
8.4.6	Nominal size 10 mm	Kgs.	200		
	Miscellaneous work (including provision and laying)				
8.4.6	1:3 cement sand mortar screed placed on reservoir walls and floor as shown on drawings to facilitate reservoir drainage				
8.4.7	1:3 cement sand mortar screed placed on reservoir floor and walls	m ³	1		
	Sub-Total Carried Over to the Next Page				

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)
	Sub-Total Brought Overfrom the previous Page				
8.5	CLASS J: PIPEWORK - FITTINGS AND VALVES				
	STEEL PIPEWORK Supply, lay and joint pipe fittings & valves. Include for excavation & backfilling of pipe trenches				
	INLET PIPE WORK BENDS				
8.5.1	100 mm dia GI 90 ⁰ elbow	No.	1		
	OUTLET PIPE WORK				
	BENDS				
8.5.2	80 mm dia .90 ⁰ elbow	No.	2		
	MISCELLANEOUS				
8.5.3	Strainer, 100mm dia.	No.	1		
	SCOUR & OVERFLOW PIPEWORK				
	BENDS				
8.5.4	90 ⁰ Elbow, 100mm dia.	No.	2		
	TEES				
8.5.5	100 x 100 mm tee	No.	1		
	CLASS N: MISCELLANEOUS METAL WORK				
	Rate to include supply and fixing and inclusive of foundations where applicable				
8.5.6	Lockable mild steel sheet metal covers for access; 1100 x 1100 x 20 mm	No.	1		
8.5.7	50mm dia. elbows as Ventilators,	No.	4		
8.6	CLASS U: BLOCKWORK AND MASONRY				
	To include supply and lay dressed building stones for masonry walls				
8.6.1	225mm thick ashlar masonry, vertical straight walls; thickness 150 - 250	m ²	25		
BILL NO. 8 TOTAL CARRIED OVER TO GRAND SUMMARY					

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)
	BILL NO. 9- 100 m³ MASONRY STORAGE TANK				
9.1	CLASS D: DEMOLITION AND SITE CLEARANCE				
	All materials arising from Demolition and site clearance unless otherwise stated shall remain the property of the employer and re-usable items to be stored at the employer's depot. Rates to include disposal to tip as directed				
9.1.1	General clearance; removal of all bushes, grass and shrubs etc. haul distance n.e. 1km	m ²	25.0		
9.2	CLASS E: EARTHWORKS				
	<i>Excavation shall include for strutting, shuttering, stabilising excavated surfaces and keeping excavations free of water by bailing out, pumping or other means and preparation of the excavated surfaces (Excluding disposal of excavated material)</i>				
9.2.1	Topsoil; maximum depth n.e 0.25 m	m ³	14		
9.2.2	Topsoil; maximum depth n.e 0.25 m - 0.5 m	m ³	14		
9.2.3	Materials other than topsoil, rock or artificial hard material maximum depth 0.5 - 1 m	m ³	29		
9.2.4	Materials other than topsoil, rock or artificial hard material maximum depth 1 - 1.5 m	m ³	29		
9.3	EXCAVATION ANCILLIARIES				
	<i>Filling</i> Filling to completed structures including compaction as specified				
9.3.1	Selected excavated material other than topsoil, rock, or artificial hard material	m ³	12		
9.3.2	Rock material (Hard Core) distance of haul n.e. 1 km	m ³	12		
9.4	CLASS F: IN SITU CONCRETE				
	<i>Provide materials and mix concrete to the specified class; cement to BS 12 and place as directed by the Supervising Engineer</i>				
	Blinding Concrete				
9.4.1	Blinding Concrete, 75 mm thick Class 15/40 to base of the Tank	m ²	44		
9.4.2	Ditto for base of Valve Chambers	m ²	4		
9.4.3	Reinforced Conrete Class 25/20 to the Base Slab	m ³	13		
9.4.4	Ditto for Roof Slab	m ³	12		
9.4.5	Ditto for Base of Chambers (2 No. 1000 x 1000 x 1200 mm Chambers for Offtake and Washouts)	m ³	7		
	Sub-Total Carried Over to the Next Page				

