



KENYA URBAN ROADS AUTHORITY

Efficient and safe urban roads

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P.O. Box 41727-00100, GPO, NAIROBI

Ref. No. KURA/EO/SCM/3/Vol.29 (78)

Date: 13th October, 2021

To All Bidders,

RE: 1. UPGRADING TO BITUMEN STANDARD OF BANISA TOWNSHIP ROADS
TENDER NO. KURA/DEV/HQ/256/2021-2022
2. CONSTRUCTION OF BUTE TOWNSHIP ROADS
TENDER NO. KURA/DEV/HQ/255/2021-2022
3. CONSTRUCTION OF ELDAS TOWNSHIP ROADS
TENDER NO. KURA/DEV/HQ/257/2021-2022
4. CONSTRUCTION OF HABASWEIN TOWNSHIP ROADS
TENDER NO. KURA/DEV/HQ/258/2021-2022
5. UPGRADING TO BITUMEN STANDARDS OF MANDERA TOWNSHIP ROADS
TENDER NO. KURA/DEV/HQ/259/2021-2022

ADDENDUM NO.1.

This is to notify all bidders that an addendum has been issued for the above mentioned tenders. All bidders are required to take note of this addendum and incorporate it in their bid before tender submission.

S/No	Contract Name.	Tender No.	Addendum No.2
1.	Upgrading to Bitumen Standards of Banisa Township Roads	KURA/DEV/HQ/256/2021-2022	- Replace page 131 with the indicated page in Appendix I - Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix II
2.	Construction of Bute Township Roads	KURA/DEV/HQ/255/2021-2022	- Replace page 128 with the indicated page in Appendix III - Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix IV
3.	Construction of Eldas Township Roads	KURA/DEV/HQ/257/2021-2022	- Replace page 144 with the indicated page in Appendix V - Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix VI

4.	Construction of Habaswein Township Roads	KURA/DEV/HQ/258 /2021-2022	• Replace page 144 with the indicated page in Appendix VII • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix VIII
5.	Upgrading to Bitumen Standards of Mandera Town Roads Phase II	KURA/DEV/HQ/259 /2021-2022	• Replace page 133 with the indicated page in Appendix IX • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix X

The submission date changes to 22nd October, 2021 and the tender opening date also changes to 25th October, 2021.

Details of the addendum can be accessed on www.kura.go.ke.


 Saadia Haji Adankhalif
FOR:DIRECTOR GENERAL

S/N o	Contract Name.	Tender No.	Addendum No.2
1	Upgrading to Bitumen Standards of Banisa Town Roads	KURA/DEV/HQ/256/2021-2022	• Replace page 131 with the indicated page in Appendix I • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix II
2	Construction of Bute Township Roads	KURA/DEV/HQ/255/2021-2022	• Replace page 128 with the indicated page in Appendix III • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix IV
3	Construction of Eldas Township Roads	KURA/DEV/HQ/257/2021-2022	• Replace page 144 with the indicated page in Appendix V • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix VI
4	Construction of Habaswein Township Roads	KURA/DEV/HQ/258/2021-2022	• Replace page 144 with the indicated page in Appendix VII • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix VIII
5	Upgrading to Bitumen Standards of Mandera Town Roads Phase II	KURA/DEV/HQ/259/2021-2022	• Replace page 133 with the indicated page in Appendix IX • Replace the entire Bills of Quantities with the indicated Bills of Quantities in Appendix X

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Appendix IX



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The existing alignments comprises of gravel/earth road and is approximately 6.5 Km long. The site of the works shall be within the road reserve and any other places as may be designated in the Construction Contract.

102 Extent of Contract

The major works to be executed under the Contract comprise mainly of but are not limited to the following:

- (i) Provision of facilities to the supervising Engineers
- (ii) Site clearance and top soil removal
- (iii) Earthworks to formation level including pavement Construction as follows:
 - a) Construction of 300mm improved Sub-Grade as shown in the drawings or as instructed by the Engineer
 - b) Construction of 150mm Gravel Sub-Base on carriageway and shoulder
 - c) Construction of 150mm Cement improved Gravel Base on carriageway and shoulders
 - d) Provision of 50mm thick Asphalt Concrete Type 1 as wearing course on carriageway & shoulders
- (iv) Drainage and Protection Works
- (v) Road Furniture
- (vi) Identification and relocation of services
- (vii) Other Ancillary Works
 - Other works ancillary to the main works shall be as follows: -
 - Construction of guardrail barriers as directed by the Engineer
- (viii) Maintenance of passage of traffic through the works
- (ix) Any other activity not listed above but may be deemed necessary and instructed by the Engineer.

(x) 102.1 Projects Components

The works proposed in this Contract include but not limited to the following;

- 7.0-meter-wide carriageway, 0.5m shoulders (where applicable)
- 2 m wide footpaths where necessary with approved coloured concrete paving blocks;
- Lined drain on both side of the road where necessary;
- Road furniture and markings.
- Identification and relocation of services

• 103 Drawings

This clause shall be read as under:

The drawings provided for bidding purpose shall be as contained in the Bid documents. The Engineer may from time to time, in order to enable satisfactory completion of works, revise, amend, or supersede any of these drawings. It shall be the Contractor's responsibility to construct the works in conformity with the latest revision and amendment to the drawings provided that the Engineer has given the Contractor in writing such reasonable prior notices of intention to revise, amend, or supersede as the nature of the intended change required and relevant drawings have been issued to the Contractor.


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Appendix X


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**BILLS OF QUANTITIES FOR UPGRADING TO BITUMEN STANDARDS OF
MANDERA TOWN ROADS PHASE II**

MANDERA TOWNSHIP					
BILL 1	PRELIMINARY AND ADMINISTRATION OVERHEADS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
1.01	Provide or rent accommodation for the Resident Engineer and his/her site staff as per section 132.1	Lump Sum	1.00		-
1.02	Provide and maintain Engineer's office as per Section 132.2 of the special Specifications	Lump Sum	1.00		-
1.03	Provide and maintain furniture and equipment for the Engineer's office as specified for the Contract period and as detailed in Appendix to Bill Item № 1.03.	Lump Sum	1.00		-
1.04	Provide Laboratory equipment and reagents for use by the Engineer's Representative's and his staff for entire duration of the contract as detailed in Appendix to Bill № 1.04.	Lump Sum	1.00		-
1.05	Allow a provisional sum of KShs. 500,000 for offsite Material Testing as directed by the Engineer	Prime Cost	1.00	500,000.00	500,000.00
1.06	Extra over item 1.05 for contractor's overheads and profits	%	500,000.00		-
1.07	Allow a provisional sum of KShs. 500,000.00 for onsite Material Testing as directed by the Engineer to be reimbursed through receipts from Materials lab	Prime Cost	1.00	500,000.00	500,000.00
1.08	Extra over item 1.07 for contractor's overheads and profits	%	500,000.00		-
1.09	Provide with driver and maintain Two (2) Type 2 vehicle, with 2.5 - 2.8 litre turbocharged 4-wheel drive vehicle or similar as per the Engineer's instructions and approval, fitted with air bags, mobile telephone hand free	V/Mn th	48		-



