

SUMMARY OF BILL OF QUANTITIES		
BILL ITEM	DESCRIPTION	AMOUNT (KSHS)
1	Preliminaries and General Items	
4	Site Clearance and Top Soil Stripping	
5	Earth Works	
7	Excavation and Filling of Structures	
8	Culverts and Drainage Works	
9	Passage to Traffic	
12	Natural Gravel Base and Subbase	
14	Lime/Cement Improved gravel Subbase and Base	
15	Bituminous Surface Treatment and Surface Dressing	
16	Bituminous Mixes	
17	Concrete Works	
20	Road Furniture	
21	Miscellaneous Bridge works	
22	Schedule of Dayworks.	
25	HIV/AIDS, Gender &Social Issues, Local Participation	
(A)	SUB-TOTAL (1)	
	(B) Add 15% VARIATION OF PRICE of sub total (1)	
	(C) Add 10% CONTIGENCIES of sub total (1)	
	(D) SUB-TOTAL (2) = (A + B + C)	
	(E) Add ...16% VAT of sub-total (2)	
	(F) Add 0.03% Public Procurement Capacity Building Levy of sub-total (2)	
TOTAL CARRIED FORWARD TO FORM OF BID AS BID SUM 1		

BILL NO. 1: PRELIMINARIES AND GENERAL ITEMS					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
1.01	Provide or rent accommodation for Engineer's senior and junior staff	Month	24	65,000	1,560,000.00
	(i) Type I - 1 No.	Month	72	55,000	3,960,000.00
	(ii) Type II - 3 No.	Month	144	40,000	5,760,000.00
	(iii) Type III - 5 No.	Month	192	30,000	5,760,000.00
	(iv) Type IV - 5 No.	Month	240	21,000	5,040,000.00
	Total	Total Item 1.01			22,080,000.00
1.02	E.O item 1.01 for contractor's overhead and profit	%	22,080,000		
1.03	Provide or rent and maintain Engineer's Representative's office as shown on the drawings or as instructed by the Engineer for use during the duration of the Contract, ownership to revert to the Contractor at the end of the Contract	LS	1		
1.04	Provide or rent and maintain Engineer's Site Laboratory for the duration of the Contract, ownership to revert to the Contractor at the end of the Contract	LS	1		
1.05	Provide and maintain Laboratory equipment, reagents and other items as priced in Appendix 'A' to the Bill of Quantities for use by the Engineer's representative for the duration of the contract ownership to revert to the Contractor at the end of the Contract.	LS	1		
1.06A	Provide and maintain furniture, tools and other items for the Engineers office as priced in Appendix B for the duration of the contract ownership to revert to the Contractor at the end of the Contract.	LS	1		
1.06B	Provide and maintain survey equipment as priced in Appendix C for the duration of the contract ownership to revert to the Contractor at the end of the Contract.	LS	1		
1.07	Provide with a driver, fuel and maintain one (1) new 4WD fully loaded station wagon of minimum diesel engine capacity 2400cc approved by the Engineer for his exclusive use, inclusive of the first 5000km per vehicle month. Vehicle to revert to the Contractor at the end of the project.	Veh Month	24		
1.08	E.O item 1.08 for total aggregated mileage in excess of 5000km per vehicle month.	km	72,000		
1.09	Provide with drivers, fuel and maintain one (1) new 4WD fully loaded double cabin pick-up of minimum diesel engine capacity 2400cc approved by the Engineer for his exclusive use, inclusive of the first 5000km per vehicle month. Vehicles to revert to the Contractor at the end of the project.	Veh Month	24		
1.10	E.O item 1.10 for total aggregated mileage in excess of 5000 km per vehicle per month.	km	54,000		
1.11	Ditto item 1.10, but one (1) new 4WD standard double cabin pick-ups of minimum diesel engine capacity 2500cc approved by the Engineer for his exclusive use inclusive of the first 5000km per vehicle month. Vehicles to revert to the Contractor at the end of the project.	Veh Month	24		
1.12	E.O item 1.12 for total aggregated mileage in excess of 5000 km per vehicle per month.	km	36,000		
1.13	Ditto item 1.10, but two (2) new 4WD standard Single cabin pick-ups with fibre glass body and cushioned benches of minimum diesel engine capacity 2200cc approved by the Engineer for his exclusive use inclusive of the first 5000km per vehicle month. Vehicles to revert to the Contractor at the end of the project.	veh Month	48		
1.14	E.O item 1.12 for total aggregated mileage in excess of 5000 km per vehicle per month.	km	72,000		
1.15	Allow a Prime Cost Sum of Kshs. 9,000,000 for the RE's miscellaneous account to be spent in whole or part as directed by the RE against receipts.	PC Sum	1		
1.16	E.O. item 1.15 for Contractor's overheads and profits.	%	0		