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ITEM No.	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)
	Sub-Total Brought Overfrom the previous Page				
9.5	CLASS G: CONCRETE ANCILLARIES				
	<i>Dimensions as per details on Drawings of specific structural</i>				
	Formwork : Rough finish; Plane vertical				
9.5.1	External sides of foundation slab width > 0.4 < 1.22	m ²	10		
9.5.2	External side of roof slab internal sides of parapet walls width > 0.2 < 0.4m	m ²	5		
9.5.3	Sides of columns; width > 0.4 < 1.22 mm	m ²	15		
9.5.4	Internal sites of the roof slab	m ²	40		
	Reinforcement; plain round steel bars to BS4449 Rate to include for cutting, bending, supporting, tying and securing reinforcement				
9.5.5	Nominal size 6 mm	Kgs.	19		
9.5.6	Nominal size 8 mm	Kgs.	392		
	Reinforcement; deformed high yield steel bars to BS 4449				
	Rate to include for cutting, bending, supporting tying and securing reinforcement				
9.5.7	Nominal size 10 mm	Kgs.	1,776		
9.5.8	Nominal size 16 mm	Kgs.	705		
9.5.9	Nominal size 20 mm	Kgs.	0		
	MISCELLANEOUS WORKS				
	(Rates to include for provision and laying)				
9.5.10	1:3 cement sand mortar screed placed on reservoir floor and walls as shown on drawings to facilitate reservoir drainage	m ²	185		
9.5.11	Supply and place water proof cement	Kgs.	36		
9.5.12	Supply and place lime in plaster	Kgs.	35		
9.5.13	Supply and place bondex joint as specified in the drawing	Kgs.	15		
9.6	CLASS H: PRECAST CONCRETE				
9.6.1	Plain covering slabs 600 x 600 x 100mm	No.	2		
	Sub-Total Carried Over to the Next Page				

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	Sub-Total Brought Overfrom the previous Page				
9.7	CLASS J: PIPEWORK - FITTINGS AND VALVES				
	Supply, lay and joint pipe fittings & valves. Include for excavation & backfilling of pipe trenches. Steel Pipe Fittings to NP 10				
	INLET PIPE WORK AND BENDS				
	BENDS				
9.7.1	90°, 80 mm dia threaded Long Radius Bend in trenches depth n.e. 2500 mm	No.	2		
9.7.2	80 mm dia, 90° GI Elbow	No.	1		
	STRAIGHT SPECIALS AND VALVES				
9.7.3	80 mm dia Threaded GI pipe (Class B - Riser for inlet pipe)	No.	1		
9.7.4	80 mm dia, 0.5 m Long, Threaded GI Spigot (for inlet pipe)	No.	1		
	OUTLET PIPE WORK (DRAW OFF)				
	BELLMOUTHS				
9.7.5	Flanged Bell mouth 100 mm dia	No.	1		
	BENDS				
9.7.6	100 mm dia , 0.5 m long threaded GI spigot	No.	1		
9.7.7	100 mm dia, 90 degrees , GI Long Radius Bend	No.	1		
	STRAIGHT SPECIALS				
9.7.8	100 mm dia threaded GI Pipe (Rates to include for provision of Sockets)	m	6		
9.7.9	100 mm dia, 0.5m long single flanged GI pipe	No.	2		
	VALVES , NIPPLES AND UNIONS				
9.7.10	100 mm dia Gate Valve To B55163, hand operated with hand wheel	No.	1		
9.7.11	100 mm dia GI Nipple	No.	3		
9.7.12	80 mm dia GI Union	No.	1		
	Sub-Total Carried Over to the Next Page				

