

REPUBLIC OF KENYA



MINISTRY OF PUBLIC WORKS

DETAILED DESIGN STUDY  
ON  
THE NAIROBI BYPASS PROJECT  
COST ESTIMATE

SEPTEMBER 1992

Japan International  
Cooperation Agency

The Permanent Secretary  
Ministry of Public Works  
P.O.Box 30260  
NAIROBI

The Chief Engineer (Roads)  
Ministry of Public Works  
P.O.Box 30260  
NAIROBI



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COST ESTIMATE**

**AUGUST 1992**

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マイクロ  
フィルム作成



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## 1. GENERAL

This Report presents the construction cost for the implementation of the Nairobi Bypass Project. The construction cost of the project is estimated as follows with February 1992 prices.

Foreign Currency	:	K.Shs.	868.42 x 10 <sup>6</sup>
Local Currency	:	K.Shs.	766.02 x 10 <sup>6</sup>
Total (Equivalent to)	:	K.Shs.	1,634.44 x 10 <sup>6</sup>
			(U.S.\$ 56.36 x 10 <sup>6</sup> )
			(Yen 7,159 x 10 <sup>6</sup> )

The construction cost of the project is estimated on the basis of the detailed design and the proposed construction plan and schedule. In order to attain an accurate cost estimate, an unit price estimate method is mainly applied for each work. Furthermore, the estimate procedures and the breakdown are applied taking into account a recent tender system and a financial source.

The unit prices are estimated and analysed on the basis of local conditions, the proposed construction method, accurate unit rate of labor rate, material cost and equipment cost, and the cost data referring to the recent tender prices on the similar project.

## 2. BASIC CONDITIONS

The basic conditions and assumptions applied for the cost estimate are presented below:

- The unit prices and rates are based on the current prices for labor, material and equipment as of February 1992.
- The estimated cost is composed of a foreign currency portion and a local currency portion expressed in Kenya Shilling. The total amount is converted into U.S. Dollar and Japanese Yen as an equivalent price.
- The exchange rate are employed in consideration of the prevailing exchange rate in February 1992. The exchange rate used in this cost estimate is as follows:

$$\text{U.S.\$ 1.0} = \text{Yen 127} = \text{K.Shs. 29.0} \quad (1 \text{ K.Shs.} = 4.38 \text{ Yen})$$





- The work quantities are calculated from the detailed design drawings and the technical specifications of the tender documents. The work quantities are shown in APPENDIX A.
- The construction works will be carried out by a contractor selected through an international competitive bidding in accordance with a guideline of the financial source.

### 3. CONSTITUTION OF CONSTRUCTION COST

The construction cost consists of a direct cost and an indirect cost. The direct construction cost is estimated based on the work items and quantities derived from the detailed design. This cost includes the labor cost, material cost, equipment cost and contractor's indirect cost such as overhead and profit. The direct construction cost is estimated in the priced Bill of Quantities as shown in APPENDIX A.

The work items for the direct cost cover the following items:

- |        |   |
|--------|---|
| No. 1  | General   |
| No. 2  | Site clearance and topsoil stripping              |
| No. 5  | Earthworks  |
| No. 7  | Excavation and filling for structures             |
| No. 8  | Culverts and drainage works                       |
| No. 9  | Passage of traffic                                |
| No.10  | Gravel wearing course                             |
| No.13  | Graded crushed stone subbase and base             |
| No.14A | Lean concrete                                     |
| No.15  | Bituminous surface treatment and surface dressing |
| No.16  | Bituminous wearing course                         |
| No.17  | Concrete works                                    |
| No.20  | Road furniture                                    |
| No.21  | Miscellaneous                                     |
| No.22  | Daywork   |
| No.23  | Piling  |

While, the indirect cost includes the costs for land acquisition and compensation, engineering services, physical contingency and price escalation.



#### 4. DIRECT CONSTRUCTION COST

The direct construction cost is estimated by adopting unit prices and lump sum costs, which include labor cost, material cost and equipment cost. The contractor's indirect cost consisting of overhead expenses and profit is included in the unit price of each work item. The main components of the cost are described as follow:

##### (1) Labor Cost

All the labors required for the construction are assumed to be local labors. The direct daily wages in 8-hour shift of labor applied to the cost estimate are based on the wages obtained in Nairobi. The applied labor cost is shown in Table 4.1.

##### (2) Material Cost

Most of the construction materials are to be supplied by contractors mainly from local markets. Major local materials employed in the cost estimate are cement, fuel, gasoline, reinforcement bar, asphalt bitumen, structural steel, explosives, timber, plywood, etc. The material prices of the above items are canvassed in Nairobi. The material prices are assumed to be purchased price at site including inland transportation expenses from the markets. The local material prices are divided into foreign and local portions. The local materials include Value Added Tax (VAT).

While, imported material costs for steel pipe pile, consumable goods of drilling and concrete works, etc. are estimated referring to the prevailing prices in Japan. These costs are estimated on the basis of CIF price at Mombasa including freight and insurance premium. The CIF price is estimated in foreign currency. The cost of handling charge at port and inland transportation expenses from Mombasa to the site are included in the material price and estimated in local currency. The imported materials are exempted from import duties and VAT. The material cost is shown in Table 4.2.

##### (3) Equipment Cost

The construction equipment and plant will be provided by a contractor. The prices of equipment are prevailing prices in Japan on February 1992. The equipment cost is estimated based on the CIF price at Mombasa. The import duties and taxes for equipment are excluded in



this cost estimate according to the re-export conditions after the completion of the project. The equipment cost is divided into foreign and local currency portions. The foreign currency portion includes mainly depreciation cost, spare parts and consumable cost, while the local portion includes the cost of mechanic labor cost for the repair and maintenance and administration expenses. The equipment cost is listed in Table 4.3.

(4) Contractor's Indirect Cost

The overhead and profit is distributed to the unit prices and lump sum of each work item. These expenses are estimated at 15% of direct unit cost comprising labor cost, material cost and equipment cost.

(5) Direct Construction Cost

The unit prices for various work items in the Bill of Quantities are estimated in accordance with the above conditions. The unit prices are as shown in APPENDIX I and APPENDIX J.

The direct construction cost of the project is estimated at K.Shs. 1,055.64 million in total, comprising K.Shs. 664.60 million in foreign currency (63.0%) and K.Shs. 391.04 million in local currency (37.0%)

5. INDIRECT COST

5.1 Land Acquisition and Compensation

All required land acquisition and compensation shall be acquired by the Ministry of Public Works in accordance with the project implementation schedule. This cost is estimated based on the information such as land value and housing value obtained from the Ministry of Lands and Housings.

The cost for land acquisition and compensation is estimated at K.Shs. 132.40 million. However, this cost will be actually estimated on the financial arrangement stage between the Commissioner of Lands and Housing and the Ministry of Public Works.



## 5.2 Engineering Services

The cost of consulting services for the construction supervision is estimated referring to assumed man-month (Expatriate 90 M/M, Local 82 M/M). The engineering services cost includes remuneration, direct cost and contingency.

## 5.3 Contingency

The contingency is provided to cope with unforeseen physical conditions and price escalation due to inflation. The physical contingency amounting to 10 percent of the direct construction cost is applied for both foreign and local portions.

The price escalation is estimated by applying the inflation rate of 2 percent per annum for foreign currency portion and 10 percent per annum for local currency portion. These escalation rate are referred to "International Finance Statistics, 1992", "Economic Survey , 1991" and "Statistical Abstract". The cost of price escalation is estimated over 2.5 years from Mid 1994 on the basis of expected disbursement schedule. The land acquisition and compensation will be performed from 1993 to 1994.

## 6. CONSTRUCTION COST

The construction cost of the project is estimated at K.Shs. 1,634.44 million in total, comprising K.Shs. 868.42 million for foreign currency portion (53.1%) and K.Shs. 766.02 million for local currency portion (46.9%).

The construction cost is summarized as follows and as tabulated in Table 6.1 and Table 6.2.





	Foreign Currency (Mill K.Shs.)	Local Currency (Mill K.Shs.)	Total (Mill K.Shs.)	Total (Mill US\$ or J. Yen in equivalent)
1. Direct Construction Cost	664.60	391.04	1,055.64	US\$ 36.40
	(63.0%)	(37.0%)		Yen 4,624
2. Land Acquisition and Compensation	0.00	132.40	132.40	
3. Engineering Services	79.06	8.37	87.43	
4. Physical Contingency	66.46	39.11	105.37	
Total	810.12	570.92	1,381.04	US\$ 47.62
				Yen 6,049
5. Price Escalation	58.30	195.10	253.40	
Grand Total	868.42	766.02	1,634.44	US\$ 56.36
	(53.1%)	(46.9%)		Yen 7,159

## 7. ANNUAL DISBURSEMENT SCHEDULE

The annual disbursement schedule is estimated according to the construction schedule and summarized below. The disbursement schedule of the construction cost is tabulated in Table 7.1.

	Foreign Currency (Mill K.Shs.)	Local Currency (Mill K.Shs.)	Total (Mill K.Shs.)
- 1st Year (1993)	0.00	76.46	76.46
1st Year (1994)	239.63	299.42	539.05
2nd Year (1995)	378.73	234.54	613.27
3rd Year (1996)	250.06	155.60	405.66
Total	868.42	766.02	1,634.44

## 8. CONSTRUCTION COST (VAT EXEMPTION)

The construction cost is estimated in case VAT-exemption conditions for local materials. The construction cost and the annual disbursement are summarized below and tabulated in Table 8.1 to Table 8.3.

The breakdown of direct construction cost is shown in APPENDIX B.



