



KENYA URBAN ROADS AUTHORITY

Efficient and safe urban roads

Barabara Plaza, Mazao Road - Off South Airport Road, JKIA

Tel: 254-020-8013844 / 254-717-105233

Email: info@kura.go.ke Web: www.kura.go.ke

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

Ref. No. KURA/EO/SCM/Vol.3 (253)

Date: 30th April, 2020

TO ALL BIDDERS

RE: UPGRADING TO BITUMEN STANDARDS OF MLOLONGO-ATHRIVER JOSKA ROAD
MACHAKOS COUNTY

TENDER NO: KURA/DEV/HQ/310/2019-2020

RE: ADDENDUM 1

Reference is made to the above subject matter.

This to notify all bidders that an addendum has been issued for the above tender as attached.

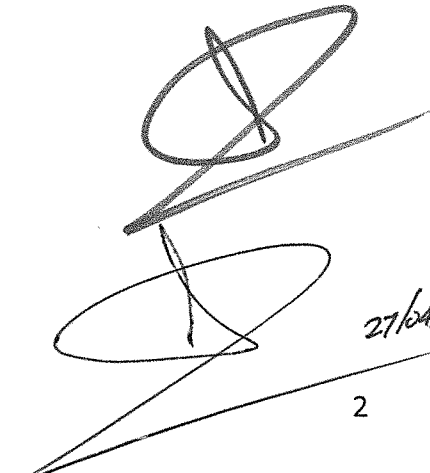
S/NO	AMENDMENT	ACTION
1.	Location map Issued is not Clear	Replace with attachment
2.	Design drawings	Replace with attachment
3.	Will the submission date be changed	Extend project submission date to 12 th May 2020
4.	Bill of quantities	Replace with attachment

Please note that the tender Opening Date/Closing has been moved to 12th May 2020 at 10.00 am.


Samuel M. Adankhalif

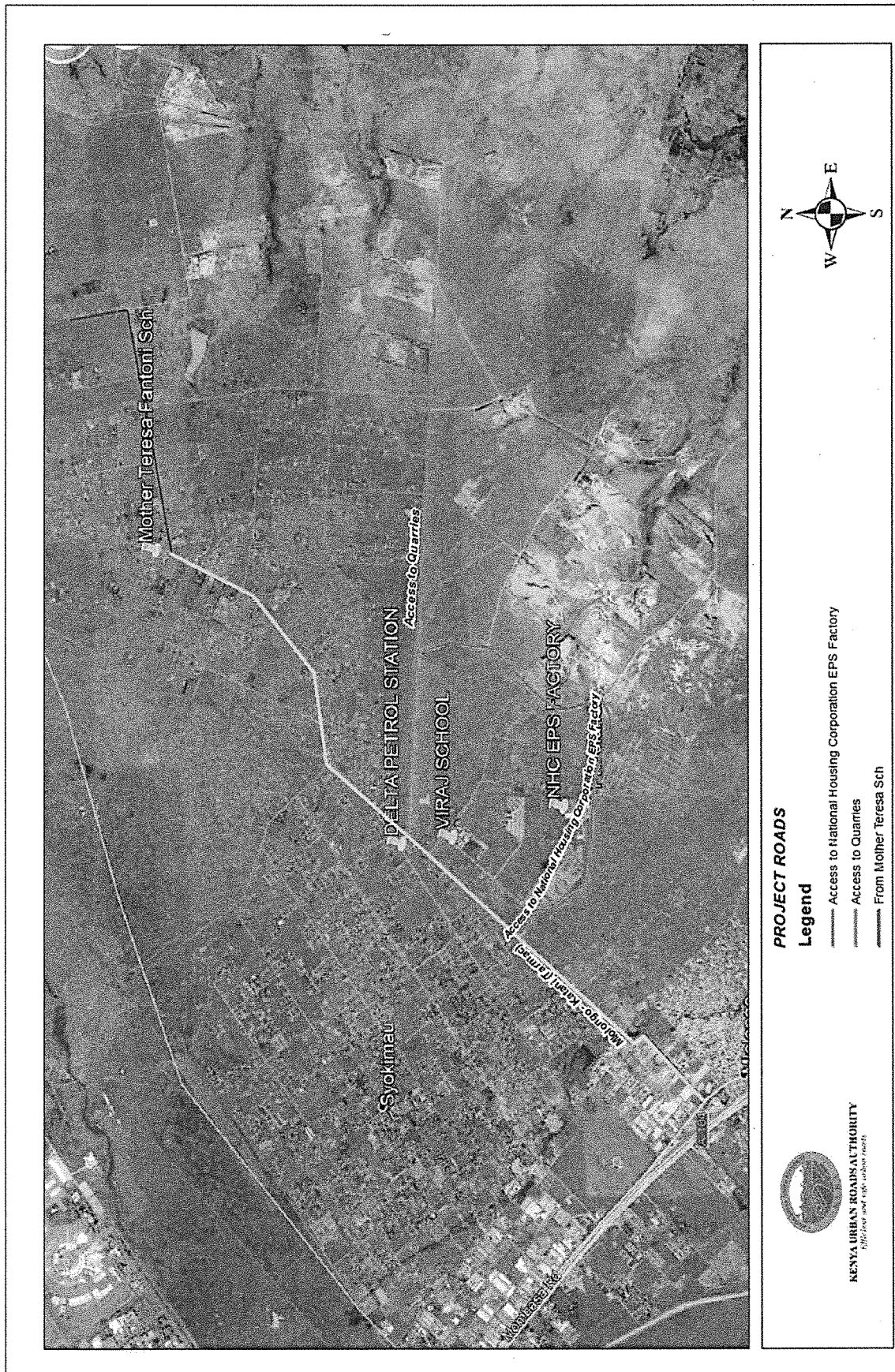
Deputy Director, Supply Chain Management
FOR: DIRECTOR GENERAL

LOCATION MAP

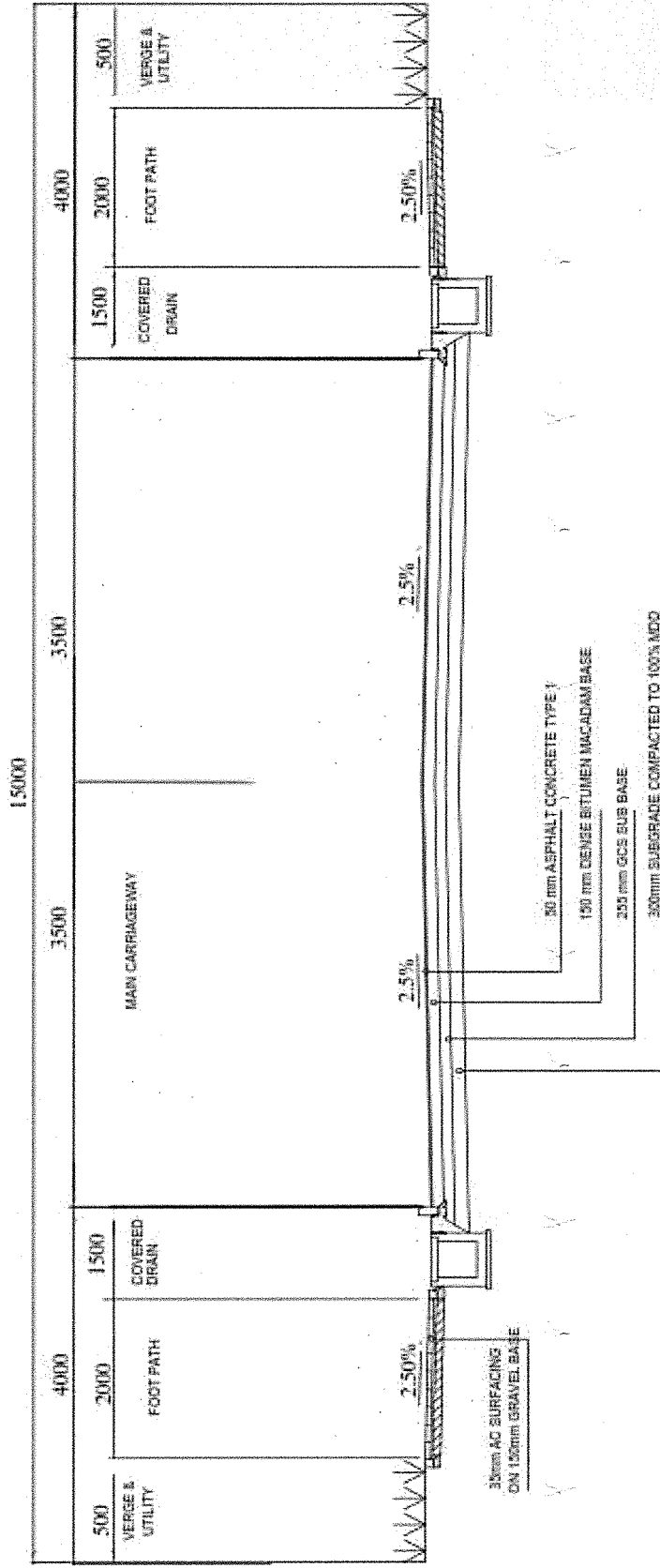


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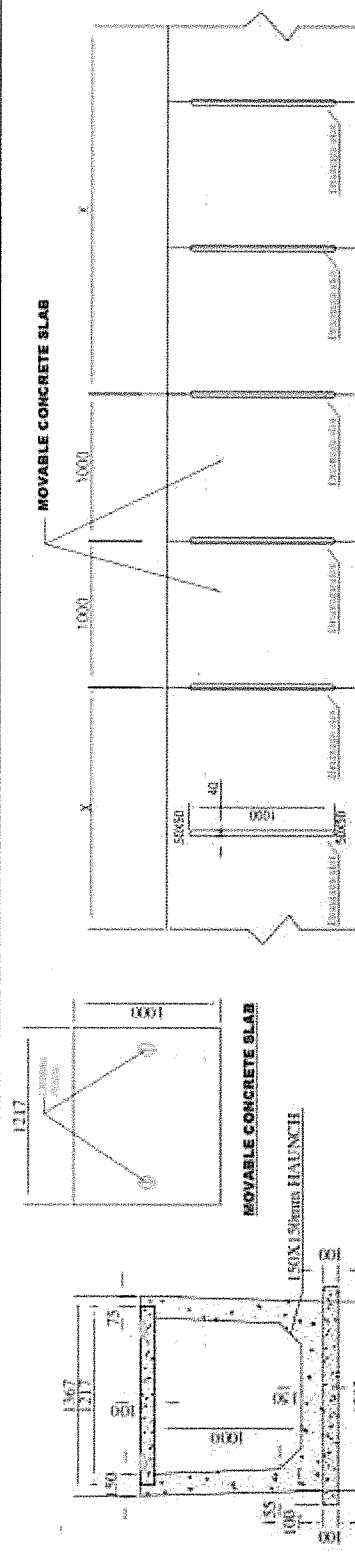


