



**Kenya National Highways Authority**

**Quality Highways, Better Connections**

**HORN OF AFRICA GATEWAY DEVELOPMENT PROJECT (HoAGDP),  
PROJECT ID: P161305**

**PKG 1: UPGRADING OF ISIOLO – KULAMAWE - MODOGASHE (A10/B84) ROAD AND  
CIVIL WORKS ASSOCIATED WITH INSTALLING A FIBRE OPTIC CABLE ALONG THE  
ROAD SECTION**

**ICB NO: KE-KENHA-201783-CW-RFB**

**LOT 2: TENDER NO. KeNHA/2351/2020 - KULAMAWE – MODOGASHE ROAD AND  
GARBATULA SPUR ROAD (128 KM)**

**AND**

**CIVIL WORKS ASSOCIATED WITH INSTALLING A FIBRE OPTIC CABLE ALONG THE  
KULAMAWE - MODOGASHE - SAMATAR ROAD SECTION (218 KM)**

**BIDDING DOCUMENT:**

**VOLUME 3 OF 7 – BILLS OF QUANTITIES; 3A - LOT 2**

**NOVEMBER, 2020**

**Director (Development)  
Kenya National Highways Authority  
P.O. Box 49712  
NAIROBI, 00100**

**Director General  
Kenya National Highways Authority  
P.O. Box 49712  
NAIROBI, 00100**



## Bill of Quantities – Lot 2

### Preamble

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions of Contract, Technical Specifications and Drawings.
2. The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.
3. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
4. There is no guarantee to the Contractor that he will be required to carry out all the quantities of work indicated under any one particular item or group of items in the Bill of Quantities.
5. The price and rates entered in the Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all constructional plant to be used, labour, insurance, supervision, compliance testing, materials, erection, maintenance of works, overheads and profits, taxes and duties together with all general risks, liabilities and obligations set out or implied in the Contract, transport, electricity and telephones, water, use and replenishment of all consumables, including those required under the Contract by the Engineer and his staff.
6. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
7. Any entry of “nil” or any other price or rate that shall render the Bid unresponsive in accordance with Clause 29 of the instructions to Bidders, unless deemed justifiably covered elsewhere in the Bills of Quantities, may lead to the entire Bid being rejected
8. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
9. General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
10. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Clause 13 of the Conditions of Contract.
11. The method of measurement of completed work for payment shall be in accordance with *Standard Specification for Road and Bridge Construction* of the Ministry of Transport and Communications, 1986.
12. "Authorized" "Directed" or "Approved" shall mean the authority, direction or approval of the Engineer.
13. Unless otherwise stated, all measurements shall be net taken on the finished work carried out in accordance with the details shown on the drawings or instructed, with no allowance for extra cuts or fills, waste or additional thickness necessary to obtain the minimum finished thickness or dimensions required in this contract. Any work performed in excess of the requirements of the plans and Specifications will not be paid for, unless ordered in writing by the Engineer.

14. Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:
- Where there is a discrepancy between amounts in figures and in words, the amount in words will govern; and
  - where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer, there is an obviously gross misplacement of the decimal point in the unit price, in which event the total amount as quoted will govern and the unit rate will be corrected.
15. (a) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledge hammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 300 kilowatt power with a single, rear-mounted, hydraulic ripper. Boulders of more than 0.2m<sup>3</sup> occurring in soft material shall be classified as hard material
- (b) Soft material shall be all material other than hard material.
16. The Contractor shall be entitled to payments due in respect of:-
- Equipment employed on Daywork basis on the rental rates entered by him in the “schedule of Dayworks: Plant”
  - That Labour (ordinary) employed on daywork basis at the rates entered by him in the “Schedule of Daywork: Labour”
  - Materials used on daywork at the rates entered by him in the “Schedule of Dayworks: Materials”.
17. Units of Measurement and Abbreviations used herein shall have the following meanings:

<b>Unit</b>	<b>Abbreviation</b>	<b>Unit</b>	<b>Abbreviation</b>
cubic meter	m <sup>3</sup> or cu m	millimetre	mm
hectare	Ha	month	mth
hour	hr.	number	No.
House-month	hse-month		
kilogram	Kg	provisional sum	Prov. Sum
kilometre	Km		
lump sum	L.sum.	square meter	m <sup>2</sup> or sq m
man month	m mth	square millimetre	mm <sup>2</sup> or sq mm
meter	M	vehicle	veh
metric tonne (1,000kg)	T	vehicle month	v mth
litres	ltrs	week	wk

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
1.01	Engineer's senior staff houses				
	(i) Type I	No.	1		
	(ii) Type II	No.	8		
1.02	Engineer's junior staff houses				
	(i) Type III	No.	10		
	(ii) Type IV	No.	20		
	(iii) Type V (Dormitory-style Guest house)	No.	1		
1.03	Engineer's office.	No.	1		
1.04	Engineer's Laboratory				
	(a) main laboratory	No.	1		
	(b) Mobile Laboratory	No.	1		
1.05	Furniture and equipment for Engineer's office as listed in the appendix to this item	Lump Sum	1		
1.06	Furniture and equipment for Engineer's laboratory as listed in the appendix to this item	Lump Sum	1		
1.07	Vehicles for the Engineer				
	(a) Type 1: 5 No. 4 - Wheel Drive Vehicle Station Wagons with minimum engine capacity of 3000 c.c. and turbo charged engine	Veh.Mth	250		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
1.08	(b) Type 2: 15 No. 4 - Wheel Drive twin cab pick-up with engine capacity of 2500 - 3000 cc and turbo charged diesel engine	Veh.Mth	710		
	(c) Type 3: 4 No. 4 - Wheel Drive single cab pick-up with engine capacity of 2500 - 3000 cc and turbo charged diesel engine with fibreglass canopy	Veh.Mth	180		
	Extra over Item 1.07 for kilometres travelled above 4000km in a calendar month				
1.09	(a) Type 1 Vehicle	km.	1,318,400		
	(b) Type 2 Vehicle	km.	3,245,022		
	(c) Type 3 Vehicle	km.	949,248		
	Wireless communication for Engineer's office and site vehicles				
	(a) Fixed radio	No	1		
1.10	(b) Mobile radio	No	16		
	(c) Mobile phones	No	15		
	(d) Provide, install and maintain a V-Sat Facility (or similar)	No	1		
	(e) Provide, install and maintain a LAN system and equipment for the Resident Engineers Office and laboratory	No	1		
1.10	Lump sum for installation of intercom facility, including	Lump Sum	1		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	PABX and 20 extensions, to the Engineer's office				
1.11	Not used				
1.12	Allow for a Provisional Sum of KShs. 4,000,000 for the engineer's staff mobile phone airtime charges	Provisional Sum			4,000,000
1.13	Contract's overheads and profits on item 1.12	%	4,000,000		
1.14	Allow for a Provisional Sum of KShs. 50,000,000 for removal and alteration to existing services	Provisional Sum			50,000,000
1.15	Contract's overheads and profits on item 1.14	%	50,000,000		
1.16	Allow for a Provisional Sum of KShs. 60,000,000 for land acquisition and PAPs resettlement	Provisional Sum			60,000,000
1.17	Contract's overheads and profits on item 1.16	%	60,000,000		
1.18	Not used				
1.19	Not used				
1.20	Digital camera	No	1		
1.21	Allow for a Provisional Sum of KShs. 3,000,000 for regular video and still photography as instructed by the Engineer	Provisional Sum			3,000,000

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
1.22	Contract's overheads and profits on item 1.21		3,000,000		
1.23	Signboards	No	2		
1.24	Allow for a Provisional Sum of KShs. 5,000,000 for the Engineer's temporary accommodation	Provisional Sum			5,000,000
1.25	Contract's overheads and profits on item 1.24	%	5,000,000		
1.26	Not used				
1.27	Not used				
1.28	Allow a Provisional Sum of KShs. 195,000,000 for providing of social amenities as directed.	Provisional Sum			195,000,000
1.29	Contract's overheads and profits on item 1.28	%	195,000,000		
1.30	Allow for a Provisional Sum of Kshs. 20,000,000 for confirmatory geotechnical investigations as directed by the Engineer.	Provisional Sum			20,000,000
1.31	Contractor's overheads and profits on item 1.30	%	20,000,000		
1.32	Allow for a Provisional Sum of K.Sh. 10,000,000 for environmental mitigation beyond measures as required by the contract (off road).	Provisional Sum			10,000,000



<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
1.33	Contract's overheads and profits on item 1.32	%	10,000,000		
1.34	Security Arrangements:				
	(a) Provide and maintain security camps including security arrangement at each camp as detailed in the specifications	No.	4		
	(b) Provide transport and equipment's for use by employer's security personnel over the contract period:				
	(i) Special fitted – 4 Wheel Drive twin cab pick-up with engine capacity of 2500 - 3000 cc and turbo charged diesel engine	No	5		
	(ii) 4 Wheel Drive single cab pick-up Land cruiser with engine capacity of 4000 - 4200 cc and turbo charged diesel engine	No	8		
	(iii) 4 Wheel Drive Land cruiser van with engine capacity of 4000 - 4200 cc and turbo charged diesel engine	No.	2		
	(iv) 7 Ton Lorry fitted with Tarpaulin covers with engine capacity of 4300 - 4500 cc diesel engine	No.	3		
	(v) Covered body Van fitted to Ambulance specifications with engine capacity of 2500 - 3000 cc diesel engine	No.	1		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	(vi) Motorbikes with engine capacity of 150 -170 cc petrol engine	No.	8		
	(c) Maintain the security vehicles:				
	(i) Special fitted Twin cab pick-up	Veh-mth	270		
	(ii) Single cab Land cruiser pick-up & land cruiser van	Veh-mth	492		
		Veh-mth	126		
	(iii) 7-ton lorry	Veh-mth	48		
	(iv) Ambulance	Veh-mth	336		
	(v) Motorbikes				
	(d) Provide and maintain security communication equipment and facilities for use by the employer's security personnel, as detailed in the specifications				
	i. HF Radios	No.	22		
	ii. VHF	No.	4		
	iii. Mobile phones	No.	40		
	iv. Satellite phones	No.	20		
	v. Allow for a Provisional Sum of KShs. 6,000,000 for the Satellite phone annual subscription fee and units	Provisional Sum			6,000,000
	vi. Contractors profit and overhead on item 1.34 d(v)	%	6,000,000		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	vii. Allow for a Provisional Sum of KShs. 9,000,000 for the purchase of airtime for mobile phones	Provisional Sum			9,000,000
	viii. Contractors profit and overhead on item 1.34 d(vii)	%	9,000,000		
	ix. Allow for a Provisional Sum of KShs6,000,000 for the wireless annual subscription fee and installation	Provisional Sum			6,000,000
	x. Contractors profit and overhead on item 1.34 d(ix)	%	6,000,000		
	xi. Provide air compressor 2.5-5 HP	No.	3		
	xii. Provide Tyre repair Kits/Tool box	No.	3		
	xiii. Provider pressure washer 3.5-5.5 HP	No.	3		
	xiv. Provide Portable Water Tank of capacity 5000 L	No.	3		
	(e) Provide and maintain prefabricated housing units for 40 No. security officers, including furniture and furnishing, as detailed in the specifications	LS	4		
	(f) Provide and maintain computers and accessories, printers, scanners/photocopiers and paper shredders for use by the Employer's security personnel over the contract	LS	4		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	period as detailed in the specifications				
	(g) Allow for a Provisional Sum of KShs. 580,000,000 for security staff allowances.	Provisional Sum			580,000,000
	(h) Contractor's profits and overheads on item 1.34(g)	%	580,000,000		
	(i) Allow for a Provisional Sum of KShs. 4,000,000 for assorted stationery for use by the Employer's security personnel..	Provisional Sum			4,000,000
	(j) Contractor's overheads and profits on item 1.34(i)	%	4,000,000		
1.35	Grievance Redress Committee logistics:				
	(a) Allow for a Provisional Sum of KShs. 5,000,000 for grievance redress committee logistics				5,000,000
	(b) Contract's overheads and profits on item 1.35(a)	%	5,000,000		
1.36	Allow for a Provisional Sum for additional ESHS outcomes.	Provisional Sum			5,000,000
1.37	Extra over Item 1.36 for Contractor's overheads and profit	%	5,000,000		
1.38	Allow for a Provisional Sum for sexual exploitation and abuse (SEA) / gender-based violence (GBV) awareness and sensitization training.	Provisional Sum			5,000,000
1.39	Extra over Item 1.38 for Contractor's overheads and profit	%	5,000,000		
1.40	Allow a provisional sum for purchase of additional Testing and other equipment	Prov. Sum			2,000,000