	Foreign Currency (Mill K.Shs.)	Local Currency (Mill K.Shs.)	Total (Mill K.Shs.)	Total (Mill US\$ or J. Yen in equivalent)
1. Direct Construction Cost	664.60 (68.4%)	306.94 (31.6%)	971.54	US\$ 33.50 Yen 4,255
2. Land Acquisition and Compensation	0.00	132.40	132.40	
3. Engineering Services	79.06	8.37	87.43	
4. Physical Contingency	66.46	30.69	97.15	
Total (1 to 4)	810.12	478.40	1,288.52	US\$ 44.43 Yen 5,644
5. Price Escalation	58.30	157.19	215.49	
Grand Total	868.42 (57.7%)	635.59 (42.3%)	1,504.01	US\$ 51.86 Yen 6,588

#### Annual Disbursement

	Foreign Currency (Mill K.Shs.)	Local Currency (Mill K.Shs.)	Total (Mill K.Shs.)
- 1st Year (1993)	0.00	76.46	76.46
1st Year (1994)	239.63	269.53	509.16
2nd Year (1995)	378.73	179.33	558.06
3rd Year (1996)	250.06	110.27	360.33
Total	868.42	635.59	1,504.01







## TABLE





Table 4.1 Labor Cost (1/2)

Description	Unit	Wage Rate Kshs.
Foreman	M.D.	199
Skilled labor, III	M.D.	142
Skilled labor, II	M.D.	157
Skilled labor, I	M.D.	185
Unskilled labor	M.D.	114
Operator, light	M.D.	132
Operator, heavy	M.D.	189
Assist operator	M.D.	125
Driver, truck	M.D.	143
Driver, vehicle	M.D.	133
Electrician	M.D.	192
Assist electrician	M.D.	141
Mechanic	M.D.	193
Assist mechanic	M.D.	142
Carpenter/Formworker, III	M.D.	143
Carpenter/Formworker, II	M.D.	158
Carpenter/Formworker, I	M.D.	186
Concrete worker	M.D.	142
Steel worker	M.D.	158
Masonry	M.D.	158
Asphalt paver	M.D.	142
Driller	M.D.	158
Blaster	M.D.	186



Table 4.1 Labor Cost (2/2)

Description	Minimum Wage(Day)	Monthly House Allowance	Overtime Sunday Working	Annual Leave Allowance	Trav Allowance	Sick Leave Allowance	Tool Allowance	Other Allowance	Monthly Total	Daily Wage		
Foreman	98.00	2,548.00	376.00	269.91	479.84	243.67	16.67	609.17	57.50	584.80	5,185.55	199.44
Skilled labor, III	67.85	1,764.10	336.50	193.90	344.71	175.05	16.67	437.63	0.00	420.12	3,688.68	141.87
Skilled labor, II	76.35	1,985.10	336.50	214.30	380.98	193.47	16.67	483.67	0.00	464.32	4,075.01	156.73
Skilled labor, I	92.30	2,399.80	336.50	252.58	449.03	228.03	16.67	570.06	0.00	547.26	4,799.93	184.61
Unskilled labor	52.00	1,352.00	336.50	155.86	277.09	140.71	16.67	351.77	0.00	337.70	2,968.30	114.17
Operator, light	62.35	1,621.10	336.50	180.70	321.25	163.13	16.67	407.83	0.00	391.52	3,438.71	132.26
Operator, heavy	94.60	2,459.60	336.50	258.10	458.85	233.01	16.67	582.52	0.00	559.22	4,904.47	188.63
Assist.operator	57.95	1,506.70	336.50	170.14	302.47	153.60	16.67	384.00	0.00	368.64	3,238.73	124.57
Driver, truck	68.30	1,775.80	336.50	194.98	346.63	176.03	16.67	440.06	0.00	422.46	3,709.13	142.66
Driver, vehicle	62.75	1,631.50	336.50	181.66	322.95	164.00	16.67	410.00	0.00	393.60	3,456.89	132.96
Electrician	95.85	2,492.10	336.50	261.10	464.18	235.72	16.67	589.29	34.50	555.72	4,995.78	192.15
Assist.electrician	66.40	1,726.40	336.50	190.42	338.53	171.91	16.67	429.77	34.50	412.58	3,657.28	140.66
Mechanic	95.85	2,492.10	336.50	261.10	464.18	235.72	16.67	589.29	57.50	565.72	5,018.78	193.03
Assist.mechanic	66.40	1,726.40	336.50	190.42	338.53	171.91	16.67	429.77	57.50	412.58	3,680.28	141.55
Carpenter, III	67.85	1,764.10	336.50	193.90	344.71	175.05	16.67	437.63	40.25	420.12	3,728.93	143.42
Carpenter, II	76.35	1,985.10	336.50	214.30	380.98	193.47	16.67	483.67	40.25	464.32	4,115.26	158.28
Carpenter, I	92.30	2,399.80	336.50	252.58	449.03	228.03	16.67	570.06	40.25	547.26	4,840.18	186.16
Concrete worker	67.85	1,764.10	336.50	193.90	344.71	175.05	16.67	437.63	0.00	420.12	3,688.68	141.87
Steel worker	76.35	1,985.10	336.50	214.30	380.98	193.47	16.67	483.67	28.75	464.32	4,103.76	157.84
Masonry	76.35	1,985.10	336.50	214.30	380.98	193.47	16.67	483.67	34.50	464.32	4,109.51	158.06
Asphalt paver	67.85	1,764.10	336.50	193.90	344.71	175.05	16.67	437.63	0.00	420.12	3,688.68	141.87
Driller	76.35	1,985.10	336.50	214.30	380.98	193.47	16.67	483.67	28.75	464.32	4,103.76	157.84
Blasterer	92.30	2,399.80	336.50	252.58	449.03	228.03	16.67	570.06	34.50	547.26	4,834.43	185.94



Table 4.2 Material Cost (1/3)

(Unit:Kshs.)

Description	Unit	F.C.	L.C. (Excl.VAT)	Total (Excl.VAT)	Valu Added Tax	Total (Incl.VAT)
Cement(Athi River)	ton	1,718.96	978.48	2,697.44	402.80	3,100.24
Cement(Bamburi)	ton	1,773.22	1,009.37	2,782.59	319.32	3,101.91
Light oil	litre	6.83	0.59	7.42	4.02	11.44
Gasoline	litre	7.70	0.81	8.51	6.44	14.95
Heavy oil	litre	6.58	0.13	6.71	2.73	9.44
Lubricant	litre	25.49	2.30	27.79	4.17	31.96
Grease	kg	35.26	1.24	36.50	2.73	39.23
Bitumin 80/100	ton	6,778.05	256.56	7,034.61	2,351.65	9,386.26
Bitumin 80/100	kg	6.78	0.26	7.04	2.35	9.39
Bitumin MC30,MC70,drum	litre	15.50	0.31	15.81	2.79	18.60
Bitumin KL70,drum	litre	15.50	0.31	15.81	2.79	18.60
Cut-back bit MC3000,drum	litre	17.80	0.36	18.16	3.20	21.36
Bitumin KL60,drum	litre	10.95	0.22	11.17	1.97	13.14
Reinforcement,round						
More than 16 mm	ton	8,928.00	5,760.00	14,688.00	2,592.00	17,280.00
Equal,less.16 mm	ton	9,490.00	5,402.00	14,892.00	2,628.00	17,520.00
Reinforcement,twist.high						
More than 16 mm	ton	9,620.00	5,476.00	15,096.00	2,664.00	17,760.00
Equal,less.16 mm	ton	9,880.00	5,624.00	15,504.00	2,736.00	18,240.00
Explosive	kg	125.60	39.25	164.85	28.26	193.11
Detonator,s/delay	No	64.00	20.00	84.00	14.40	98.40
Lead wire	m	1.51	0.08	1.59	0.00	1.59
AN-FO	kg	18.00	0.90	18.90	0.00	18.90
Timber,square	m3	0.00	4,284.00	4,284.00	756.00	5,040.00
Timber,plain	m3	0.00	4,284.00	4,284.00	756.00	5,040.00
Plywood	m3	7,000.00	7,280.00	14,280.00	2,520.00	16,800.00
Wire	kg	15.60	8.88	24.48	4.32	28.80
Nail	kg	11.05	6.29	17.34	3.06	20.40
Barbed wire	m	1.37	0.77	2.14	0.38	2.52
Channel steel	ton	10,530.00	5,994.00	16,524.00	2,916.00	19,440.00
Angle steel 8mm	ton	9,360.00	5,328.00	14,688.00	2,592.00	17,280.00
Angle steel 10mm	ton	10,075.00	5,735.00	15,810.00	2,790.00	18,600.00
Concrete pipe,300mm	m	147.50	162.25	309.75	53.10	362.85
Concrete pipe,600mm	m	466.00	512.60	978.60	167.76	1,146.36
Concrete pipe,750mm	m	722.50	794.75	1,517.25	260.10	1,777.35
Concrete pipe,900mm	m	905.50	996.05	1,901.55	325.50	2,227.05
Concrete pipe,1200mm	m	1,479.00	1,626.90	3,105.90	532.44	3,638.34
Timber,log	m3	0.00	2,142.00	2,142.00	378.00	2,520.00
Paint	kg	47.70	2.39	50.09	0.00	50.09
PVC pipe,50mm,VP	m	83.30	4.17	87.47	0.00	87.47
PVC pipe,50mm,VU	m	39.27	1.96	41.23	0.00	41.23
PVC pipe,75mm,VP	m	163.00	8.15	171.15	0.00	171.15
PVC pipe,75mm,VU	m	80.36	4.02	84.38	0.00	84.38
PVC pipe,100mm,VP	m	241.00	12.05	253.05	0.00	253.05
PVC pipe,100mm,VU	m	121.00	6.05	127.05	0.00	127.05
PVC pipe,150mm,VP	m	0.00	0.00	0.00	0.00	0.00
PVC pipe,150mm,VU	m	463.00	23.15	486.15	0.00	486.15
PVC pipe,200mm,VP	m	695.00	34.75	729.75	0.00	729.75
PVC pipe,200mm,VU	m	464.00	23.20	487.20	0.00	487.20



Table 4.2 Material Cost (2/3)

(Unit:Kshs.)