TYPICAL ROAD CROSS SECTION TYPE I

[Signature]

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27/09/2020



DETAILED DIMENSION OF COVERED DRAIN

THE MOVABLE CONCRETE SLAB IS APPLICABLE FOR COVER DRAINS WITH PEDESTRIAN LIVE LOAD ONLY

LAYOUT OF PRECAST CONCRETE SLAB

%	Top of Sill	Finishing Level	W. to Sew.	Length of Sew.	Stage
31	710	250	14	1453	1453
32	710	250	7	1410	1422
33	713	250	24	1422	1453
34	712	250	7	1442	1453
35	710	250	14	1420	1453
36	712	250	4	1415	1453

REINFORCEMENT DETAIL OF COVERED DRAIN



DETAIL - X IN SIDE ELEVATION VIEW

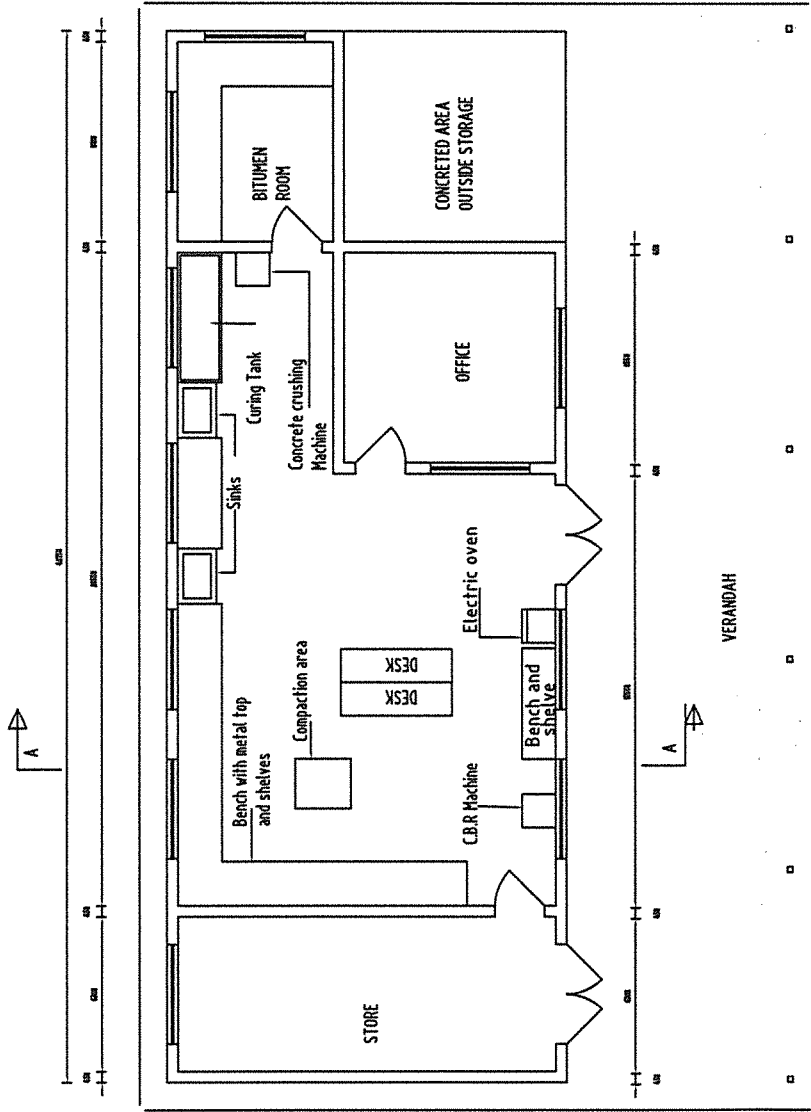
BAR BENDING SCHEDULE OF COVERED DRAIN					
S/N	Type and size	Quantity (kg)	Box or main	Length of each	Shape
06	Y10	250	14	820	
07	Y10	200	10	920	
08	Y10	250	14	915	
09	Y10		2	1850	

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. DIMENSIONS ARE NOT IN SOLED, ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED.
3. CLEAR COVER FOR REINFORCEMENT WHICH CLOSEST TO CONCRETE SURFACE SHALL BE 25MM.
4. GRADE OF CONCRETE FOR FOUNDATION AND BEARING SHOULD BE C30.
5. THE GRADE OF REINFORCEMENT SHALL BE GRADE 400 CONFORMING TO BS 4449.
6. COMBINATION OF PRECAST CONCRETE COLUMN SHALL BEED EVERY 10M BY TWO PILES OF VARIABLE CONCRETE LOWER SLAB IN THE MIDDLE.
7. THERE ARE TOTALLY 4 NOS LIFTING RING BARS IN ONE COASTED COLUMN.
8. AT POSITION COASTED COLUMN JOINT, IT SHOULD BE SMOOTHLY.



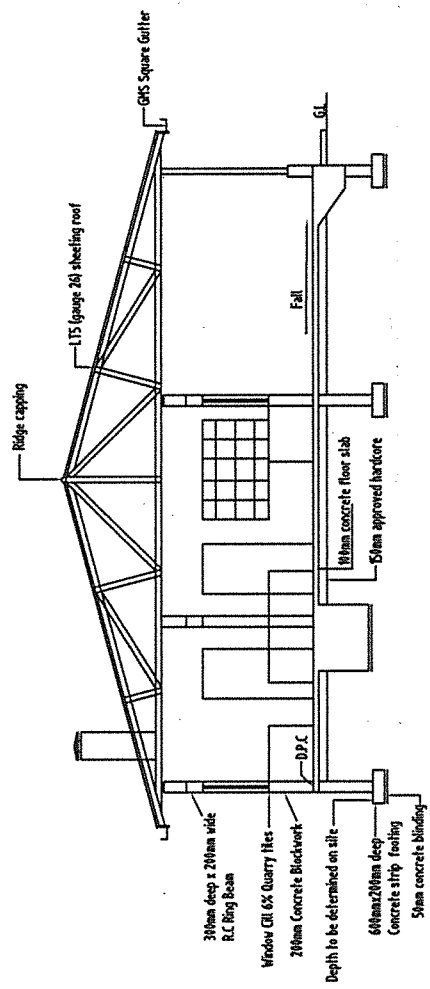
27/04/2020



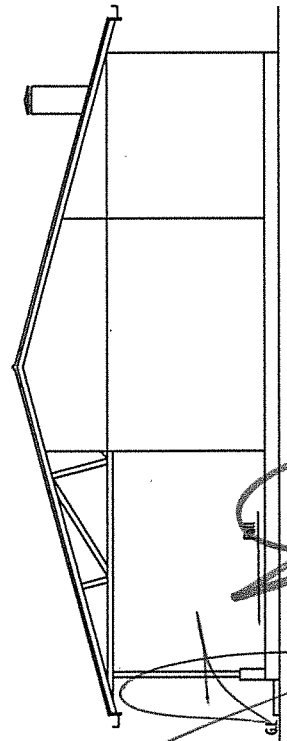
NOTES

1. The location of the office, laboratory and houses, type of construction, details of internal and external services and equipment and finishes are included in the standard and/or specifications, or as directed by the Engineer.
2. All doors to be fitted with mortice locks. These are to be heavy duty on external doors. All windows to be fitted with burglar bars.
3. All buildings are to be provided with fire extinguishers. 2kva for the Resident Engineers site office. 2kva for the site laboratory.
4. Eaves to be bat proof.
5. DPC under all walls.
6. At least 3 substantial shelves to be fitted in all stores rooms.
7. Where gas cookers are provided, gas cylinders will be kept outside the building and adequate provision should be made to prevent theft of the same.
8. Covered parking to be provided for vehicles adjacent to the Resident Engineers site office.