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
1.41	EO Item 1.40 for the Contractor's profit and overheads	%	2,000,000		
1.42	Provide 150 mm dia Solar powered tube well up to sweet water aquifer with pumping arrangements and 20,000 litre overhead storage for construction water and nearby habitants and hand over to Employer on completion of works in working conditions.  <i>The overhead tanks shall be made of plastic, and shall be supplied, delivered and installed complete with cover and having screwed connections for inlet, outlet, overflow and drain pipe. The tank shall be supported on galvanized steel tower structure capable of supporting the tank full of water inclusive of wind, complete with reinforced concrete base supports, ladder and guardrails.</i>	No.	15		
1.43	Allow a provisional sum for payment of Dispute Board (Employers portion of Dispute Board payment)	Prov. Sum			31,000,000
1.44	E.O. Item 1.43 for the Contractor's overheads and profit	%	31,000,000		
1.45	Allow a provisional sum of Ksh. 7,000,000 for design of solar powered streetlighting for interchange and select townships and market centres				7,000,000

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
1.46	E.O. Item 1.45 for the Contractor's overheads and profit	%	7,000,000		120,000,000
1.47	Allow a provisional sum of Ksh. 120,000,000 for provision and installation of solar powered streetlighting for interchange and select townships and market centres				
1.48	E.O. Item 1.47 for the Contractor's overheads and profit	%	120,000,000		
1.49 (a)	ICT fibre optic cable civil works: Kulamawe – Modogashe (113 Km)				
	(a) Trenching:				
	(i) Excavation for trenching in standard/normal soils	m <sup>3</sup>	52,300		
	(ii) Excavation for special trenching in sandy, loose and eroded soils	m <sup>3</sup>	13,100		
	(iii) Excavation for special trenching with gabion protection at river/lagger crossings	m <sup>3</sup>	100		
	(iv) Provide all materials and lay compacted treated bedding at bottom of trench	m <sup>3</sup>	5,688		
	(v) Normal backfill with excavated material	m <sup>3</sup>	50,100		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	(vi) Provide all materials and lay compacted treated backfill at top of trench and for erosion protection	m <sup>3</sup>	36,910		
	(vii) Provide and install gabion boxes	m <sup>2</sup>	250		
	(viii) Rockfill to gabions	m <sup>3</sup>	35		
	(ix) Provide and place warning tape in the trench	M	113,000		
	(x) Excavation for special trenching in Hard material	m <sup>3</sup>	15,000		
	(b) Provide all materials and place reinforced concrete covering	m <sup>3</sup>	7,500		
	(c) Boring and bore marking:				
	(i) Boring across spur roads	m	300		
	(ii) Boring across major highways	m	300		
	(iii) Provide and install reinforced concrete bore end marker pillar	No.	55		
	(d) Ducts/conduits:				
	(i) Provide and lay HPDE ducts	m	113,000		
	(ii) Provide and lay galvanized steel ducts	m	1,800		
	(e) Hand holes and manholes				
	(i) Excavate for, provide all materials and install 600mm diameter x 600mm high hand	No.	30		

<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	hole chambers complete with lockable covers				
	(ii) Excavate for, provide all materials and install 900mm diameter x 1000mm high hand hole chambers complete with lockable covers	No.	30		
	(iii) Excavate for, provide all materials and construct manholes in accordance with the specifications	No.	30		
	(f) Provide and install concrete poles in accordance with the specifications	No	460		
1.49 (b)	<b>ICT fibre optic cable civil works: Modogashe - Samatar (90Km)</b>				
	(a) Trenching				
	(i) Excavation for trenching in standard/normal soils	m <sup>3</sup>	41,655		
	(ii) Excavation for special trenching in sandy, loose and eroded soils	m <sup>3</sup>	10,500		
	(iii) Excavation for special trenching with gabion protection at river/lagger crossings	m <sup>3</sup>	80.00		
	(iv) Provide all materials and lay compacted treated bedding at bottom of trench	m <sup>3</sup>	4,550		
	(v) Normal backfill with excavated material	m <sup>3</sup>	40,000		



<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	(vi) Provide all materials and lay compacted treated backfill at top of trench and for erosion protection	m <sup>3</sup>	30,000		
	(vii) Provide and install gabion boxes	m <sup>2</sup>	200		
	(viii) Rockfill to gabions	m <sup>3</sup>	30		
	(ix) Provide and place warning tape in the trench	m	90,000		
	(x) Excavation for special trenching in Hard material	m <sup>3</sup>	12,000		
	(b) Provide all materials and place reinforced concrete covering	m <sup>3</sup>	6,000		
	(c) Boring and bore marking				
	(i) Boring across spur roads	m	240		
	(ii) Boring across major highways	m	240		
	(iii) Provide and install reinforced concrete bore end marker pillar	No.	44		
	(d) Ducts/conduits				
	(i) Provide and lay HPDE ducts	m	90,000		
	(ii) Provide and lay galvanized steel ducts	m	1,500		
	(e) Hand holes and manholes				
	(i) Excavate for, provide all materials and install 600mm diameter x 600mm high hand hole chambers complete with lockable covers	No.	25		
	(ii) Excavate for, provide all materials and install 900mm diameter x 1000mm high hand hole chambers complete with lockable covers	No.	25		
	(iii) Excavate for, provide all materials and construct manholes in accordance with the specifications	No.	25		
<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (K.Sh.)
1.49(c)	(f) Provide and install concrete poles in accordance with the specifications	No.	370		
	<b>ICT fibre optic cable civil works: Garbatula Spur Road (15Km)</b>				
	(a) Trenching	m <sup>3</sup>	6,950		
	(i) Excavation for trenching in standard/normal soils				
	(ii) Excavation for special trenching in sandy, loose and eroded soils	m <sup>3</sup>	1,740.00		
	(iii) Excavation for special trenching with gabion protection at river/lagger crossings	m <sup>3</sup>	14.00		
	(iv) Provide all materials and lay compacted treated bedding at bottom of trench	m <sup>3</sup>	755		
	(v) Normal backfill with excavated material	m <sup>3</sup>	6,650		
	(vi) Provide all materials and lay compacted treated backfill at top of trench and for erosion protection	m <sup>3</sup>	5,000		
	(vii) Provide and install gabion boxes	m <sup>2</sup>	34		
	(viii) Rockfill to gabions	m <sup>3</sup>	5		
	(ix) Provide and place warning tape in the trench	m	15,000		
	(x) Excavation for special trenching in Hard material	m <sup>3</sup>	2,000		
	(b) Provide all materials and place reinforced concrete covering	m <sup>3</sup>	1,000		
	(c) Boring and bore marking				
	(i) Boring across spur roads	m	40		
	(ii) Boring across major highways	m	40		
(iii) Provide and install reinforced concrete bore end marker pillar	No.	8			

**BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS**

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (K.Sh.)	
1.49 (d)	(d) Ducts/conduits	m	15,000			
	(i) Provide and lay HPDE ducts					
	(ii) Provide and lay galvanized steel ducts	m	240			
	(e) Hand holes and manholes					
	(i) Excavate for, provide all materials and install 600mm diameter x 600mm high hand hole chambers complete with lockable covers	No.	4			
	(ii) Excavate for, provide all materials and install 900mm diameter x 1000mm high hand hole chambers complete with lockable covers	No.	4			
	(iii) Excavate for, provide all materials and construct manholes in accordance with the specifications	No.	4			
	(f) Provide and install concrete poles in accordance with the specifications	No.	65			
	<b>ICT fibre optic cable civil works: Connection to Institutions and County Roads: Kulamawe - Modogashe – Samatar (203 Km)</b>					
	(a) Trenching					
(i) Excavation for trenching in standard/normal soils	m <sup>3</sup>	41655				
(ii) Excavation for special trenching in sandy, loose and eroded soils	m <sup>3</sup>	10500				
(iii) Excavation for special trenching with gabion protection at river/lagger crossings	m <sup>3</sup>	80				
(iv) Provide all materials and lay compacted treated bedding at bottom of trench	m <sup>3</sup>	4550				
(v) Normal backfill with excavated material	m <sup>3</sup>	40000				
<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>						