1.17	Allow a Prime Cost Sum of Kshs 32,400,000.00 for attendance upon the Resident Engineer' staff.	PC Sum	1		
1.18	E.O. item 1.17 for Contractor's overheads and profits.	%	0		
1.19	Provide, erect and maintain publicity signs as directed by the Engineer.	No.	5		
1.20	Allow for lumpsum for Engineer's training	LS	1		
1.21	E.O. item 1.20 for Contractor's overheads and profits.	%	0		
Bill No. 1 Total Carried Forward to Grand Summary					22,080,000.00
BILL NO. 4 : SITE CLEARANCE AND TOP SOIL STRIPPING					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Note: No separate payments shall be made for gravel for blinding or hauling to spoil unsuitable excavation materials and the cost of such shall be included in the rates and prices				
4.01	Clear site on road reserve including removal of all growths, bushes, hedges, trees, stumps, grub up roots, and other deleterious materials and back-fill and compact to 100% MDD(AASHTO 199) with approved material as directed by the engineer	Ha.	59.94		
4.02	Strip top soil upto 0.2m in thickness along alignment or material sites including removal of all grass and other vegetation,transport to spoil and spread or stock pile for re-use as directed by the Engineer.	m³	87,912.00		
4.03	Provide KShs 2,500,000 for the removal of structures and obstructions to be paid on dayworks basis	Prov Sum	1		
Bill No. 4 Total Carried Forward to Grand Summary					0.00
BILL NO. 5 : EARTHWORKS					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Note: No separate payments shall be made for gravel for blinding or hauling to spoil unsuitable excavation materials and the cost of such shall be included in the rates and prices				
5.01	Fill in soft material including benching of shoulders and embankments and compaction to 95% MDD (AASHTO 199) in layers not exceeding 150mm	m³	156,090		
5.02	E.O item 5.01 for compaction of the top 300mm subgrade to 100% MDD	m³	94,905		
5.03	Ditto item 5.01 but in hard material	m³	39,022.50		
5.04	Cut to spoil in soft material	m³	93,654.00		
5.05	Ditto item 5.04 but in hard material	m³	23,413.50		
5.06	Provide improved sub grade material to a thickness as shall be instructed by the Engineer and process, water and compact to 100% MDD (AASHTO 199)	m³	44,995.00		
5.07	Compaction of top 300mm below formation level in cuts and fills to 100% MDD (AASHTO 199)	m³	62,436.00		
5.08	Compaction of 150mm original ground below fills to 95% MDD. (AASHTO 199)	m³	29,970.00		
5.09	Top-soiling prior to planting grass as directed by the Engineer	m²	39,960		
5.10	Grassing as directed by the Engineer	m²	39,960		
5.11	Provide Rock Fill to swampy areas as directed by Engineer	m³	2,500		
5.12	Provide Filter Fabric to swamp under, over, and around rock fill	m²	5,000		
5.13	Provide and install geogrids	m²	5,000		
Bill No. 5 Total Carried Forward to Grand Summary					0.00
BILL NO. 7 : EXCAVATION AND FILLING OF STRUCTURES					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Note: No separate payments shall be made for gravel for blinding or hauling to spoil unsuitable excavation materials and the cost of such shall be included in the rates and prices				
7.01	Excavate to spoil for structures in soft materials.	m³	500.00		
7.02	As item 7.01 but in hard material.	m³	200.00		
7.03	Provide,place and compact rockfill below and around strucures.	m³	140.00		
7.04	Provide and place 150mm thick stone pitching as directed by the Engineer including cement grouting .	m³	49,950.00		
7.05	Excavate for gabions in soft material.	m³	6,660.00		
7.06	Provide and place gabion boxes and mattresses where directed by the Engineer.	m²	36,630.00		
7.07	Rockfill to gabions.	m³	6,660.00		
7.08	Filter fabric behind gabion boxes and mattresses.	m²	6,660.00		
7.09	Provide and backfill approved material around new box culverts, compact to 100% MDD (AASHTO 199) in layers not exceeding 150mm.	m³	300.00		
7.10	Allow for protection of structures pursuant to section 707 of the specifications	LS	1		
7.11	Allow for river training in soft material	m³	400		
7.12	Allow for river diversion	m³	0		
7.13	Provide for coffer dams as directed by the Engineer	LS	0		
Bill No. 7 Total Carried Forward to Grand Summary					0.00
BILL NO. 8. CULVERTS AND DRAINAGE WORKS					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Note: No separate payments shall be made for gravel for blinding or hauling to spoil unsuitable excavation materials and the cost of such shall be included in the rates and prices.				