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	headset and a two-way radio for the exclusive use of the Engineer inclusive of the first 4,000 km per vehicle month.				
1.10	Extra over on item 1.09	km	20,000.00		-
1.11	Allow a Provisional Sum of KShs 4,500,000 for the Engineer's miscellaneous account to be spent in whole or part as instructed by the Engineer and to be reimbursed against receipts.	Prime Cost	1.00	4,500,000.00	4,500,000.00
1.12	Extra over item on item 1.11 for contractor's overheads and profits.	%	4,500,000.00		-
1.13	Provide, erect and maintain publicity signs as instructed by the Engineer.	No	2.00		-
1.14	Provide a provisional sum of KShs 4,500,000 for reimbursement to the Contractor for payment of the Engineer's superintendent staff and or Junior Engineer's over time and allowances.	Prime Cost	1.00	4,500,000.00	4,500,000.00
1.15	Include a percentage on Item 1.14 for the Contractor's Overheads and Profit	%	4,500,000.00		-
1.16	Allow for attendance upon the Engineer by the following staff in accordance with Clause 137.2 of Special Specification	LS	1.00		-
1.17	Allow a Provisional Sum of KShs 500,000 for the Engineer's staff mobile phone airtime charges	Prov. Sum	1.00	500,000.00	500,000.00
1.18	Include a percentage on Item 1.17 for the Contractor's Overheads and Profit	%			-
1.19	Provide and maintain survey equipment for the Engineer's office as specified for the Contract period and as detailed in Appendix to Bill Item No 1.19	Lump Sum	1.00		-
1.20	Provide PC Sum of Kshs.2,000,000 to facilitate	PC Sum	1.00	2,000,000.00	2,000,000.00



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	attendance of site meetings.				
1.21	Include a percentage on Item 1.20 for the Contractor's Overheads and Profit	%			
Total Carried Forward to Summary:					
BILL 4	SITE CLEARANCE	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
4.01	Clear site on road reserve including removal of trees, hedges, bushes, and other vegetation or deleterious organic material, grub up roots in accordance with the specifications	m ²	19,500.00		-
4.02	Remove upto 0.2m top soil including removal of all grass, transport to spoil and spread or stockpile for re-use as directed by the Engineer	m ³	6,500.00		-
4.03	Excavate, remove and dispose existing 900mm, 600mm and 300mm dia pipe culverts including the inlet and outlet structures as directed by the Engineer				-
	(a) 900mm	M	100.00		-
	(b) 600mm	M	700.00		-
	©300mm	M	100.00		-
4.04	Dismantling of structures on roadway including sorting out the dismantled material, disposal of unserviceable material completes with leads and lifts as instructed by the Engineer and utilizing the serviceable material free of cost in permanent works.				-
	(a) Stone masonry	m ³	500.00		-
	(b) Plain Concrete	m ³	500.00		-
	(c) Reinforced Concrete	m ³	500.00		-
	(e) Dismantling				-
	(i) MS Pipes and Guard rails	m	200.00		-
	(ii) Fencing	m			

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			1,000.00		-
4.05	Provide a provisional sum of KShs 5,000,000 for relocation of services.	Prov. Sum	1.00	5,000,000.00	5,000,000.00
4.06	Include a percentage on Item 4.05 for the Contractor's Overheads and Profit	%	5,000,000.00		-
Total Carried Forward to Summary					
BILL 5	EARTHWORKS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
	No separate payments shall be made for the overhaul of the material and the cost of such haulage shall be included in the rates and or prices.				
5.01	Cut to spoil in soft material as directed by the Engineer including excavation in swamps.	M³	46,800.00		-
5.02	As Item 5.01 but in hard material	m3	5,000.00		-
5.03	Provide, spread, water, process and compact 300 mm improved subgrade to 100% MDD (AASHTO T99) in two layers of 150 mm thickness.	m3	19,562.40		-
5.04	Fill in soft material to 95% MDD (AASHTO T99) in layers of 150mm each in accordance with Cl. 502, 504, 505, 508, 511, 512, & 513 of the specs.	m3	17,784.00		-
5.05	Provide and fill in hard material as per standard specifications.	m3	1,000.00		-
5.06	Rock fill as directed by the Engineer	m3	1,200.00		-
5.07	Grade and Compact existing ground to at least 100% MDD to a depth of 150mm below ground level.	m3	12,324.00		-
Total carried forward to summary					
BILL 7	EXCAVATION AND FILLING FOR STRUCTURES	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
	No separate payment shall be made for the haulage of surplus or unsuitable excavated material and the cost of such haulage shall be included in the rates and/or prices				


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7.01	Excavate for structure in soft materials.	M3	600.00		-
7.02	Excavations for structures in hard materials	M3	120.00		-
7.03	Provide and place gabions boxes and mattresses as specified or directed by the engineer	M2	1,000.00		-
7.04	Provide and place rock fill to gabions boxes and mattresses.	M3	1,500.00		-
	Total carried forward to summary				-
BILL 8	CULVERTS AND DRAINAGE WORKS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
	No separate payments shall be made for the overhaul of the material and the cost of such haulage shall be included in the rates and or prices.				
8.01	Excavate in soft material to the range of depths stated below for pipe culverts, subsoil drains, headwalls, wing walls, aprons, toe walls, drop inlets, mitre drains, cut off drains, outfall to free flowing, catch water drains and median drains including support of trench sides, backfilling and compacting as specified or as instructed by the Engineer.	m3	15,600.00		-
8.02	As Item 8.01 but hard material (requiring no blasting)	m3	4,000.00		-
8.03	Provide, lay and joint 300mm or 450 mm I.D. Reinforced Cement Concrete pipes for Service ducts as per the drawings or as instructed by the Engineer	m	350.00		-
8.04	Provide, lay and joint 600 mm I.D. Reinforced Cement Concrete pipes including class 15/20 concrete haunching	m	1,000.00		-
8.05	Provide, lay and joint 900 mm Internal Diameter (I.D.) Reinforced Cement Concrete pipes class 15/20 concrete haunching	m	250.00		-


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8.06	Provide, lay and joint 1200 mm I.D. Reinforced Cement Concrete pipes	m	100.00		~
8.07	Provide and place A142 fabric mesh reinforcement for wing walls, toewalls and headwalls	m2	1,624.00		~
8.08	Provide, place and compact class 15/20 for bedding	m3	1,462.00		~
8.09	Provide and place Class 20/20 concrete for side walls, top slabs, trenches, drains, retaining walls, toe walls, head walls, rest crushed sand including formwork and wing walls and aprons, 20% natural and provision and placing of reinforcement as shown on the drawings or as instructed by the Engineer.	m3	150.00		~
8.10	Provide and place class 25/20 concrete as directed by Engineer	M3	460.00		~
8.09	Provide class 20/20 for drainage bed	m3	180.00		~
8.10	Provide, lay and joint 450mm x 225mm Invert Block Drain (IBD) complete with 2 side slabs as per the specifications or as instructed by the Engineer.	m	13,000.00		~
8.11	Extra over Item 8.10 for precast sideslab of 600x225 75mm	M2	8,500.00		~
8.12	Provide stone pitching for lining for drains	m2	4,000.00		~
8.13	Provide class 20/20 scour checks as directed by the Engineer	M3	50.00		~
	Total Carried Forward to Summary:				~
BILL 9	PASSAGE OF TRAFFIC	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
9.01	Allow for the passage of traffic through the works	Lump Sum	1.00		~
9.02	Provide natural gravel of CBR greater than 20% on existing and deviation as specified by the Engineer	M ³	11,700.00		~
	Total Carried Forward to Summary:				~
BILL 11	SHOULDER TO PAVEMENT	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)