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (K.Sh.)
	(vi) Provide all materials and lay compacted treated backfill at top of trench and for erosion protection	m <sup>3</sup>	30000		
	(vii) Provide and install gabion boxes	m <sup>2</sup>	200		
	(viii) Rockfill to gabions	m <sup>3</sup>	30		
	(ix) Provide and place warning tape in the trench	m	90000		
	(x) Excavation for special trenching in Hard material	m <sup>3</sup>	12,000		
	(b) Provide all materials and place reinforced concrete covering	m <sup>3</sup>	6000		
	(c) Boring and bore marking				
	(i) Boring across spur roads	m	240		
	(ii) Boring across major highways	m	240		
	(iii) Provide and install reinforced concrete bore end marker pillar	No.	44		
	(d) Ducts/conduits				
	(i) Provide and lay HPDE ducts	m	90000		
	(ii) Provide and lay galvanized steel ducts	m	1500		
	(e) Hand holes and manholes				
	(i) Excavate for, provide all materials and install 600mm diameter x 600mm high hand hole chambers complete with lockable covers	No.	25		
	(ii) Excavate for, provide all materials and install 900mm diameter x 1000mm high hand hole chambers complete with lockable covers	No.	25		
<b>BILL NO. 1 : PRELIMINARY AND GENERAL ITEMS</b>					

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (K.Sh.)
1.50	(iii) Excavate for, provide all materials and construct manholes in accordance with the specifications (f) Provide and install concrete poles in accordance with the specifications Relocation of Existing Fire Optic Cable From Kulamawe - Modogashe - Samatar (203 Km )	No.	25		
		No.	370		
		m	203,000		
	<b>TOTAL OF BILL NO.1 CARRIED FORWARD TO SUMMARY</b>				

<b>BILL NO. 4 : SITE CLEARANCE AND TOPSOIL STRIPPING</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	<p><u><b>IMPORTANT NOTE</b></u> All costs and charges connected with haulage are to be included within the unit rates entered against the items described in this Bill of Quantities</p>				
4.01	Clear site on road reserve including removal of trees, hedges, bushes and other vegetation or deleterious organic material, grub up roots and back fill to 100% MDD (AASHTO T99) with approved material in accordance with the specification.	Ha	592		
4.02	Remove top soil to an approved depth and cart to spoil or stockpile for reuse as directed by the Engineer.	m <sup>3</sup>	598636		
4.03	Excavate, remove and dispose existing 600mm and 900mm dia. Concrete pipe culverts.	m	850		
4.04	Demolish and dispose existing culvert inlet and outlet structures	No.	55		
4.05	Demolish and dispose existing drift structures	m <sup>2</sup>	5525		

<b>BILL NO. 4 : SITE CLEARANCE AND TOPSOIL STRIPPING</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
4.06	Allow a Provisional Sum for demolition and disposing of the existing bridges and box culverts as instructed by the engineer. Item to be expended using the rates for other items in the bill of quantities which already contain contractors profit and overheads therefore no additional separate overheads and profit is applicable.	Provisional Sum			5,000,000
<b>TOTAL OF BILL NO.4 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 5 : EARTHWORKS</b>					
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT (K.Sh.)
5.01	Fill in soft material compacted to 100% MDD (AASHTO 99)	m <sup>3</sup>	1,928,000		
5.02	Fill in hard material	m <sup>3</sup>	175,250		
5.03	Cut to spoil in soft material	m <sup>3</sup>	170,000		
5.04	Cut to spoil in hard material	m <sup>3</sup>	17,000		
5.05	Provide, transport, spread and compact to at least 100% MDD Improved Subgrade material G25 (Minimum CBR=25%)	m <sup>3</sup>	294,000		
5.06	Compaction to 150mm depth of existing ground below fills	m <sup>3</sup>	363,815		
5.07	Compaction of 300mm below Improved subgrade layer in cuts to 100% MDD (AASHTO T99)	m <sup>3</sup>	102,631		
5.08	E.O. Item 5.01 for compaction of top 300mm in fills to 100% MDD	m <sup>3</sup>	428,578		
5.09	Top soiling prior to grassing	m <sup>2</sup>	754,360		
5.10	Grassing	m <sup>2</sup>	754,360		
5.11	Planting of selected trees	No.	12,860		
<b>TOTAL OF BILL NO.5 CARRIED FORWARD TO SUMMARY</b>					



<b>BILL NO. 7: EXCAVATION AND FILLING FOR STRUCTURES</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
7.01	Excavation to spoil for structures in soft material as per the drawings and specifications	m <sup>3</sup>	7,163		
7.02	E.O. Item 7.01 for excavation in hard material	m <sup>3</sup>	821		
7.03	Excavate for gabions in soft material	m <sup>3</sup>	1253		
7.04	Provide and lay porous filter material as specified	m <sup>3</sup>	758		
7.05	Provide and place gabion mesh-boxes size 2mx1mx1m	m <sup>2</sup>	8,064		
7.06	Provide and place rockfill to gabion boxes	m <sup>3</sup>	1,876		
7.07	Supply and fix filter fabric (300g/m <sup>2</sup> ) behind porous filter material and under gabions as per drawings and specifications	m <sup>2</sup>	4,509		
7.08	Provide and place stone pitching as directed by the Engineer	m <sup>2</sup>	4,791		
7.09	E.O. item 7.08 for cement grouting	m <sup>2</sup>	4,791		
7.10	Provide and backfill approved material around box culverts, compact to 100% MDD (AASHTO T99) in layers not exceeding 150mm	m <sup>3</sup>	4,183		

<b>BILL NO. 7: EXCAVATION AND FILLING FOR STRUCTURES</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
7.11	Provide, place and compact rock fill below structure	m <sup>3</sup>	1,685		
7.12	Carry out river training works as directed	m <sup>3</sup>	19,338		
<b>TOTAL OF BILL NO.7 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 8 : CULVERTS AND DRAINAGE WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
8.01	Excavate for channels, cut-off drains, mitre drains, catchwater drains, inlet and outfall drains in soft material	m <sup>3</sup>	49,090		
8.02	Excavation in soft material for pipe culverts, headwalls, wingwalls, apron, toe walls and drop inlets and compact as directed by the engineer	m <sup>3</sup>	7,515		
8.03	Extra over item 8.01 and 8.02 for excavation in hard material	m <sup>3</sup>	1,415		
8.04	Provide rockfill below minor structures	m <sup>3</sup>	1,965		
8.05	Selected Backfill Material	m <sup>3</sup>	2,340		
8.06	Provide, lay and joint 600mm diameter Ogee jointed concrete pipe culverts	m	1,480		
8.07	As item 8.06 but 900mm diameter	m	2,680		
8.08	As item 8.06 but 1200mm diameter	m	335		
8.09	Provide, place and compact class 15/20 concrete to beds, surround and haunches to concrete pipe culverts including formwork	m <sup>3</sup>	2,855		
8.10	Provide, place and compact class 25/20 concrete for headwalls, wingwalls, aprons, toe walls and other minor drainage structures including formwork and provision and placing of reinforcement as shown in the drawings	m <sup>3</sup>	1,060		

<b>BILL NO. 8 : CULVERTS AND DRAINAGE WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
8.11	Construct concrete scour checks as shown in the drawings	m <sup>3</sup>	75		
8.12	Provide and joint 300mm half round concrete channels on 75mm gravel blinding with 150mm haunch	m	2,940		
8.13	Provide and joint 450mmx225mmx75mm thick precast invert block drain on 75mm gravel blinding with 150mm haunch	m	1,470		
8.14	Provide and joint 600mmx125mmx100mm thick precast concrete channel on 75mm gravel blinding with 150mm haunch	m	490		
8.15	Provide and place stone pitching and grout with mortar as specified or as directed by the Engineer.	m <sup>2</sup>	23,990		
8.16	Provide, lay and joint (2No. Courses) 600mmx225mmx75mm thick side slabs for invert block drains on well compacted murrum bed and jointed by 1:3 cement - sand mortar as shown in the drawings.	m	15,680		
8.17	Provide and Lay RC (1500mm*1000mm*100mm) IBD cover slabs for pedestrian crossings in Township areas	No	400		
8.18	Provide and place A142 fabric mesh reinforcement	m <sup>2</sup>	300		
<b>TOTAL OF BILL NO.8 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 9 : PASSAGE OF TRAFFIC</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
9.01	Provide and compact natural gravel of CBR greater than 20% for maintenance of existing road ahead of works	m3	115,740.0		
9.02	Construct and maintain, including watering 8.0m wide deviations in maximum lengths of 10km sections, having a 150mm thick compacted gravel wearing course of CBR greater than 20%.	km	130		
9.03	Provide signs and barriers in accordance with clause 907 of the Specifications	km	130		
9.04	Maintain the passage of traffic	Lump Sum			
9.05	Reinstatement of deviations to the condition prevailing prior to commencement of construction works	km	130		
	<b>Note: Failure to comply with provisions of this section as instructed by the Engineer will result to penalties as detailed in the Technical Specifications Clause 912</b>				
<b>TOTAL OF BILL NO.9 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 10: GRAVEL WEARING COURSE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
10.01	Provide, lay and compact to 95% AASHTO T180, Gravel wearing course	m <sup>3</sup>	5,000		
<b>TOTAL OF BILL NO. 10 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 12 : NATURAL MATERIAL SUBBASE AND BASE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	NOTE: No overhaul will be paid for these items as they shall be deemed to have been included in the Contractor's rates				
12.01	Provide, lay and compact to 95% AASHTO T180, natural material for subbase (Base Quality)	m <sup>3</sup>	368,296		
12.02	Provide, lay and compact to 95% AASHTO T180, natural material for base	m <sup>3</sup>	285,637		
<b>TOTAL OF BILL NO.12 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 14 : CEMENT AND LIME TREATMENT</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
14.01	Provision, Storage, Haulage, Transport and spreading of portland cement as the stabilizer at any point of the works in conformity with the instructions of the Engineer.	tonne	46,522		
14.02	E.O. Item 14.01 for processing, mixing and compaction in accordance with the specifications and as directed by the Engineer.	m <sup>3</sup>	653,933		
14.03	Watering, provision, placing and maintenance of the curing system.	m <sup>2</sup>	3,762,425		
<b>TOTAL OF BILL NO.14 CARRIED FORWARD TO SUMMARY</b>					