ENGINEERS LABORATORY PLAN
SCALE 1:50

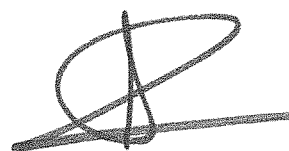


SECTION A-A
SCALE 1:50

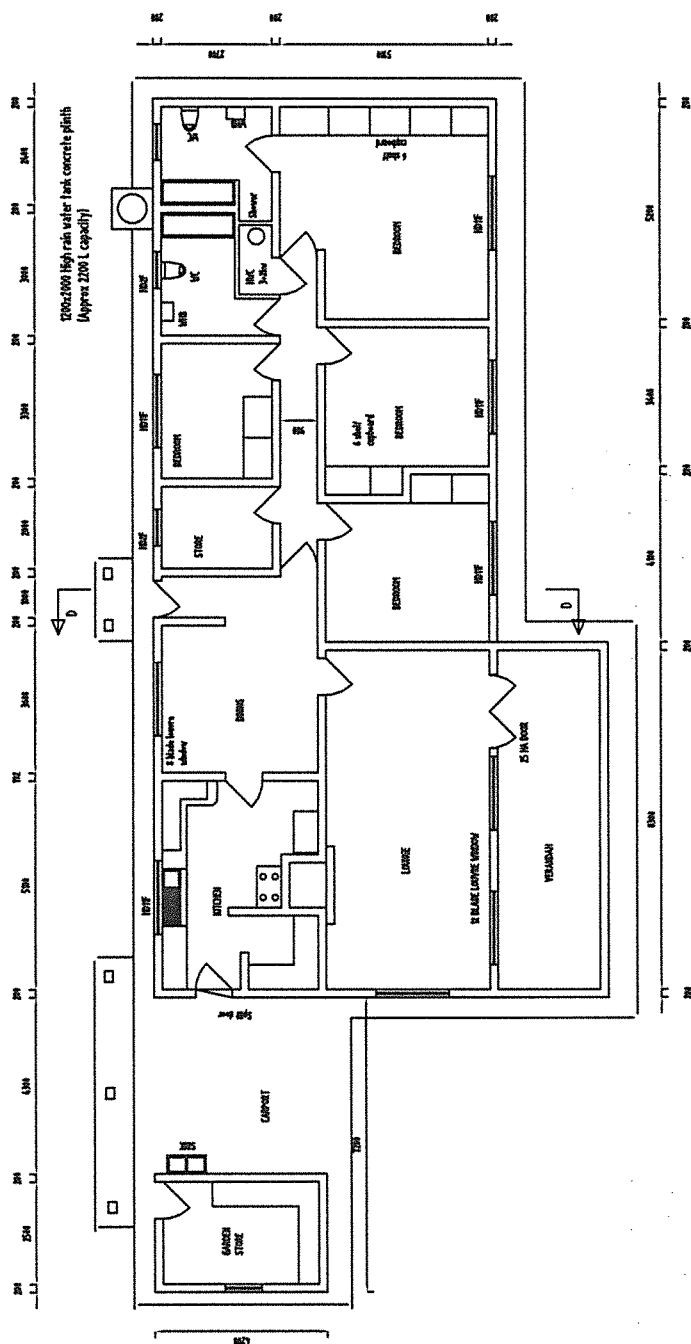


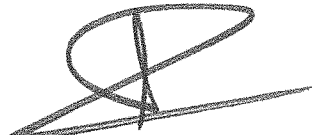
SECTION SIDE ELEVATION 02
SCALE 1:50

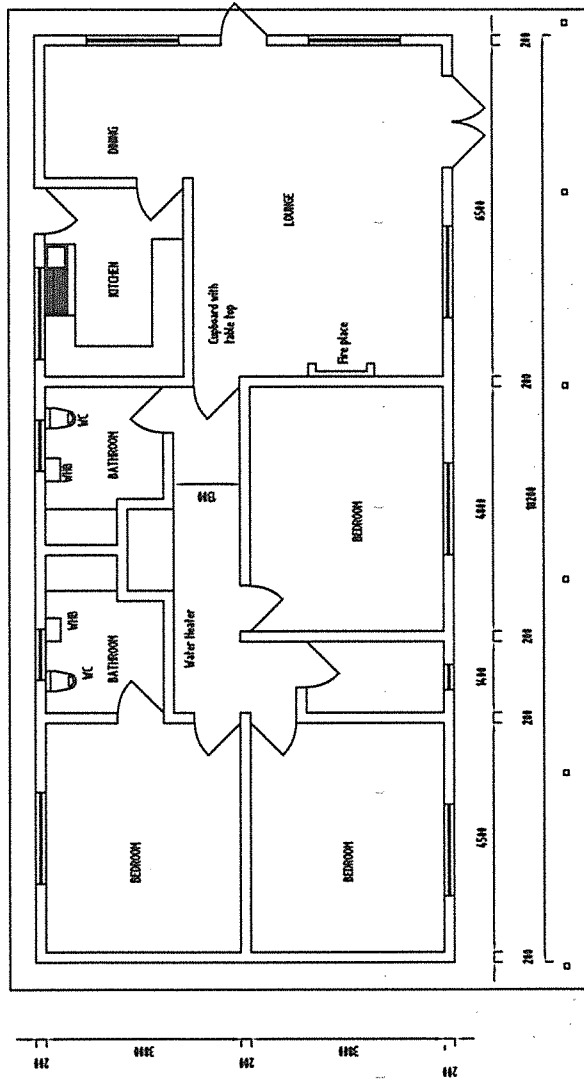
NO.		DATE	REVISION	BY	APPROVED	CLIENT :	CONTRACTOR :	PROJECT NO.:	PROJECT :	SCALE :	DRAWING TITLE :	REV.		
												DATE :	NO.	
1/2020														
KENYA URBAN ROADS AUTHORITY P.O. BOX 41727-00100 GPO NAIROBI							KURA/DEV/HQ/310/2018-2020			UPGRADING TO BITUMEN STANDARDS OF MLOLONGO ROADS			NOT TO SCALE	
										ENGINEERS LABORATORY DETAIL			April 2020	
										DRAWING NUMBER :				

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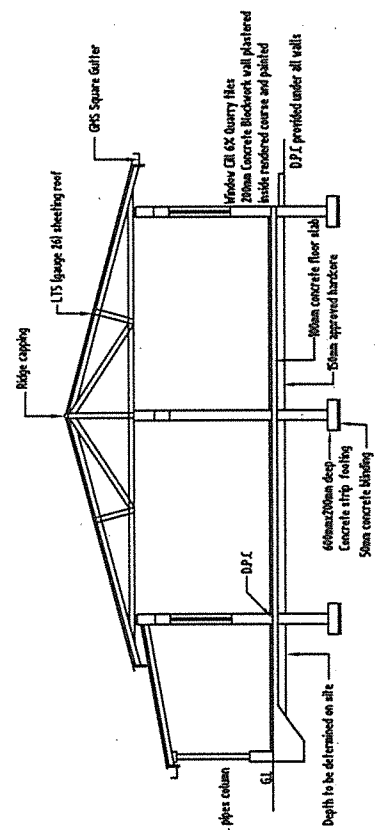
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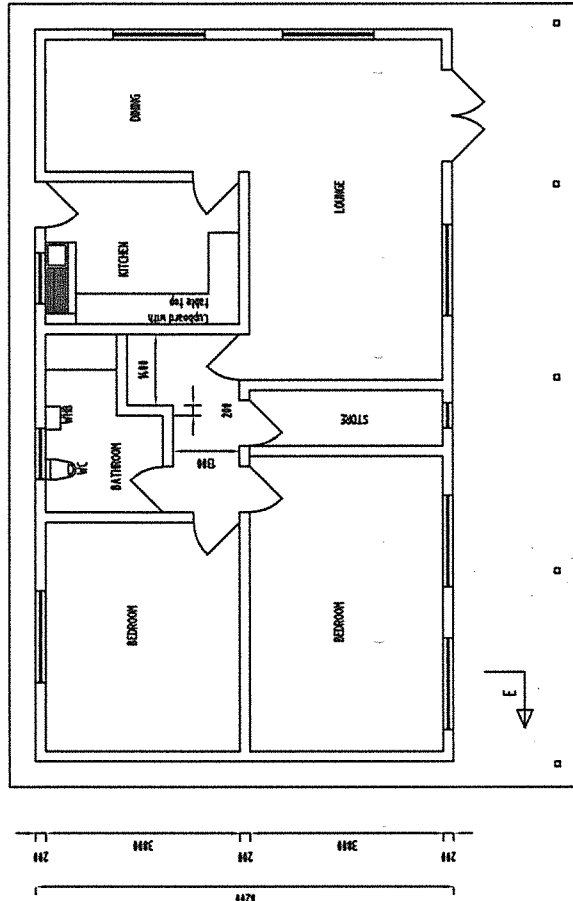

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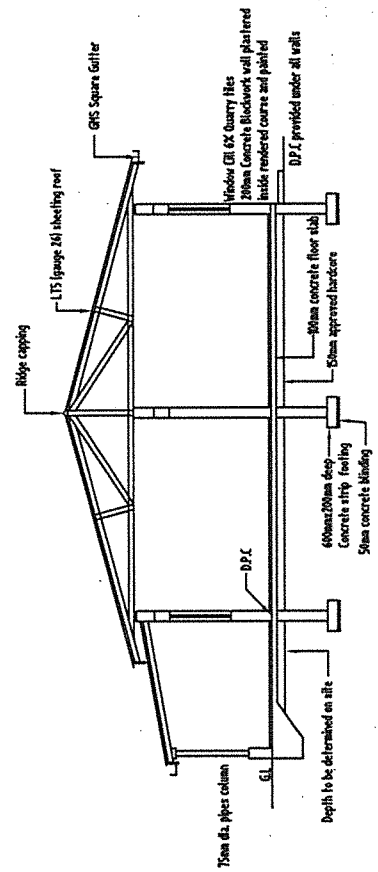
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SECTION E-E
SCALE 1/50



SCALE 1:75

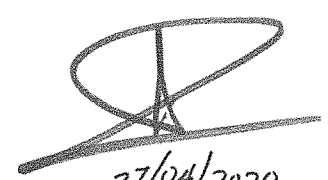


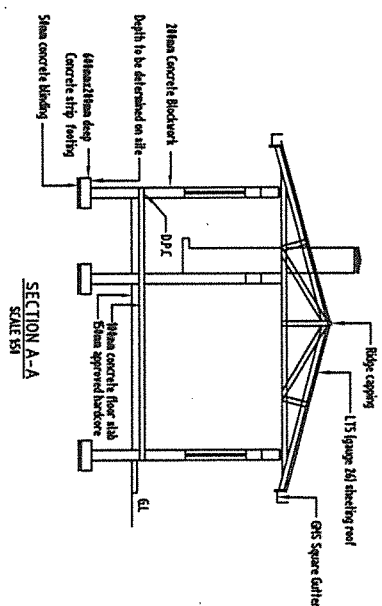
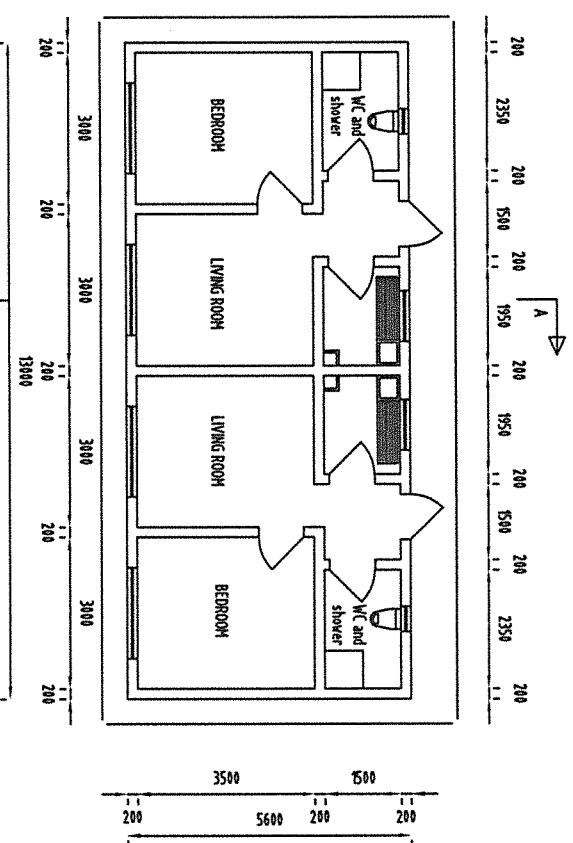
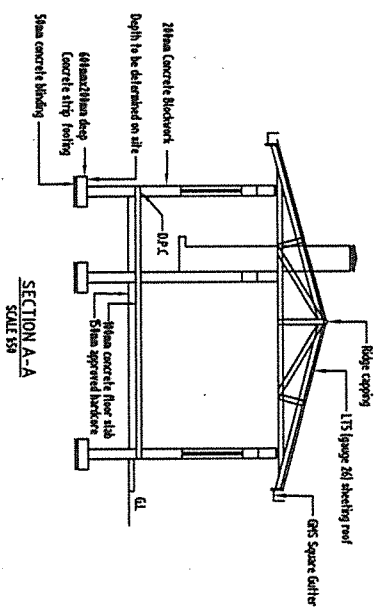
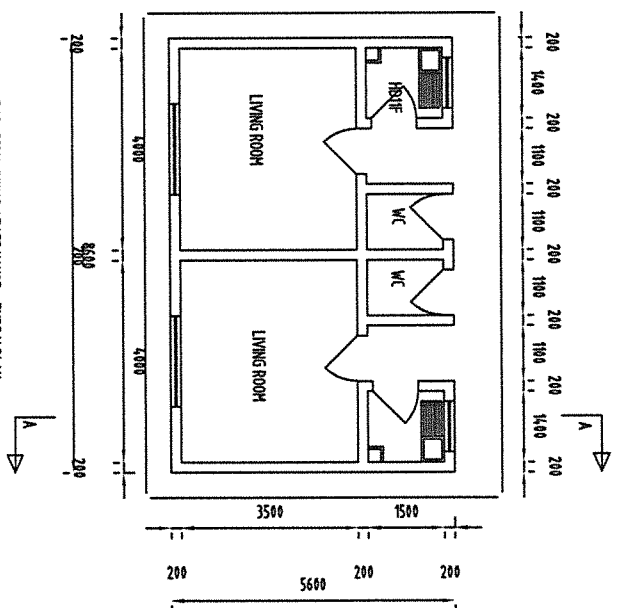
SECTION E-E
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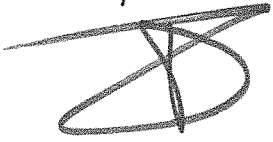
1. The first part of the document is a list of the names of the members of the committee who have been appointed to the various sub-committees. The names are listed in alphabetical order of the last name.