8.01	Excavate for inlet,outfall,mitre and catch water drains in soft material	m³	6,000		
8.02	As per item 8.01, but for hard material	m³	1,500		
8.03	Excavation in soft material for pipe culverts,headwalls, wingwalls, apron, toewalls,and drop inlets and compact as directed by the engineer	m³	3,409.50		
8.04	As per item 8.03, but for hard material	m³	852.38		
8.05	Provide,lay and joint 600mm dia. concrete pipes (precast to BS 5911 Parts 1 & 3) for access roads	m	1,800.00		
8.06	As for item 8.05 but 900mm dia concrete pipes (precast to BS 5911 parts 1 & 3) for cross culverts	m	600		
8.07	As for item 8.05 but 1200mm dia concrete pipes (precast to BS 5911 parts 1 & 3) for cross culverts	m	120		
8.08	Provide and place class 15/20 concrete to beds, surround and haunches	m³	2,021		
8.09	Provide, place and compact class 25(20) concrete for headwalls, wingwalls, aprons, and toewalls to access and cross pipe culverts including all form work and the provision and placing of reinforcement as shown in the drawings	m³	1,020.96		
8.10	Provide and place invert block drains with two course scour checks as instructed	m	5,000		
8.11	Construct in concrete class 15(20) side drains scour checks as instructed	m²	500		
8.12	Provide and place precast concrete slabs 1000mm x 600mm x 50mm and place over open lined drains in trade centres and markets	No.	1,066		
8.13	Provide Subsoil filter drains fabric to isolated wet spots inclusive of artesian cloth, and 1420mm single size aggregates as directed by the Engineer	m	250		
8.14	Remove existing culverts of any diameter either for reuse or to be discarded as directed by the Engineer.	m	500		
Bill No. 8 Total Carried Forward to Grand Summary					0.00
BILL NO. 9: PASSAGE OF TRAFFIC					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	NOTE: Notwithstanding the provision of Section 9 of the Standard Specification, no extra payments shall be due as all costs shall be deemed to be included in the rates inserted herein				
9.01	Construct and maintain diversions in maximum lengths of 5km sections as directed by the Engineer, including 150mm wearing course gravel all signage, lighting and barriers	km	25		
9.02	Provide, spread, water and compact gravel of minimum CBR 30% as directed by the Engineer for maintenance works.	m³	22,500		
9.03	Allow for the passage of traffic through and around the works	LS	1		
9.04	Grade, water and compact existing road ahead of works	km	25		
9.05	Reinstatement of deviations to original state	km	25		
Bill No. 9 Total Carried Forward to Grand Summary					0.00
BILL NO. 12 : NATURAL MATERIAL FOR SUBBASE AND BASE					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Note: No overhaul will be paid for separately under these items as it shall be deemed to have been included in the Contractor's rates				
12.01	Provide gravel sub-base material, haul, spread, compact to at least 100% M.D.D (AASHTO 1-180) and shape to level and tolerance.	m³	49,450.50		
12.02	Ditto item 12.01 but for base	m³	46,703.25		
Bill No. 12 Total Carried Forward to Grand Summary					0.00
BILL NO. 14 : CEMENT OR LIME TREATED SUBBASE AND BASE					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Note: No overhaul will be paid for separately under these items as it shall be deemed to have been included in the Contractor's rates				
14.01	Provide and spread lime as an improvement agent for sub-base	Tonne	1.00		
14.02	Provide and spread lime as an improvement agent for base	Tonne	1.00		