Description	Unit	F.C.	L.C. (Excl.VAT)	Total (Excl.VAT)	Value Added Tax	Total (Incl.VAT)
PVC pipe,200mm,perforate	m	326.00	16.30	342.30	0.00	342.30
Concrete aggregate	m3	342.00	92.41	434.41	29.71	464.12
Sand	m3	201.60	134.40	336.00	60.48	396.48
Graded crushed stone	m3	342.00	92.41	434.41	29.71	464.12
Chipping,sealing	m3	353.79	95.60	449.39	30.74	480.13
Stone dust	ton	235.86	63.73	299.59	20.49	320.08
Rubble,cobble	m3	256.50	69.31	325.81	22.28	348.09
Gabion rock	m3	256.50	69.31	325.81	22.28	348.09
Stone pitching	m3	256.50	69.31	325.81	22.28	348.09
Bit,65mm	No	6,849.00	342.45	7,191.45	0.00	7,191.45
Rod,3m	No	9,132.00	456.60	9,588.60	0.00	9,588.60
Sleeve	No	2,283.00	114.15	2,397.15	0.00	2,397.15
Shank rod	No	6,849.00	342.45	7,191.45	0.00	7,191.45
Cross bit,36mm	No	1,826.00	91.30	1,917.30	0.00	1,917.30
Taper rod,22mm	No	2,169.00	108.45	2,277.45	0.00	2,277.45
Metal form,300x1500	No	653.00	32.65	685.65	0.00	685.65
Joint filler,20mm	m2	422.00	21.10	443.10	0.00	443.10
PVC waterstop,200mm	m	314.00	15.70	329.70	0.00	329.70
Portal frame	No	1,070.00	53.50	1,123.50	0.00	1,123.50
Water reduce agent	kg	62.80	3.14	65.94	0.00	65.94
Pipe support	No	666.00	33.30	699.30	0.00	699.30
Scaffolding,pipe	No	161.00	8.05	169.05	0.00	169.05
Gabion box,2mx1mx1m	box	421.20	239.76	660.96	116.64	777.60
Mattress,6mx2mx0.3m	box	1,157.00	658.60	1,815.60	320.40	2,136.00
Reinforce fabric,A-193	m2	40.95	23.31	64.26	11.34	75.60
Kerb inlet,125x250,600mm	pc	40.00	44.00	84.00	14.40	98.40
Channel intake block						
125x250x915mm	pc	40.00	44.00	84.00	14.40	98.40
150x305x915mm	pc	60.00	66.00	126.00	21.60	147.60
Invert block drain						
450x225x610mm	pc	55.00	60.50	115.50	19.80	135.30
750x355x610mm	pc	124.00	136.40	260.40	44.64	305.04
Side slab,610x235x75mm	pc	16.00	17.60	33.60	5.76	39.36
Flush kerb,150x100x915	pc	25.20	27.72	52.92	9.07	61.99
Flush kerb,150x80x915	pc	20.16	22.18	42.34	7.26	49.60
Flush kerb,125x250x915	pc	40.00	44.00	84.00	14.40	98.40
Raised kerb,125x250	pc	40.00	44.00	84.00	14.40	98.40
Build stone,150x230x450	pc	0.00	10.50	10.50	1.80	12.30
Flexbeam guardrail	m	848.00	42.40	890.40	0.00	890.40
Kerb, radius,150x100x915	pc	32.50	35.75	68.25	11.70	79.95
Kerb, radius,150x80x915	pc	26.00	28.60	54.60	9.36	63.96
Kerb, radius,125x250x915	pc	49.00	53.90	102.90	17.64	120.54
Grass	bag	0.00	63.00	63.00	10.80	73.80
Grass	m2	0.00	7.00	7.00	1.20	8.20
Shrub & bush	pc	0.00	31.50	31.50	5.40	36.90
Tree	pc	0.00	31.50	31.50	5.40	36.90
U-drain,375x250x600mm	pc	70.00	77.00	147.00	25.20	172.20
Fence post,100x130mm	ft	21.50	23.65	45.15	7.74	52.89
Fence supp.post,100x130	ft	24.50	26.95	51.45	8.82	60.27





Table 4.2 Material Cost (3/3)

(Unit:Kshs.)

Description	Unit	F.C.	L.C. (Excl.VAT)	Total (Excl.VAT)	Value Added Tax	Total (Incl.VAT)
Concrete pipe,535mm	m	328.50	361.35	689.85	118.26	808.11
Concrete pipe,225mm	m	97.00	106.70	203.70	34.92	238.62
Galv. steel pipe,4"	m	513.00	25.65	538.65	0.00	538.65
8"UPVC	m	695.00	34.75	729.75	0.00	729.75
10"UPVC	m	1,079.00	53.95	1,132.95	0.00	1,132.95
6"UPVC	m	463.00	23.15	486.15	0.00	486.15
6"cast iron pipe	m	492.00	24.60	516.60	0.00	516.60
2"cast iron pipe	m	125.00	6.25	131.25	0.00	131.25
1"cast iron pipe	m	60.50	3.03	63.53	0.00	63.53
3/4"cast iron pipe	m	42.70	2.14	44.84	0.00	44.84
1/2"cast iron pipe	m	34.25	1.71	35.96	0.00	35.96
Steel pipe pile	ton	28,881.00	2,888.10	31,769.10	0.00	31,769.10
Air-entrain agent	kg	45.20	2.26	47.46	0.00	47.46
Bolt & nut	No	7.50	0.38	7.88	0.00	7.88
Clamp	No	75.33	3.77	79.07	0.00	79.07
Clip	No	8.90	0.44	9.34	0.00	9.34
Anchor bolt,22mm,0.4m	No	37.70	1.88	39.58	0.00	39.58
Metal form,200x1500	No	653.00	32.65	685.65	0.00	685.65
Cone	No	5.00	0.25	5.25	0.00	5.25
Separator,8-10mm	m	20.10	1.00	21.10	0.00	21.10
Form oil	lit	50.20	2.51	52.71	0.00	52.71
Metal form,150x1500	No	490.00	24.50	514.50	0.00	514.50
Metal form,100x1500	No	452.00	22.60	474.60	0.00	474.60
Hunch form,200x1500	No	917.00	45.85	962.85	0.00	962.85
Adhesive agent	kg	125.00	6.25	131.25	0.00	131.25
Steel pipe pile	ton	28,881.00	2,888.10	31,769.10	0.00	31,769.10
Filter fabric	m2	75.30	3.77	79.07	0.00	79.07
Waterproof primer	lit	138.00	6.90	144.90	0.00	144.90
Dowel bar,stainless	kg	100.00	5.00	105.00	0.00	105.00
Joint filler,30mm	m2	633.00	31.65	664.65	0.00	664.65
Joint filler,25mm	m2	527.00	26.35	553.35	0.00	553.35
Sealant,30x50mm	m	377.00	18.85	395.85	0.00	395.85
Sealant,25x50mm	m	314.00	15.70	329.70	0.00	329.70
Elastomeric bearing,20mm	m2	15,847.00	792.35	16,639.35	0.00	16,639.35
Elastomeric bearing,18mm	m2	14,262.00	713.10	14,975.10	0.00	14,975.10
Elastomeric bearing,56mm	m2	44,372.00	2,218.60	46,590.60	0.00	46,590.60
Elastomeric bearing,37mm	m2	29,317.00	1,465.85	30,782.85	0.00	30,782.85
Elastomeric bearing,46mm	m2	36,448.00	1,822.40	38,270.40	0.00	38,270.40
Elastomeric bearing,65mm	m2	51,503.00	2,575.15	54,078.15	0.00	54,078.15



Table 4.3 Equipment Cost (1/3)

Unit:Kshs.					Unit:Kshs.				
Equipment		FC KSHS	LC KSHS	Total kshs	Equipment		FC KSHS	LC KSHS	Total kshs
Bulldozer ripper,32t	H	1,617.0	387.2	2,004.2	Leg drill	D	255.4	34.6	290.0
Bulldozer ripper,21t	H	1,282.6	316.3	1,599.0	Truck,2t	H	81.7	18.9	100.6
Bulldozer,21t	H	1,149.0	275.1	1,424.1	Concrete mixer,0.2 m3	D	1,113.8	238.4	1,352.2
Bulldozer,11t	H	553.1	132.4	685.5	Concrete bucket,0.75 m3	D	417.1	82.9	500.0
Backhoe,0.2 m3	H	481.7	111.6	593.3	Concrete vibrator,50mm	D	121.5	19.4	141.0
Backhoe,0.6 m3	H	757.7	181.4	939.2	Soil plant,150t	H	1,438.2	307.9	1,746.1
Tractor shovel,2.3 m3	H	891.6	213.5	1,105.1	Water pump,50mm,20m,2.2kw	D	73.1	18.3	91.4
Tractor shovel,1.6 m3	H	749.3	173.6	923.0	Water pump,100mm,20m,7.5k	D	195.8	49.0	244.8
Wheel loader,2.7 m3	H	757.7	181.4	939.2	Jaw crusher,100t/hr	H	950.4	231.9	1,181.5
Wheel loader,2.1 m3	H	668.6	160.1	828.7	Grizzly feeder,100t/hr	H	180.8	37.8	218.7
Dump truck,11t	H	364.0	84.3	448.4	Impact crusher,100t/hr	H	855.4	207.9	1,063.4
Dump truck,8t	H	278.3	64.5	342.7	Cone crusher,50t/hr	H	1,093.1	265.7	1,358.8
Cargo truck,8 ton	H	214.1	49.6	263.8	Screen,40/20mm	H	182.4	47.3	229.8
Cargo truck,6 ton	H	171.4	39.7	211.1	Screen,5mm	H	156.4	40.6	197.0
Truck crane,20t	H	922.1	192.9	1,115.0	Belt conveyor,450mm,500mm	H	1,398.8	176.4	1,575.3
Crawler drill,7 m3/min	H	450.1	96.3	546.4	Apron feeder,100t/hr	H	228.5	53.8	282.3
Crawler drill,10 m3/min	H	600.3	128.5	728.8	Welder,400A	D	175.5	34.9	210.4
Jack hammer,20kg	D	211.4	28.6	240.0	Tire roller,6-10t	H	302.6	63.3	365.8
Pick hammer,7kg	D	34.8	4.7	39.5	Land rover	H	130.5	30.8	161.3
Moter grader,3.7m	H	642.3	148.8	791.1	Pick up car	H	145.6	34.3	179.9
Macadam roller,10-12t	H	384.2	80.4	464.6					
Tandem roller,8-10t	H	336.2	70.3	406.5					
Tire roller,8-20t	H	384.2	80.4	464.6					
Vibrating roller,10t	H	867.3	197.3	1,064.6					
Vibrating roller,4t	H	333.7	75.9	409.7					
Vibrating roller,0.5t	H	105.1	20.9	126.0					
Tamping roller,CA	H	825.2	172.6	997.8					
Rammer,60-100kg	D	191.5	34.6	226.1					
Concrete plant,20 m3/hr	H	1,369.6	293.2	1,662.8					
Agitator truck,3.2 m3	H	321.2	74.4	395.6					
Truck crane,10t	H	576.4	120.5	696.9					
Diesel pile hammer,2.5t	H	866.3	156.6	1,022.9					
Crawler pile driver,2.5t	H	2,212.0	400.0	2,612.0					
Asphalt plant,100t/h	H	7,304.9	1,563.7	8,868.6					
Asphalt finisher,2.4-5m	H	1,536.9	321.4	1,858.3					
Asphalt kettle,6000 l	D	798.3	108.1	906.4					
Distributor,4000 l	H	576.3	120.5	696.8					
Chip spreader,hang,0.4m3	H	44.5	7.4	52.0					
Engin sprayer,600 l	D	950.8	152.1	1,102.9					
Engin sprayer,200 l	D	189.4	30.3	219.7					
Line marker,15cm	H	48.5	8.1	56.6					
Water sprinkler,5.5kl	H	256.9	59.5	316.5					
Air compressor,13.5 m3	D	4,075.8	852.4	4,928.2					
Air compressor,5 m3/min	D	1,323.9	276.9	1,600.8					
Belt conveyor,10m	D	335.9	62.8	398.8					
Bulldozer,3t	H	286.7	58.5	345.2					
Deasel generater,300KVA	D	4,362.1	788.7	5,150.8					
Deasel generater,200KVA	D	3,331.9	602.4	3,934.4					



Table 4.3 Equipment Cost (2/3)