2. The second part of the document is a list of the names of the members of the committee who have been appointed to the various sub-committees. The names are listed in alphabetical order of the last name.


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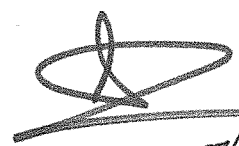
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UPGRADING TO BITUMEN STANDARDS OF MLOLONGO - ATHI RIVER JOSKA ROAD MACHAKOS COUNTY
TENDER No.: KURA/DEV/HQ/310/2019-2020

BILL OF QUANTITIES

UPGRADING TO BITUMEN STANDARDS OF MLOLONGO ROADS					
BILL № 1: PRELIMINARY AND ADMINISTRATION OVERHEADS					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
1.01	Provide or rent approved Engineer's staff accommodation equivalent to:				
	(i) Type I house	№	1		
	(ii) Type II house	№	3		
	(iii) Type III house	№	3		
	(iv) Type IV house	№	4		
	(v) Type V house	№	4		
1.02	Provide and maintain Engineer's main office as shown on the drawings or as instructed by the Engineer for use during the duration of the Contract.	Lump sum	1		
1.03	Provide and maintain furniture and equipment for the Engineer's office as well as survey equipment as specified for the Contract period and as detailed in Appendix to Bill No. 1.03 and the Special Specifications	Lump sum	1		
1.04	Allow a provisional sum of KShs. 3,000,000 for Material Testing as directed by the Engineer	Prov. Sum	1	1,000,000.00	1,000,000.00
1.05	Extra Over on Item 1.04 for the Contractor's Overheads and Profit.	%	1,000,000.00		
1.06	Construct and maintain Engineer's main Laboratory	Lump sum	1		
1.07	Provide Laboratory equipment and reagents for use by the Engineer's Representative's and his staff for entire duration of the contract as detailed to Bill Item № 1.07.	Lump sum	1		
1.08	Provide with driver and maintain two (2) Type 1, minimum 3.0 litre turbocharged 4-wheel drive, 5 door utility vehicle or similar, approved by the Engineer, fitted with air bags, mobile telephone hands free headset and a two way radio for the exclusive use of the Engineer inclusive of the first 4,000 km per vehicle month.	V. Month	84.00		
1.09	Extra Over on Item 1.08 inclusive of fuels, maintenance, lubricants and servicing for mileage over 4,000 km per vehicle month.	km	30,000		

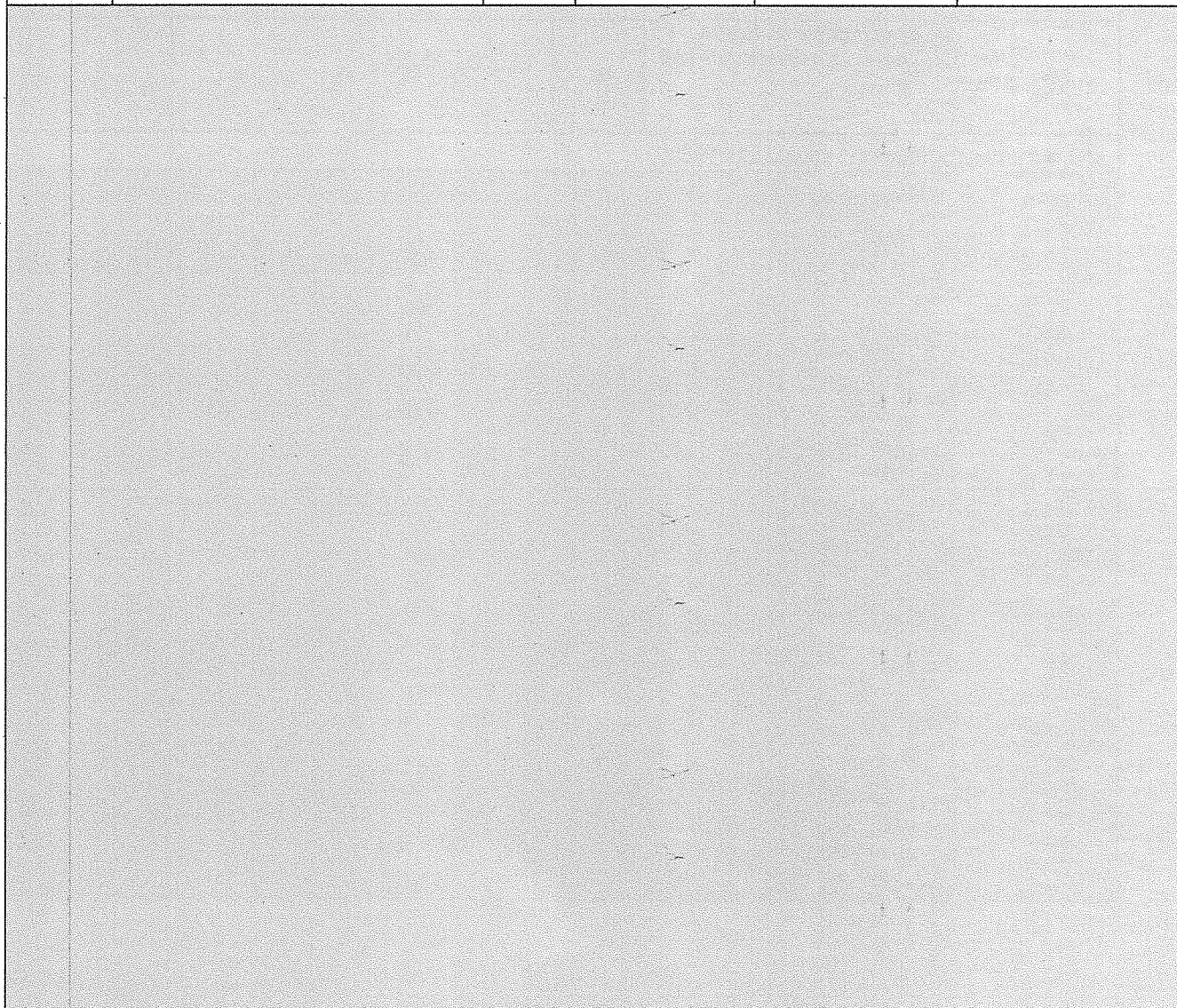

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1.10	Provide with driver and maintain two (2) Type 2, minimum 2.8 litre turbocharged 4-wheel drive, twin-cab pick up vehicle or similar approved by the Engineer, fitted with air bags, mobile telephone hand free headset and a two way radio for the exclusive use of the Engineer inclusive of the first 4,000 km per vehicle month.	V. month	72		
1.11	Extra Over on Item 1.10 inclusive of fuels, maintenance, lubricants and servicing for mileage over 4,000 km per vehicle month.	km	20,000		
1.12	Provide with driver and maintain One (1) Type 3 vehicle, with 2.5 - 3.2 litre 4-wheel drive, single-cab pick-up vehicle or similar as per the Engineer's instructions and approval, fitted with air bags, mobile telephone hand free headset and a two way radio for the exclusive use of the Engineer inclusive of the first 4,000 km per vehicle month.	V. Month	42		
1.13	Extra Over on Item 1.12 inclusive of fuels, maintenance, lubricants and servicing for mileage over 4,000 km per vehicle month.	km	10,000		
1.14	Allow a sum of KShs 6,000,000 for the Engineer's miscellaneous account to be spent in whole or part as instructed by the Engineer and to be reimbursed against receipts.	Prov. Sum	1	6,000,000.00	6,000,000.00
1.15	Extra Over on Item 1.14 for the Contractors Overheads and Profit.	%	6,000,000.00		
1.16	Provide, erect and maintain publicity signs as instructed by the Engineer.	Nº	6		
1.17	Allow for attendance upon the Engineer by the following staff in accordance with Clause 137 of Special Specification				
	(i) Assistant Engineer	M.mth	42		
	(ii) Inspector of works	M.mth	72		
	(iii) Laboratory Technologist	M.mth	42		
	(iv) Survey Assistants	M.mth	60		
	(v) Levellers	M.mth	30		
	(vi) Laboratory Assistants	M.mth	60		
	(vii) Office Assistants	M.mth	60		
	(viii) Secretary	M.mth	42		
	(ix) Environmentalist/Sociologist	M.mth	30		