14.03	Provide and spread Cement as an improvement agent for sub-base	Tonne	2,101.65		
14.04	Provide and spread Cement as an improvement agent for base	Tonne	2,778.84		
14.05	Mix and process natural material with improvement agent for pavement layers as instructed by the Engineer or as specified.	m³	96,153.75		
14.06	Curing of cement / lime treated base and sub-base layers	m²	532,800.0		
Bill No. 14 Total Carried Forward to Grand Summary					0.00
BILL NO. 15: BITUMINOUS SURFACE TREATMENT & SURFACE DRESSING TO SHOULDERS					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
15.01	Prepare surface of shoulders, provide, heat and spray MC 30 cutback bitumen prime coat at 0.8-1.2 Litres/m2.	Litres	360,439.2		
15.02	Prepare surface of carriageway and shoulders, provide, heat and spray 80/100 straight run bitumen as Binder for first seal on the shoulders at a rate of 1.0-1.2 Litres/m2.	Litres	0.0		
15.03	Provide, transport, lay and roll 14/20 mm Class 3 pre-coated with MC 30, chippings at a rate of 60-90m2/m	m³	0.00		
15.04	Prepare surface of carriageway and shoulders, provide, heat and spray 80/100 straight run bitumen as Binder for as seal on the carriageway and shoulder at a rate of 0.6-1.0 Litres/m2.	Litres	276,000.0		
15.05	Provide, transport, lay and roll 10/14 mm pre-coated chippings	m³	3,680.00		
15.06	Prepare surface of carriageway and shoulders, provide, heat and spray 80/100 straight run bitumen as Binder for as third seal on the carriageway and shoulder at a rate of 0.6-1.0 Litres/m2.	Litres	0		
15.07	Provide, transport, lay and roll 6/10 mm pre-coated chippings				

MAINTENANCE OF KIONYO-KANYAKINE - MITUNGUU ROAD					RWC 200
APPENDIX A					
APPENDIX TO BILL ITEM 1.05:					
PROVIDE AND MAINTAIN FURNITURE AND EQUIPMENT FOR THE ENGINEER'S LABORATORY					
S/NO.	DESCRIPTION	UNIT	QTY	RATE (KSHS)	AMOUNT (KSHS)
	I. FURNITURE				
A104/1.01	Desk 2.2x0.9 m with chair and lockup drawers	No	2		
A104/1.02	Desk chair (standard)	No	15		
A104/1.03	Stationery cupboard, 1.2 m ² , lockable	No	2		
A104/1.04	Steel filing cabinet, 4 drawers, lockable	No	2		
A104/1.05	Steel filing cabinet, 2 drawers, lockable	No	2		
A104/1.06	Bookshelf, 3 shelves 1.2 m long (to hold box files)	No	2		
A104/1.07	Table - 6 m ²	No	2		
A104/1.08	Two Plate electric heater	No	1		
A104/1.09	Fire extinguisher, 10 litre capacity, CO ₂ type	No	4		
A104/1.10	Complete first aid kit	No	2		
	EQUIPMENT				
	<i>(The following equipment shall be purpose made for use in the Engineer's laboratories and shall comply with the relevant British (BS) or American (ASHTO) Standards)</i>				
	2. General Equipment				
A104/2.02	2.49kg. Compaction hammer, drop regulated to 304.8mm	No	2		
A104/2.03	4.535kg compaction hammer drop regulated to 457.2mm	No	2		
A104/2.04	Electric vibrating Kango Hammer fitted with steel tamper(BS 1377) with support frame	No	1		
A104/2.05	Straight edge 300 mm long with handles	No	4		
A104/2.06	Steel Tamper (BS1377) compatible with Kango hammer	No	3		
A104/2.07	Compaction mould 152.4 mm. dia x 116.43 mm complete with base plate and extension collar, 101.6 mm	No	2		
A104/2.08	Galvanized metal tray 1m x 0.5m x 75 mm deep	No	4		
A104/2.09	75mm brush	No	2		
A104/2.10	Semi-automatic balance, 25kg Capacity accurate to 1g, including weights	No	1		
A104/2.11	20mm BS Sieve, 300mm diameter	No	1		
A104/2.12	Stop Clock	No	2		
A104/2.13	Thermostatically controlled electric oven 105-110°C, capacity 0.225 m ³	No	2		
A104/2.14	As above but gas heated	No	1		