Item No.	Equipment	Initial Cost kshs	Econo Life Hrs	Year Hour	Depr. Maint Mana % Repir %	Total Rate			Equipment Cost			Sub-Total kshs	Port/Land kshs	FC KSHS	LC KSHS	Total kshs
						10-6	10-6	LC	FC	LC	kshs					
1	Bulldozer ripper, 32t	9,110,000	10,000	5 2,000	H 90	100	5	177.5	37.5	1,617.0	341.6	1,958.7	45.6	1,617.0	387.2	2,004.2
2	Bulldozer ripper, 21t	6,952,000	10,000	5 2,000	H 90	110	5	184.5	40.5	1,282.6	281.6	1,564.2	34.8	1,282.6	316.3	1,599.0
3	Bulldozer, 21t	6,473,000	10,000	5 2,000	H 90	100	5	177.5	37.5	1,149.0	242.7	1,391.7	32.4	1,149.0	275.1	1,424.1
4	Bulldozer, 11t	3,116,000	10,000	5 2,000	H 90	100	5	177.5	37.5	553.1	116.9	669.9	15.6	553.1	132.4	685.5
5	Backhoe, 0.2 m3	2,260,000	8,000	5 1,600	H 90	90	5	213.1	43.1	481.7	97.5	579.1	14.1	481.7	111.6	593.3
6	Backhoe, 0.6 m3	4,269,000	10,000	5 2,000	H 90	100	5	177.5	37.5	757.7	160.1	917.8	21.3	757.7	181.4	939.2
7	Tractor shovel, 2.3 m3	5,023,000	10,000	5 2,000	H 90	100	5	177.5	37.5	891.6	188.4	1,079.9	25.1	891.6	213.5	1,105.1
8	Tractor shovel, 1.6 m3	3,516,000	8,000	5 1,600	H 90	90	5	213.1	43.1	749.3	151.6	901.0	22.0	749.3	173.6	923.0
9	Wheel loader, 2.7 m3	4,269,000	10,000	5 2,000	H 90	100	5	177.5	37.5	757.7	160.1	917.8	21.3	757.7	181.4	939.2
10	Wheel loader, 2.1 m3	3,767,000	10,000	5 2,000	H 90	100	5	177.5	37.5	668.6	141.3	809.9	18.8	668.6	160.1	828.7
11	Dump truck, 11t	2,135,000	10,000	5 2,000	H 90	90	5	170.5	34.5	364.0	73.7	437.7	10.7	364.0	84.3	448.4
12	Dump truck, 8t	1,632,000	10,000	5 2,000	H 90	90	5	170.5	34.5	278.3	56.3	334.6	8.2	278.3	64.5	342.7
13	Cargo truck, 8 ton	1,256,000	10,000	5 2,000	H 90	90	5	170.5	34.5	214.1	43.3	257.5	6.3	214.1	49.6	263.8
14	Cargo truck, 6 ton	1,005,000	10,000	5 2,000	H 90	90	5	170.5	34.5	171.4	34.7	206.0	5.0	171.4	39.7	211.1
15	Truck crane, 20t	6,027,000	10,000	5 2,000	H 90	65	5	153.0	27.0	922.1	162.7	1,084.9	30.1	922.1	192.9	1,115.0
16	Crawler drill, 7 m3/min	1,438,000	5,000	5 1,000	H 90	70	5	313.0	57.0	450.1	82.0	532.1	14.4	450.1	96.3	546.4
17	Crawler drill, 10 m3/min	1,918,000	5,000	5 1,000	H 90	70	5	313.0	57.0	600.3	109.3	709.7	19.2	600.3	128.5	728.8
18	Jack hammer, 20kg	48,000	260	2 130	D 90	25	5	4,403.8	403.8	211.4	19.4	230.8	9.2	211.4	28.6	240.0
19	Pick hammer, 7kg	7,900	260	2 130	D 90	25	5	4,403.8	403.8	34.8	3.2	38.0	1.5	34.8	4.7	39.5
20	Motor grader, 3.7m	3,767,000	10,000	5 2,000	H 90	90	5	170.5	34.5	642.3	130.0	772.2	18.8	642.3	148.8	791.1
21	Macadam roller, 10-12t	2,009,000	8,000	5 1,600	H 90	65	5	191.3	33.8	384.2	67.8	452.0	12.6	384.2	80.4	464.6
22	Tandem roller, 8-10t	1,758,000	8,000	5 1,600	H 90	65	5	191.3	33.8	336.2	59.3	395.6	11.0	336.2	70.3	406.5
23	Tire roller, 8-20t	2,009,000	8,000	5 1,600	H 90	65	5	191.3	33.8	384.2	67.8	452.0	12.6	384.2	80.4	464.6
24	Vibrating roller, 10t	3,116,000	6,000	5 1,200	H 90	85	5	278.3	55.0	867.3	171.4	1,038.7	26.0	867.3	197.3	1,064.6
25	Vibrating roller, 4t	1,199,000	6,000	5 1,200	H 90	85	5	278.3	55.0	333.7	65.9	399.7	10.0	333.7	75.9	409.7
26	Vibrating roller, 0.5t	288,000	4,000	5 800	H 90	55	5	365.0	60.0	105.1	17.3	122.4	3.6	105.1	20.9	126.0
27	Tamping roller, CA	4,315,000	8,000	5 1,600	H 90	65	5	191.3	33.8	855.2	145.6	970.9	27.0	825.2	172.6	997.8
28	Rammer, 60-100kg	53,000	375	3 125	D 90	50	5	3,613.3	520.0	191.5	27.6	219.1	7.1	191.5	34.6	226.1
29	Concrete plant, 20 m3/hr	6,301,000	7,200	6 1,200	H 90	65	5	217.4	39.6	1,369.6	249.4	1,619.0	43.8	1,369.6	293.2	1,662.8
30	Agitator truck, 3.2 m3	1,507,000	8,000	5 1,600	H 90	90	5	213.1	43.1	321.2	65.0	386.2	9.4	321.2	74.4	395.6
31	Truck crane, 10t	3,767,000	10,000	5 2,000	H 90	65	5	153.0	27.0	576.4	101.7	678.1	18.8	576.4	120.5	696.9
32	Diesel pile hammer, 2.5t	1,918,000	3,000	5 600	H 90	40	5	451.7	65.0	866.3	124.7	991.0	32.0	866.3	156.6	1,022.9
33	Pile driver, 2.5t, boom	9,795,000	6,000	6 1,000	H 90	35	5	225.8	32.5	2,212.0	318.3	2,530.4	81.6	2,212.0	400.0	2,612.0
34	Asphalt plant, 100t/h	42,009,000	9,000	6 1,500	H 90	65	5	173.9	31.7	7,304.9	1,330.3	8,635.2	233.4	7,304.9	1,563.7	8,868.5



Table 4.3 Equipment Cost (3/3)

Item No.	Equipment	Initial Cost kshs	Econo Life Hrs	Year Hour	Depr. Maint Mana % Repir %	Total Rate				Equipment Cost				Sub-Total	Port/Land kshs	FC		LC		Total kshs
						10-6	10-6	10-6	10-6	FC	LC	kshs	kshs			kshs	kshs	kshs	kshs	
35	Asphalt finisher, 2.4-5m	6,027,000	6,000	5	1,200	H	90	65	5	255.0	45.0	1,538.9	271.2	1,808.1	50.2	1,536.9	321.4	1,858.3		
36	Asphalt kettle, 6000 l	251,000	360	4	90	D	90	15	5	3,180.6	291.7	798.3	73.2	871.5	34.9	798.3	108.1	906.4		
37	Distributor, 4000 l	2,260,000	6,000	5	1,200	H	90	65	5	255.0	45.0	576.3	101.7	678.0	18.8	576.3	120.5	696.8		
38	Chip spreader, hang, 0.4m3	53,000	1,530	3	510	H	90	40	5	839.9	107.8	44.5	5.7	50.2	1.7	44.5	7.4	52.0		
39	Engin sprayer, 600 l	251,000	330	3	110	D	90	35	5	3,787.9	454.5	950.8	114.1	1,064.8	38.0	950.8	152.1	1,102.9		
40	Engin sprayer, 200 l	50,000	330	3	110	D	90	35	5	3,787.9	454.5	189.4	22.7	212.1	7.6	189.4	30.3	219.7		
41	Line marker, 15cm	151,000	4,000	4	1,000	H	90	35	5	321.3	41.3	48.5	6.2	54.7	1.9	48.5	8.1	56.6		
42	Water sprinkler, 5.5kl	1,507,000	10,000	5	2,000	H	90	90	5	170.5	34.5	256.9	52.0	308.9	7.5	256.9	59.5	316.5		
43	Air compressor, 13.5 m3	1,918,000	720	6	120	D	90	60	5	2,125.0	375.0	4,075.8	719.3	4,795.0	133.2	4,075.8	852.4	4,928.2		
44	Air compressor, 5 m3/min	623,000	720	6	120	D	90	60	5	2,125.0	375.0	1,323.9	233.5	1,557.5	43.3	1,323.9	276.9	1,600.8		
45	Belt conveyor, 10m	58,000	240	2	120	D	90	60	5	5,791.7	875.0	335.9	50.8	386.7	12.1	335.9	52.8	398.8		
46	Bulldozer, 3t	959,000	5,000	5	1,000	H	90	60	5	299.0	51.0	286.7	48.9	335.7	9.6	286.7	58.5	345.2		
47	Deasel generator, 300KVA	2,511,000	780	6	130	D	90	35	5	1,737.2	250.0	4,362.1	627.8	4,989.8	161.0	4,362.1	788.7	5,150.8		
48	Deasel generator, 200KVA	1,918,000	780	6	130	D	90	35	5	1,737.2	250.0	3,331.9	479.5	3,811.4	122.9	3,331.9	602.4	3,934.4		
49	Leg drill	58,000	260	2	130	D	90	25	5	4,403.8	403.8	255.4	23.4	278.8	11.2	255.4	34.6	290.0		
50	Truck, 2t	479,000	10,000	5	2,000	H	90	90	5	170.5	34.5	81.7	16.5	98.2	2.4	81.7	18.9	100.6		
51	Concrete mixer, 0.2 m3	427,000	600	5	120	D	90	70	5	2,608.3	475.0	1,113.8	202.8	1,316.6	35.6	1,113.8	238.4	1,352.2		
52	Concrete bucket, 0.75 m3	100,000	350	5	70	D	90	55	5	4,171.4	685.7	417.1	68.6	485.7	14.3	417.1	82.9	500.0		
53	Concrete vibrator, 50mm	35,000	360	3	120	D	90	35	5	3,472.2	416.7	121.5	14.6	136.1	4.9	121.5	19.4	141.0		
54	Soil plant, 150t	5,514,000	6,000	6	1,000	H	90	65	5	260.8	47.5	1,438.2	261.9	1,700.2	46.0	1,438.2	307.9	1,746.1		
55	Water pump, 50mm, 2.2kw	28,000	720	6	120	D	90	110	5	2,611.1	583.3	73.1	16.3	89.4	1.9	73.1	18.3	91.4		
56	Water pump, 100mm, 20m, 7.5k	75,000	720	6	120	D	90	110	5	2,611.1	583.3	195.8	43.7	239.6	5.2	195.8	49.0	244.8		
57	Jaw crusher, 100t/hr	5,251,000	10,000	8	1,250	H	90	90	5	181.0	39.0	950.4	204.8	1,155.2	26.3	950.4	231.0	1,181.5		
58	Grizzly feeder, 100t/hr	1,182,000	10,000	8	1,250	H	90	50	5	153.0	27.0	180.8	31.9	212.8	5.9	180.8	37.8	218.7		
59	Impact crusher, 100t/hr	4,726,000	10,000	8	1,250	H	90	90	5	181.0	39.0	855.4	184.3	1,039.7	23.6	855.4	207.9	1,063.4		
60	Cone crusher, 50t/hr	6,039,000	10,000	8	1,250	H	90	90	5	181.0	39.0	1,093.1	235.5	1,328.6	30.2	1,093.1	265.7	1,358.8		
61	Screen, 40/20mm	919,000	10,000	8	1,250	H	90	115	5	198.5	46.5	182.4	42.7	225.2	4.6	182.4	47.3	229.8		
62	Screen, 5mm	788,000	10,000	8	1,250	H	90	115	5	198.5	46.5	156.4	36.6	193.1	3.9	156.4	40.6	197.0		
63	Belt conveyor 450mm, 500mm	6,301,000	5,000	4	1,250	H	90	10	5	222.0	18.0	1,398.8	113.4	1,512.2	63.0	1,398.8	176.4	1,575.3		
64	Apron feeder, 100t/hr	1,313,000	10,000	8	1,250	H	90	80	5	174.0	36.0	228.5	47.3	275.7	6.6	228.5	53.8	282.3		
65	Welder, 400A	101,000	840	7	120	D	90	45	5	1,738.1	285.7	175.5	28.9	204.4	6.0	175.5	34.9	210.4		
66	Tire roller, 6-10t	1,582,000	8,000	5	1,600	H	90	65	5	191.3	33.8	302.6	53.4	356.0	9.9	302.6	63.3	365.8		
67	Land rover	450,000	6,000	6	1,000	H	90	60	10	290.0	60.0	130.5	27.0	157.5	3.8	130.5	30.8	161.3		
68	Pick up car	502,000	6,000	6	1,000	H	90	60	10	290.0	60.0	145.6	30.1	175.7	4.2	145.6	34.3	179.9		