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11.0 1	Prepare surface of existing shoulders, accesses, and busbays including benching where necessary water, process and compact as directed by the Engineer.	M ³	1,800.00		-
11.0 2	Provide, place and compact natural gravel to shoulders accesses and busbays	M ³	1,800.00		-
Total Carried Forward to Summary:					-
BILL 12	NATURAL MATERIAL BASES AND SUBBASES	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
12.0 1	Provide, spread, water, process and compact natural gravel for footpath and carriageway as Subbase material as directed by the Engineer.	M ³	12,090.00		-
12.0 2	Provide, place, water, process and compact to 95% MDD (AASHTO T180) natural gravel for base.	m ³	6,825.00		-
Total Carried Forward to Summary:					-
BILL 14	CEMENT AND LIME TREATED SUBBASE AND BASES	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
14.0 1	Provide transport and spread cement or lime for base and subbase as directed by the Engineer	Ton	481.57		-
14.0 2	Mix the sub base and base material with the instructed cement or lime quantity, use a pulvimixer, grade with a motor grader and compact with a road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of base as specified or as instructed by the Engineer.	m ³	8,190.00		-
14.0 3	Allow for curing and protection of treated sub-base as specified or as instructed by the Engineer.	m ²	54,600.00		-
Total Carried Forward to Summary:					-
BILL 15	BITUMINOUS SURFACE TREATMENT	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)

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15.0 1	Clean and prepare surfaces of main carriageway, slip roads, shoulders, bus bays, accesses and junctions, provide, heat and spray on the same MC 30 cutback bitumen prime coat at a rate of spray in the range of 1.0 litre/m ² to 1.2 litres/m ² or as instructed by the Engineer	L	65,520.00		
15.0 2	Clean and prepare surfaces of main carriageway, slip roads, shoulders, bus bays, accesses and junctions, provide, heat and spray two coats of K1-60 bitumen emulsion as tack coat on the bituminous layer in Item 15.01 at a spray rate in the range of 0.3 litre/m ² to 0.8 litre/m ² or as instructed by the Engineer	L	43,680.00		
	Total Carried Forward to Summary:				
BILL 16	BITUMINOUS MIXES	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
16.0 1	Prepare surfaces, provide, mix, lay and compact 50mm Asphaltic Concrete (AC) (Type 1) on base with bitumen and 0/20 mm aggregates on prepared surface of asphalt base layer	M ³	2,730.00		
16.0 2	Prepare surfaces, provide, mix, lay and compact 35mm Asphaltic Concrete (AC) Type 1 as wearing course on base with bitumen and 0/14 mm aggregates on prepared surface of bituminous layer	m3	1,911.00		
	Total Carried Forward to Summary:				
BILL 17	CONCRETE WORKS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
	Note: No haulage will be paid for material this should be included in the rates billed rates.				
17.0 1	Provide, place and compact concrete class 15/20 for blinding	M3	65.00		
17.0 2	Provide, place and compact concrete class 25/20	M3	150.00		
17.0	Vertical format class F2 finish	M2			



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3			170.00		~
17.0 4	Horizontal format class F2 finish	M2	70.00		~
17.0 5	Provide, cut, bend and fix steel reinforcement of diameter greater than 16mm	Ton	45.00		~
17.0 6	Provide, cut, bend and fix steel reinforcement of diameter less than or equal to 16mm	Ton	25.00		~
	Total Carried Forward to Summary:				~
BILL 20	ROAD FURNITURE REPAIR AND MAINTENANCE	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
20.0 1	Provide and lay hot applied thermoplastic road marking compound in approved colour and shade (ASTM 9) for road marking on bituminous surface on centerline, 100 mm, edge line 150 mm wide 3.0 mm thick, using fully automatic extrusion machine and using pre-melter for melting thermoplastic material including cleaning the surface of all dirt, dust, and other foreign matter, complete with demarcation at site/pre-marking, finishing and managing the traffic movements. Marking to be done as per the specifications, detailed drawings and as instructed by the Engineer.				~
	(i) For lane marking (broken lines) with yellow paint, 100 mm wide	M2	390.00		~
	(ii) For edge lines (continuous line) with white paint, 150 mm wide	M2	1,560.00		~
20.0 2	Supply and fix regulatory/mandatory road sign boards made up with high intensity grade retro-reflective type sheeting (ASTM 9) complete as per the drawings and Technical specifications.	No	10.00		~


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20.0 3	Supply and fix cautionary/warning road sign boards made up with high intensity grade retro-reflective type sheeting (ASTM 9) complete as per the drawings and Technical Specifications	Nº	10.00		
20.0 4	Supply and fix informatory road sign boards made up with high intensity grade retro-reflective type sheeting complete as per drawing and Technical specifications.				
	(i) Area less than 1.0 m2	Nº	10.00		
	(ii) Area more than 1.0 m2 but less than 2 m2	Nº	10.00		
20.0 5	Excavate for, provide and place 250x125mm class 25/20 precast concrete straight raised kerbs haunched in 100mm thick class 15/20 concrete base bedding and mortar joined in support to carriageaways, bus bays and junctions as directed by the Engineer	M	6,500.00		
20.0 6	Excavate for, provide, lay and joint 100mm x 125mm wide precast concrete channels to radius greater than 12m and laid on 100mm thick concrete class 15/20 bed and haunch as specified	M	45,500.00		
20.0 7	Construct AC bumps on carriageway in locations directed by the Engineer	M3	10.00		
	Total Carried Forward to Summary:				
BILL Nº 21: Miscellaneous bridge works.					
ITE M	MISCELLANEOUS BRIDGE WORKS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
21.0 1	Provide and apply bituminous waterproof to abutments and wingwalls in two layers at a rate of 0.55L/m2 as shown in the drawings or as directed by the Engineer.	m ²	400.00		


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21.0 2	Provide and place as directed by the Engineer P.V.C. pipes of diameter 50mm to form weep holes in abutment and wingwalls.	m	160.00		-
21.0 3	Provide and place handrails to bridge deck including steel post, anchors and welding as directed by the Engineer.	M	240.00		-
	Total carried forward to summary				-
BILL 22	DAY WORKS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
Note :	Any plant employed upon Day works which have power rating lower than that specified, shall be paid for at rates lower than those in the Schedule of Day works. The reduction in the payable rate shall be in proportion to the power rating below that specified.				
22.0 1	Crawler Dozer with Hydraulic Ripper				-
	(a) 100-135 Kw rated flywheel power	hr	10.00		-
	(b) 136-185 Kw rated flywheel power	hr	5.00		-
	(c) 186-250 Kw rated flywheel power	hr	5.00		-
22.0 2	Motorized rubber tyred single engine scrapers				-
	(a) Up to 16m3 heaped capacity	hr	5.00		-
	(b) 17-26 m3 heaped capacity	hr	5.00		-
22.0 3	Motorized rubber tyred twin engine scrapers				-
	(a) Up to 16 m3 heaped capacity	hr	5.00		-
	(b) 17-26 m3 heaped capacity	hr	5.00		-
22.0 4	Motor Graders with Hydraulic Ripper or Scarifier				-
	(a) 80-110 Kw rated flywheel power	hr	5.00		-
	(b) 111-120 Kw rated flywheel power	hr	8.00		-