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UPGRADING TO BITUMEN STANDARDS OF MLOLONGO - ATHI RIVER JOSKA ROAD MACHAKOS COUNTY
TENDER No.: KURA/DEV/HQ/310/2019-2020

	(x) Chainmen	M.mth	60		
1.18	Include a percentage on Item 1.17 for the Contractor's Overheads and Profit.	%			
1.19	Allow for a provisional sum of KShs 4,500,000 for Engineer's staff allowances and overtime	Prov. Sum	1	3,000,000.00	3,000,000.00
1.20	Include a percentage on Item 1.19 for the Contractor's Overheads and Profit.	%	3,000,000.00		
1.21	Allow a provisional Sum of KShs 1,000,000 for the Engineer's staff mobile phone airtime charges	Prov. Sum	1	1,000,000.00	1,000,000.00
1.22	Include a percentage on Item 1.21 for the Contractor's Overheads and Profit	%	1,000,000.00		
BILL 1 TOTAL CARRIED TO SUMMARY PAGE					



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BILL № 4: Site Clearance and Topsoil Stripping					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
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	Ha	25.0		
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	47,000.0		
4.03	Excavate, remove and dispose existing pipe culverts including the inlet and outlet structures as directed by the Engineer	m	1,000		
4.04	Provide a provisional sum of KShs 10,000,000 for relocation of services.	Prov. Sum	1.0	10,000,000.00	10,000,000.00
4.05	Include a percentage on Item 4.04 for the Contractor's Overheads and Profit .	%	10,000,000.00		
BILL 4 TOTAL CARRIED TO SUMMARY PAGE					


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UPGRADING TO BITUMEN STANDARDS OF MLOLONGO - ATHI RIVER JOSKA ROAD MACHAKOS COUNTY
TENDER No.: KURA/DEV/HQ/310/2019-2020

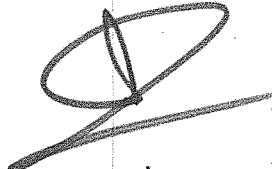
BILL № 5: Earthworks					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	No separate payments shall be made for the overhaul of the material and the cost of such haulage shall be included in the rates and or prices.				
5.01	Cut to spoil in soft material as directed by the Engineer.	m ³	338,000		
5.02	Cut to fill in hard material	m ³	20,000		
5.03	Provide and Fill in soft material from borrow pits	m ³	60,000		
5.04	As Item 5.03 but in hard material	m ³	110,000		
5.05	Provide, spread, water, process and compact 300 mm improved subgrade to 100% MDD (AASHTO T99) in two layers of 150 mm thickness.	m ³	34,000		
5.06	Rock fill as directed by the Engineer	m ³	70,000		
5.07	Provide filter fabric over or around rock fill	m ²	64,500		
BILL 5 TOTAL CARRIED TO SUMMARY PAGE					



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BILL № 8: Culvert and Drainage Works					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	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				
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, catch water drains and median drains including support of trench sides, backfilling and compacting as specified or as instructed by the Engineer.	m ³	5,000		
8.02	As Item 8.01 but in hard material	m ³	1,250		
8.03	Provide, place and compact class 20/20 pre-cast/insitu concrete to side drains as instructed by the Engineer inclusive of formwork	m ³	8,600		
8.04	Provide High yield reinforcement steel bars to BS 4461 of sizes 12mm and below	Tonne	1,650		
8.04	Provide, lay and joint 450mm inner diameter (ID) precast concrete pipes.	m	500		
8.05	Provide, lay and joint 600mm inner diameter (ID) precast concrete pipes.	m	850		
8.06	Provide, lay and joint 900mm inner diameter (ID) precast concrete pipes.	m	1,250		
8.07	Provide, lay and joint 1200mm inner diameter (ID) precast concrete pipes.	m	300		
8.08	Provide, place and compact class 25/20 concrete to headwalls, wing walls, apron, toe walls to pipe culvert and to the side drain base	m ³	10,500		
8.09	Provide and place RC Class 15/20 concrete for use as bed, haunch and surround, including formwork	m ³	5,000		
8.10	Provide and place stonepitching 200mm thick with grout and mortar as specified and directed by the Engineer to the side drains as directed by the Engineer	m ²	1,000		
8.10	Provide, lay and joint 750mm x 335mm precast concrete rectangular invert block drains with 2No. Side slabs as specified.	m	500		
8.11	Extra over item 8.10 for side slabs	m	500		
BILL 8 SUB-TOTAL CARRIED TO SUMMARY PAGE					


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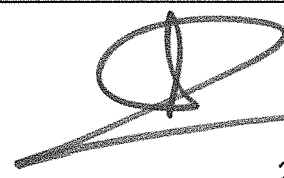
UPGRADING TO BITUMEN STANDARDS OF MLOLONGO - ATHI RIVER JOSKA ROAD MACHAKOS COUNTY
TENDER No.: KURA/DEV/HQ/310/2019-2020

BILL № 9: Passage of Traffic					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
9.01	Provide and maintain the signs and barriers for safe passage of traffic				
	(i) Signage	№	100		
	(ii) Barricades - drum type	№	30		
	(iii) Barricades - steel portable	№	35		
9.02	Allow for the passage of traffic through the works	Prov. Sum	1		
9.03	Provide, spread, water and compact gravel on deviations, thickness 150mm.	m ³	4,200		
BILL 9 TOTAL CARRIED TO SUMMARY PAGE					
BILL № 12: Natural Material for Sub base and Base					
12.02	Provide , place, water and compact natural gravel of CBR greater than 15% for walkway as directed by the Engineer	M ³	9,000		
BILL 12 TOTAL CARRIED TO SUMMARY PAGE					
BILL № 13: Graded Crushed Stone Sub-base and Base					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
13.01	Provide, mixing, spreading and compacting Graded Crushed Stone (GCS) for Subbase in the main carriageway, service roads, slip roads, junctions, accesses, bus bays and shoulders with all leads and lifts complete shown in the Book of Drawings complete with approved specifications or as instructed by the Engineer.	m ³	28,100		
BILL 13 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 14: Cement and Lime Treated Material					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
14.01	Provide, store and transport to site of works cement improvement agent for GCS Subbase as specified or as instructed by the Engineer	Tonne	960.00		
14.02	Mix the Subbase material with the instructed cement 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 sub-base as specified or as instructed by the Engineer.	m ³	28,100.00		
14.03	Allow for curing and protection of treated sub-base as specified or as instructed by the Engineer.	m ²	110,000.00		
BILL 14 TOTAL CARRIED TO SUMMARY PAGE					
BILL № 15: Bituminous Surface Treatments and Surface Dressing					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	<i>Note: No haulage will be paid for bitumen, chippings or sand this should be included in the rates billed rates.</i>				
15.01	Clean and prepare surfaces of main carriageway, slip roads, shoulders, bus bays, accesses and junctions, provide, heat and spray on the same MC 70 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	litre	131,000		
15.02	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	litre	225,000		
BILL 15 TOTAL CARRIED TO SUMMARY PAGE					

UPGRADING TO BITUMEN STANDARDS OF MLOLONGO - ATHI RIVER JOSKA ROAD MACHAKOS COUNTY
TENDER No.: KURA/DEV/HQ/310/2019-2020

BILL № 16: Bituminous Mix Bases, Binder Courses and Wearing Courses					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	<i>Note: No haulage will be paid for bituminous mix bases and Asphalt Concrete (AC) binder course and the rate shall be all inclusive.</i>				
16.01	Prepare surfaces, provide, mix, lay and compact Asphaltic Concrete (AC) (Type 1) as wearing course on base with bitumen and 0/20 mm aggregates on prepared surface of asphalt base layer	m ³	6,000		
16.02	Prepare surface of underlying material, provide, lay and compact DBM (0/30) as base layer in compacted thickness as specified using 4.5 % nominal bitumen content by weight of total mix..	m ³	17,000		
16.03	Prepare surfaces, provide, mix, lay and compact 35mm Asphaltic Concrete (AC) Type I as wearing course on base with bitumen and 0/14mm aggregates on prepared surface of footpaths	m ³	2,500		
BILL 16 TOTAL CARRIED TO SUMMARY PAGE					

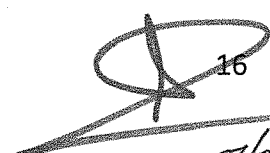

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BILL № 20: Road Furniture					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
20	Road Marking and Road Signs				
	Road Marking				
20.01	Provide and lay hot applied thermoplastic road marking compound in approved colour and shade (ASTM 9) for 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	m ²	1,500		
	(ii) For edge lines (continuous line) with white paint, 150 mm wide	m ²	4,500		
	Permanent Road Signs				
20.02	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.	№	30		
20.03	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	№	30		
20.04	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 m ²	№	30		
	(ii) Area more than 1.0 m ² but less than 2 m ²	№	30		
	Other Road Furniture				
20.05	Pre-cast/cast-in-situ kerb / divider				

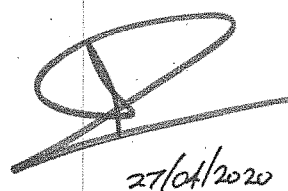

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UPGRADING TO BITUMEN STANDARDS OF MLOLONGO - ATHI RIVER JOSKA ROAD MACHAKOS COUNTY
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	(i) High kerb	m	10,000		
	(ii) Flash Kerbs	m	30,000		
20.06	Construct AC speed humps and rumble strips on carriageway in locations directed by the Engineer	m3	40		
20.07	Excavate in any material for, provide all materials, supply and install bollards 150mm diameter class A black pipes circular hollow sections 6mm thick, 200mm diameter with brackets welded at base and filled with compacted concrete class 10/15 and 1:3 cement mortar conical capping on top to the Engineer's satisfaction. The pipes shall be 1000mm long with 550mm protruding above the ground and the part above ground painted black with a 300mm white reflective strip.	Nº	100		
20.08	Provide and install retro-reflective reflective road studs (cat's eyes) as per the drawings and as instructed by the Engineer	Nº	1,500		
20.09	Provide a provisional sum for Kshs. 2,000,000.00 for provision and laying of service ducts for utilities as instructed by the Engineer	Prov. Sum	1	2,000,000.00	2,000,000.00
20.10	Extra Over on Item 20.09 for the Contractor's Overheads and Profit.	%			
20.11	Provide a provisional sum for Kshs. 20,000,000.00 for provision of street lighting	Prov. Sum	1	20,000,000.00	20,000,000.00
20.12	Extra Over on Item 20.11 for the Contractor's Overheads and Profit.				
BILL 20 TOTAL CARRIED TO SUMMARY PAGE					