<b>BILL NO. 15 : BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
15.01	Prepare surface of road base, provide, heat and spray MC 30 cut back bitumen prime coat at 1 - 1.2 litres per sq. metre.	Litres	2,146,433		
15.02	Provide and spray 80/100 penetration grade bitumen as binder coat to carriageways, bus bays, accesses and junctions for the Single Seal at the rate of 0.8 - 1.2 L/m <sup>2</sup> or as directed by the Engineer.	Litres	1,372,586		
15.03	Provide, spread and roll pre-coated chippings of size 10/14 at a spread rate of 60 m <sup>2</sup> /m <sup>3</sup> - 90 m <sup>2</sup> /m <sup>3</sup> to Carriageway.	m <sup>3</sup>	19,064		
15.04	Provide and spray 80/100 penetration grade bitumen as binder coat to shoulders for the Single Seal at the rate of 0.6 - 1.0 L/m <sup>2</sup> or as directed by the Engineer.	Litres	619,959		
15.05	Provide, spread and roll pre-coated chippings of size 6/10 at a spread rate of 80 m <sup>2</sup> /m <sup>3</sup> - 130 m <sup>2</sup> /m <sup>3</sup> to Shoulders.	m <sup>3</sup>	7,749		
15.06	Clean and prepare surfaces of main carriageway, slip roads, shoulders, bus bays, accesses and junctions, provide, transport and spray on the same K1-60 emulsion as tack coat at a rate of spray in the range of 0.3 litre/m <sup>2</sup> to 0.8 litres/m <sup>2</sup> or as instructed by the Engineer	Litres	1,408,103		
<b>TOTAL OF BILL NO.15 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 16: BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
16.01	Provide lay and compact Type I Asphalt Concrete (SUPERPAVE) binder course with nominal bitumen of 5.5 % (75 mm thick on carriageway, accesses, junctions, bus bays, etc and 35 mm thick on shoulders); all in accordance with the specifications and as directed by the Engineer	m <sup>3</sup>	105,458		
16.02	Provide lay and compact 35 mm thick Type II Asphalt Concrete wearing course with nominal bitumen of 5.5 % on market loop roads including the walkways, etc; all in accordance with the specifications and as directed by the Engineer	m <sup>3</sup>	456		
16.03	Allow for binder variation	Litres	1,339,819		
<b>TOTAL OF BILL NO.16 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 17: CONCRETE WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
17.01	Provide all material, labour, plant etc and lay concrete Class 30/20 as per the specifications	m3	2,625		
17.02	Provide all material, labour, plant etc and lay concrete Class 25/20 as per the specifications	m3	4,135		
17.03	Provide all material, labour, plant etc and lay blinding concrete Class 15/20 as per the specifications	m3	259		
17.04	Provide Unformed surface finish UF2 as per specifications	m2	4,298		
17.05	Provide all materials, labour and plant for formwork for formed surfaces as per specifications; Formwork rates to include for 25x25mm chamfer to all exposed edges				
	(a) F1-vertical	m2	3,943		
	(b) F1-sloping	m2	0		
	(c) F3-horizontal	m2	2,981		
	(d) F3-vertical	m2	4,875		
	(e) F3-sloping	m2	769		
17.06	Formwork to edges of slabs	m	488		

<b>BILL NO. 17: CONCRETE WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
17.07	Provide, cut, bend and fix reinforcement as per drawings and specifications as follows:				
	(a) High yield not exceeding 16mm diameter	Tonnes	306		
	(b) High yield exceeding 16mm diameter	Tonnes	294		
	(c) A252 Fabric Mesh for reinforcement of truck parking	Tonnes	37		
	(d) Provide Stainless steel dowel bars 20mm DIA, 400mm long at Transverse contraction joints of the Truck parking	No.	4,956		
	(e) Provide T12mm DIA, 750mm long Tie bars at Longitudinal joints of the Truck parking	Tonnes	1.08		
	(f) Provide 3mm THICK polythene sheet (de-bonding membrane) for the Truck parking	m <sup>2</sup>	9,225		
<b>TOTAL OF BILL NO.17 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 20: ROAD FURNITURE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
20.01	Provide and erect concrete road reserve boundary posts	No.	1,400		
20.02	Provide and erect reinforced concrete kilometre marker posts	No.	129		
20.03	Warning signs- 750mm size	No.	78		
20.04	As item 20.04 but 600mm size	No.	56		
20.05	Priority signs- 1000mm size	No.	15		
20.06	Prohibitory Signs- 600mm Size	No.	51		
20.07	Mandatory Signs	no.	10		
20.08	Standard Informatory Signs- 400mm x 300mm size	no.	27		
20.09	Non-Standard Informatory signs less than 1m2	no.	15		
20.10	As item 20.11 but equal or more than 1 m2 but less than 2m2	no.	2		
20.11	As item 20.11 but equal or more than 2 m2 but less than 5 m2	no.	2		
20.12	As item 20.11 but equal to or more than 5 m2	no.	7		
20.13	Road marking in yellow thermoplastic paint- line 100mm wide	m2	14,789		
20.14	Road marking in white thermoplastic paint- line 100mm wide	m2	29,578		

<b>BILL NO. 20: ROAD FURNITURE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
20.15	Reflective road studs (cat's eyes) provide, transport, handle and place approved reflective	No.	288		
20.16	Single headed arrows	No.	0		
20.17	Zebra Crossings: Provide all material, lay and construct raised zebra crossing	No.	20		
20.18	Provide Guardrails, transport materials, post, excavate, erect flexbeam guardrails including guardrail end pieces	m	4,560		
20.19	Provide and place precast concrete channel blocks 125mm x 100mm to footpaths, busbays, inclusive of excavation, laying and jointing, concrete bedding and haunching	m	7,120		
20.20	Provide, lay and joint precast concrete kerbs 250mm x 125mm	m			
	(a) straight	m	5,696		
	(b) radius 1m to 5m	m	712		
	(c) radius >5m to 20m	m	712		
20.21	Provide material, transport, handle, mix and place New jersey barrier/crash barrier	m	5		
20.22	Provide and fix galvanised steel pipes on top of crush barriers 48.3 mm diameter circular pipes x 5mm thick x 5.34kg per meter fixed with inverted T steel plates to Engineer's approval	m	5		

<b>BILL NO. 20: ROAD FURNITURE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
20.23	Service ducts: Provide all materials and construct 4no. X 400mm diameter Service Ducts under road as per the drawings or as instructed by the Engineer	m	360		
20.24	Ducts marker posts: Provide duct marker posts in accordance with the drawings	No.	32		
20.25	Provide and erect reinforced concrete culvert marker posts	no.	0		
20.26	Provide and erect precast concrete bollards	no.	1,200		
20.27	Provide and erect asphalt concrete rumble strips on the shoulders before bumps as directed by the Engineer	m <sup>3</sup>	250		
20.28	Provide and erect overhead road signage gantry at locations as instructed by the Engineer	No.	3		
<b>TOTAL OF BILL NO.20 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 21: MISCELLANEOUS BRIDGE WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
21.01	Provide all material and apply bituminous waterproofing paint to structures as per drawings and specification	m2	4,890		
21.02	Provide and fix Elastomeric rubber bridge bearings as specified (a) at abutments (b) at piers	No. No.	50 0		
21.03	Allow for provision of movement joints at supports as indicated on the drawings and specifications for bridges	m	77		
21.04	Provide all materials and fix 75mm diameter deck drains	No	216		
21.05	Provide all materials and fix drip 25mm in deck soffit as per drawings	m	204		
21.06	Provide all materials and fix weepholes, 100mm diameter as per the drawings provided	m	20		
21.07	Provide all materials and fix weepholes, 75mm diameter as per the drawings provided	m	176		
21.08	Supply and fix 25 mm thick "flex cell" or similar approved low compression joint filler at expansion joints as per drawings and specifications	m	77		



<b>BILL NO. 21: MISCELLANEOUS BRIDGE WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
21.09	Paraseal' or similar approved cold poured Polysulphide sealant for bridge expansion joints	m	77		
<b>TOTAL OF BILL NO.21 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
22.01	Crawler dozers with dozers and hydraulic attachments- 100kw-135 kw rated flywheel power	hr.	100		
22.02	As item 22.01 but 136kw-185kw rated flywheel power	hr.	100		
22.03	As item 22.01 but 186kw- 250kw rated flywheel power	hr.	300		
22.04	Motor Grader- 80kw-110kw rated flywheel power	hr.	200		
22.05	As item 22.04 but 111kw- 120kw rated flywheel power	hr.	200		
22.06	As item 22.04 but 121kw- 160kw rated flywheel power	hr.	300		
22.07	Rollers, towed vibratory including tractor 6.5t-8.8t unballasted weight	hr.	200		
22.08	As item 22.07 but 8.9t-11.7t unballasted weight	hr.	100		
22.09	Rollers deadweight (3-wheel include tractor) 6.5t-8.8t unballasted weight	hr.	100		
22.10	As item 22.09 but 8.9t-10.5t unballasted weight	hr.	50		
22.11	Pneumatic tyre rollers, self-propelled Up to 1.0t per wheel	hr.	50		
22.12	As item 22.11 but 1.1t-2.0t per wheel	hr.	50		
22.13	Rollers, vibratory single drum, rubber tyred, self propelled 8.3t-10.5t unballasted weight	hr.	50		

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
22.14	Rollers, vibratory pedestrian twin drums, self-propelled 651kg-1.3t unballasted weight	hr.	100		
22.15	Towed grid roller of up to 10t unballasted dead weight	hr.	50		
22.16	Vibratory sheep-foot roller, self propelled or towed and up to 10t unballasted weight	hr.	100		
22.17	Vibrating plate compactor, 114kg-200kg operating weight	hr.	50		
22.18	Deleted				
22.19	Deleted				
22.20	Compressors, rated by normal delivery of free air per minute at 7kg/m <sup>2</sup> complete with tools, hoses, steel, etc- 6.0-7.4m <sup>3</sup> /min	hr.	100		
22.21	As item 22.20 but 7.5-9.7m <sup>3</sup> /min	hr.	100		
22.22	As item 22.20 but 9.8- 25m <sup>3</sup> /min	hr.	100		
22.23	Wheel loaders, 4 WD articulated 1.5-2.0m <sup>3</sup> SAE rated capacity	hr.	100		
22.24	As item 22.23 but 2.01-3.4 m <sup>3</sup> SAE rated capacity	hr.	200		
22.25	As item 22.23 but 3.41-5.35 m <sup>3</sup> SAE rated capacity	hr.	300		
22.26	Crawler loader 0.8-1.3m <sup>3</sup> SAE rated capacity	hr.	50		
22.27	As item 22.26 but 1.31-1.90 m <sup>3</sup> SAE rated capacity	hr.	100		

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
22.28	As item 22.26 but 1.91-2.50 m3 SAE rated capacity	hr.	100		
22.29	Cranes, mobile rubber tyred, rough terrain type of 23.0- 40.0 t max. working load	hr.	20		
22.30	Cranes; excavator cranes, tracked wheels- 20-28t working load	hr.	50		
22.31	As item 22.30 but 28.1t- 36.0t working load	hr.	50		
22.32	Excavators; hydraulic crawler or wheel mounted full circle slew 14- 17t nominal weight of the machine	hr.	200		
22.33	Excavators; hydraulic wheel dual- purpose (backhoe/loader) 0.6- 0.8m3 rated bucket capacity	hr.	500		
22.34	As item 22.33 but 0.81-1.0m3 rated bucket capacity	hr.	100		
22.35	Tractors; rubber tyred including trailers 50kw-75kw rated flywheel power	hr.	200		
22.36	Pumps (inclusive of all hoses) 50- 76mm delivery	hr.	1000		
22.37	As item 22.36 but 77mm to 101 mm delivery	hr.	20		
22.38	Concrete mixer capacity up to 100 litres	hr.	100		
22.39	As item 22.38 but capacity 101 litres to 200 litres	hr.	100		
22.40	As item 22.38 but 201 litres to 300 litres	hr.	50		