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	(c) 121-160 Kw rated flywheel power	hr	5.00		~
22.0 5	Tracked Excavator Cranes				~
	(a) 20-28t max working load	hr	5.00		~
	(b) 28.1-36.1t max working load	hr	5.00		~
	(c) 36.1-56t max working load	hr	5.00		~
22.0 6	Excavators hydraulic wheeled dual purpose				~
	(a) 0.6-0.8m ³ rated bucket capacity	hr	5.00		~
	(b) 0.81-1.0m ³ rated bucket capacity	hr	8.00		~
22.0 7	Wheeled loaders 4X4 articulated				~
	(a) 1.5-2.0 m ³ SAE rated capacity	hr	5.00		~
	(b) 2.01-3m ³ SAE rated capacity	hr	5.00		~
	(c) 3-5 m ³ SAE rated capacity	hr	5.00		~
22.0 8	Crawler Loaders with Hydraulic Ripper				~
	(a) 0.8-1.3m ³ SAE rated capacity	hr	5.00		~
	(b) 1.31-1.99 m ³ SAE rated capacity	hr	5.00		~
	(c) 2-2.5 m ³ SAE rated capacity	hr	5.00		~
22.0 9	Rollers Towed vibratory including tractor				~
	(a) 6.5-8.8 t un-ballasted weight	hr	5.00		~
	(b) 8.6-11.7 t un-ballasted weight	hr	5.00		~
22.1	Road Roller deadweight (Steel Three Wheel)				~
	(a) 6.5 -8.8 t un-ballasted weight	hr	5.00		~
	(b) 8.6-11.7 t un-ballasted weight	hr	5.00		~
22.1 1	Roller rubber tyred self propelled				~
	(a) up to 1 t per wheel	hr	5.00		~
	(b) 1.1 t -2.0 t per wheel	hr	5.00		~
22.1 2	Roller Vibratory single roll Rubber tyred, 8.3-10.5 t un-ballasted weight	hr	8.00		~


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22.1 3	Vibrating plate compactor 114-200 kg operating weight	hr	5.00		~
22.1 4	Compressor rated by normal delivery of free air per minute complete with all tools				~
	(a) 6.0-7.4 m ³ /min	hr	5.00		~
	(b) 7.5-9.7m ³ /min	hr	5.00		~
	(c) 9.8-25.5m ³ /min	hr	5.00		~
22.1 5	Mobile rubber tyred rough terrain crane 23-40t max working load	hr	5.00		~
22.1 6	Small dumpers 751kg-1.2t max rated payload	hr	5.00		~
22.1 7	Pumps (Inclusive of all hoses)				~
	(a) 50-76mm delivery	hr	5.00		~
	(b) 77-101mm delivery	hr	5.00		~
22.1 8	Rubber tyred tractors including trailer. 50-70kw rated flywheel power	hr	5.00		~
22.1 9	Concrete mixers (wet capacity)				~
	(a) up to 100 litres	hr	5.00		~
	(b) 101-200 litres	hr	5.00		~
	(c) 201-300 litres	hr	5.00		~
22.2	Transit Mixer 4.5 m ³ /hour	hr	5.00		~
22.2 1	Concrete pump of 45 and 30 m ³ capacity	hr	5.00		~
22.2 2	Concrete poker vibrator	hr	5.00		~
22.2 3	Concrete pump of 45 and 30 m ³ capacity	hr	5.00		~
22.2 4	Lorries - Flatbed				~
	(a) up to 7.5t gross vehicle weight	hr	5.00		~
	(b) 7.6-12.0t gross vehicle weight	hr	5.00		~
22.2 5	Lorries - Tippers				~
	(a) up to 11t gross vehicle weight	hr	5.00		~
	(b) 11-17t gross vehicle weight	hr	5.00		~


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	(c) 17.1- 25t gross vehicle weight	hr	10.00		~
22.2 6	Van, Pickup or similar utility vehicle				~
	(a) up to 1 t carrying capacity	hr	5.00		~
	(b) 1.1-2.6 t carrying capacity	hr	5.00		~
22.2 7	Self propelled water or fuel tanker				~
	(a) 3500-4550 litre capacity	hr	5.00		~
	(b) 4551-7000 litre capacity	hr	5.00		~
	(c) 7001-12000 litre capacity	hr	5.00		~
22.2 8	Bitumen pressure distributor				~
	(a) 3500-4550 litre capacity	hr	5.00		~
	(b) 4551-9000 litre capacity	hr	5.00		~
22.2 9	Hot mix plant - 60 tonnes per hour	hr	5.00		~
22.3	Wet mix plant - 60 tonnes per hour	hr	5.00		~
22.3 1	Hydrostatic paver & finisher with sensor control	hr	5.00		~
22.3 2	Batching and mixing plant 15-20 m ³ capacity	hr	5.00		~
22.3 3	Concrete paver finisher with 40 HP motor	hr	5.00		~
22.3 4	Chip spreader	hr	5.00		~
22.3 5	Mechanical broom	hr	5.00		~
22.3 6	Kerb making machine	hr	5.00		~
22.3 7	Road marking machine	hr	5.00		~
22.3 8	Electric generator				~
	(a) 100 KVA	hr	5.00		~
	(b) 125 KVA	hr	5.00		~
22.3 9	Crusher Plant	hr	5.00		~
22.4	Pulvimixer	hr	5.00		~
22.4 1	LABOUR				~
	(a) Unskilled Labour	hr			~

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			15.00		~
	(b) Skilled Labour	hr	5.00		~
	(c) Artisan	hr	5.00		~
	(d) Plant Operator	hr	15.00		~
	(e) Driver	hr	15.00		~
	(f) Foreman	hr	15.00		~
	(g) Office attendants and chainmen	hr	5.00		~
	(h) Blaster (Certified)	hr	5.00		~
	MATERIALS				~
	All items of materials must be priced to comply with the Specifications.				~
22.4 2	Ordinary Portland Cement	tonne	2.00		~
22.4 3	Hydrated Lime	tonne	2.00		~
22.4 4	Mild Steel				~
	(a) Up to and including 16 mm diameter	tonne	2.00		~
	(b) Over 16 mm diameter	tonne	2.00		~
22.4 5	High Yield Steel				~
	(a) Up to and including 16mm diameter	tonne	2.00		~
	(b) Over 16mm diameter	tonne	2.00		~
22.4 6	Aggregates for Concrete				~
	(a) Fine	m3	15.00		~
	(b) coarse	m3	15.00		~
22.4 7	Shuttering Timber				~
	(a) F1 finish	m2	10.00		~
	(b) F2 finish	m2	20.00		~
	(b) F3 finish	m3	15.00		~
22.4 8	Chippings				~
	(a) Class 3 any size	m3			~