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BILL NO .22: DAYWORKS					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Plant/Equipment				
	The rates inserted herein are to include all operational and maintenance costs,fuel, oil, grease drivers/operators wages, supervision overheads and profits. Only time actually employed upon the work will be measured and the rates shall include for idle time				
22.01	Crawler dozers with dozers and hydraulic attachment.				
	(a) 100 - 135 kw rated flywheel power.	hr.	100.00		
	(b) 136 - 185 kw rated flywheel power.	hr.	100.00		
22.02	Self -loading wheeled motor scraper of				
	(a) upto 15 m ³	hr.	50.00		
	(b) Upto 25 m ³ struck capacity	hr.	70.00		
22.03	Motor Graders				
	(a) 80 - 110 kw rated flywheel power.	hr.	150.00		
	(b) 111 -150 kw rated flywheel power.	hr.	150.00		
22.04	Rollers: pneumatic tyred, self-propelled of 1 - 2 tonne per wheel.	hr.	70.00		
22.05	Vibratory compactor, smooth drum, with a flywheel of about 77 kw capable of generating - a centrifugal force of up to 112KN at 30 HZ	hr.	70.00		
22.06	Self propelled vibratory roller of 650 - 1000 kg unballasted weight.	hr.	100.00		
22.07	Sheep's foot roller or heavy grid roller self - propelled.	hr.	100.00		
22.08	Compressor rated by normal delivery of free air per min. at about 7 kg/cm ² , capable of 70m ³ of air per min.	hr.	100.00		
22.09	Small dumpers, 750-1000kg rated payload.	hr.	100.00		
22.10	Dual - purpose Hydraulic excavator (with a backhoe/ loader) and a rated bucket capacity of upto 1m ³ .	hr.	100.00		
22.11	Wheel loader 4WD, articulated:				
	(a) 1.5 - 2.0 m ³				
	SAE rated bucket capacity.	hr.	100.00		
	(b) 2.1 - 3.4m ³				


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	SAE rated bucket capacity.	hr.	150.00		
22.12	Pump (inclusive of all houses) and 50 - 80mm delivery.	hr.	30.00		
22.13	Welding machine	hr	50.00		
22.14	As item 22.11 but crawler loader				
	(a) 1.5 - 2.0 m ³	hr.	100.00		
	SAE rated bucket capacity.				
	(b) 2.1 - 3.4m ³	hr.	100.00		
	SAE rated bucket capacity.				
22.15	Concrete mixer of 0.2 - 0.3m ³ (wet capacity)	hr.	70.00		
22.16	Poker vibrator for concrete, diesel.	hr.	100.00		
22.17	Ordinary flat -bed lorry, 8-15 Ton gross vehicle wt.	hr.	50.00		
22.18	Tip (dump) truck				
	(a) 10 - 15 Tonne gross weight	hr.	50.00		
	(b) 16-25 tonne gross weight.	hr.	50.00		
22.19	Pick - up 1 tonne gross weight of upto 1 tonne carrying capacity.	hr.	10.00		
22.20	Water tanker/bowser self propelled, 5000 - 10,000 l capacity.	hr.	100.00		
22.21	Pressure bitumen distributor, 4500 - 9000 l capacity.	hr.	50.00		
22.22	Mechanical broom.	hr.	50.00		
22.23	Mechanical Bitumen handspray unit.	hr.	100.00		
22.24	Self-propelled chip spreader or equivalent approved.	hr.	50.00		
22.25	Pulverizer	hr.	50.00		
	LABOUR				
	All items of labour must be priced (see clause 2202 (b) in the specifications) Only the actual time engaged upon the work will be paid for.				
	<i>Note: The rate inserted herein shall include all costs of labour, as well as overtime, travelling, time and cost of accommodation, social security, contributions, use and maintenance of small tools of trade, supervision, insurance, overheads, profits and</i>				
22.25	Unskilled Labour	hr.	20,000.00		
22.26	Carpenter/Stone mason	hr.	10,000.00		
22.27	Blaster (or certified explosives handler)	hr.	10,000.00		

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22.28	Artisan	hr.	10,000.00		
22.29	Watchman (all round surveillance)	hr.	10,000.00		
	MATERIALS				
	All items of materials must be priced, and in accordance with clause 2202 (c) requirements of the specifications.				
22.30	Ordinary Portland cement	ton.	20.00		
22.31	Hydrated Lime	ton.	5.00		
22.32	Aggregates for Concrete				
	(a) Sand	ton.	60.00		
	(b) Coarse				
	(nominal size 10-20)	ton.	150.00		
22.33	Shuttering Timber				
	(a) Class F1 finish	m3	50.00		
	(b) Class F3 finish	m3	50.00		
22.34	Mild steel				
	(a) Up to and including 16mm diameter.	ton.	10.00		
	(b) Over 16mm diameter size.	ton.	5.00		
22.35	As item 22.33 but High yield steel				
	(a) Up to and including 16mm diameter.	ton.	10.00		
	(b) Over 16mm diameter size.	ton.	5.00		
22.36	Class 2 nominal size chippings				
	(a) 14/20 mm	m3	150.00		
	(b) 6/10 mm	m3	100.00		
22.37	Bitumen				
	(a) 80/100 penetration grade bitumen	L	1,000.00		
	(b) Bitumen cutback MC 30	L	1,000.00		
	(c) Bitumen cutback MC 3000	L	1,000.00		
	(d) 60/70 penetration bitumen	L	1,000.00		
22.38	Gabion Mesh				
	(2.0 x 1.0 x 1.0 m)	m2	100.00		
22.39	Rock fill to Gabions or around structures	m3	150.00		
22.40	Pentolite stick explosives or equivalent	kg	10.00		
22.41	Explosive fuse	m	50.00		
22.42	Detonating relay	No.	10.00		
22.43	Welding rods of any gauge	No	150.00		
22.44	Red oxide undercoat paint for metallic surface.	Lts	100.00		


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22.45	Oil paint for metallic surfaces	Lts	100.00		
22.46	Pipe hand rails	m	50.00		
22.47	Guardrails	m	30.00		
22.48	Bolt fasteners of any size	No	100.00		
	Total of Bill carried forward Summary				

This image shows a blank, aged, cream-colored page, likely an endpaper or flyleaf of a book. The paper has a slightly textured appearance with some faint smudges and discoloration, characteristic of old paper. The left edge of the page shows the binding of the book, and the overall tone is a warm, off-white or light beige.

BILL № 25: CROSS CUTTING ISSUES

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
25.01	Allow a Prime Cost sum of Kshs.500,000.00 for preparation of Environmental and social Reports.	PC Sum	1	500,000	500,000.00
25.02	E.O. item 25.01 for Contractor's overheads and profits.	% of item	500,000.00		
25.03	Allow for prime cost of 600,000.00 for Environmental monitoring and provision of Environmental mitigation Measures as directed by the Engineer.	PC Sum	1	600,000	600,000.00
25.04	E.O. item 25.01 for Contractor's overheads and profits.	% of item	600,000.00		
BILL 25 TOTAL CARRIED TO SUMMARY PAGE					



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BILL № 26: HIV/AIDS Awareness					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
26.01	Implement HIV/AIDS awareness campaign amongst the workers for the duration of the Contract	month	30		
26.02	Allow for the availability of condoms to workers and staff for the duration of Contract	month	30		
26.03	Allow for the participation of representative of local health authorities, provincial director of health and National AIDS council to train and communicate with workers. Allowance to include transport, meals, accommodation and any other reasonable allowances associated expenses and equipment expenses	month	30		
26.04	Allow for the engagement of specialist HIV sub contractor to deal with prevention and awareness activities as per programme to be approved by the Engineer	month	30		
26.05	Allow for the preparation and submission of monthly report for HIV/AIDS awareness and prevention activities report to be tabled at site meetings	month	30		
BILL 26 TOTAL CARRIED TO SUMMARY PAGE					

SUMMARY OF BILLS OF QUANTITIES

BILL No.	DESCRIPTION	AMOUNT (KES)
1	GENERAL	
4	SITE CLEARANCE AND TOPSOIL STRIPPING	
5	EARTHWORKS	
8	CULVERTS AND DRAINAGE WORKS	
9	PASSAGE OF TRAFFIC	
12	NATURAL MATERIAL FOR SUBBASE AND BASE	
13	GRADED CRUSHED STONE FOR SUBBASE AND BASE	
14	CEMENT AND LIME TREATED MATERIAL	
15	BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING	
16	BITUMINOUS MIX BASES BINDER COURSES AND WEARING COURSES	
20	ROAD FURNITURE	
22	DAY WORKS	
25	CROSS -CUTTING ISSUES	
26	HIV AWARENESS	
	SUB TOTAL A	
	Add of 2.5% for VOP	
	Add of 2.5% of Subtotal for physical contingencies.	
	SUB TOTAL B	
	Add 16% VAT of SUB TOTAL B	
	GRAND TOTAL CARRIED TO FORM OF TENDER	

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APPENDIX A1.03 TO BILL ITEM 1.03: FURNITURE AND EQUIPMENT FOR R.E.'S OFFICE					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
				(KSHS)	(KSHS)
	1. ENGINEER'S MAIN OFFICE AND FURNITURE				
A1.03/1.01	Executive desk 2.2 m x 0.9 m with six lockup drawers	No	2		
A1.03/1.02	Desk 2.2 m x 0.9 m with chair and three lockup drawers	No	4		
A1.03/1.03	Swivel Chair with arms	No	3		
A1.03/1.04	Standard office chairs	No	8		
A1.03/1.05	Typist's desk and chair	Set	1		
A1.03/1.06	Lockable steel stationery cupboard, 1.2 m ³ , lockable	No	4		
A1.03/1.07	Medium size steel filing cabinet, 4 drawers lockable	No	3		
A1.03/1.08	Bookshelf, 1.5 m wide 3 shelves (for box files) sliding glass door	No	2		
A1.03/1.09	Conference table with 12 chairs	No	1		
A1.03/1.10	Table 0.8m ² surface area for making tea	No	1		
A1.03/1.11	LAPTOP with Intel i7 3 GHz, 16GB DDR2 SDRAM 667MHz, 1 TB, DVD+/-RW, 15" screen 1024x800 resolution, Compliant 100-240V / 50-60Hz, Internal Wi-Fi Card & Bluetooth, Keyboard with touchpad dual pointing device & external-USB optical mouse, Std stereo speakers, built-in microphone & headphone jacks, modem In-built with SIM slot, 100 Kbps Ethernet port RJ45, Latest Genuine Windows Professional with license, Latest MS Office Pro with license, Kaspersky Antivirus with license Carry Case - One, PC Card slots - Card reader, Battery type & life - 6 cell Li-Ion battery up to 5 hrs, Salient features - 1.3 Mega pixel Webcam 4 x 2.0 USB slots Security cable lock slot, Warranty - 3years	No	2		
A1.03/1.12	As item A.103/1.11 but similar approved branded Desktop Computer with 20" TFT screen	No	2		
A1.03/1.13	Provide and maintain Konica Minolta bizhub 220 or similar multifunctional colour/print system	No	1		
A1.03/1.14	Colour Laser-jet printer, HP Color LaserJet CP4025 or similar approved	No	1		