A104/2.15	Moisture content tins, 75 mm dia, Cadmium or aluminium plated	No	60		
A104/2.16	Cone penetrometer with gauge and automatically controlled test cup	No	2		
	C/Forward to next page				
	B/Forward from previous page				
	3. Density (Sand replacement method BS 1377)				
A105/3.01	Metal containers 450mm diameter	No	2		
A105/3.02	Stainless steel tray 305mm diameter	No	2		
A105/3.03	Metal tray with 150 mm diameter hole in the centre, 300mmx300 mm square or equivalent area, 40mm deep	No	2		
A105/3.04	Metal tray with 200mm diameter hole in the centre, 500mm x 500 mm square , 50 mm deep	No	2		
A105/3.05	Steel pegs for fixing tray in position	No	15		
A105/3.06	Sand pouring cylinder, 150 mm diameter	No	2		
A105/3.07	Sand pouring cylinder, 215 mm diameter	No	2		
A105/3.08	Cold steel chisel 20mm x 300mmm	No	4		
A105/3.09	Cold steel chisel 10mm x 250mmm	No	4		
A105/3.10	1.5kg, 3.5kg hammers and 1kg rubber mallet	Set	1		
A105/3.11	Scoop for removing excavated material from hole, 250 mm long handle	No	6		
A105/3.12	100mm brush, soft	No	3		
A105/3.13	50mm brush, soft	No	3		
A105/3.14	Primus gas stove	No	1		
A105/3.15	Calibrating can 150 mm diameter x 150 mm deep	No	3		
A105/3.16	Ditto but 200 mm diameter x 250 mm deep	No	3		
	5. CBR (AASHTO T193)				
A104/5.01	CBR mould, 152.4 mm dia x 178 mm high, complete with perforated base plate and extension collar 50.8 mm high that can be fitted to either side of mould	No	50		
A104/5.02	Perforated swell plate 150 mm dia with an adjustable centre post of rust proof metal provided with a lock-nut	No	40		
A104/5.03	2.25 kg split surcharge weight	No	2		
A104/5.04	Set of annular surcharge weights	No	1		
A104/5.05	Solid base plate for CBR mould	No	2		
A104/5.06	Static compaction displacer discs 1 Nox 61.4 mm, 1 No x 50.8 mm and 2 Nox 38.8 mm thick with handles	set	1		
A104/5.07	Disk lifting handle	No	2		
A104/5.08	Central extruder, complete with 20kN hydraulic jack and accessories	No	1		
A104/5.09	Automatic CBR Proctor Compaction press, 50 tonnes capacity with an adjustable distance between platens of 530mm-250mm, rammer weights and automatic count selector	No	1		
A104/5.10	Set of guards for above press.	No	1		
A104/5.11	50 kN CBR Load frame complete with stabilising bar (electric and hand operated) including proving rings for 10kN, 28kN and 50kN, piston and bracket	No	1		
	C/Forward to next page				
	B/Forward From previous page				
A104/5.12	Penetration gauge range 0 - 25mm	No	2		
A104/5.13	CBR piston including bracket	No	2		
A104/5.14	Swell measurement tripod complete with guage calibrated in 0.01 mm divisions	No	2		
A104/5.15	Soaking tank for CBR mould sufficient for 50 moulds	No	1		
	6. Relative Density of Aggregates (BS 812)				
A104/6.01	Wire mesh basket with apertures not greater than 6.5 mm large enough to contain 2.5 kg of aggregate	No	2		
A104/6.02	A stout watertight container in which the basket can be freely suspended	No	2		
A104/6.03	Soft absorbent cloth (tea towel)	No	10		
A104/6.04	Shallow tray of area not less than 0.065 m ²	No	2		
A104/6.05	An airtight container of similar capacity to the basket	No	2		
A104/6.06	Pycnometer of 1 litre capacity	No	4		
A104/6.07	Semi automatic 5 kg balance accurate to 0.1g to be of size and type to permit the basket containing the sample to be suspended in water(to be supplied with weights)	No	1		
A104/6.08	Hot air drier (electric)	No	2		
	7. Flakiness (BS 812)				
A104/7.01	Thickness gauge (various sizes)	No	2		