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			5.00		-
	(b) fine aggregate	m3	5.00		-
22.4 9	Cutback Bitumen and emulsion				-
	(a) 80/100 penetration grade bitumen	litre	15.00		-
	(b) MC 3000 cut-back bitumen	litre	15.00		-
	(c) MC 70 cut-back bitumen	litre	15.00		-
	(d) K-160 bitumen emulsion	litre	15.00		-
22.5	Gabion mesh, size 1.0 m x 1.0 m x 1.0 m	m2	5.00		-
22.5 1	Stone for gabions	m3	5.00		-
22.5 2	Dynamite stick explosives	kg	5.00		-
22.5 3	Explosive fuse	m	5.00		-
22.5 4	Detonators	No	5.00		-
	BILL 22 TOTAL CARRIED TO SUMMARY PAGE				-
BILL 23	PAVING BLOCKS	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
23.0 1	Supply, lay and compact 50mm thick precast concrete paving blocks with 49N/mm2 cube crushing strength conforming to BS 6717 Part I of 1986 or KEBS equivalent standard	m2	23,200.00		-
23.0 2	Provide, spread, 50mm thick quarry dust for voids and as layer above gravel	M3	1,160.00		-
	BILL 23 TOTAL CARRIED TO SUMMARY PAGE				-
BILL 25	CROSS CUTTING ISSUES	UNIT	QUANTITY	RATE (KShs)	AMOUNT (KShs)
25.0 1	Allow a Prime Cost sum of Kshs.500,000.00 for preparation of Environmental and social Reports.	PC Sum	1.00	500,000.00	500,000.00
25.0 2	E.O. item 25.01 for Contractor's overheads and profits.	% of item	500,000.00		-


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25.03	Allow for prime cost of 500,000.00 for Environmental monitoring and provision of Environmental mitigation Measures as directed by the Engineer.	PC Sum	1.00	500,000.00	500,000.00
25.04	E.O. item 25.03 for Contractor's overheads and profits.	% of item	500,000.00		-
25.05	Allow for prime cost of Kshs. 1000,000.00 landscaping and beautification including planting and maintaing of trees, shrubs, and grasses as directed by the Engineer.	PC Sum	1.00	1,000,000.00	1,000,000.00
25.06	E.O. item 25.05 for Contractor's overheads and profits.	% of item			-
25.07	Allow for the engagement of a HIV/AIDS specialist subcontractor to deal with preventive and awareness activities as per programe to be approved by the Engineer.	Months	24.00		-
25.08	Allow for preparation and submission of Monthly reports on HIV/AIDS awareness and prevention action activitiess. Reports to be tabled at site meetings.	Months	24.00		-
BILL 25 TOTAL CARRIED TO SUMMARY PAGE					

SUMMARY OF BILL OF QUANTTTIES

BILL ITEM	DESCRIPTION	AMOUNT(KShs)
1	Preliminary 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	
11	Shoulder to pavement	
12	Natural Material fo Subbase and Base	


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14	Cement or Lime Treatment for Base and Subbase	
15	Bituminous Surface Treatment and Surface Dressing	
16	Bituminous Mixes	
17	Concrete Works	
20	Road Furniture	
21	Miscellaneous bridge works.	
22	Schedule of Dayworks	
23	Paving blocks	
25	ENVIRONMENTAL MITIGATION MEASURES & HIV AIDS CAMPAIGN	
(A)	SUB-TOTAL (1)	
(B)	Add 2.5% VARIATION OF PRICE of sub-total (1)	
(C)	Add 2.5% CONTINGENCY of sub-total (1)	
(D)	SUB-TOTAL (2) = (A+B+C)	
(E)	Add ...16% VAT of sub-total (2)	
GRAND TOTAL CARRIED FORWARD TO FORM OF BID AS BID SUM 1 (D+E)		

APPENDIX A1.03 TO BILL ITEM 1.03: FURNITURE AND EQUIPMENT FOR R.E.'S OFFICE					
ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	1. ENGINEER'S MAIN OFFICE AND FURNITURE				
A1.02/1.01	Executive Desk	No	1		-
A1.02/1.02	Desk with lockable drawer	No	2		-
A1.02/1.03	Chairs executive (swivel type)	No	3		-
A1.02/1.04	Lockable steel cabinets (with 4 drawers)	No	8		-
A1.02/1.05	Bookshelf 2 door with drawers & shelves 2m long	Set	1		-
A1.02/1.06	Bookshelf 3 door with drawers & shelves 2m long	No	1		-
A1.02/1.07	Stapling machine (Ofrex) and pins	No	4		-
A1.02/1.08	Paper punch	No	2		-
A1.02/1.09	3m tape measures	No			-


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			4		
A1.02/1.10	Scientific calculator (Fx 951MS or above)	No	5		-
A1.02/1.11	Fully equipped first aid kit	No	1		-
A1.02/1.12	Waste paper basket	No	2		-
A1.02/1.13	Electric heater fans	No	1		-
A1.02/1.14	Padlock	No	2		-
A1.02/1.15	Wall clocks battery powered	No	1		-
A1.02/1.16	Filling trays	No	10		-
A1.02/1.17	Chairs (standard desk type)	No	5		-
A1.02/1.18	Triplicate book	No	2		-
A1.02/1.19	Diary	No	5		-
A1.02/1.20	Inventory Book	No	4		-
A1.02/1.21	Rulers	No	4		-
A1.02/1.22	Hard cover note books (4quire)	No	10		-
A1.02/1.23	Survey Books (Rise and Fall)	No	10		-
A1.02/1.24	Field note books	No	24		-
A1.02/1.25	Rims of Conqueror printing paper	No	4		-
A1.02/1.26	A4 Envelops 50No. per packet	No	10		-
A1.02/1.27	B5 Envelops 50No. per packet	No	10		-
A1.02/1.28	B6 Envelops 50No. per packet	No	10		-
A1.02/1.29	Payment voucher books	No	4		-
A1.02/1.30	Engineer's pens(Uniball)0.7mm 10No.	No	10		-
A1.02/1.31	Pens (Bic Ball points) 25 in a Pkt	No	10		-
A1.02/1.32	Cellotape	No	5		-
A1.02/1.33	Office glue stick	No	4		-
A1.02/1.34	Dictionary	No	1		-



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A1.02/1.35	Photocopy / Printing papers (Reams)	No	60		~
A1.02/1.36	Masking tape	No	4		~
A1.02/1.37	Highlighters (Dozens)	No	2		~
A1.02/1.38	Spring files	No.	10		~
A1.02/1.39	Box files(500pages and above)	No	15		~
A1.02/1.39	HP laserjet P2055	No	3		~
A1.02/1.40	Multifunctional printer(Kyocera	No.	1		~
A1.02/1.41	Laptops	No.	2		~
A1.02/1.42	Desktops	No	3		~
A1.02/1.43	Provide office Rent/construct Resident Engineers office for duration of contract	Months	30		~
	Total carried to Bill Item 1.03				~
APPENDIX B1.04 TO BILL ITEM 1.04 - FURNITURE, EQUIPMENT AND REAGENTS FOR THE ENGINEER'S LABORATORY					
	1. FURNITURE				
B1.03/1.01	Desk 2.2x0.9 m with chair and lockup drawers	No	2		~
B1.03/1.02	Desk chair (standard)	No	6		~
B1.03/1.03	Stationery cupboard, 1.2 m ³ , lockable	No	1		~
B1.03/1.04	Steel filing cabinet, 4 drawers, lockable	No	1		~
B1.03/1.05	Steel filing cabinet, 2 drawers, lockable	No	1		~
B1.03/1.06	Bookshelf, 3 shelves 1.2 m long (to hold box files)	No	1		~
B1.03/1.07	Table - 6 m ²	No	1		~
B1.03/1.08	Two Plate electric cooker	No	1		~
B1.03/1.09	Fire extinguisher, 10 litre capacity, CO2 type	No	4		~
B1.03/1.10	Complete first aid kit	No	2		~
	EQUIPMENT				