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A1.03/1.15	UPS 600 VA	No	2		
A1.03/1.16	Electronic scientific calculator, Casio fx 992s or equivalent approved	No	4		
A1.03/1.17	Digital Camera, 16.1 Megapixel(min), 1920x1080 full HD movie recording, optical steadyShot, sweep panorama, 2.7" LCD screen, minimum 5x digital zoom, multimedia card/SD 8GB memory, 12 scene selection modes, all inclusive.	No	1		
A1.03/1.18	Refrigerator minimum capacity 6 cu. ft.	No	1		
A1.03/1.19	Drinking water dispenser, hot/cold	No	1		
A1.03/1.20	Cooker 2 plate electric cooker with oven and grill	No	1		
A1.03/1.21	First Aid Kit	No	4		
A1.03/1.22	Document binding machine	No	1		
A1.03/1.23	Reams of A4 photocopying paper	No	200		
A1.03/1.24	Reams of A3 photocopying paper	No	50		
A1.03/1.25	Stapling machine Ofrex size 66 or similar with 5000 staples	No	2		
A1.03/1.26	Stapling machine Ofrex size 50 or similar with 5000 staples	No	3		
A1.03/1.27	Paper punch	No	4		
A1.03/1.28	Survey Books	No	200		
A1.03/1.29	Field note books	No	50		
A1.03/1.30	A4 Envelops 50No. per packet	No	50		
A1.03/1.31	B5 Envelops 50No. per packet	No	50		
	3.0 SURVEY EQUIPMENT				
A1.03/1.28	Engineer's automatic level Wild NAK - 2 or similar including tripod and accessories	No	1.00		
A1.03/1.29	Surveyor's laser distance measuring equipment (200m range)	No	1.00		
A1.03/1.30	Two way radio	Set	1.00		
A1.03/1.31	Total station complete with a field data collector LEICA or similar including all accessories and supporting software	No	1.00		
	Total of Appendix to Bill Item 1.03 (Carried Forward to Bill No 1.03)				

APPENDIX B1.07 TO BILL ITEM 1.07 - FURNITURE, EQUIPMENT AND REAGENTS FOR THE ENGINEER'S LABORATORY

		Unit	QUANTITY	RATE	AMOUNT
	1. FURNITURE				
B1.07/1.01	Desk 2.2x0.9 m with chair and lockup drawers	No	2		
B1.07/1.02	Desk chair (standard)	No	6		
B1.07/1.03	Stationery cupboard, 1.2 m ³ , lockable	No	1		
B1.07/1.04	Steel filing cabinet, 4 drawers, lockable	No	1		
B1.07/1.05	Steel filing cabinet, 2 drawers, lockable	No	1		
B1.07/1.06	Bookshelf, 3 shelves 1.2 m long (to hold box files)	No	1		
B1.07/1.07	Table - 6 m ²	No	1		
B1.07/1.08	Two Plate electric cooker	No	1		
B1.07/1.09	Fire extinguisher, 10 litre capacity, CO2 type	No	4		
B1.07/1.10	Complete first aid kit	No	2		
	EQUIPMENT				
	(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				
B1.07/2.01	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		
B1.07/2.02	Set of guards for above press.	No	1		
B1.07/2.03	Compaction mould complete with base plate and extension collar, 101.6 mm dia x 116.43 mm high	No	6		
B1.07/2.04	2.49kg. Compaction hammer, drop regulated to 304.8mm	No	1		
B1.07/2.05	4.535kg compaction hammer, drop regulated to 457.2mm	No	1		
B1.07/2.06	Electric vibrating Kango Hammer fitted with steel tamper(BS1377) with support frame	No	1		
B1.07/2.07	Straight edge 300 mm long with handles	No	6		
B1.07/2.08	Steel Tamper (BS1377) compatible with Kango hammer	No	2		
B1.07/2.09	Compaction mould 152.4 mm. dia x 116.43 mm complete with base	No	6		

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	plate and extension collar, 101.6 mm				
B1.07/2.10	Galvanized metal tray 1m x 0.5m x 75 mm deep	No	6		
B1.07/2.11	75mm brush	No	4		
B1.07/2.12	Semi-automatic balance, 25kg Capacity accurate to 1g, including weights	No	3		
B1.07/2.13	20mm BS Sieve, 300mm diameter	No	2		
B1.07/2.14	Stop Clock	No	2		
B1.07/2.15	Thermostatically controlled electric oven 105-1100C, capacity 0.225 m ³	No	1		
B1.07/2.16	Moisture content tins, 75 mm dia, Cadmium or aluminium plated	No	60		
B1.07/2.17	Cone penetrometer with gauge and automatically controlled test cup	No	1		
	3. Density (Sand replacement method BS 1377)				
B1.07/3.01	Metal containers 450mm diameter	No	4		
B1.07/3.02	Stainless steel tray 305mm diameter	No	4		
B1.07/3.03	Metal tray with 150 mm diameter hole in the centre, 300mmx300mm square or equivalent area, 40mm deep	No	2		
B1.07/3.04	Metal tray with 200mm diameter hole in the centre, 500mm x 500mm square, 50 mm deep	No	2		
B1.07/3.05	Steel pegs for fixing tray in position	No	40		
B1.07/3.06	Sand pouring cylinder, 150 mm diameter	No	1		
B1.07/3.07	Sand pouring cylinder, 215 mm diameter	No	1		
B1.07/3.08	Cold steel chisel 20mm x 300mm	No	6		
B1.07/3.09	Cold steel chisel 10mm x 250mm	No	6		
B1.07/3.10	1.5kg hammer	No	3		
B1.07/3.11	Scoop for removing excavated material from hole, 250 mm long handle	No	3		
B1.07/3.12	100mm brush, soft	No	3		
B1.07/3.13	50mm brush, soft	No	3		
B1.07/3.14	Primus gas stove	No	3		
B1.07/3.15	Calibrating can 150 mm diameter x 150 mm deep	No	4		
B1.07/3.16	Ditto but 200 mm diameter x 250 mm deep	No	4		
	4. Density (Nuclear Density method AASHTO T238)				

B1.07/4.01	Nuclear moisture/density gauge (Troxler 3411B or similar approved)	No	1		
B1.07/4.02	Hole forming device (drill rod)	No	3		
B1.07/4.03	Guide for above	No	3		
B1.07/4.04	5. CBR (AASHTO T193)				
B1.07/4.05	CBR load frame (electric and hand operated)	No	1		
B1.07/4.06	Stabilising bar for the above	No	1		
B1.07/4.07	Proving ring for above, 10 kN and 28 kN capacity	set	2		
B1.07/4.08	Penetration gauge range 0 - 25mm	No	2		
B1.07/4.09	CBR piston including bracket	No	2		
B1.07/4.10	Swell measurement tripod complete with guage calibrated in 0.01mm divisions	No	3		
B1.07/4.11	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		
B1.07/4.12	Perforated swell plate 150 mm dia with an adjustable centre post				
B1.07/4.13	of rust proof metal provided with a lock-nut	No	60		
B1.07/4.14	2.25 kg split surcharge weight	No	4		
B1.07/4.15	Set of annular surcharge weights	No	50		
B1.07/4.16	Solid base plate for CBR mould	No	3		
B1.07/4.17	Static compaction displacer discs 1 No 61.4 mm, 1 No x 50.8mm and 2 No 38.8 mm thick	set	2		
B1.07/4.18	Disc lifting handle	No	2		
B1.07/4.19	Central extruder, complete with 20kN hydraulic jack and accessories	No	1		
B1.07/4.20	Proving ring for the above	No	2		
B1.07/4.21	CBR piston including bracket	No	2		
B1.07/4.22	Swell measurement tripod complete with guage calibrated in 0.01mm divisions	No	3		
B1.07/4.23	Soaking tank for CBR mould sufficient for 50 moulds	No	1		
	6. Relative Density of Aggregates (BS 812)				
B1.07/6.01	Wire mesh basket with apertures not greater than 6.5 mm large enough to contain 2.5 kg of aggregate	No	2		
B1.07/6.02	A stout watertight container in which the basket can be freely suspended	No	2		
B1.07/6.03	Soft absorbent cloth (tea towel)	No	40		

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B1.07/6.04	Shallow tray of area not less than 0.065 m ²	No	2		
B1.07/6.05	An airtight container of similar capacity to the basket	No	2		
B1.07/6.06	Pycnometer of 1 litre capacity	No	4		
B1.07/6.07	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		
B1.07/6.08	Hairdrier (electric)	No	2		
B1.07/6.09	7. Flakiness (BS 812)				
B1.07/6.10	Thickness gauge (various sizes)	No	2		
B1.07/6.11	8. Sieve Analysis (BS 1377)				
B1.07/6.12	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		
B1.07/6.13	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		
B1.07/6.14	Electric sieve shaker	No	1		
B1.07/6.15	BS sieve 200mm diameter 0.425 and 0.075 mm	set	1		
B1.07/6.16	1 m x 1 m x 75mm deep galvanized metal tray	No	10		
B1.07/6.17	Riffle box with 50mm slots (BS 1377)	No	2		
	9. Miscellaneous Equipment				
B1.07/9.01	Wheel barrow	No	4		
B1.07/9.02	Dustpan and brush	No	4		
B1.07/9.03	Shovel	No	6		
B1.07/9.04	Pick axe with handle	No	6		
B1.07/9.05	Metal scoop, large (150mm wide)	No	4		
B1.07/9.06	Metal scoop, medium (100mm wide)	No	6		
B1.07/9.07	Garden trowel	No	6		
B1.07/9.08	Steel tray 0.3m x 0.3m x 0.01m deep	No	20		
B1.07/9.09	3.5 kg hammer	No	2		
B1.07/9.10	7kg hammer	No	2		
B1.07/9.11	Rubber mallet (1kg)	No	4		
B1.07/9.12	Cold chisel	No	12		
B1.07/9.13	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		
B1.07/9.14	3 metre straight-edge including calibrated wedges	No	2		