	8. Sieve Analysis (BS 1377)				
A104/8.01	BS Sieve 300mm diameter in sizes 75, 63, 50, 37.5, 28, 20, 14, 10, 6.3, 5 and 4 mm, plus lid and receiver	Set	2		
A104/8.02	BS Sieve 200mm diameter in sizes 2, 1, 0.6, 0.5, 0.425, 0.300,0.150 and 0.075 mm, plus lid and receiver	Set	2		
A104/8.03	Electric sieve shaker	No	1		
A104/8.04	BS sieve 200mm diameter 0.425 and 0.075 mm	set	1		
A104/8.05	1 m x 1 m x 75mm deep galvanized metal tray	No	10		
A104/8.06	Riffle box with 50mm slots (BS 1377)	No	1		
	9. Miscellaneous Equipment				
A104/9.01	Wheel barrow	No	3		
A104/9.02	Dustpan and brush	No	3		
A104/9.03	Shovel	No	4		
A104/9.04	Pick axe with handle	No	4		
A104/9.05	Metal scoop, large (150mm wide)	No	3		
A104/9.06	Metal scoop, medium (100mm wide)	No	4		
A104/9.07	Garden trowel	No	2		
A104/9.08	Steel tray 0.3m x 0.3m x 0.01m deep	No	15		
A104/9.09	Palette knife 200mm long blade	No	3		
A104/9.10	Palette knife 100mm long blade	No	4		
A104/9.11	BS sieve 450mm diameter, 37.5mm	No	1		
A104/9.12	BS sieve 450mm diameter, 20mm	No	1		
A104/9.13	BS sieve 450mm diameter, 5mm	No	1		
A104/9.14	BS sieve 450mm diameter, 0.425mm	No	1		
A104/9.15	BS sieve 450mm diameter, 0.3mm	No	1		
	Page 5 C/Forward tonext page				
	B/Forward from prevoius page				
A104/9.16	BS sieve 450mm diameter, 0.075mm	No	1		
A104/9.17	Set of lid and receiver for metal scoop and steel trays	No	2		
A104/9.18	BS Sieve brush	No	2		
A104/9.19	Measuring cylinder set, 25 ml, 100 ml, 500 ml, 1000 ml, 2000 ml	set	2		
A104/9.20	Glass jar capacity 5 litres with lid	No	10		
A104/9.21	200mm x 200mm x 20mm cadmium plated or aluminium tin	No	20		
A104/9.22	Electronic balance capacity 1000 g, accurate to 0.01gm.	No	1		
A104/9.23	Balance 2000 g capacity accuracy to 0.1g (manual), including weights	No	1		
A104/9.24	Balance 50kg capacity accurate to 10gm including weights	No	1		
A104/9.25	Still for producing distilled water	No	1		
A104/9.26	Polythene or glass 20 litres storage vessel with tap at bottom	No	2		
A104/9.27	Stiff broom	No	2		
A104/9.28	Vernier calipers, 150mm	No	2		
A104/9.29	Vernier calipers, 250mm	No	2		
A104/9.30	Pestle and mortar	No	2		
A104/9.31	Linear shrinkage mould (BS 1377)	No	6		
A104/9.32	Liquid Limit Device	No	2		
A104/9.33	Average least dimension gauge	No	2		
A104/9.34	Lockable tool box containing: 1 pr"Molegrips", 2 x 150mm screwdriver, 2 x 200 mm screwdriver, 2 x 300 mm screwdriver,(1 standard and 1 Phillips head of each) adjustable spanners 200 mm and 300 mm, 1 pair round nosed pliers, 1 pair general purpose pliers,	No	1		
A104/9.35	Plastic or metal bucket including lid, 10 litres capacity	No	6		
A104/9.36	Polythene wash bottle (500 ml)	No	5		
A104/9.37	A4 size clipboard	No	4		
A104/9.38	Thermometer, range -10°C to 150°C, glass (BS 593)	No	2		
A104/9.39	Laboratory thermometer, range + 0°C to + 250°C (BS 593)	No	2		
A104/9.40	Maximum and minimum thermometer (BS692)	No	2		
A104/9.41	Rain gauge	No	1		
A104/9.42	Portable dial thermometer + 50°C to +250°C accurate to ± 3%	No	1		
A104/9.43	Ditto with 0.75m long stem	No	1		
A104/9.44	Pocket thermometer + 50°C to +250°C accurate to ± 3% with 0.1 m stem	No	2		
A104/9.45	5 litre capacity steel storage containers with leak and dust proof lids for storage of bitumen samples.	No	50		
A104/9.46	Hotplate 200mm diameter with Simmerstat heat control unit.	No	2		
A104/9.47	450mm diameter x 150mm deep metal mason's basin	No	6		
	C/Forward to next page				
	B/Forward from previous page				