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	Sub-Total Brought Overfrom the previous Page				
	SCOUR & OVERFLOW PIPEWORK				
	SCOUR				
	BENDS				
9.7.13	80 mm dia GI Flanged as shown in drawings	No.	1		
9.7.14	80 mm dia, 90 ⁰ Double flanged long radius bend	No.	1		
	STRAIGHT SPECIALS				
9.7.15	80 mm dia threaded GI Pipe (Rates to include for provision of Sockets)	m	12		
9.7.16	80 mm dia, 0.5 m Long threaded GI Pipe	No.	12		
	VALVE				
9.7.17	80 mm dia Gate Valve To BS5163, hand operated with hand wheel	No.	1		
9.7.18	80mm dia, Flanged adaptor	No.	1		
	OVER FLOW				
	TAPER				
9.7.19	Flanged bell mouth 80 mm dia.	No.	1		
	STRAIGHT SPECIALS				
9.7.20	80mm dia, 0.5m Long GI Spigot Single flanged GI Pipe	No.	1		
9.7.21	Flanged spigot 2500mm length with puddle flange 400mm from flanged end, 80mm dia.	No.	1		
	DRAINAGE PIPEWORK				
	BENDS				
9.7.22	90 ⁰ Double socket short radius bend, 80mm dia	No.	2		
	STRAIGHT SPECIALS				
9.7.23	Plain ended spigot, 500mm length, 80mm dia.	No.	2		
9.7.24	Plain ended spigot, 2000mm length, 80mm dia	No.	1		
9.8	CLASS K: PIPEWORK - MANHOLES AND PIPEWORK ANCILLARIES				
9.8.1	Excavate for, provide all materials and construct complete Lockable inspection valve chambers of internal dimensions 750 x 750 x 1000 mm. Rates to including thrust blocks, step irons, pipe supports and covers as shown in the drawings.	Nr	1		
	Sub-Total Carried Over to the Next Page				

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9.9	CLASS N: MISCELLANEOUS METAL WORK				
9.9.1	Rectangular section ditches; line; cross-sec area not exceeding 0.25m ² to take Washout Drainage pipe	m	5		
	Rate to include supply and fixing and inclusive of foundations where applicable				
9.9.2	Galvanised mild steel ladders. The ladders should be of rounded steel bars of 25mm dia.	No.	2		
9.9.3	Locakable mild steel sheet metal covers for access; 1100 x 1100 x 20 mm	No.	2		
9.9.4	Ventilators, 80mm dia. To include for Elbows and GI Straigths	No.	4		
9.10	CLASS U: BLOCKWORK AND MASONRY				
	Masonry Block Work for Walls as shown in drawings				
	Rates for Masonry blocks to include for Supply, Dressing, and Curing				
9.10.1	300 mm thick	m ²	40		
9.10.2	225 mm thick	m ²	67		
9.10.3	Ditto for 2 No. (100 x 100 x 1200 mm) Inspection Valve Chambers	m ²	6		
9.11	CLASS V: PAINTING AND BRANDING				
9.11.1	Provide for painting and branding of the Tank as directed	m ²	50		
	BILL NO. 9 TOTAL CARRIED OVER TO GRAND SUMMARY				

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	BILL No. 11 - ELECTRO - MECHANICAL WORKS			
11.1	Requirement			
11.1.1	Solar Pumping System to power a 11Kw (15HP) Submersible Pump.			
11.2	Site Conditions:			
11.2.1	Desired Yield- 30-35m ³ /Hr			
11.2.2	Distance to Pumphouse- 10m			
11.2.3	Total Dynamic Head- 75m			
11.3	Equipment Required:			
11.3.1	Pump Premium quality GRUNDFOS SP30-13 or DAYLIFF DS30-13 or PEDROLLO 6SR27/10 pumps being constructed of stainless steel and fitted with 11Kw 3Ph motor.			
11.3.2	Control Unit The controller Sunverters for controlling of the pump system, monitoring of the operating states and incorporates the following alarm functions: over current, under voltage, over speed, over temperature, reverse polarity, low water. It should have an integrated MPPT (Maximum Power Point Tracking) which maximizes power use from PV modules.			
11.3.3	Solar Panels 51 No. 330W, 24V, crystalline PV solar modules to provide a maximum of 16,830W output and a reserve capacity over the rated power requirement of the pump. The array will consist of 3 parallel strings of 17pieces in series each will be wired to provide the voltage requirement of the pump.			
11.3.4	Accessories These will include underground cables and inter-panel wiring among others.			
11.3.5	Ground Mount Solar Support Structure for the Solar Panels 3.5m high galvanized steel support structure for mounting the solar panels.			
11.3.6	Installation To include: i. Transport of equipment to the site, ii. Electrical connections between pump and controller, iii. Cable Connections between pump, controller and the solar modules, iv. Commissioning and testing with water delivered to the surface.			