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
22.41	Small dumpers 750kg to 1.2 tonnes maker's rated payload	hr.	100		
22.42	Concrete vibrator, poker type	hr.	100		
22.43	Lorries, ordinary- up to 7.5t gross vehicle weight	hr.	300		
22.44	As item 22.43 but over 7.5t gross vehicle weight	hr.	100		
22.45	Lorries, tipper up to 11.0t gross vehicle weight	hr.	400		
22.46	As item 22.45 but 11.1-17.0t gross vehicle weight	hr.	400		
22.47	As item 22.45 but 17.1 to 25.5t gross vehicle weight	hr.	400		
22.48	Van, pick up or similar utility vehicle- up to 1.0t carrying capacity	hr.	400		
22.49	As item 22.48 but 1.1t to 2.6t carrying capacity	hr.	400		
22.50	Water tanker, self propelled 3500 litres to 4550 litres capacity	hr.	1,000		
22.51	As item 22.50 but 4551 litres to 7000 litres capacity	hr.	1,000		
22.52	As item 22.50 but 7001 litres to 12000 litres capacity	hr.	1,500		
22.53	Pressure bitumen distributor 3500 litres to 4500 litres capacity	hr.	50		
22.54	As item 22.53 but 4501 litres to 8000 litres capacity	hr.	50		

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
22.55	Mechanical broom	hr.	50		
22.56	4WD saloon vehicle or station wagon	hr.	500		
22.57	Bitumen hand sprayer of 200 litres carrying capacity	hr.	400		
22.58	Self propelled fuel tanker	hr.	50		
22.59	Hand compactor, whacker or equivalent	hr.	400		
22.60	Chip spreader	hr.	50		
22.61	Pulvimixer	hr.	100		
22.62	Unskilled labour	hr.	25,000		
22.63	Mason/Artisan/Carpenter/Storeman/Pipelayer/Concreter/(i.e. Skilled labour)	hr.	10,000		
22.64	Blaster	hr.	50		
22.65	Watchman	hr.	1,000		
22.67	Hydrated lime	t	5		
22.68	Aggregates for Concrete- fine (sand)	m <sup>3</sup>	200		
22.69	As item 22.68 but coarse (nominal size 10-40 mm)	m <sup>3</sup>	200		
22.70	Timber Shuttering- for class F1 finish	m <sup>2</sup>	50		
22.71	As item 22.70 but for Class F2 Finish	m <sup>2</sup>	50		
22.72	Mild Steel Reinforcement Up to and including 10mm diameter	t	10		

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
22.73	As item 22.72 but over 10mm diameter	t	5		
22.74	High Yield Steel Reinforcement- Up to and including 16mm diameter	t	10		
22.75	As item 22.74 but over 16mm diameter	t	5		
22.76	Chippings- Class 2, nominal size 20/14mm	m <sup>3</sup>	500		
22.77	As item 22.76 but Class 2 , nominal size 3/6mm	m <sup>3</sup>	500		
22.78	As item 22.76 but fine aggregates (building sand)	m <sup>3</sup>	100		
22.79	Bitumen and emulsions- bitumen penetration grade 80/100	litre	5,000		
22.80	As item 22.79 but bitumen cut- back MC3000	litre	5,000		
22.81	As item 22.79 but bitumen cut- back MC70	litre	5,000		
22.82	As item 22.79 but bitumen cut- back MC30	litre	5,000		
22.83	Gabion mesh	m <sup>2</sup>	200		
22.84	Rockfill for gabions	m <sup>3</sup>	500		
22.85	Dynamite stick explosives	kg.	25		
22.86	Explosive fuse	m	150		
22.87	Detonators	no.	25		
<b>TOTAL CARRIED FORWARD TO BILL NO. 22 DAYWORK SUMMARY</b>					

<b>BILL NO. 22: DAYWORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>

<b>BILL NO .25: HIV/AIDS AWARENESS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
25.01	Institute an HIV/AIDS awareness campaign	Month	42		
25.02	Institute an HIV/AIDS prevention campaign	Month	42		
25.03	Allow a Provisional Sum of Kshs. 9,000,000 to Institute a HIV/AIDS Training	Provisional Sum			9,000,000
25.04	Allow for Contractor's Overheads and Profits on item 25.03	%	9,000,000		
<b>TOTAL OF BILL NO.25 CARRIED FORWARD TO SUMMARY</b>					



<b>BILL NO .26: PILING WORKS</b>					
		<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
26.01	Allow for bringing all plant, equipment and materials necessary for piling and removal after completion	Lumpsum	1		
26.02	Move and set up piling rig for piling on each pile position	No.	143		
26.03	Form 600mm diameter cast insitu reinforced concrete piles. Pile capacity 1200KN reinforced full length. Pile length not exceeding 20m. Rate to include drilling to the required depth	M	2,860		
26.04	Allow for sets of projecting steel reinforcements 1000mm from top of the piles	No.	143		
26.05	Allow for trimming piles to level and bedding projecting reinforcement to shape	No.	143		
26.06	Carry out initial load (load up to ultimate failure load) testing on 600mm diameter bored cast insitu pile of length 20m near the bridge position or as directed by resident engineer as per technical specification and a or as directed by Engineer: Vertical=300MT capacity	No.	2		

<b>BILL NO .26: PILING WORKS</b>					
		<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
26.07	Carrying out high strain testing on 600mm working pile directed by Resident Engineer as per technical specification and or as directed by Engineer: Vertical=240MT capacity	No.	2		
<b>TOTAL OF BILL NO.26 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO .27: ROAD SAFETY ENHANCEMENT</b>					
		<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
27.01	Institute a Road Safety Awareness Campaign	Month	42		
27.02	Allow a Provisional Sum for Road Safety Awareness Training	PC Sum			9,000,000
27.03	Contract's overheads and profits on item 27.02	%	9,000,000		
<b>TOTAL OF BILL NO.27 CARRIED FORWARD TO SUMMARY</b>					

<b>BILL NO. 28: ACCESS ROADS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	<p>NOTE: All the following Items are Provisional. Works under this bill will be in respect of construction of low volume seal roads to selected public institutions/facilities and will only be expended upon specific instructions of the Engineer.</p> <p>SITE CLEARANCE AND TOPSOIL STRIPPING</p>				
28.4.01	Clear site on road reserve including removal of trees, hedges, bushes and other vegetation or deleterious organic material, grub up roots and back fill to 100% MDD (AASHTO T99) with approved material in accordance with the specification.	Ha	5		
28.4.02	Remove top soil to an approved depth and cut to spoil or stockpile for reuse as directed by the Engineer.	m <sup>3</sup>	10,000		
	EARTHWORKS				
28.5.01	Fill in soft material compacted to 100% MDD (AASHTO 99)	m <sup>3</sup>	50,000		
28.5.02	Fill in hard material	m <sup>3</sup>	12,500		
28.5.03	Cut to spoil in soft material	m <sup>3</sup>	50,000		
28.5.04	Cut to spoil in hard material	m <sup>3</sup>	12,500		
28.5.05	Compaction to 150mm depth of existing ground below fills	m <sup>3</sup>	10,000		

<b>BILL NO. 28: ACCESS ROADS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
28.5.06	Compaction of 300mm below Improved subgrade layer in cuts to 100% MDD (AASHTO T99)	m <sup>3</sup>	20,000		
28.5.07	E.O. Item 5.07 for compaction of top 300mm in fills to 100% MDD	m <sup>3</sup>	20,000		
<b>CULVERTS AND DRAINAGE STRUCTURES</b>					
28.8.01	Excavate for channels, cut-off drains, mitre drains, catchwater drains, inlet and outfall drains in soft material	m <sup>3</sup>	2,000		
28.8.02	Excavation in soft material for pipe culverts, headwalls, wingwalls, apron, toe walls and drop inlets and compact as directed by the engineer	m <sup>3</sup>	250		
28.8.03	Extra over item 8.01 and 8.02 for excavation in hard material	m <sup>3</sup>	250		
28.8.04	Provide rockfill below minor structures	m <sup>3</sup>	100		
28.8.05	Selected Backfill Material	m <sup>3</sup>	100		
28.8.06	Provide, lay and joint 600mm diameter Ogee jointed concrete pipe culverts	m	250		
28.8.07	Provide, place and compact class 15/20 concrete to beds, surround and haunches to concrete pipe culverts including formwork	m <sup>3</sup>	150		

<b>BILL NO. 28: ACCESS ROADS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
28.8.10	Provide, place and compact class 25/20 concrete for headwalls, wingwalls, aprons, toe walls and other minor drainage structures including formwork and provision and placing of reinforcement as shown in the drawings	m <sup>3</sup>	75		
28.8.11	Provide and joint 300mm half round concrete channels on 75mm gravel blinding with 150mm haunch	m	200		
28.8.12	Provide and place stone pitching and grout with mortar as specified or as directed by the Engineer.	m <sup>2</sup>	5,000		
NATURAL MATERIAL FOR BASE AND SUBBASE					
28.12.01	Provide, lay and compact to 95% AASHTO T180, natural material for subbase	m <sup>3</sup>	8,500		
28.12.02	Provide, lay and compact to 95% AASHTO T180, natural material for base	m <sup>3</sup>	8,050		
CEMENT AND LIME TREATMENT					
28.14.01	Provision, Storage, Haulage, Transport and spreading of portland cement as the stabilizer at any point of the works in conformity with the instructions of the Engineer.	tonne	1,270		
28.14.02	E.O. Item 14.01 for processing, mixing and compaction in accordance with the specifications and as directed by the Engineer.	m <sup>3</sup>	16,550		
28.14.03	Watering, provision, placing and maintenance of the curing system.	m <sup>2</sup>	40,000		

<b>BILL NO. 28: ACCESS ROADS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
28.15.01	<p>BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING</p> <p>Prepare surface of road base, provide, heat and spray MC 30 cut back bitumen prime coat at 1 - 1.2 litres per sq. metre.</p>	Litres	40,250		
28.16.01	<p>BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES</p> <p>Provide lay and compact 35 mm thick Type II Asphalt Concrete wearing course with nominal bitumen of 5.5 % on the access road carriageways and shoulders, etc; all in accordance with the specifications and as directed by the Engineer</p>	m <sup>3</sup>	1225		
28.20.01	<p>ROAD FURNITURE</p> <p>Warning signs- 750mm size</p>	No.	10		
28.20.02	As item 20.04 but 600mm size	No.	4		
28.20.03	Priority signs- 1000mm size	No.	4		
28.20.04	Prohibitory Signs- 600mm Size	No.	4		
28.20.05	Mandatory Signs	No.	2		