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	(The following equipment shall be purpose made for use in the Engineer's laboratories and shall comply with the relevant British (BS) or American (AASHTO) Standard)				
	2. General Equipment				
B1.03/2.01	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		-
B1.03/2.02	Set of guards for above press.	No	1		-
B1.03/2.03	Compaction mould complete with base plate and extension collar, 101.6 mm dia x 116.43 mm high	No	6		-
B1.03/2.04	2.49kg. Compaction hammer, drop regulated to 304.8mm	No	1		-
B1.03/2.05	4.535kg compaction hammer, drop regulated to 457.2mm	No	1		-
B1.03/2.06	Electric vibrating Kango Hammer fitted with steel tamper (BS1377) with support frame	No	1		-
B1.03/2.07	Straight edge 300 mm long with handles	No	6		-
B1.03/2.08	Steel Tamper (BS1377) compatible with Kango hammer	No	2		-
B1.03/2.09	Compaction mould 152.4 mm. dia x 116.43 mm complete with base plate and extension collar, 101.6 mm	No	6		-
B1.03/2.10	Galvanized metal tray 1m x 0.5m x 75 mm deep	No	6		-
B1.03/2.11	75mm brush	No	4		-



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B1.03/2.12	Semi-automatic balance, 25kg Capacity accurate to 1g, including weights	No	3		
B1.03/2.13	20mm BS Sieve, 300mm diameter	No	2		
B1.03/2.14	Stop Clock	No	2		
B1.03/2.15	Thermostatically controlled electric oven 105-1100C, capacity 0.225 m ³	No	1		
B1.03/2.16	Moisture content tins, 75 mm dia, Cadmium or aluminium plated	No	60		
B1.03/2.17	Cone penetrometer with gauge and automatically controlled test cup	No	1		
	3. Density (Sand replacement method BS 1377)				
B1.03/3.01	Metal containers 450mm diameter	No	4		
B1.03/3.02	Stainless steel tray 305mm diameter	No	4		
B1.03/3.03	Metal tray with 150 mm diameter hole in the centre, 300mmx300mm square or equivalent area, 40mm deep	No	2		
B1.03/3.04	Metal tray with 200mm diameter hole in the centre, 500mm x 500mm square , 50 mm deep	No	2		
B1.03/3.05	Steel pegs for fixing tray in position	No	40		
B1.03/3.06	Sand pouring cylinder, 150 mm diameter	No	1		
B1.03/3.07	Sand pouring cylinder, 215 mm diameter	No	1		
B1.03/3.08	Cold steel chisel 20mm x 300mm	No	6		
B1.03/3.09	Cold steel chisel 10mm x 250mm	No	6		
B1.03/3.10	1.5kg hammer	No	3		



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B1.03/3.11	Scoop for removing excavated material from hole, 250 mm long handle	No	3		-
B1.03/3.12	100mm brush, soft	No	3		-
B1.03/3.13	50mm brush, soft	No	3		-
B1.03/3.14	Primus gas stove	No	3		-
B1.03/3.15	Calibrating can 150 mm diameter x 150 mm deep	No	4		-
B1.03/3.16	Ditto but 200 mm diameter x 250 mm deep	No	4		-
	4. Density (Nuclear Density method AASHTO T238)				
B1.03/4.01	Nuclear moisture/density gauge (Troxler 3411B or similar approved)	No	1		-
B1.03/4.02	Hole forming device (drill rod)	No	3		-
B1.03/4.03	Guide for above	No	3		-
B1.03/4.04	5. CBR (AASHTO T193)				-
B1.03/4.05	CBR load frame (electric and hand operated)	No	1		-
B1.03/4.06	Stabilising bar for the above	No	1		-
B1.03/4.07	Proving ring for above, 10 kN and 28 kN capacity	set	2		-
B1.03/4.08	Penetration gauge range 0 - 25mm	No	2		-
B1.03/4.09	CBR piston including bracket	No	2		-
B1.03/4.10	Swell measurement tripod complete with guage calibrated in 0.01mm divisions	No	3		-
B1.03/4.11	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	60		-
B1.03/4.12	Perforated swell plate 150 mm dia with an adjustable centre post				-
B1.03/4.13	of rust proof metal provided with a lock-nut	No	60		-
B1.03/4.14	2.25 kg split surcharge weight	No	4		-


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B1.03/4.15	Set of annular surcharge weights	No	50		-
B1.03/4.16	Solid base plate for CBR mould	No	3		-
B1.03/4.17	Static compaction displacer discs 1 Nox 61.4 mm, 1 No x 50.8mm and 2 Nox 38.8 mm thick	set	2		-
B1.03/4.18	Disc lifting handle	No	2		-
B1.03/4.19	Central extruder, complete with 20kN hydraulic jack and accessories	No	1		-
B1.03/4.20	Proving ring for the above	No	2		-
B1.03/4.21	CBR piston including bracket	No	2		-
B1.03/4.22	Swell measurement tripod complete with guage calibrated in 0.01mm divisions	No	3		-
B1.03/4.23	Soaking tank for CBR mould sufficient for 50 moulds	No	1		-
	6. Relative Density of Aggregates (BS 812)				
B1.03/6.01	Wire mesh basket with apertures not greater than 6.5 mm large enough to contain 2.5 kg of aggregate	No	2		-
B1.03/6.02	A stout watertight container in which the basket can be freely suspended	No	2		-
B1.03/6.03	Soft absorbent cloth (tea towel)	No	40		-
B1.03/6.04	Shallow tray of area not less than 0.065 m ²	No	2		-
B1.03/6.05	An airtight container of similar capacity to the basket	No	2		-
B1.03/6.06	Pycnometer of 1 litre capacity	No	4		-
B1.03/6.07	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		-
B1.03/6.08	Hairdrier (electric)	No	2		-
B1.03/6.09	7. Flakiness (BS 812)				-
B1.03/6.10	Thickness gauge (various sizes)	No	2		-
B1.03/6.11	8. Sieve Analysis (BS 1377)				-