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	RATE (KSHS)	AMOUNT (KSHS)
BILL No. 11 - ELECTRO - MECHANICAL WORKS					
11.4	Cost				
11.4.1	SUBMERSIBLE 11KW PUMP END	No.	1		
11.4.2	11KW 3PH SUB-MOTOR	No.	1		
11.4.3	11KW 3PH SUNVERTER	No.	1		
11.4.4	DC PV DISCONNECT SWITCH 1000VDC/40A	No.	1		
11.4.5	330W 24VDC CRYSTALLINE SOLAR MODULE	No.	51		
11.4.6	4mm ² x 4 PVC FLAT SUBMERSIBLE DROP CABLE	m	20		
11.4.7	4mm x 4 CORE U/G CABLE	m	20		
11.4.8	SENSUS WATER METER	No.	1		
11.4.9	LIGHTNING ARRESTOR SYSTEM	Ls	1		
11.4.10	GALVANISED STEEL GROUND MOUNT 3M STRUCTURE	No.	16830		
11.4.11	TWIN FLAT 6mm CABLE WITH EARTH	No.	25		
11.4.12	2NO EARTHROD C/W CLAMP & 10M COPPER EARTH WIRE	Ls	1		
11.4.13	PV SURGE PROTECT	No.	1		
11.4.14	INSTALLATION SUNDRIES & FITTINGS	Ls	1		
11.4.15	INSTALLATION LABOUR AND TRANSPORT	Ls	1		
TOTAL BILL 11 CARRIED OVER TO GRAND SUMMARY					

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	AMOUNT (KSHS)
	BILL No. 12 - GREEN HOUSE (8m x 40m)			
12.1	Green House (40m x 8m): Greenhouse gutter heigth- 2.1m - 3.0m Apex Height- 4m - 5.5m width- 8m Length- 30m			
	<i>Rate should include Supply, installation and training of personnel.</i>			
12.1.1	<ul style="list-style-type: none"> ▶ Prefabricated Galvanised metallic greenhouse tunnel type structure ▶ UV stabilized Green house polythene, thickness of between 200-220 microns, 1000 gauge, the colour yello or milky, bilted, W-wire, and profile. ▶ 0.005mm vent and screen net/shade net 50% to 70% ▶ Crop Support ▶ It should come with a kit comprising of seedling trays, PPEs, 20L knapsack Sprayer, etc 	Ls	1	
12.1.2	Complete drip irrigation system with 1,000L Plastic tank, and metallic stand	Ls	1	
12.1.3	Training	Ls	1	
12.1.4	Nursery pack for one season	Ls	1	
12.1.5	Soil sampling and Full Analysis	Ls	1	
TOTAL BILL 12 CARRIED OVER TO GRAND SUMMARY				