<b>BILL NO. 28: ACCESS ROADS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
28.20.06	Standard Informatory Signs- 400mm x 300mm size	No.	6		
28.20.07	Non-Standard Informatory signs less than 1m <sup>2</sup>	No.	2		
28.20.08	As item 20.11 but equal or more than 1 m2 but less than 2m2	No.	2		
28.20.09	Road marking in yellow thermoplastic paint- line 100mm wide	m2	500		
28.20.10	Road marking in white thermoplastic paint- line 100mm wide	m2	1,000		
28.20.11	Zebra Crossings: Provide all material, lay and construct raised zebra crossing	No.	4		
28.20.12	Provide Guardrails, transport materials, post, excavate, erect flexbeam guardrails including guardrail end pieces	m	200		
28.20.13	Provide, lay and joint precast concrete kerbs 250mm x 125mm	m			
	(a) straight	m	500		
	(b) radius 1m to 5m	m	100		
	(c radius >5m to 20m	m	100		
<b>TOTAL OF ACCESS ROADS CARRIED FORWARD TO SUMMARY PAGE</b>					



<b>SUMMARY OF PROVISIONAL SUMS</b>
------------------------------------

ITEM	DESCRIPTION	UNIT	AMOUNT (K.Sh.)
1.12	Allow for a Provisional Sum of KShs. 4,000,000 for the engineer's staff mobile phone airtime charges	Provisional Sum	4,000,000
1.14	Allow for a Provisional Sum of KShs. 50,000,000 for removal and alteration to existing services	Provisional Sum	50,000,000
1.16	Allow for a Provisional Sum of KShs. 60,000,000 for land acquisition and PAPs resettlement	Provisional Sum	60,000,000
1.21	Allow for a Provisional Sum of KShs. 3,000,000 for regular video and still photography as instructed by the Engineer	Provisional Sum	3,000,000
1.24	Allow for a Provisional Sum of KShs. 5,000,000 for the Engineer's temporary accommodation	Provisional Sum	5,000,000
1.28	Allow a Provisional Sum of KShs. 195,000,000 for providing of social amenities as directed.	Provisional Sum	195,000,000
1.30	Allow for a Provisional Sum of Kshs. 20,000,000 for confirmatory geotechnical investigations as directed by the Engineer.	Provisional Sum	20,000,000
1.32	Allow for a Provisional Sum of K.Sh. 10,000,000 for environmental mitigation beyond measures as required by the contract (off road).	Provisional Sum	10,000,000
1.34(d) (v)	Allow for a Provisional Sum of KShs. 6,000,000 for security satellite phones annual subscription fees and units	Provisional Sum	6,000,000
1.34(d) (viii)	Allow for a Provisional Sum of KShs. 9,000,000 for security team air time and purchase of mobile phones	Provisional Sum	9,000,000
1.34(d) (ix)	Allow for a Provisional Sum of KShs. 6,000,000 for security wireless communication annual subscription fees and installation	Provisional Sum	6,000,000
1.34(g)	Allow for a provisional sum of Kshs. 580,000,000 for security staff allowances as instructed by the Engineer	Provisional Sum	580,000,000

ITEM	DESCRIPTION	UNIT	AMOUNT (K.Sh.)
1.34(i)	Allow for a Provisional Sum for 4,000,000 for assorted stationery	Provisional Sum	4,000,000
1.35(a)	Allow for a Provisional Sum for 5,000,000 for Grievence Redress Committee logistical expenses	Provisional Sum	5,000,000
1.36	Allow for a Provisional Sum for additional ESHS outcomes.	Provisional Sum	5,000,000
1.38	Allow for a Provisional Sum for sexual exploitation and abuse (SEA) / gender-based violence (GBV) awareness and sensitization training.	Provisional Sum	5,000,000
1.40	Allow a provisional sum for purchase of additional Testing and other equipment	Prov. Sum	2,000,000
1.43	Allow a provisional sum for payment of Dispute Board (Employers portion of Dispute Board payment)	Prov. Sum	31,000,000
1.45	Allow a provisional sum of Ksh. 7,000,000 for design of solar powered streetlighting for interchange and select townships and market centres	Prov. Sum	7,000,000
1.47	Allow a provisional sum of Ksh. 120,000,000 for provision and installation of solar powered streetlighting for interchange and select townships and market centres	Prov. Sum	120,000,000
4.06	Allow a Provisional Sum for demolition and disposing of the existing bridges and box culverts as instructed by the engineer. Item to be expended using the rates for other items in the bill of quantities which already contain contractor's profit and overheads therefore no additional separate overheads and profit is applicable.	Provisional Sum	5,000,000
25.03	Allow a Provisional Sum of Kshs. 9,000,000 to Institute a HIV/AIDS Training	Provisional Sum	9,000,000
26.02	Allow a Provisional Sum of Kshs 9 Million for Road Safety Training	Provisional Sum	9,000,000
<b>TOTAL OF PROVISIONAL SUMS SUMMARY CARRIED TO SUMMARY PAGE</b>			<b>1,150,000,000</b>

## BILLS SUMMARY SHEET

BILL NO	DESCRIPTION	AMOUNT
1	PRELIMINARY AND GENERAL ITEMS	
4	SITE CLEARANCE	
5	EARTHWORKS	
7	EXCAVATION AND FILLING FOR STRUCTURES	
8	CULVERTS AND DRAINAGE WORKS	
9	PASSAGE OF TRAFFIC	
10	BILL NO. 10: GRAVEL WEARING COURSE	
12	NATURAL MATERIAL FOR BASE AND SUBBASE	
14	CEMENT AND LIME TREATMENT	
15	BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING	
16	BITUMINOUS MIX BASES, BINDER COURSES & WEARING COURSES	
17	CONCRETE WORKS	
20	ROAD FURNITURE	
21	MISCELLANEOUS BRIDGE WORKS	
22	DAYWORKS	
25	HIV/AIDS AWARENESS AND EDUCATION	
26	ROAD SAFETY ENHANCEMENT	
27	ACCESS ROADS	
<b>A</b>	<b>SUB TOTAL</b>	
B	Provisional and Prime Cost Sums Specified in the Bills	
<b>C</b>	<b>Sub-Total of Bills less Provisional &amp; Prime Cost Sums Specified in the Bills</b>	
D	Add 10% of (C) for Contingencies to be Expended in part or deleted entirely by the Engineer in accordance with Clause 13 of the Conditions of Contract	
E	Add 15% of (C) for Price Adjustment in accordance with Clause 13.8 of the Conditions of Contract	
<b>F</b>	<b>GRAND TOTAL CARRIED FORWARD TO FORM OF BID; F = A + D + E</b>	

<b>APPENDIX TO ITEM 1.05: FURNITURE AND EQUIPMENT FOR THE ENGINEER'S OFFICE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	<b>1. ENGINEER'S FURNITURE</b>				
A1.05/1.01	Executive desk 2.2x0.9 m with six lockup drawers	No.	2		
A1.05/1.02	Desk 2.2x0.9 m with chair and three lockup drawers	No.	4		
A1.05/1.03	Office tables	No.	3		
A1.05/1.04	Swivel orthopedic chairs	No.	2		
A1.05/1.05	Standard chairs	No.	8		
A1.05/1.05	Bench 3m long with cushioned backrest (located as directed)	No.	1		
A1.05/1.07	Typist's desk	No.	1		
A1.05/1.08	Typist's chair	No.	3		
A1.05/1.09	Stationery cupboard, 1.2 m <sup>3</sup> , lockable	No.	4		
A1.05/1.10	Steel filing cabinet, 4 lockable drawers	No.	4		
A1.05/1.11	Steel filing cabinet, 2 lockable drawers	No.	3		
A1.05/1.12	Bookshelf, 3 shelves 1.2 m long (to hold box files) with a sliding glass door	No.	3		

<b>APPENDIX TO ITEM 1.05: FURNITURE AND EQUIPMENT FOR THE ENGINEER'S OFFICE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.05/1.13	Conference table with 12 chairs	No.	1		
A1.05/1.14	Curtains for office and laboratory	Set	2		
<b>2. ENGINEER'S OFFICE EQUIPMENT</b>					
A1.05/2.11	Multimedia Personal Computer with a 17 " screen, 500GB Hard Disk,16GB RAM, i7, 2.5 MHZ duo processor, complete with all accessories preloaded with the latest OS, MS Office Professional and MS Project 2016.	No.	5		
A1.05/2.12	Autocad Civil 3D and Licences for 2 of the above computers	No.	2		
A1.05/2.14	Personal Laptop, that has 500GB Hard disk,16GB RAM similar approved	No.	5		
A1.05/2.15	Latest HP (A4) laser printer with accessories	No.	3		
A1.05/2.16	Latest HP (A3) Laser Printer with accessories	No.	1		
A1.05/2.17	UPS 700 VA	No.	6		
A1.05/2.18	A3 Photocopier (approved make), with feeder sorting trays	No.	1		

<b>APPENDIX TO ITEM 1.05: FURNITURE AND EQUIPMENT FOR THE ENGINEER'S OFFICE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.05/2.19	Reams of A4 photocopying paper	No.	100		
A1.05/2.20	Reams of A3 photocopying paper	No.	20		
A1.05/2.21	Electronic scientific calculator, 12 figures	No.	6		
A1.05/2.22	Stapling machine Ofrex size 50 or similar with 5000 staples	No.	6		
A1.05/2.23	Heavy duty punch and spiral binder, IBICO AG or similar approved	No.	2		
A1.05/2.25	Pencil sharpener (desk mounted type)	No.	6		
A1.05/2.26	Heavy duty 2 hole paper punch	No.	2		
A1.05/2.27	Ordinary 2 hole paper punch	No.	8		
A1.05/2.28	First Aid Kit	No.	4		
A1.05/2.29	Fire Extinguisher	No.	4		
A1.05/2.30	Filing Tray	No.	10		
A1.05/2.31	Waste paper basket	No.	24		
A1.05/2.32	Refrigerator minimum capacity 0.2m <sup>3</sup>	No.	1		