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B1.03/6.12	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		
B1.03/6.13	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		
B1.03/6.14	Electric sieve shaker	No	1		
B1.03/6.15	BS sieve 200mm diameter 0.425 and 0.075 mm	set	1		
B1.03/6.16	1 m x 1 m x 75mm deep galvanized metal tray	No	10		
B1.03/6.17	Riffle box with 50mm slots (BS 1377)	No	2		
9. Miscellaneous Equipment					
B1.03/9.01	Wheel barrow	No	4		
B1.03/9.02	Dustpan and brush	No	4		
B1.03/9.03	Shovel	No	6		
B1.03/9.04	Pick axe with handle	No	6		
B1.03/9.05	Metal scoop, large (150mm wide)	No	4		
B1.03/9.06	Metal scoop, medium (100mm wide)	No	6		
B1.03/9.07	Garden trowel	No	6		
B1.03/9.08	Steel tray 0.3m x 0.3m x 0.01m deep	No	20		
B1.03/9.09	3.5 kg hammer	No	2		
B1.03/9.10	7kg hammer	No	2		
B1.03/9.11	Rubber mallet (1kg)	No	4		
B1.03/9.12	Cold chisel	No	12		
B1.03/9.13	Oven, electric thermostatically controlled to any temperature between 100 and 1500C, 0.225 cu.m. minimum capacity including dial thermometer range 0-1600 0 C (BS 1377)	No	1		
B1.03/9.14	3 metre straight-edge including calibrated wedges	No	2		



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B1.03/9.15	500mm x 500mm x 10mm plate glass (BS 1377)	No	4			-
B1.03/9.16	Steel rod 75mm long x 3.2mm diameter	No	4			-
B1.03/9.17	Palette knife 200mm long blade	No	3			-
B1.03/9.18	Palette knife 100mm long blade	No	4			-
B1.03/9.19	BS sieve 450mm diameter, 37.5mm	No	1			-
B1.03/9.20	BS sieve 450mm diameter, 20mm	No	1			-
B1.03/9.21	BS sieve 450mm diameter, 5mm	No	1			-
B1.03/9.22	BS sieve 450mm diameter, 0.425mm	No	2			-
B1.03/9.23	BS sieve 450mm diameter, 0.3mm	No	2			-
B1.03/9.24	BS sieve 450mm diameter, 0.075mm	No	2			-
B1.03/9.25	Set of lid and receiver for metal scoop and steel trays	No	2			-
B1.03/9.26	BS Sieve brush	No	10			-
B1.03/9.27	Measuring cylinder set, 25 ml, 100 ml, 500 ml, 1000 ml, 2000 ml	set	3			-
B1.03/9.28	Glass jar capacity 5 litres with lid	No	10			-
B1.03/9.29	200mm x 200mm x 20mm cadmium plated or aluminium tin	No	30			-
B1.03/9.30	Electronic balance capacity 1000 g, accurate to 0.01gm.	No	1			-
B1.03/9.31	Balance 2000 g capacity accuracy to 0.1g (manual), including weights	No	1			-
B1.03/9.32	Balance 50kg capacity accurate to 10gm including weights	No	1			-
B1.03/9.33	Still for producing distilled water	No	1			-
B1.03/9.34	Polythene or glass 20 litres storage vessel with tap at bottom	No	3			-
B1.03/9.35	Stiff broom	No	5			-
B1.03/9.36	Vernier calipers, 150mm	No	2			-
B1.03/9.37	Vernier calipers, 250mm	No	2			-
B1.03/9.38	Pestle and mortar	No				-

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			2		
B1.03/9.39	Linear shrinkage mould (BS 1377)	No	8		-
B1.03/9.40	Liquid Limit Device	No	2		-
B1.03/9.41	Average least dimension gauge	No	2		-
B1.03/9.42	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 200mm and 300 mm, 1 pair round nosed pliers, 1 pair general purpose pliers,	No	1		-
B1.03/9.43	Plastic or metal bucket including lid, 10 litres capacity	No	5		-
B1.03/9.44	Plastic or metal bucket including lid, 20 litres capacity	No	5		-
B1.03/9.45	Polythene wash bottle (500 ml)	No	6		-
B1.03/9.46	Thermometer, range -10°C to 150°C, glass (BS 593)	No	4		-
B1.03/9.47	Laboratory thermometer, range + 0°C to + 250°C (BS 593)	No	2		-
B1.03/9.48	Maximum and minimum thermometer (BS 692)	No	2		-
B1.03/9.49	Rain gauge	No	5		-
B1.03/9.50	Portable dial thermometer + 50°C to +250°C accurate to $\pm 3\%$	No	3		-
B1.03/9.51	Ditto with 0.75m long stem	No	1		-
B1.03/9.52	Pocket thermometer + 50°C to +250°C accurate to $\pm 3\%$ with 0.1 m stem	No	2		-
B1.03/9.53	5 litre capacity steel storage containers with leak and dust proof lids for storage of bitumen samples	No	100		-
B1.03/9.54	Hotplate 200mm diameter with Simmerstat heat control unit.	No	2		-
B1.03/9.55	450mm diameter x 150mm deep metal mason's basin	No	10		-
	11. Concrete: Slump and Cube Manufacture (BS 1881)				-

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B1.03/11.01	Slump cone, tamping rod and base	Set	3			~
B1.03/11.02	Concrete cube mould, 150mm cube	No	30			~
B1.03/11.03	Soaking tank for cubes (capacity 50 No.)	No	1			~
B1.03/11.04	Cube tamping bars	No	3			~
	12. Concrete: Cube Compression Testing					~
B1.03/12.01	Concrete compression machine to BS1610 Grade A with 300mm gauge, rectangular platens, capacity 1560 kN with load spacer	No	1			~
B1.03/12.02	Safety guard for above	No	1			~
B1.03/12.03	50mm distance piece	No	1			~
B1.03/12.04	70mm distance piece	No	1			~
B1.03/12.05	Electro-mechanical load pacer, 100 mm or equivalent distance piece	No	1			~
	13. Aggregate and Chippings					~
B1.03/13.01	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			~
B1.03/13.02	Beaker 250ml	No	2			~
B1.03/13.03	Aggregate Crushing Value Apparatus, 130 mm nominal diameter, including plunger and base plate	No	1			~
B1.03/13.04	Tamping rod and metal measure for above	Set	2			~
B1.03/13.05	Los Angeles Abrasion to ASTM standards	No	1			~
B1.03/13.06	Set of 12 abrasive charges	No	1			~
B1.03/13.07	Thermometer, 0°C to +50°C	No	2			~
B1.03/13.08	Thermometer, 0°C to +250°C	No	2			~



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B1.03/13.09	Reagent grade Silica gel, 500g container	No	100			-
B1.03/13.10	Aggregate Crushing Value apparatus, 150mm nominal diameter, including plunger and base plate	No	1			-
B1.03/13.11	Tamping rod and metal measure for above (BS 812)	set	1			-
B1.03/13.12	Transverse distribution of spray test for bitumen distributor (tray test to BS 1707) equipment	set	1			-
B1.03/13.13	Steel tray 20 mm deep x 0.1 m ² (for measuring bitumen spray quantity)	No	2			-
B1.03/13.14	Purpose-made detachable handle 1.5m long to pick above trays	No	2			-
	14. Bitumen Spray Test (BS 1707) and Penetration Test					-
B1.03/14.1	Transverse distribution of spray test bitumen distributor (depot tray test to BS 1707) or equivalent.	Set	1			-
B1.03/14.2	Steel tray 20 mm deep x 0.1m ² (for measuring bitumen spray rates) with purpose made detachable handle 1.5m long	No	2			-
B1.03/14.3	(a) ELE - Automatic bitumen penetrometer (EL 46-5380/01) with accessories with IP 380C thermometer	No	1			-
	(b) Penetration test cup	No	3			-
	(c) Certified bitumen penetration needle	No	3			-
	15. Marshall Test (ASTM D 1559)					-
B1.05/15.01	Thermometer (50oC - 250oC), 50mm diameter with 180mm stainless steel stem	No	2			-
	16. Bitumen Extraction Test					-
	A) Extractor Bottle Method BS 598 Part 2					-
B1.03/16.01	Electronic top pan balance 4kg capacity, sensitive to 0.1gm	No	1			-
B1.03/16.02	Flat bottomed scoop	No	3			-