BILL OF QUANTITIES FOR CONSTRUCTION OF CHARIRIK WATER PAN TO 20,000 M³

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	<u>BILL NO.13: PROPOSED PIT LATRINE/BATHROOM</u>				
	<u>BILL NO.13.1</u>				
	<u>SUBSTRUCTURE WORKS ALL PROVISIONAL</u>				
A	Clear site of bushes, shrubs and the like, grub up their roots and burn the arisings	SM	30		
B	Excavate vegetable top soil average 150mm deep set aside in spoil heaps and later spread around the site as directed.	SM	30		
C	Excavate oversite commencing from stripped level average depth 300mm but not exceeding 1.5m deep	SM	25		
D	Excavate foundation trench not exceeding 1.50m deep commencing from stripped level and backfill av depth 600mm.	CM	20		
F	Allow for plunking and strutting sides of excavation trenches	ITEM	1		
	<u>Disposal</u>				
G	Load, wheel and cart away surplus soil.	CM	20		
	<u>Hardcore filling</u>				
H	Imported hardcore ; water and well compacted in thickness of 150mm but maximum depth of 300mm to sides of the excavated pit.	SM	16		
J	50mm thick murrum blinding to surfaces of hardcore surfaces.	SM	16		
	<u>PIT EXCAVATION (4X1.5M)</u>				
K	Excavate for pit commencing from stripped level but not exceeding 1.5m deep	CM	12		
L	Ditto but over 1.5m n.e 3.0m deep.	CM	12		
M	Ditto but over 3.0m n.e 4.5m deep.	CM	12		
N	Ditto but over 4.5m deep but not exceeding 9.0m deep.	CM	34		
M	Extra over excavation in soft rocks	CM	35		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	<u>Mesh fabric reinforcement to B.S 4483 and setting in concrete with 300mm side and end laps (measured nett-allow for laps)</u>				
A	Fabric mesh ref:A142weighing 2.22kg per square metre in floor bed	SM	25		
	<u>DAMP PROOF MEMBRANE</u>				
B	500 gauge polythene damp proof memmbrane laid under surface bed with 300mm side and end laps (measured net -allow for laps)	SM	25		
	<u>CONCRETE</u>				
C	50mm thick concrete (1:4:8 mix) blinding under footings	SM	9		
	<u>Insitu concrete class 20/20, vibrated and reinforced as described, in:-</u>				
D	strip footing and groundbeam	CM	4		
E	150mm thick surface bed	SM	25		
	<u>Reinforcement works all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to:</u>				
F	strip footing and ground Beam	Kg	200		
	<u>SAWN FORMWORK TO:</u>				
G	Vertical sides of strip footing size175-225mm high.	LM	55		
H	Edges of ground floor slab over 75mm but not exceeding 150mm high	LM	18		
J	200mm thick natural stone foundation walling to a stable base of the pit bedded and jointed in c.s morta 1;4	SM	10		
	<u>DPC</u>				
	Three -ply bituminous felt damp proof course bedded in cement and sand morta(1:3)				
K	200mm Wide horizontal layer	LM	15		
	<u>PLINTH FINISH</u>				
	<u>Cement and Sand 1:4 render</u>				
L	12 mm thick render wood float	SM	7		
	<u>Prepare and apply two coats bituminous paint to:</u>				
M	Render surfaces externally	SM	7		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	<u>COLLECTION</u>				
1	Total Brought Forward From Page No.1				
2	Total Brought Forward From Page No. 2				
	TOTAL CARRIED TO SUMMARY				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
REINFORCED CONCRETE WORKS SUPERSTRUCTURE					
BILL NO. 13.2					
Vibrated reinforced concrete (1;2;4) class 20 in;					
A	Ring Beams and lintols	CM	2		
REINFORCEMENT					
Reinforcement in different sizes in structural concrete work all in accordance with the Engineer's details and approval including all cutting,bending,laying and binding wire to;					
B	Ring Beams and lintols	kg	120		
SAWN FORMWORK TO;					
C	Sides and soffits of ring beams average heights 125-175mm.	LM	58		
Carried to summary					