<b>APPENDIX TO ITEM 1.05: FURNITURE AND EQUIPMENT FOR THE ENGINEER'S OFFICE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.05/2.33	Table - 0.8 m <sup>2</sup> surface area	No.	1		
A1.05/2.34	Cupboard, 0.15 m <sup>3</sup> , lockable	No.	1		
A1.05/2.35	Cooker 4 plate electronic cooker with oven and grill	No.	1		
<b>3. ENGINEER'S SURVEY EQUIPMENT</b>					
A1.05/3.01	Engineer's Electronic Level Wild, or similar (2 mm accuracy) with accessories and tripod	No.	2		
A1.05/3.02 (a)	Total station complete with a Field Data collector LEICA Model Leica Flexline TS06 (1"), or similar including accessories and supporting software	No.	1		
A1.05/3.02 (b)	Geodetic GPS - Leica GS15 GNSS Receivers set (1 base + 1 rover), or similar including all the necessary accessories and supporting software	No.	1		
A1.05/3.02 (c)	Stonex S4H Handheld GPS unit with the necessary accessories or similar	No.	1		
A1.05/3.03	Survey umbrella	No.	3		
A1.05/3.04	Levelling staff 3m with levelling bubble (Wild GNLE 3 or similar)	No.	6		

<b>APPENDIX TO ITEM 1.05: FURNITURE AND EQUIPMENT FOR THE ENGINEER'S OFFICE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.05/3.05	2.5m ranging rod	No.	6		
A1.05/3.06	1m stainless steel straight edge	No.	2		
A1.05/3.07	3m aluminium straight edge	No.	1		
A1.05/3.08	30m steel white face tape	No.	2		
A1.05/3.09	100m steel band tape	No.	1		
A1.05/3.10	3m tape measure	No.	15		
A1.05/3.11	Steel tape repair outfit	No.	1		
A1.05/3.12	Pangas (16")	No.	4		
<b>TOTAL CARRIED FORWARD BILL ITEM 1.05</b>					



<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	<b>1. FURNITURE</b>				
A1.06/1.01	Desk 2.2x0.9 m with chair and lockup drawers	No.	2		
A1.06/1.02	Desk chair (Standard)	No.	6		
A1.06/1.03	Stationary cupboard, 1.2m <sup>3</sup> , lockable	No.	1		
A1.06/1.04	Steel filing cabinet, 4 drawers, lockable	No.	1		
A1.06/1.05	Steel filing cabinet, 2 drawers, lockable	No.	1		
A1.06/1.06	Bookshelf, 3 shelves 1.2 m long (to hold box files)	No.	1		
A1.06/1.06	Table - 0.8 m <sup>3</sup>	No.	1		
A1.06/1.08	Two plate electric heater	No.	1		
A1.06/1.09	Fire extinguisher, 10 litres capacity, CO <sub>2</sub> type	No.	4		
A1.06/1.10	Complete first aid kit	No.	2		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	<b>2. EQUIPMENT</b>				
	(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				
A1.06/2.01	Compaction mould complete with base plate and extension collar, 101.6 mm dia x 116.43 mm high	No.	5		
A1.06/2.02	2.49kg. Compaction hammer, drop regulated to 304.8mm	No.	5		
A1.06/2.03	4.535kg compaction hammer drop regulated to 457.2mm	No.	5		
A1.06/2.04	Electric vibrating kango hammer fitted with steel tamper (BS 1377) with support frame	No.	1		
A1.06/2.05	Straight edge 300 mm long with handles	No.	6		
A1.06/2.06	Steel tamper (BS1377) compatible with kango hammer	No.	4		
A1.06/2.07	Compaction mould 152.4 mm. dia. X 116.43 mm complete with base plate and extension collar, 101.6 mm	No.	3		
A1.06/2.08	Galvanized metal tray 1m x 0.5 m x 75 mm deep	No.	6		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/2.09	75 mm brush	No.	4		
A1.06/2.10	Semi - automatic balance, 25kg capacity accurate to 1g, including weights	No.	3		
A1.06/2.11	20mm BS sieve, 300mm diameter	No.	2		
A1.06/2.12	Stop clock	No.	3		
A109/2.13	Thermostatically controlled electric oven 105 - 1100 C, capacity 0.225 m <sup>3</sup>	No.	2		
A109/2.14	As above but gas heated	No.	1		
A109/2.15	Moisture content tins, 75 mm dia. Cadmium or aluminium plated	No.	50		
A109/2.16	Cone penetrometer with gauge and automatically controlled test cup	No.	3		
	<b>3. Density (sand replacement method BS 1377)</b>				
A1.06/3.01	Metal containers 450mm diameter	No.	4		
A1.06/3.02	Stainless steel tray 305mm diameter	No.	4		
A1.06/3.03	Metal tray with 150mm diameter hole in the centre, 300mm x 300mm	No.	6		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/3.04	Metal tray with 200mm diameter hole in the centre, 500mm x 500mm square or equivalent area, 40mm deep	No.	3		
A1.06/3.05	Steel pegs for fixing tray in position	No.	100		
A1.06/3.06	Sand pouring cylinder, 150 mm diameter	No.	3		
A1.06/3.07	Sand pouring cylinder, 215 mm diameter	No.	3		
A1.06/3.08	Cold steel chisel 20 mm x 300 mm	No.	12		
A1.06/3.09	Cold steel chisel 10 mm x 250 mm	No.	6		
A1.06/3.10	1.5kg hammer	No.	1		
A1.06/3.11	Scoop for removing excavated material from hole, 250mm long handle	No.	10		
A1.06/3.12	100 mm brush, soft	No.	10		
A1.06/3.13	50 mm brush, soft	No.	6		
A1.06/3.14	Primuss gas stove	No.	3		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/3.15	Calibrating can 150 mm diameter x 150 mm deep	No.	4		
A1.06/3.16	Ditto but 200 mm diameter x 250 mm deep	No.	4		
	<b>4. Density (Nuclear Density method AASHTO T238)</b>				
A1.06/4.01	Nuclear moisture/density gauge (Troxler 3411B or similar approved)	No.	1		
A1.06/4.02	Hole forming device (drill rod)	No.	3		
A1.06/4.03	Guid for above	No.	3		
	<b>5. CBR (AASHTO T193)</b>				
A1.06/5.01	CBR mould, 152.4 mm dia. X 178 mm high, complete with perforated base plate and extension collar 50.8mm high that can be fitted to either side of mould	No.	50		
A1.06/5.02	Perforated swell plate 150 mm dia with an adjustable centre post of rust proof metal provided with a lock - nut	No.	60		
A1.06/5.03	2.25 kg split surcharge weight	No.	4		
A1.06/5.04	Set of annular surcharge weights	No.	50		
A1.06/5.05	Solid base plate for CBR mould	No.	2		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/5.06	Static compaction displacer discs 1 No. x 61.4mm, 1 No x 50.8 mm and 2 No. x 38.8 mm thick	Set	1		
A1.06/5.07	Disk lifting handle	No.	2		
A1.06/5.08	Central extruder, complete with 20KN hydraulic jack and accessories	No.	1		
A1.06/5.09	Automatic CBR proctor compaction press,50 tonne capacity with an adjustable distance between platens of 530mm - 250mm, rammer weights and automatic count selector	No.	1		
A1.06/5.10	Set of gaurds for above press	No.	1		
A1.06/5.11	CBR load frame (electric and hand operated)	No.	1		
A1.06/5.12	Stabilizing bar for the above	No.	1		
A1.06/5.13	Proving ring for the above	No.	2		
A1.06/5.14	Proving ring for above, 10KN and 28KN capacity	Set	2		
A1.06/5.15	Penetration gauge range 0 - 25 mm	No.	2		
A1.06/5.16	CBR piston including bracket	No.	2		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/5.17	Swell measurement tripod complete with gauge calibrated in 0.01mm divisions	No.	3		
A1.06/5.18	Soaking tank for CBR mould sufficient for 50 moulds	No.	1		
<b>6. Relative density of Aggregates (BS 812)</b>					
A1.06/6.01	Wire mesh basket with apertures not greater than 6.5 mm large enough to contain 2.5 kg of aggregate	No.	2		
A1.06/6.02	A stout watertight container in which the basket can be freely suspended	No.	2		
A1.06/6.03	Soft absorbent cloth (tea towel)	No.	20		
A1.06/6.04	Shallow tray of area not less than 0.065 m <sup>2</sup>	No.	2		
A1.06/6.05	An airtight container of similar capacity to the basket	No.	2		
A1.06/6.06	Pycnometer of 1 litre capacity	No.	4		
A1.06/6.07	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		
A1.06/6.08	Hair dryer (electric)	No.	2		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/7.01	<b>7. Flakiness (BS 812)</b> Thickness gauge (various sizes)	No.	2		
A1.06/8.01	<b>8. Sieve Analysis (BS 1377)</b> 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		
A1.06/8.02	BS Sieve 200mm diameter in sizes 2, 1, 0.6, 0.5, 0.425, 0.300, 0.150 and 0.075 mm, plus lid and receiver	Set	2		
A1.06/8.03	Electric sieve shaker	No.	1		
A1.06/8.04	BS sieve 200mm diameter 0.425 and 0.075 mm	Set	1		
A1.06/8.05	1 m x 1 m x 75mm deep galvanized metal tray	No.	10		
A1.06/8.06	Riffle box with 50mm slots (BS 1377)	No.	2		
	<b>9. Miscellaneous Equipment</b>				
A1.06/9.01	Wheel barrow	No.	4		
A1.06/9.02	Dustpan and brush	No.	4		
A1.06/9.03	Shovel	No.	6		