B1.07/9.15	500mm x 500mm x 10mm plate glass (BS 1377)	No	4		
B1.07/9.16	Steel rod 75mm long x 3.2mm diameter	No	4		
B1.07/9.17	Palette knife 200mm long blade	No	3		
B1.07/9.18	Palette knife 100mm long blade	No	4		
B1.07/9.19	BS sieve 450mm diameter, 37.5mm	No	1		
B1.07/9.20	BS sieve 450mm diameter, 20mm	No	1		
B1.07/9.21	BS sieve 450mm diameter, 5mm	No	1		
B1.07/9.22	BS sieve 450mm diameter, 0.425mm	No	2		
B1.07/9.23	BS sieve 450mm diameter, 0.3mm	No	2		
B1.07/9.24	BS sieve 450mm diameter, 0.075mm	No	2		
B1.07/9.25	Set of lid and receiver for metal scoop and steel trays	No	2		
B1.07/9.26	BS Sieve brush	No	10		
B1.07/9.27	Measuring cylinder set, 25 ml, 100 ml, 500 ml, 1000 ml, 2000 ml	set	3		
B1.07/9.28	Glass jar capacity 5 litres with lid	No	10		
B1.07/9.29	200mm x 200mm x 20mm cadmium plated or aluminium tin	No	30		
B1.07/9.30	Electronic balance capacity 1000 g, accurate to 0.01gm.	No	1		
B1.07/9.31	Balance 2000 g capacity accuracy to 0.1g (manual), including weights	No	1		
B1.07/9.32	Balance 50kg capacity accurate to 10gm including weights	No	1		
B1.07/9.33	Still for producing distilled water	No	1		
B1.07/9.34	Polythene or glass 20 litres storage vessel with tap at bottom	No	3		
B1.07/9.35	Stiff broom	No	5		
B1.07/9.36	Vernier calipers, 150mm	No	2		
B1.07/9.37	Vernier calipers, 250mm	No	2		
B1.07/9.38	Pestle and mortar	No	2		
B1.07/9.39	Linear shrinkage mould (BS 1377)	No	8		
B1.07/9.40	Liquid Limit Device	No	2		
B1.07/9.41	Average least dimension gauge	No	2		
B1.07/9.42	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		
B1.07/9.43	Plastic or metal bucket including lid,10 litres capacity	No	5		
B1.07/9.44	Plastic or metal bucket including lid,20 litres capacity	No	5		


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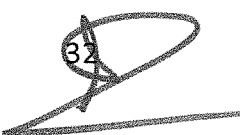
B1.07/9.45	Polythene wash bottle (500 ml)	No	6		
B1.07/9.46	Thermometer, range -10°C to 150°C, glass (BS 593)	No	4		
B1.07/9.47	Laboratory thermometer, range + 0°C to + 250°C (BS 593)	No	2		
B1.07/9.48	Maximum and minimum thermometer (BS692)	No	2		
B1.07/9.49	Rain gauge	No	5		
B1.07/9.50	Portable dial thermometer + 50°C to +250°C accurate to ± 3%	No	3		
B1.07/9.51	Ditto with 0.75m long stem	No	1		
B1.07/9.52	Pocket thermometer + 50°C to +250°C accurate to ± 3% with 0.1 m stem	No	2		
B1.07/9.53	5 litre capacity steel storage containers with leak and dust proof lids for storage of bitumen samples	No	100		
B1.07/9.54	Hotplate 200mm diameter with Simmerstat heat control unit.	No	2		
B1.07/9.55	450mm diameter x 150mm deep metal mason's basin	No	10		
	11. Concrete: Slump and Cube Manufacture (BS 1881)				
B1.07/11.01	Slump cone, tamping rod and base	Set	3		
B1.07/11.02	Concrete cube mould, 150mm cube	No	30		
B1.07/11.03	Soaking tank for cubes (capacity 50 No.)	No	1		
B1.07/11.04	Cube tamping bars	No	3		
	12. Concrete: Cube Compression Testing				
B1.07/12.01	Concrete compression machine to BS1610 Grade A with 300mm gauge, rectangular platens, capacity 1560 kN with load spacer	No	1		
B1.07/12.02	Safety guard for above	No	1		
B1.07/12.03	50mm distance piece	No	1		
B1.07/12.04	70mm distance piece	No	1		
B1.07/12.05	Electro-mechanical load pacer, 100 mm or equivalent distance piece	No	1		
	13. Aggregate and Chippings				
B1.07/13.01	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		
B1.07/13.02	Beaker 250ml	No	2		
B1.07/13.03	Aggregate Crushing Value Apparatus; 130 mm nominal diameter, including plunger and base plate	No	1		

B1.07/13.04	Tamping rod and metal measure for above	Set	2		
B1.07/13.05	Los Angeles Abrasion to ASTM standards	No	1		
B1.07/13.06	Set of 12 abrasive charges	No	1		
B1.07/13.07	Thermometer, 0°C to +50°C	No	2		
B1.07/13.08	Thermometer, 0°C to +250°C	No	2		
B1.07/13.09	Reagent grade Silica gel, 500g container	No	100		
B1.07/13.10	Aggregate Crushing Value apparatus, 150mm nominal diameter, including plunger and base plate	No	1		
B1.07/13.11	Tamping rod and metal measure for above (BS 812)	set	1		
B1.07/13.12	Transverse distribution of spray test for bitumen distributor (tray test to BS 1707) equipment	set	1		
B1.07/13.13	Steel tray 20 mm deep x 0.1 m ² (for measuring bitumen spray quantity)	No	2		
B1.07/13.14	Purpose-made detachable handle 1.5m long to pick above trays	No	2		
	14. Bitumen Spray Test (BS 1707) and Penetration Test				
B1.07/14.1	Transverse distribution of spray test bitumen distributor (depot tray test to BS 1707) or equivalent.	Set	1		
B1.07/14.2	Steel tray 20 mm deep x 0.1m ² (for measuring bitumen spray rates) with purpose made detachable handle 1.5m long	No	2		
B1.07/14.3	(a) ELE - Automatic bitumen penetrometer (EL 46-5380/01) with accessories with IP 38oC thermometer	No	1		
	(b) Penetration test cup	No	3		
	(c) Certified bitumen penetration needle	No	3		
	15. Marshall Test (ASTM D 1559)				
B1.07/15.01	Thermometer (50oC - 250oC), 50mm diameter with 180mm stainless steel stem	No	2		
	16. Bitumen Extraction Test				
	A) Extractor Bottle Method BS 598 Part 2				
B1.07/16.01	Electronic top pan balance 4kg capacity, sensitive to 0.1gm	No	1		
B1.07/16.02	Flat bottomed scoop	No	3		
B1.07/16.03	Steel garden trowel	No	2		
B1.07/16.04	Large steel spoon	No	2		
B1.07/16.05	Heat resistant gloves	pair	10		


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B1.07/16.06	Foot pump for pressurising air water assemblies up to a maximum of 700KN/m2 and fitted with flexible hose approximately 1.2m long and connector	No	2		
B1.07/16.07	Steel bottle 600ml capacity with 49mm rubber stopper	No	2		
B1.07/16.08	Steel bottle 2500ml capacity with 71mm rubber stopper	No	2		
B1.07/16.09	Steel bottle 7000ml capacity with 71mm rubber stopper	No	2		
B1.07/16.10	Flask funnel for fitting to the 700ml steel bottle with rim of funnel retaining sieve 200mm nominal diameter	No	2		
B1.07/16.11	Bottle roller compact bench mounted unit designed to rotate 2 bottles simultaneously about longitudinal axis	No	1		
B1.07/16.12	Pressure filter complete with cutting tool for making hole in the filter paper	No	1		
B1.07/16.13	Filter funnel to take 200mm nominal diameter sieves	No	2		
B1.07/16.14	Centrifuge complying with BS 598	No	1		
B1.07/16.15	Binder recovery	No	1		
B1.07/16.16	Volumetric flask 250ml, 500ml, 1000ml and 2000ml capacity	set	2		
B1.07/16.17	Recovery still for Dichloromethane	No	1		
	B) Hot Extractor Method BS 598 Part 2				
B1.07/16.18	Hot extractor complete with wire gauze container gasket, cork lid and support assembly	No	2		
B1.07/16.19	Dean and Stark receiver with condenser to suite Trichloroethylene	No	2		
B1.07/16.20	Gyratory compactor ELE Servo Pac or equivalent with 1 x100mm and 1 x 150mm moulds	No	1		
B1.07/16.21	PRD Vibrating hammer compactor complete with 6 moulds, 7 base plates from ELE	No	1		
B1.07/16.22	Tamping foot 102mm diameter and 146mm diameter and shanks to fit the supplied vibratory hammer	Set	2		
	17. Consumables				
B1.07/17.01	Paraffin wax	Kg	50		
B1.07/17.02	Gas	Kg	1,000		
B1.07/17.03	Gunny sack	No	400		
B1.07/17.04	Plastic bag 900x450x1000 gauge	No	2,000		


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B1.07/17.05	Plastic bag 450x300x1000 gauge	No	2,000		
B1.07/17.06	Filter paper 150mm diameter Whatman No. 5 (Boxes of 100)	No	40		
B1.07/17.07	Filter paper 400mm diameter Whatman No. 5 (Boxes of 100)	No	20		
B1.07/17.08	Filter paper 100mm diameter Whatman No. 5 (Boxes of 100)	No	20		
B1.07/17.09	Filter paper 400mm diameter Whatman No. 54 (Boxes of 100)	No	5		
B1.07/17.10	Filter paper 270mm diameter with 33 diameter hole at centre Whatman No. 5 (Boxes of 100)	No	15		
B1.07/17.11	Trichloroethylene	kg	1,000		
B1.07/17.12	Dichloromethane	kg	1,000		
B1.07/17.13	Cotton waste	kg	400		
	Total of Appendix B1.05 Carried to Bill No.1 item 1.04				


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