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.13.3				
	LOAD BEARING WALLINGS				
	<u>EXTERNAL WALLING</u>				
	Load bearing chisel cut natural stone walling, jointed in cement and sand(1:3) mortar and including hoop iron reinforcement at alternate courses including all necessary working around all door and windows openings formed accurately as per Architects schedule				
A	150mm thick walling	SM	46		
B	Ditto but to dwarf wall at the entrance and cable wall	SM	13		
	<u>INTERNAL WALLING</u>				
	Load bearing chisel cut natural stone walling, jointed in cement and sand(1:3) mortar and including hoop-iron reinforcement at alternate courses, including all necessary working around all door and window openings formed accurately				
C	150mm thick	SM	17		
	Carried to summary				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.13.4				
	<u>ROOF CONSTRUCTION AND COVERING</u>				
	MAIN ROOF -TIMBER TRUSSES				
	Structural timber trusses in pressure impregnated treated sawn cypress including fabrication, jointing with necessary timber plates ,bolts and connecting plates, hoisting and fixing in position all in accordance with Engineers details and drawings				
	100X50mm wall plate secured with and including 12mm diameter mild steel 'J'bolt				
A	100x50mm thick at 1500mm centres cast in concrete ring beam principle rafters.	LM	30		
B	100x50mm principle members	LM	80		
B	100x50mm but common rafters, struts and ties and kingpost	LM	50		
C	75x50mm purlins	LM	60		
	<u>ROOF FINISHES AND COVERING</u>				
D	Supply and fix 30 gauge prepainted box profile Roof covering at 15.0 degrees from horizontal including all necessary timber battens and fixtures m/s.	SM	31		
E	Wrot timber selected and kept clean 225x25mm Fascia or barge board	LM	24		
F	Prepare and apply Three coats gloss paint to :- knot prime and stop and apply three coats of gloss oil paints to General surfaces of timber 100 to 200mm girth externally	LM	24		
	Carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
RAIN WATER DISPOSAL					
A	100mm diameter UPVC gutters fixed to fascia with including appropriate brackets hangers bends, and gutter spout or out lets for connection to down pipes by outs all in accordance with architect drawings.	LM	11		
B	Down Pipes with solvent welded joints, fixed to walls with holderbolts size 100 x 100 mm or any other approved	LM	4		
C	Extraover for swan kneck in pipe , size' - 100 x 100 mm	No.	1		
D	Extraover for shoe in pipe , size' - 100 x 100 mm	No.	1		
Carried to collection					
COLLECTION					
1	Total Brought Forward From above			Page No	
2	Total Brought Forward From Page No.				
Carried Forward to summary of Section					

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	<u>BILL NO.13.5 WINDOWS AND DOORS</u>				
	<u>Supply and fix Steel casement windowssecti including mullions,4mm thick glass clear glass to schedule and approval Steel casement windowssecti including mullions,5mm window stays,fasteners all to architect's schedule and approvalthick obscured glass</u>				
A	window size 800x600mm high	NO	4		
B	louvered window with clay bricks jointed with c/s morta 1:3 to approval size 1000x600mm	NO	0		
	<u>window cill</u>				
C	75mm cast in situ concrete cill in class 20 concrete	LM	4		
	PAINTING AND DECORATION				
D	Prepare and apply three coats of gloss oil paints to metal surface of window externally	SM	3		
E	ditto internally	SM	3		
	DOORS & IRON MONGERY-(Supply and fix items)				
	Timber doors				
	<i><u>45 mm Semi-Solid core flush doors faced both sides with 6 mm plywood zen veneered for polishing , moulded and lipped all round, size :</u></i>				
F	900x2100mm	No.	4		
	Doors, frames and finishings in wrought hardwood				
G	100 x 50 mm thick door frame with 3 labours	LM	28		
	Ironmongery				
H	100 mm steel butt hinges	Pairs	6		
J	Two lever mortice lock complete with fittings as per Union catalogue 2237	NO	4		
	Carried Forward to summary of Section				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	BILL NO.7 FINISHES				
	EXTERNAL WALL FINISHES				
A	Horizontal key pointing and verticle flash joint to external surface of walls.	SM	59		
B	Ditto but to verticle sides of ringbeams externaly and internaly.	SM	9		
	Prepare and apply one undercoat and two finishing coats acrylic paint or other approved by the architect				
C	Rendered walls	SM	9		
	INTERNAL WALL FINISHES				
	16mm thick (minimum) cement sand (1:3) screed to receive ceramic tiles and 2 coats of paint m/s to approval.				
D	Steel trowelled smooth plasters to surfaces of wall to receive paint (m/s)	SM	93		
	PAINTING AND DECORATING				
	Prepare and apply three coats silk vinyl emulsion paint or other approved by Architect				
F	To plastered surfaces of walls	SM	93		
	INTERNAL FLOOR FINISHES				
	<u>cement and sand (1:3) backing</u>				
H	32mm thick cement and sand screed steel float finish/ smooth finish to floor with redoxide paints.	SM	25		
	Total carried to collection				

Item	Description	Unit	Qty	Rate Kshs	Amount Kshs
	<u>SECTION SUMMARY</u>				
1	Substructures works				
2	Reinforced concrete works				
3	External and internal walling				
4	Roof construction and covering				
5	Windows, Doors and iron mongery				
6	External, internal wall finishes				
TOTAL BILL 13 CARRIED OVER TO GRAND SUMMARY					