Table 6.1 Summary of Construction Cost (1)  
(Including VAT)

Unit: 1,000 Kshs.

Description	Foreign Currency	Local Currency	Value Added Tax	Total Local	Total
<b>1. Direct Construction Cost</b>					
General	10,409	54,418	0	54,418	64,827
Site Clearance and Topsoil Stripping	5,420	1,999	425	2,424	7,844
Earthworks	179,249	65,665	15,694	81,359	260,608
Excavation and Filling for Structures	5,904	2,897	645	3,542	9,446
Culverts and Drainage Works	19,897	17,445	3,368	20,813	40,710
Passage to Traffic	9,973	4,413	1,669	6,082	16,055
Gravel Wearing Course	1,473	407	134	541	2,014
Graded Crushed Stone Subbase and Base	92,167	30,338	8,994	39,332	131,499
Lean Concrete	77,910	30,960	8,413	39,373	117,283
Bituminous Surface Treatment and Surface Dressing	28,363	1,244	4,262	5,506	33,869
Bituminous Binder Course Wearing Course	133,463	27,443	27,067	54,510	187,973
Concrete Works	62,429	48,174	10,975	59,149	121,578
Road Furniture	23,863	16,466	1,968	18,434	42,297
Miscellaneous	7,788	1,004	177	1,181	8,969
Daywork	2,813	3,648	309	3,957	6,770
Piling	3,477	416	8	424	3,901
Sub Total (1)	664,599	306,937	84,108	391,045	1,055,644
2. Land Acquisition and Compensation	0	132,400	0	132,400	132,400
3. Engineering Services	79,062	8,370	0	8,370	87,432
4. Physical Contingency	66,460	30,694	8,411	39,105	105,565
Sub Total (1 to 4)	810,121	478,401	92,519	570,920	1,381,041
5. Price Escalation	58,296	157,196	37,911	195,107	253,403
Total	868,417	635,597	130,430	766,027	1,634,444



Table 6.2 Summary of Construction Cost (2)  
(Including VAT)

				Unit: Kshs.
Description	Foreign Currency	Local Currency	Value Added Tax	Total
<b>1. Direct Construction Cost</b>				
General	10,408,772.00	54,418,500.00	0.00	64,827,272.00
Site Clearance and Topsoil Stripping	5,420,270.78	1,998,604.46	425,593.76	7,844,469.00
Earthworks	178,249,421.70	65,664,780.50	15,694,224.10	260,608,426.30
Excavation and Filling for Structures	5,904,449.70	2,896,789.70	645,355.15	9,446,594.55
Culverts and Drainage Works	19,897,191.68	17,444,630.39	3,367,573.66	40,709,395.73
Passage of Traffic	9,972,780.26	4,413,355.94	1,669,026.73	16,055,162.93
Gravel Wearing Course	1,473,607.80	406,678.90	133,952.70	2,014,239.40
Graded Crushed Stone Subbase and Base	92,167,301.00	30,337,555.90	8,994,526.20	131,499,383.10
Lean Concrete	77,909,650.20	30,960,367.50	8,412,572.80	117,282,590.50
Bituminous Surface Treatment and Surface Dressing	28,363,066.29	1,243,712.61	4,262,107.42	33,868,886.32
Bituminous Binder Course and Wearing Course	133,463,081.20	27,443,005.80	27,066,537.80	187,972,624.80
Concrete Works	62,428,975.50	48,174,481.52	10,974,725.50	121,578,182.52
Road Furniture	23,863,031.76	16,465,692.51	1,968,524.89	42,297,249.16
Miscellaneous	7,788,119.56	1,004,065.21	177,435.23	8,969,620.00
Daywork	2,812,430.00	3,648,443.80	308,556.00	6,769,429.80
Piling	3,477,342.24	416,364.64	7,332.96	3,901,039.84
Sub Total (1)	664,599,491.67	306,937,029.38	84,108,044.90	1,055,644,565.95
2. Land Acquisition and Compensation	0.00	132,400,000.00	0.00	132,400,000.00
3. Engineering Service	79,061,600.00	8,370,600.00	0.00	87,432,200.00
4. Physical Contingency	66,459,900.00	30,693,700.00	8,410,800.00	105,564,400.00
Sub Total (1 to 4)	810,120,991.67	478,401,329.38	92,518,844.90	1,381,041,165.95
6. Price Escalation	58,296,000.00	157,196,000.00	37,911,000.00	253,403,000.00
Total	868,416,991.67	635,597,329.38	130,429,844.90	1,634,444,165.95



Table 7.1 Annual Disbursement Schedule

(Including VAT)

Unit: 1,000 Kshs.

Description	1st Year (1993)		2nd Year (1994)		3rd Year (1995)		Total		Total	
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1. Direct Construction Cost										
General	10,409	54,418	0	0	10,409	54,418	0	0	0	0
Site Clearance and Topsoil Stripping	5,420	2,424	0	0	4,507	2,060	813	364	0	0
Earthworks	179,249	81,359	0	0	53,775	24,408	107,549	48,815	156,364	8,136
Excavation and Filling for Structures	5,904	3,542	0	0	1,181	708	4,103	2,479	6,612	355
Culverts and Drainage Works	19,897	20,813	0	0	5,959	6,244	12,933	13,528	26,461	1,041
Passage of Traffic	9,973	6,082	0	0	3,989	2,433	5,984	3,649	9,633	0
Gravel Wearing Course	1,474	541	0	0	0	0	0	0	0	0
Graded Crushed Stone	92,167	39,332	0	0	0	0	0	0	1,473	541
Subbase and Base			0	0	0	0	64,517	27,532	27,550	11,800
Lean Concrete	77,910	39,373	0	0	0	0	38,955	19,687	38,955	19,685
Bituminous Surface Treatment and Surface Dressing	28,363	5,506	0	0	0	0	11,345	2,202	13,547	3,304
Bituminous Binder Course and Wearing Course	133,463	54,510	0	0	0	0	53,385	21,804	80,072	32,706
Concrete Works	62,429	59,149	0	0	18,729	17,745	31,215	29,575	60,790	11,829
Road Furniture	23,863	18,434	0	0	0	0	4,773	3,687	19,090	14,747
Miscellaneous	7,788	1,181	0	0	2,336	354	3,894	501	4,485	236
Daywork	2,813	3,957	0	0	253	1,187	1,125	1,583	2,708	1,187
Piling	3,477	424	0	0	0	0	3,477	424	3,501	0
Sub Total (1)	694,599	391,045	0	0	101,248	109,557	210,805	175,920	520,018	105,538
(Subtotal/advance)	****	****	0	0	185,751	151,760	337,531	149,532	442,015	89,783
2. Land Acquisition and Compensation	0	132,400	0	65,200	0	66,200	65,200	0	0	0
3. Engineering Service	79,062	8,370	0	0	23,719	2,511	31,625	3,348	34,973	2,511
4. Physical Contingency	66,460	39,105	0	0	18,575	15,178	33,753	14,953	41,201	8,974
Sub Total (1 to 4)	810,121	570,920	0	65,200	228,045	235,869	463,714	167,833	521,189	101,218
5. Price Escalation	58,296	195,107	0	10,261	11,585	63,748	75,333	25,371	92,085	54,384
Total	868,417	766,027	0	75,461	239,630	299,417	539,047	234,547	613,274	155,602



Table 8.1 Summary of Construction Cost (1)  
(VAT Exemption)

Unit: 1,000 Kshs.

Description	Foreign Currency	Local Currency	Total
<b>1. Direct Construction Cost</b>			
General	10,409	54,418	64,827
Site Clearance and Topsoil Stripping	5,420	1,999	7,419
Earthworks	179,249	65,665	244,914
Excavation and Filling for Structures	5,904	2,897	8,801
Culverts and Drainage Works Passage to Traffic	19,897	17,445	37,342
Gravel Wearing Course	9,973	4,413	14,386
Graded Crushed Stone Subbase and Base	1,473	407	1,880
Lean Concrete	92,167	30,338	122,505
Bituminous Surface Treatment and Surface Dressing	77,910	30,960	108,870
Bituminous Binder Course Wearing Course	28,363	1,244	29,607
Concrete Works	133,463	27,443	160,906
Road Furniture	62,429	48,174	110,603
Miscellaneous	23,863	16,466	40,329
Daywork	7,788	1,004	8,792
Piling	2,813	3,648	6,461
Sub Total (1)	3,477	416	3,893
2. Land Acquisition and Compensation	664,599	306,937	971,536
3. Engineering Services	0	132,400	132,400
4. Physical Contingency	79,062	8,370	87,432
Sub Total (1 to 4)	66,460	30,694	97,154
5. Price Escalation	810,121	478,401	1,288,522
Total	58,296	157,196	215,492
	868,417	635,597	1,504,014





Table 8.2 Summary of Construction Cost (2)  
(VAT Exemption)

Unit: Kshs.