	11. Concrete: Slump and Cube Manufacture (BS 1881)				
A104/11.01	Slump cone, tamping rod and base	set	2		
A104/11.02	Concrete cube mould, 150mm cube	No	30		
A104/11.03	Soaking tank for cubes (capacity 50 No.)	No	1		
A104/11.04	Cube tamping bars	No	10		
	12. Concrete: Cube Compression Testing				
A104/12.01	Concrete compression machine to BS1610 Grade A with 300 mm gauge, rectangular platens, capacity 1560 kN with load spacer	No	1		
A104/12.02	Safety guard for above				
A104/12.03	50mm distance piece				
A104/12.04	70mm distance piece				
A104/12.05	Electro-mechanical load pacer, 100 mm or equivalent distance piece				
	13. Aggregate and Chippings				
A104/13.01	Sand equivalent to AASHTO T176 including graduated plastic cylinder, rubber stopper, irrigation tube weighted foot assembly, siphon assembly, 85ml tin box (57mm dia.), 100 mm dia wide mouth funnel, stop clock,mechanical shaker and 10 litre jar	Set	1		
A104/13.02	Beaker 250ml	No	2		
A104/13.03	Aggregate Crushing Value Apparatus, 150 mm nominal diameter, including plunger and base plate	No	2		
A104/13.04	Tamping rod and metal measure for above	Set	4		
A104/13.05	Los Angeles Abrasion to ASTM standards	No	1		
A104/13.06	Set of 12 abrasive charges	No	2		
A104/13.07	Thermometer, 0°C to +50°C	No	2		
A104/13.08	Thermometer, 0°C to +250°C	No	2		
A104/13.09	Reagent grade Silica gel, 500g container	No	50		
	14. Bitumen Spray Test (BS 1707)				
A104/14.1	Transverse distribution of spray test bitumen distributor (depot tray test to BS 1707) or equivalent.	Set	1		
A104/14.2	Steel tray 20 mm deep x0.1m ² (for measuring bitumen spray rates) with purpose made detachable handle 1.5m long.	No.	4		
	16. Bitumen Extraction Test				
	A) Extractor Bottle Method BS 598 Part 2				
A104/16.01	Electronic top pan balance 4kg capacity, sensitive to 0.1gm	No	1		
A104/16.02	Flat bottomed scoop	No	3		
A104/16.03	Steel large trowel	No	2		
A104/16.04	Large steel spoon	No	2		
A104/16.05	Heat resistant gloves	pair	10		
A104/16.06	Foot pump for pressurising air water assemblies up to a maximum of 700kN/m ² and fitted with flexible hose approximately 1.2m long and connector	No	2		
	C/Forward to next page				
	B/Forward from previous page				
A104/16.07	Steel bottle 600ml capacity with 49mm rubber stopper	No	2		
A104/16.08	Steel bottle 2500ml capacity with 71mm rubber stopper	No	2		
A104/16.09	Steel bottle 7000ml capacity with 71mm rubber stopper	No	2		
A104/16.10	Flask funnel for fitting to the 700ml steel bottle with rim of funnel retaining sieve 200mm nominal diameter	No	2		
A104/16.11	Bottle roller compact bench mounted unit designed to rotate 2 bottles simultaneously about longitudinal axis	No	1		
A104/16.12	Pressure filter complete with cutting tool for making hole in the filter paper	No	1		
A104/16.13	Filter funnel to take 200mm nominal diameter sieves	No	2		
A104/16.14	Centrifuge complying with BS 598	No	1		
A104/16.15	Binder recovery	No	1		
A104/16.16	Volumetric flask 250ml, 500ml, 1000ml and 2000ml capacity	set	2		
A104/16.17	Recovery still for Dichloromethane	No	1		
	B) Hot Extractor Method BS 598 Part 2				
A104/16.18	Hot extractor complete with wire gauze container gasket, cork lid and support assembly	No	2		
A104/16.19	Dean and Stark receiver with condenser to suite Trichloroethylene	No	2		
A104/16.20	Gyratory compactor ELE Servo Pac or equivalent with 1 x 100mm and 1 x 150mm moulds	No	2		
A104/16.21	PRD Vibrating hammer compactor complete with 6 moulds, 7 base plates from ELE	Set	1		