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B1.03/16.03	Steel garden trowel	No	2		-
B1.03/16.04	Large steel spoon	No	2		-
B1.03/16.05	Heat resistant gloves	pair	10		-
B1.03/16.06	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		-
B1.03/16.07	Steel bottle 600ml capacity with 49mm rubber stopper	No	2		-
B1.03/16.08	Steel bottle 2500ml capacity with 71mm rubber stopper	No	2		-
B1.03/16.09	Steel bottle 7000ml capacity with 71mm rubber stopper	No	2		-
B1.03/16.10	Flask funnel for fitting to the 700ml steel bottle with rim of funnel retaining sieve 200mm nominal diameter	No	2		-
B1.03/16.11	Bottle roller compact bench mounted unit designed to rotate 2 bottles simultaneously about longitudinal axis	No	1		-
B1.03/16.12	Pressure filter complete with cutting tool for making hole in the filter paper	No	1		-
B1.03/16.13	Filter funnel to take 200mm nominal diameter sieves	No	2		-
B1.03/16.14	Centrifuge complying with BS 598	No	1		-
B1.03/16.15	Binder recovery	No	1		-
B1.03/16.16	Volumetric flask 250ml, 500ml, 1000ml and 2000ml capacity	set	2		-
					-
B1.03/16.17	Recovery still for Dichloromethane	No	1		-
	B) Hot Extractor Method BS 598 Part 2				-
B1.03/16.18	Hot extractor complete with wire gauze container gasket, cork lid and support assembly	No	2		-

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B1.03/16.19	Dean and Stark receiver with condenser to suite Trichloroethylene	No	2		-
B1.03/16.20	Gyratory compactor ELE Servo Pac or equivalent with 1 x100mm and 1 x 150mm moulds	No	1		-
B1.03/16.21	PRD Vibrating hammer compactor complete with 6 moulds, 7 base plates from ELE	No	1		-
B1.03/16.22	Tamping foot 102mm diameter and 146mm diameter and shanks to fit the supplied vibratory hammer	Set	2		-
	17. Consumables				-
B1.03/17.01	Paraffin wax	Kg	50		-
B1.03/17.02	Gas	Kg	1,000		-
B1.03/17.03	Gunny sack	No	400		-
B1.03/17.04	Plastic bag 900x450x1000 gauge	No	2,000		-
B1.03/17.05	Plastic bag 450x300x1000 gauge	No	2,000		-
B1.03/17.06	Filter paper 150mm diameter Whatman No. 5 (Boxes of 100)	No	40		-
B1.03/17.07	Filter paper 400mm diameter Whatman No. 5 (Boxes of 100)	No	20		-
B1.03/17.08	Filter paper 100mm diameter Whatman No. 5 (Boxes of 100)	No	20		-
B1.03/17.09	Filter paper 400mm diameter Whatman No. 54 (Boxes of 100)	No	5		-
B1.03/17.10	Filter paper 270mm diameter with 33 diameter hole at centre Whatman No. 5 (Boxes of 100)	No	15		-
B1.03/17.11	Trichloroethylene	kg	1,000		-
B1.03/17.12	Dichloromethane	kg	1,000		-
B1.03/17.13	Cotton waste	kg	400		-
	Total of Appendix B1.04 Carried to Bill No.1 item 1.04				-



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	APPENDIX B1.16 TO BILL ITEM 1.16-attendance upon the Engineer by the following staff				
B1.14/1.0	Assistant Engineer	M.mth	24		-
B1.14/1.1	2 no. Inspector of works	M.mth	48		-
B1.14/1.2	2 no. Laboratory Technician	M.mth	48		-
B1.14/1.3	Survey Assistant	M.mth	24		-
B1.14/1.4	Laboratory Assistant	M.mth	24		-
B1.14/1.5	Environmentalist/Sociologist	M.mth	24		-
B1.14/1.6	2 no. Office Assistants	M.mth	48		-
B1.14/1.7	Levellers	M.mth	24		-
B1.14/1.8	Secretary	M.mth	24		-
B1.14/1.9	General Attendants	M.mth	24		-
	Total of Appendix B1.16 Carried to Bill No.1 item 1.16				-

	APPENDIX C1.19 TO BILL ITEM 1.19 ~ PROVIDE AND MAINTAIN SURVEY EQUIPMENT				
ITEM	DESCRIPTION	UN IT	QUAN TITY	RATE(K SHS)	AMOUNT (KSHS)
C1.08 /1.01	Engineer's digital Level machine with all its supporting accessories, that meets the requirements as indicated in the special specification	No	1		
C1.08 /1.02	Digital Levelling staff 5m with levelling bubble (Leica/topcon or similar approved)	No	6		
C1.08 /1.03	Scientific calculators [CasioFX 570 or equivalent]	No	3		
C1.08 /1.05	Trimble Geo 7X Handheld or equivalent Data Collector with a powerful 1GHz ARM Cortex A8 i.MX53, 8GB flash storage, IP65 rating, and sunlight-optimized display, with the integrated dual-mode cellular modem.	No	2		
C1.08 /1.06	Suunto 9 Multisport GPS Watch with BARO and Wrist-Based Heart Rate (Black) On long ultra runs, with unlimited battery life for recording distance and track accurately, as GPS is a heavy drain on the battery. Must be with a FusedTrack algorithm that combines GPS and motion sensor.	No	2		

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C1.08 /1.07	Provide a Tow way Radio Communiacion Walkie Talkie with at least 16 Memory Channels, 50 CTCSS /105 CDCSS, Battery Saving Features, Low Voltage Alert, VOX, Scanning, & Monitor Functions, English Voice Prompt, PC Programmable, Voice Scramble & Encryption, Emergency Alarm, High Illumination Flashlight and Transmitter Time-Out Timer (TOT) or equivalent.	No	4		
C1.08 /1.08	200m range laser distance measuring machine	No	3		
C1.08 /1.09	Bosch GWM 32 Professional Measuring Wheel or equivalent with min wheel diameter (circumference): 318.5 mm (1 m), Max. measured value: 9999.9 m: Telescopic handle, Material: Aluminium and Measurement accuracy: 1 dm/100 m	No	2		
C1.08 /1.10	Roll of tracing/matte film paper	No	4		
C1.08 /1.11	GPS System - Leica GS09 GNSS system, with at least three rovers and a controller. The contoller to have colour display, touch screen&stylus, CF card slot and alphanumeric keyboard, GLONASS, RTCM/CMR, RTK unlimited, network RTK, 5Hz positioning, and raw data loging. The system to incorporate Refrence line, DTM stake out, RoadRunner and Volume calculation. the system to include all acceossories i.e batteries with professional charger, Min 8GB memory card, compactFlash PC card adaptor, data transfer cables,modems and antennas, poles and accessories, tripod and software.	No	1		
	Total carried to Bill Item 1.19				


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