Description	Foreign Currency	Local Currency	Total
1. Direct Construction Cost			
General	10,408,772.00	54,418,500.00	64,827,272.00
Site Clearance and Topsoil Stripping	5,420,270.78	1,998,604.46	7,418,875.24
Earthworks	179,249,421.70	65,664,780.50	244,914,202.20
Excavation and Filling for Structures	5,904,449.70	2,896,789.70	8,801,239.40
Culverts and Drainage Works	19,897,191.68	17,444,630.39	37,341,822.07
Passage of Traffic	9,972,780.26	4,413,355.94	14,386,136.20
Gravel Wearing Course	1,473,607.80	406,678.90	1,880,286.70
Graded Crushed Stone	92,167,301.00	30,337,555.90	122,504,856.90
Subbase and Base			
Lean Concrete	77,909,650.20	30,960,367.50	108,870,017.70
Bituminous Surface Treatment and Surface Dressing	28,363,066.29	1,243,712.61	29,606,778.90
Bituminous Binder Course and Wearing Course	133,463,081.20	27,443,005.80	160,906,087.00
Concrete Works	62,428,975.50	48,174,481.52	110,603,457.02
Road Furniture	23,863,031.76	16,465,692.51	40,328,724.27
Miscellaneous	7,788,119.56	1,004,065.21	8,792,184.77
Daywork	2,812,430.00	3,648,443.80	6,460,873.80
Piling	3,477,342.24	416,364.64	3,893,706.88
Sub Total (1)	664,599,491.67	306,937,029.38	971,536,521.05
2. Land Acquisition and Compensation	0.00	132,400,000.00	132,400,000.00
3. Engineering Service	79,061,600.00	8,370,600.00	87,432,200.00
4. Physical Contingency	66,459,900.00	30,693,700.00	97,153,600.00
Sub Total (1 to 4)	810,120,991.67	478,401,329.38	1,288,522,321.05
6. Price Escalation	58,296,000.00	157,196,000.00	215,492,000.00
Total	868,416,991.67	635,597,329.38	1,504,014,321.05



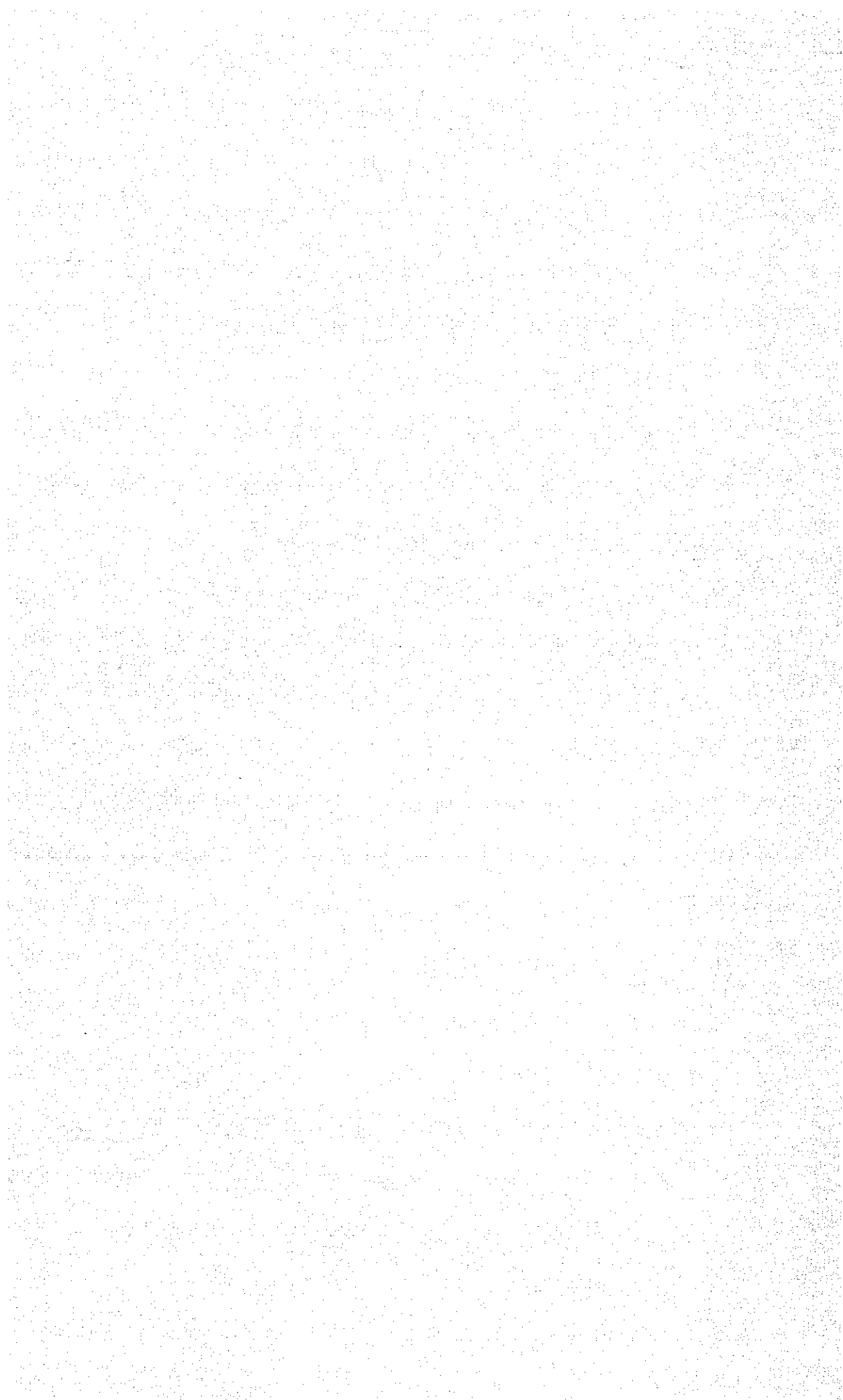
Table 8.3 Annual Disbursement Schedule  
(VAT Exemption)

Unit: 1,000 Kshs.

Description	Total		1st Year (1993)		1st Year (1994)		2nd Year (1995)		3rd Year (1996)	
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1. Direct Construction Cost										
General	10,400	54,418	0	0	10,400	54,418	0	0	0	0
Site Clearance and Topsoil Stripping	5,420	1,990	0	0	4,607	1,699	813	1,113	0	0
Earthworks	179,249	55,555	0	0	53,775	19,700	107,549	145,948	17,925	6,566
Excavation and Filling for Structures	5,904	2,327	0	0	1,181	579	4,133	6,161	530	290
Culverts and Drainage Works	19,897	17,445	0	0	5,958	5,234	12,933	24,272	995	872
Passage of Traffic	3,973	4,413	0	0	3,939	1,765	5,984	8,632	0	0
Gravel Wearing Course	1,474	407	0	0	0	0	0	0	1,473	407
Graded Crushed Stone	92,167	30,333	0	0	0	0	54,517	35,754	27,650	9,191
Subbase and Base										
Lean Concrete	77,910	30,950	0	0	0	0	38,955	54,435	38,955	15,480
Bituminous Surface Treatment	28,363	1,244	0	0	0	0	11,345	11,843	17,018	746
and Surface Dressing										
Bituminous Binder Course	133,463	27,443	0	0	0	0	53,385	64,362	20,078	16,466
and Wearing Course										
Concrete Works	62,429	43,174	0	0	18,729	14,452	31,215	55,302	12,485	9,535
Road Furniture	23,863	16,456	0	0	0	0	4,773	8,066	19,090	13,173
Miscellaneous	7,788	1,004	0	0	2,335	301	3,894	4,396	1,558	201
Daywork	2,813	3,648	0	0	233	1,094	1,125	2,584	1,435	1,095
Piling	3,477	416	0	0	0	0	3,477	3,893	0	0
Sub Total (1)	684,599	306,937	0	0	101,248	99,242	344,088	477,761	219,252	74,132
(Subtotal/advance)	****	****	0	0	185,751	130,396	292,483	406,097	186,365	62,927
2. Land Acquisition and Compensation	0	132,400	0	66,200	0	66,200	0	0	0	0
3. Engineering Service	79,062	8,370	0	0	23,719	2,511	31,625	34,973	23,718	2,511
4. Physical Contingency	66,480	30,694	0	0	18,575	13,040	29,248	40,609	18,637	6,293
Sub Total (1 to 4)	810,121	478,401	0	66,200	228,045	212,147	353,356	481,679	228,720	71,731
5. Price Escalation	58,296	157,196	0	10,261	11,585	57,386	25,371	76,379	21,340	38,541
Total	868,417	635,597	0	76,461	239,630	269,533	378,727	558,058	250,060	110,272
										360,332







## APPENDIX





## APPENDIX A      DETAILED DIREST CONSTRUCTION COST



# SUMMARY OF BILLS OF QUANTITIES

BILL NO.	DESCRIPTION	AMOUNT		FOREIGN CURRENCY		LOCAL CURRENCY		VALU ADDED TAX	
		SHILLINGS	CTS	RATE	AMOUNT	RATE	AMOUNT	RATE	AMOUNT
1	General	64,827	272.00		10,408,772.00		54,418,500.00		0.00
4	Site Clearance and Topsoil Stripping	7,844	469.00		5,420,270.78		1,998,604.46		425,593.76
5	Earthworks	260,608	426.30		179,249,421.70		65,664,780.50		15,694,224.10
7	Excavation and Filling for Structures	9,446	594.55		5,904,449.70		2,896,789.70		645,355.15
8	Culverts and Drainage Works	40,709	395.73		19,897,191.68		17,444,630.39		3,367,573.65
9	Passage of Traffic	16,055	162.93		9,972,780.26		4,413,355.94		1,569,026.73
10	Gravel Wearing Course	2,014	239.40		1,473,607.80		406,678.90		133,952.70
13	Graded Crushed Stone Subbase and Base	131,499	383.10		92,167,301.00		30,337,555.90		8,994,526.20
14A	Lean Concrete	117,282	590.50		77,909,650.20		30,960,367.50		8,412,572.80
15	Bituminous Surface Treatment and Surface Dressing	33,868	886.32		28,363,066.29		1,243,712.61		4,262,107.42
16	Bituminous Binder Course and Wearing Course	187,972	624.80		133,463,081.20		27,443,005.80		27,066,537.80
17	Concrete Works	121,578	182.52		62,428,975.50		48,174,481.52		10,974,725.50
20	Road Furniture	42,297	249.16		23,863,031.76		16,465,692.51		1,968,524.89
21	Miscellaneous	8,969	620.00		7,788,119.56		1,004,065.21		177,435.23
22	Dayworks	5,769	429.80		2,812,430.00		3,648,443.80		308,556.00
23	Piling	3,901	039.84		3,477,342.24		416,364.64		7,332.95
	Total	1,055,644	565.95		664,599,491.67		306,937,029.38		84,108,044.90