A104/16.22	Two (2) sets of Tamping foot 102mm diameter and 146mm diameter and shanks to fit the supplied vibratory hammer	Set	2		
	17. Consumables				
A104/17.01	Paraffin wax	Kg	50		
A104/17.02	Gunny sack	No	500		
A104/17.03	Plastic bag 900x450x1000 gauge	No	500		
A104/17.04	Plastic bag 450x300x1000 gauge	No	500		
A104/17.05	Filter paper 150mm diameter Whatman No. 5 (Boxes of 100)	No	20		
A104/17.06	Filter paper 400mm diameter Whatman No. 5 (Boxes of 100)	No	20		
A104/17.07	Filter paper 100mm diameter Whatman No. 5 (Boxes of 100)	No	20		
A104/17.08	Filter paper 400mm diameter Whatman No. 54 (Boxes of 100)	No	10		
A104/17.09	Filter paper 270mm diameter with 33 diameter hole at centre Whatman No. 5 (Boxes of 100)	No	15		
A104/17.10	Trichloroethylene (205 Litre Drum)	No	5		
A104/17.11	Dichloromethane	kg	200		
A104/17.12	Cotton waste	kg	50		
A104/17.13	Gas cylinders (13Kg) with compatible gas burners - filled	No	5		
A104/17.14	Sodium sulphate	kg	45		
A104/17.15	Sand for density test	kg	250		
	C/Forward to next page				
	B/Forward from previous page				
	C/Forward to item 1.05				

APPENDIX C

APPENDIX TO BILL ITEM 1.07 ENGINEERS’S SURVEY EQUIPMENT					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
1.01	Digital Total Station <u>reading to 1”accuracy</u> (<i>one second</i>) with the following facilities	No.	0		
	· Inbuilt data logger				
	· Uploading/downloading software				
	· Data transfer cable				
	· Battery (<i>2No</i>)				
	· Battery charger				
	· Tool kit				
	· Two face keyboard				
	· User manual				
	It must have the following inbuilt survey programs as a minimum				
1.02	· Survey				
	· Staking out				
	· Resection/intersection				
	· Traverse				
	· Cogo				
1.02	The following mandatory total station accessories must be included per Total station instrument				
(a)	1No. Heavy duty telescopic tripod(<i>preferably wooden</i>)	No.	0		
(b)	Telescopic plumbing prism pole complete with a prism and prism holder with target and plumbing bubble (<i>length not less than 2.15m</i>)	No.	0		
(c)	Triple prism holder set, in a casing, comprising triple prisms, prisms holder with target, tribrach and a tribrach adaptor	No.	0		
(d)	· Survey umbrella	No.	1		
(e)	· 1No.Telescopic Tripod	No.	0		
1.03	Engineer’s Automatic Level Wild NAK 2 or similar with a tripod and the following specifications	No.	2		
	· Accuracy of 0.7 mm per 1 km double run				
	· Standard magnification of: 32x				
	· Shortest focusing distance of 1.6m				
	· Compensator setting accuracy of 0.3"				
	Total carried forward to next page				
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT (KSHS)
	Brought Forward				
1.04	Hand held GPS with accuracy of 1 Metre	No.	1		
1.05	Set of two way radio communication with a range of 1 kilometer	set.	1		
1.06	5 M Leveling staff with leveling bubble	No.	4		
1.07	3 M Ranging Rods	No.	10		
1.08	Scientific Calculators FX 912ms or equivalent	No.	3		
1.09	50m. Linen Measuring Tape	No.	5		
1.1	1 M stainless steel straight edge	No.	1		
1.11	3 m tape measure	No.	10		
1.12	Sledge hammer 2kg weight	No.	2		
1.13	Mattock	No.	2		
1.14	Pangas (16’')	No.	10		
1.15	Marker Pens	No.	20		
1.16	Reflector Jackets	No.	30		
1.17	Levelling Survey Books	No.	100		
1.18	Provision of Geodetic GNSS receivers comprising of one base and two rovers as per the specifications in Appendix D	No.	1		
1.19	Provide with license and install the latest version of	L.S	1		
Total carried to Bill Item 1.06B					