<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/9.04	Pick axe with handle	No.	6		
A1.06/9.05	Metal scoop, large (150mm wide)	No.	4		
A1.06/9.06	Metal scoop, medium (100mm wide)	No.	6		
A1.06/9.07	Garden trowel	No.	6		
A1.06/9.08	Steel tray 0.3m x 0.3m x 0.01m deep	No.	20		
A1.06/9.09	3.5 kg hammer	No.	2		
A1.06/9.10	7kg hammer	No.	2		
A1.06/9.11	Rubber mallet (1kg)	No.	4		
A1.06/9.12	Cold chisel	No.	12		
A1.06/9.13	Oven, electric thermostatically controlled to any temperature between 100 0C and 1500 0C, 0.225 cu.m. minimum capacity including dial thermometer range 0-1600 0C(BS 1377)	No.	1		
A1.06/9.14	3 metre straight-edge including calibrated wedges	No.	2		
A1.06/9.15	500mm x 500mm x 10mm plate glass (BS 1377)	No.	4		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/9.16	Steel rod 75mm long x 3.2mm diameter	No.	4		
A1.06/9.17	Palette knife 200mm long blade	No.	3		
A1.06/9.18	Palette knife 100mm long blade	No.	4		
A1.06/9.19	BS sieve 450mm diameter, 37.5mm	No.	1		
A1.06/9.20	BS sieve 450mm diameter, 20mm	No.	1		
A1.06/9.21	BS sieve 450mm diameter, 5mm	No	1		
A1.06/9.22	BS sieve 450mm diameter, 0.425mm	No.	2		
A1.06/9.23	BS sieve 450mm diameter, 0.3mm	No.	2		
A1.06/9.24	BS sieve 450mm diameter, 0.075mm	No.	2		
A1.06/9.25	Set of lid and receiver for metal scoop and steel trays	No.	2		
A1.06/9.26	BS Sieve brush	No.	10		
A1.06/9.27	Measuring cylinder set, 25 ml, 100 ml, 500 ml, 1000 ml, 2000 ml	Set	3		
A1.06/9.28	Glass jar capacity 5 litres with lid	No.	10		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/9.29	200mm x 200mm x 20mm cadmium plated or aluminium tin	No.	30		
A1.06/9.30	Electronic balance capacity 1000 g, accurate to 0.01gm.	No.	1		
A1.06/9.31	Balance 2000 g capacity accuracy to 0.1g (manual), including weights	No.	1		
A1.06/9.32	Balance 50kg capacity accurate to 10gm including weights	No.	1		
A1.06/9.33	Still for producing distilled water	No.	1		
A1.06/9.34	Polythene or glass 20 litres storage vessel with tap at bottom	No.	3		
A1.06/9.35	Stiff broom	No.	5		
A1.06/9.36	Vernier calipers, 150mm	No.	2		
A1.06/9.37	Vernier calipers, 250mm	No.	2		
A1.06/9.38	Pestle and mortar	No.	2		
A1.06/9.39	Linear shrinkage mould (BS 1377)	No.	8		
A1.06/9.40	Liquid Limit Device	No.	2		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/9.41	Average least dimension gauge	No.	2		
A1.06/9.42	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 200 mm and 300mm, 1 pair round nosed pliers, 1 pair general purpose pliers,	No.	1		
A1.06/9.43	Plastic or metal bucket including lid,10 litres capacity	No.	10		
A1.06/9.44	Polythene wash bottle (500 ml)	No.	6		
A1.06/9.45	A4 size clipboard	No.	6		
A1.06/9.46	Thermometer, range -10°C to150°C, glass (BS 593)	No.	4		
A1.06/9.47	Laboratory thermometer, range + 0°C to + 250°C (BS 593)	No.	2		
A1.06/9.48	Maximum and minimum thermometer (BS692)	No.	2		
A1.06/9.49	Rain gauge	No.	5		
A1.06/9.50	Portable dial thermometer + 50°C to +250°C accurate to ± 3%	No.	3		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/9.51	Ditto with 0.75m long stem	No.	1		
A1.06/9.52	Pocket thermometer + 50°C to +250°C accurate to ± 3% with 0.1 m stem	No.	2		
A1.06/9.53	5 litre capacity steel storage containers with leak and dust proof lids for storage of bitumen samples	No.	100		
A1.06/9.54	Hotplate 200mm diameter with Simmerstat heat control unit.	No.	2		
A1.06/9.55	450mm diameter x 150mm deep metal mason's basin	No.	10		
	<b>10. Standard Specifications (Copies of each of the latest editions of the following Standards)</b>				
A1.06/10.01	BS 598	No.	1		
A1.06/10.02	BS 812	No.	1		
A1.06/10.03	BS 882	No.	1		
A1.06/10.04	BS 1377	No.	1		
A1.06/10.05	BS 1881	No.	1		
A1.06/10.06	BS 1924	No.	1		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/10.07	Standard Specifications for Transportation Material and Methods of sampling and Testing (AASHTO) Parts I and II, 14th Edition	Set	1		
A1.06/10.08	ASTM D1559	No.	1		
	<b>11. Concrete: Slump and Cube Manufacture (BS 1881)</b>				
A1.06/11.01	Slump cone, tamping rod and base	Set	3		
A1.06/11.02	Concrete cube mould, 150mm cube	No.	30		
A1.06/11.03	Soaking tank for cubes (capacity 50 No.)	No.	1		
A1.06/11.04	Cube tamping bars	No.	3		
	<b>12. Concrete: Cube Compression Testing</b>				
A1.06/12.01	Concrete compression machine to BS1610 Grade A with 300 mm gauge, rectangular platens, capacity 1560 kN with load pacer	No.	1		
A1.06/12.02	Safety guard for above	No.	1		
A1.06/12.03	50mm distance piece	No.	1		
A1.06/12.04	70mm distance piece	No.	1		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/12.05	Electro-mechanical load pacer, 100 mm or equivalent distance piece	No.	1		
A1.06/13.01	<b>13. Aggregate and Chippings</b> 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		
A1.06/13.02	Beaker 250ml	No.	2		
A1.06/13.03	Aggregate Crushing Value Apparatus, 130 mm nominal diameter, including plunger and base plate	No.	1		
A1.06/13.04	Tamping rod and metal measure for above	Set	2		
A1.06/13.05	Los Angeles Abrasion to ASTM standards	No.	1		
A1.06/13.06	Set of 12 abrasive charges	No.	1		
A1.06/13.07	Thermometer, 0°C to +50°C	No.	2		
A1.06/13.08	Thermometer, 0°C to +250°C	No.	2		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/13.09	Reagent grade Silica gel, 500g container	No.	100		
A1.06/13.10	Aggregate Crushing Value apparatus, 150mm nominal diameter, including plunger and base plate	No.	1		
A1.06/13.11	Tamping rod and metal measure for above (BS 812)	Set	1		
A1.06/13.12	Transverse distribution of spray test for bitumen distributor ( tray test to BS 1707) equipment	Set	1		
A1.06/13.13	Steel tray 20 mm deep x 0.1 m <sup>2</sup> (for measuring bitumen spray quantity)	No.	6		
A1.06/13.14	Purpose-made detachable handle 1.5m long to pick above trays	No.	4		
	<b>14. Marshall Test (ASTM D1559)</b>				
A1.06/14.01	Petrol driven 100 mm dia core cutter with all accessories	No.	1		
A1.06/14.02	Specimen mould + base plate +extension collar	No.	10		
A1.06/14.03	Specimen extractor	No.	2		
A1.06/14.04	Compaction hammer	No.	2		



<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/14.05	Compaction pedestal + specimen mould holder	No.	2		
A1.06/14.06	Breaking head mould	No.	1		
A1.06/14.07	Electrical 30 kN Marshall compression testing machine	No.	1		
A1.06/14.08	Suitable electrically operated laboratory mixer, 10 litre capacity	No.	1		
A1.06/14.09	Proving ring 28kN capacity graduated in 0.0025mm	No.	1		
A1.06/14.10	Flow meter	No.	2		
A1.06/14.11	Suitable mechanical mixer	No.	1		
A1.06/14.12	Water bath at least 150 mm deep, thermostatically controlled to maintain water temperature at 60°C ±1°C. with a perforated false bottom orequiped with a shelf to support specimens 50mm above the bottom of the bath, with cover	No.	1		
A1.06/14.13	Isomantle electric heater for mixing bowl of laboratory mixer	No.	2		
A1.06/14.14	Thermometer (50° to 250°C), 50mm dia with 180 mm stainless steel stem	No.	2		
<b>15. Bitumen Extraction Test</b>					

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/15.01	(a) Extractor Bottle Method, B.S. 598, Part 2 Electronic top pan balance 4kg capacity sensitive to 0.1g	No.	1		
A1.06/15.02	Flat bottomed scoop	No.	3		
A1.06/15.03	Steel garden trowel	No.	2		
A1.06/15.04	Large steel spoon	No.	2		
A1.06/15.05	Heat resistant gloves	Pair	10		
A1.06/15.06	Foot pump for pressurizing air-water assemblies upto a maximum of 700kN/m <sup>2</sup> and fitted with flexible hose approximately 1.2m long and connector	No.	2		
A1.06/15.07	Steel bottle 600ml capacity with 49 mm rubber stopper	No.	2		
A1.06/15.08	Steel bottle 2500 ml capacity with 71 mm rubber stopper	No.	2		
A1.06/15.09	Steel bottle 7000 ml capacity with 71 mm rubber stopper	No.	2		
A1.06/15.10	Flask funnel for fitting to the 700ml steel bottle with the rim of the funnel retaining a sieve 200mm nominal diameter	No.	2		
A1.06/15.11	Bottle roller compact bench mounted unit designed to rotate	No.	1		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/15.12	two bottles simultaneously about the longitudinal axis  Pressure filter complete with cutting tool for making a hole in the filter paper	No.	1		
A1.06/15.13	Filter funnel to take 200 mm nominal diameter sieves	No.	2		
A1.06/15.14	Centrifuge complying with BS 598	No.	1		
A1.06/15.15	Binder recovery	No.	1		
A1.06/15.16	Volumetric flask 250 ml, 500 ml, 1000 ml and 2000 ml capacity each	No.	2		
A1.06/15.17	Recovery still for Dichloromethane	No.	1		
A1.06/15.18	Hot extractor complete with wire gauze container, gasket, cork lid and support assembly	No.	2		
A1.06/15.19	Dean and Stark Receiver with condenser to suit Trichloroethylene	No.	2		
A1.06/15.20	PRD Vibrating hammer compactor complete with shanks, tampers, 6 moulds, 7 base plates from ELE	No.	1		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
	<b>16. Consumables</b>				
A1.06/16.01	Paraffin wax	Kg	50		
A1.06/16.02	Gas	Kg	1,000		
A1.06/16.03	Gunny sack	No.	400		
A1.06/16.04	Plastic bag 900mm x 450mm x 1000 gauge	No.	2,000		
A1.06/16.05	Plastic bag 450mm x 300mm x 1000 gauge	No.	2,000		
A1.06/16.06	Filter paper 150mm dia., Whatman No. 5 (Boxes of 100)	No.	40		
A1.06/16.07	Filter paper 400mm dia., Whatman No. 5 (Boxes of 100)	No.	20		
A1.06/16.08	Filter paper 100mm dia., Whatman No. 5 (Boxes of 100)	No.	20		
A1.06/16.09	Filter paper 400mm dia., Whatman No. 54 (Boxes of 100)	No.	5		
A1.06/16.10	Filter paper 270mm dia. 33mm with dia. hole in centre, Whatman No 5(Box of 100)	No.	15		
A1.06/16.11	Trichloroethylene	Kg	4,000		
A1.06/16.12	Dichloromethane	Kg	2,000		

<b>APPENDIX TO ITEM 1.06: FURNITURE AND EQUIPMENT FOR ENGINEER'S LABORATORY</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE</b>	<b>AMOUNT (K.Sh.)</b>
A1.06/16.13	Cotton waste (or drying cloths)	Kg	400		
A1.06/16.14	Gas cylinders compatible with supplied stoves	No.	30		
	<b>TOTAL CARRIED FORWARD BILL ITEM 1.06</b>				