BILL OF QUANTITIES No.1  
GENERAL

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
1.01	Provide, furnish and maintain the rented accommodation for the Engineer's Representative and his staff:				
	(1) Type I (senior staff house), 1No.	Month	30	22000.00	660,000.00
	(2) Type II (senior staff house), 5Nos.	Month	130	17000.00	2,210,000.00
	(3) Type III (junior staff house), 3Nos.	Month	90	12000.00	1,080,000.00
	(4) Type IV (junior staff house), 5Nos.	Month	150	7500.00	1,125,000.00
1.02	Provide, equip and maintain Main Office for the Engineer's Representative and his staff.	No.	1	1134000.00	1,134,000.00
1.03	Provide and maintain laboratory for the Engineer's Representative and his staff.	No.	1	694000.00	694,000.00
1.04	Provide and maintain furniture and office equipment for the Engineer's office and Laboratory as listed in the Special Specification, all to the satisfaction of the Engineer.	Lump Sum			1,006,800.00
1.05	Provide survey and laboratory equipment as listed in the Special Specification.	Lump Sum			8,747,472.00
1.06	Provide with driver and maintain one (1) new 504 Peugeot or equivalent with a minimum engine capacity of 1800 cc. approved by the Resident Engineer, inclusive of the first 3000 km travelled in any one month.	Veh. Month	30	40000.00	1,200,000.00
1.07	E.O. Item 1.06 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	100,000	6.00	600,000.00
1.08	As for Item 1.06 but three (3) new LWB 4WD Land Rovers or equivalent with a minimum engine capacity of 2300 cc., inclusive of the first 3000 km travelled in any one month.	Veh. Month	90	44000.00	3,960,000.00
1.09	E.O. Item 1.08 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	400,000	11.50	4,600,000.00
1.10	As for Item 1.06 but three (3) new Subaru or equivalent with a minimum engine capacity of 1800 cc., inclusive of the first 3000 km travelled in any one month.	Veh. Month	90	38000.00	3,420,000.00
1.11	E.O. Item 1.10 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	300,000	7.00	2,100,000.00



BILL OF QUANTITIES No.1  
GENERAL

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
1.12	Prime Cost Sum of Shs.22,100,000 for removals and alterations to following existing services;				
	(1) Telecommunication line	P.C. Sum			1,600,000.00
	(2) Electric line	P.C. Sum			8,900,000.00
	(3) Water pipe line	P.C. Sum			4,600,000.00
	(4) Railway	P.C. Sum			4,500,000.00
	(5) Sewerage pipe line	P.C. Sum			1,600,000.00
	(6) Existing street lighting	P.C. Sum			100,000.00
	(7) Electric fence of National Park	P.C. Sum			500,000.00
	(8) Fence of Kenya Rifles	P.C. Sum			300,000.00
1.13	Include percentage of P.C.Sum in Item 1.12 for Contractor's cost and profit.	% of Item 1.12	20		4,420,000.00
1.14	Prime Cost Sum of Shs.3,000,000 for the compensation and aquisition of land.	P.C. Sum			3,000,000.00
1.15	Include percentage of P.C.Sum in Item 1.14 for Contractor's cost and profit.	% of Item 1.14	40		1,200,000.00
1.16	Prime Cost Sum of Shs.600,000 for the Engineer's Miscellaneous Account.	P.C. Sum			600,000.00
1.17	Include percentage of P.C.Sum in Item 1.16 for Contractor's cost and profit.	% of Item 1.16	20		120,000.00
1.18	Provide and erect publicity signs as directed by the Engineer,all in accordance with MOH DRG.NO.SS/234.	No.	10	25000.00	250,000.00
1.19	Prime cost sum of K.Shs. 500,000 for the rectification of title deeds of acquired lands.	P.C. Sum			500,000.00
1.20	Include percentage of P.C Sum in Item 1.19 for Contractor's cost and profit.	% of Item 1.19	20		100,000.00
	Sub total (1)				64,827,272.00





**BILL OF QUANTITIES No.4  
SITE CLEARANCE AND TOPSOIL STRIPPING**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
4.01	Clear site in Open Country, including removal of trees, hedges, bushes and other vegetation and objectionable organic material, grub up roots and backfill to 95% MDD AASHTO T.99 with approved material all in accordance with the Specification.	ha	126.2	5449.80	687,764.76
4.02	As for Item 4.01 but to clear site in forest area.	ha	45.3	11842.80	536,478.84
4.03	Removal topsoil to a depth as directed by the Engineer and dispose of to spoil dump or stockpile for re-use as directed by the Engineer.	m3	106,700	52.57	5,609,219.00
4.04	Scarify and remove to stockpile existing pavement material as directed by the Engineer.	m3	2,720	137.87	375,006.40
4.05	Demolish existing railway bridge and remove debris to spoil over any distance, backfill voids and compact to 105% MDD as necessary.	Lump Sum			136,000.00
4.06	Allow a Provisional Sum to be expended on a daywork basis for the removal of existing structures, fences and other obstructions.	Prov. Sum			500,000.00
	Sub total (4)				7,844,469.00



**BILL OF QUANTITIES No.5  
EARTHWORKS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
5.01	Fill in soft material for main road and service road, and compact to at least 95% MOD AASHTO T.99.	m3	1,234,300	98.25	121,269,975.00
5.02	As for Item 5.01 but for slip roads and approach roads.	m3	196,400	98.25	19,296,300.00
5.03	As for Item 5.01 but hauling from drainage pond excavation works as shown on the Drawings.	m3	7,720	97.68	754,089.60
5.04	As for Item 5.01 but for new railway embankment.	m3	5,480	97.68	535,286.40
5.05	Fill in hard material for main road.	m3	104,900	257.47	27,008,603.00
5.06	Fill in soft material for central reserves as shown on the Drawings.	m3	11,400	164.23	1,872,222.00
5.07	Fill in soft material adjacent to shoulders as shown on the Drawings.	m3	3,310	164.23	543,601.30
5.08	Spoil in unsuitable material such as black cotton and rubbish.	m3	189,500	99.24	18,805,980.00
5.09	Spoil in soft material.	m3	5,000	99.24	496,200.00
5.10	Spoil in hard material.	m3	1,000	315.59	315,590.00
5.11	Overhaul earthworks in excess of 1.0 km free haul.	m3.km	3,432,300	10.49	36,004,827.00
5.12	Excavation in swamps.	m3	1,000	120.90	120,900.00
5.13	Provide and place rockfill in accordance with the Specification.	m3	1,000	256.05	256,050.00
5.14	Compact original ground below fills to at least 95% MOD AASHTO T.99 including all necessary scarifying and watering as directed by the Engineer, to a depth of 150mm below ground level.	m3	62,600	18.14	1,135,564.00
5.15	E.O. Item 5.01 to 5.05 for compaction of 300mm subgrade material to at least 100% MOD AASHTO T.99 in Fill area.	m3	121,700	9.07	1,103,819.00
5.16	Compact in-situ subgrade in Cut area to a depth of 300mm below formation level to at least 100% MOD AASHTO T.99.	m3	100,200	18.14	1,817,628.00
5.17	Compact in-situ subgrade material in Cut area between 150mm and 300mm below underside of imported subgrade material to at least 95% MOD AASHTO T.99.	m3	1,000	18.14	18,140.00
5.18	Compact in-situ subgrade material in Cut area between 0mm and 150mm below underside of imported subgrade material to at least 100% MOD AASHTO T.99.	m3	1,000	9.07	9,070.00
5.19	Provide, place and compact improved subgrade material in locations where directed by the Engineer.	m3	1,000	117.22	117,220.00



BILL OF QUANTITIES No.5  
EARTHWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
5.20	Rock formation levelling in Cut area below lean concrete base level or as directed by the Engineer.	m2	72,100	26.56	1,914,976.00
5.21	Haul from stockpile and spread on side-slopes and central reserves, lightly roll and compact 75mm thickness of topsoil.	m2	335,700	10.56	3,544,992.00
5.22	Haul from stockpile and spread on black cotton spoil area, lightly roll and compact 200mm thickness of topsoil in locations as directed by the Engineer.	m2	69,100	21.22	1,466,302.00
5.23	Haul from stockpile and spread on rubbish spoil area and side borrow area, and compact topsoil or as directed by the Engineer.	m3	15,400	103.16	1,588,664.00
5.24	Plant fillslopes and cutslopes with selected grass in accordance with the Specification, including the establishment of plant nurseries where required.	m2	773,000	18.91	14,617,430.00
5.25	Provide, place and compact filter material for drainage layer and sand mat in locations where directed by the Engineer.	m3	1,000	565.74	565,740.00
5.26	Fill for new national park boundary dike including demolishing existing dike.	m3	58,300	89.59	5,223,097.00
5.27	Filter fabric for rockfill.	m2	1,000	206.16	206,160.00
Sub total (5)					260,608,426.30



**BILL OF QUANTITIES No.7  
EXCAVATION AND FILLING FOR STRUCTURES**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<b>BRIDGES</b>					
7.01	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	5,330	114.63	610,977.90
7.02	E.O. Item 7.01 at any location for excavation in hard materials.	m3	1,230	335.12	412,197.60
7.03	Backfilling with selected material behind bridge abutment, wing walls and around structures.	m3	4,980	149.21	743,065.80
7.04	Provide and place porous filter material behind bridge abutments and wing walls.	m3	300	565.74	169,722.00
7.05	Provide and place selected granular fill material.	m3	200	457.54	91,508.00
<b>BOX CULVERTS</b>					
7.06	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	15,680	114.63	1,797,398.40
7.07	E.O. Item 7.06 at any location for excavation in hard materials.	m3	300	335.12	100,536.00
7.08	Backfilling with selected material behind box culvert walls and around structures.	m3	22,670	149.21	3,382,590.70
7.09	Provide and place porous filter material behind box culvert walls.	m3	1,990	565.74	1,125,822.60
7.10	Provide and place selected granular fill material.	m3	1,420	457.54	649,706.80
7.11	Excavation and backfilling for gabions in soft material.	m3	275	90.95	25,011.25
7.12	Provide and place gabion mesh, 0.5m thick as shown Drawings or directed by the Engineer.	m2	550	397.59	218,674.50
7.13	Provide and place rockfill to gabions.	m3	275	434.12	119,383.00
Sub total (7)					9,446,594.55





BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
No separate payment shall be made the haulage of surplus or unsuitable excavated material and the cost of such haulage shall be included in the rates and prices.					
8.01	Excavate in soft material for pipe culverts below existing ground level or road formation level including support of trench sides, backfilling and compact-ion at least 95% MDD AASHTO T.99 up to new road formation level or ground level whichever is the lower, dewatering, and carting surplus material to spoil dump.	m3	3,970	143.35	569,099.50
8.02	As for Item 8.01 but for inlets and outlets of culverts.	m3	2,970	143.35	425,749.50
8.03	Excavate in soft material for earth channel, drain type I.	m3	5,650	114.63	647,659.50
8.04	Excavate in soft material for stone pitching channel, drain type II.	m3	3,900	114.63	447,057.00
8.05	Excavate in soft material for concrete channel, drain type III.	m3	3,690	114.63	422,984.70
8.06	Excavate in soft material for concrete channel with cascade, drain type VII.	m3	5,600	114.63	641,928.00
8.07	Excavate and backfill for gulley pots in soft material.	m3	180	143.35	25,803.00
8.08	Excavate and backfill for concrete ditch type VI, in soft material.	m3	540	143.35	77,409.00
8.09	Excavate and backfill for gabions in soft material.	m3	580	90.95	52,751.00
8.10	Excavate for subsoil drains in soft material.	m3	460	90.95	41,837.00
8.11	E.O. Item 8.01 to 8.10 at any location for excavation in hard materials.	m3	500	335.12	167,560.00
8.12	Provide and place filter fabric to subsoil drains.	m2	3,040	103.08	313,363.20
8.13	Provide and place crushed rock backfill to subsoil drains.	m3	420	457.54	192,166.80
8.14	Provide and place perforated 200mm dia. PVC pipe to subsoil drains.	m	1,265	425.11	537,764.15
8.15	Provide, lay and joint 300mm I.D. concrete pipes ogee jointed.	m	155	471.07	73,015.85
8.16	As for Item 8.15 but 600mm I.D.	m	1,031	1580.88	1,629,887.28
8.17	As for Item 8.15 but 750mm I.D.	m	90	2159.53	194,357.70
8.18	As for Item 8.15 but 900mm I.D.	m	1,067	2973.52	3,172,745.84



BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
8.19	As for Item 8.15 but 1200mm I.D.	m	294	4645.74	1,365,847.56
8.20	Provide,place and compact class 15/20, concrete bed and surround to concrete pipes,including formwork.	m3	2,520	2818.67	7,103,048.40
8.21	As for Item 8.20 but concrete facing for drain ditch on berm,drain type VIII.	m2	1,280	105.68	135,270.40
8.22	Provide,place and compact class 25/20 concrete for headwalls,wingwalls,aprons and toewalls to pipe culverts including all formwork and provision and placing of fabric mesh reinforcement as shown in the Drawings.	m3	924	4254.82	3,931,453.68
8.23	As for Item 8.22 but class 15/20 for concrete channel,drain type III and VII.	m3	1,330	2610.93	3,472,536.90
8.24	Provide,place and compact class 20/20 concrete for concrete ditch,drain type VI including all formwork and placing of reinforcement as shown in the Drawings.	m3	94	9441.32	887,484.08
8.25	Provide,place and compact class 20/20 concrete for gulley pot including all formwork.	m3	63	6580.04	414,542.52
8.26	As for Item 8.24 but concrete cover of gulley pot.	No.	168	516.07	86,699.76
8.27	Provide and place 50mm dia.PVC weep holes.	No.	45	18.42	828.90
8.28	Excavate as necessary,provide all materials and construct 150mm thick grouting stone pitching to bed and side-slopes of drains,ditches,channels,ground faces,inlets and outlets of culverts, including carting of excavated material to spoil,as directed by the Engineer.	m2	26,090	264.98	6,913,328.20
8.29	As for Item 8.28 but 250mm building stone at concrete channel with cascade.	m2	1,730	262.29	453,761.70
8.30	Cement screen on building stone.	m2	1,730	58.44	101,101.20
8.31	Provide and place gabion mesh,1m thick, as shown on Drawings or directed by the Engineer.	m2	430	483.67	207,978.10
8.32	Provide and place mattresses,0.3m thick, as shown on Drawings or directed by the Engineer.	m2	467	247.44	115,554.48
8.33	Provide and place rockfill to gabions and mattresses.	m3	570	434.12	247,448.40
8.34	Provide and place filter fabric under and/or behind gabions.	m2	335	103.08	34,531.80
8.35	Excavate trench,provide,lay and joint 450 x 225mm P.C.C. invert block drains (I.B.D.)having 300mm dia.channel.	m	507	309.93	157,134.51



BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
8.36	Provide and lay 75mm thick P.C.C. side slabs to I.B.D.Channel.	m2	477	318.16	151,762.32
8.37	Excavate trench,provide,lay and joint 375 x 250mm P.C.C.invert block drain, drain type IV.	m	15,440	305.04	4,709,817.60
8.38	As for Item 8.37 but for on berm,drain type VIII.	m	740	305.04	225,729.60
8.39	Excavate,provide all materials and construct kerb inlet at busbays as detailed on the Drawings.	No	32	120.03	3,840.96
8.40	Excavate,provide all materials and construct intake block channel at busbays as detailed on the Drawings.	No	32	129.06	4,129.92
8.41	Provide and place concrete class 15 for 250 x 150mm in-situ gutters.	m	48	680.77	32,676.96
8.42	Provide and place selected granular fill material for gravel bedding.	m3	79	457.54	36,145.66
8.43	Plant channel slopes with selected grass in accordance with the Specification.	m2	11,330	18.91	214,250.30
8.44	Earth dike of drainage pond.	m3	710	97.68	69,352.80
	Sub total (8)				40,709,395.73



BILL OF QUANTITIES No.9  
PASSAGE OF TRAFFIC

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
9.01	Provide and maintain signs and barriers in locations as directed by the Engineer.	km	19.0	35000.00	665,000.00
9.02	Construct and maintain 7.0m wide deviations including drainage, pavement type Deviation-1(Mombasa Road Junction).	km	1.0	3301790.00	3,301,790.00
9.03	As for Item 9.02 but pavement type Deviation-1(Uhuru Monument Junction).	km	0.3	3301790.00	990,537.00
9.04	As for Item 9.02 but pavement type Deviation-2(Ngong Road Junction and Dagoretti Forest Junction).	km	1.3	652430.00	848,159.00
9.05	Construct and maintain 6.0m wide deviations including drainage, pavement type Deviation-3.	km	0.9	310910.00	279,819.00
9.06	Construct and maintain 3.0m wide deviations including drainage, pavement type Deviation-4.	km	2.5	156940.00	392,350.00
9.07	Reinstatement of deviations and existing drainages.	Lump Sum			563,100.00
9.08	Reinstatement of existing road after the completion of cross drainage works, Mombasa Road Junction.	m2	70	787.92	55,154.40
9.09	Reinstatement of existing road after the completion of cross drainage works, Kikuyu Junction.	m2	35	244.21	8,547.35
9.10	Maintenance of the project road (main road, slip road, approach road and service road) used for the deviation purpose as specified.	Lump Sum			824,300.00
9.11	Improvement of the existing road as instructed and approved by the Engineer.				
	(1) Improved subgraded material.	m3	100	117.22	11,722.00
	(2) Gravel wearing course.	m3	600	348.78	209,268.00
	(3) Graded crushed stone base.	m3	50	908.82	45,441.00
	(4) MC3000 first seal coat.	litre	150	25.81	3,871.50
	(5) Chippings, 3/6mm.	m3	2	880.84	1,761.68
9.12	Maintenance of Existing Roads used for heavy construction traffic as specified when and where directed by the Engineer.	km	30	50000.00	1,500,000.00
9.13	Re-carpeting of Existing Roads 6m wide or pro rata as specified when and where directed by the Engineer.	m3	1,800	3530.19	6,354,342.00
	Sub total (9)				16,055,162.93





BILL OF QUANTITIES No.10  
GRAVEL WEARING COURSE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
10.01	Clear site of the material site.	ha	1.0	5449.80	5,449.80
10.02	Construct access road to the material site in excess of 200m in length.	km	1.0	291780.00	291,780.00
10.03	Excavate and spoil topsoil and overburden in the material site.	m3	4,000	52.57	210,280.00
10.04	Excavate gravel wearing course material, transport, spread and compact to at least 95% MDD AASHTO T.180 for service roads.	m3	4,320	348.78	1,506,729.60
Sub total (10)					2,014,239.40



**BILL OF QUANTITIES No.13**  
**GRADED CRUSHED STONE FOR SUBBASE AND BASE**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
13.01	Provide,spread and compact graded crushed stone to subbase for main road.	m3	84,490	848.31	71,673,711.90
13.02	As for Item 13.01 but for slip road.	m3	14,020	848.31	11,893,306.20
13.03	As for Item 13.01 but for approach road and service road.	m3	3,030	848.31	2,570,379.30
13.04	Provide,spread and compact graded crushed stone to base for slip road, approach road and service roads.	m3	2,150	908.82	1,953,963.00
13.05	Provide,spread and compact graded crushed stone to shoulder for main road.	m3	43,810	848.31	37,164,461.10
13.06	As for Item 13.05 but for slip road.	m3	6,360	848.31	5,395,251.60
13.07	As for Item 13.05 but for approach road and service road.	m3	1,000	848.31	848,310.00
Sub total (13)					131,499,383.10



BILL OF QUANTITIES No.14A  
LEAN CONCRETE FOR BASE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
14.01	Provide,process,mix,transport,spread and compact lean concrete base material for main road at 4% nominal cement content by weight of total mix.	m3	90,340	1126.95	101,808,663.00
14.02	As for Item 14.01 but for slip road.	m3	11,150	1126.95	12,565,492.50
14.03	As for Item 14.01 but for approach road.	m3	1,020	1126.95	1,149,489.00
14.04	Protecting and curing lean concrete base.	m2	515,500	2.00	1,031,000.00
14.05	Variation in cement content (Provisional).	tonne	200	3639.73	727,946.00
	Sub total (14A)				117,282,590.50



BILL OF QUANTITIES No.15  
BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
No haulage will be paid for bitumen or chippings and this shall be included in the following rates and prices.					
PRIME COAT					
15.01	Preprare surface of base,provide, transport,heat as specified and spray MC 30 prime coat at at a nominal spray rate of 1.0 litre/m2 for main road.	litre	411,550	22.53	9,272,221.50
15.02	As for Item 15.01 but for slip road.	litre	55,740	22.53	1,255,822.20
15.03	As for Item 15.01 but for approach road.	litre	4,600	22.53	103,638.00
TACK COAT					
15.04	Prepare surface of binder course, provide,transport,heat as specified and spray MC 3000 cut-back bitumen tack coat at nominal spray rate of 0.6 litre/m2 for main road.	litre	493,860	25.81	12,746,526.60
15.05	As for Item 15.04 but for slip road.	litre	44,220	25.81	1,141,318.20
15.06	As for Item 15.04 but for approach road.	litre	5,520	25.81	142,471.20
SURFACE DRESSING					
(Double Surface Dressing)					
15.07	Provide,heat and spray MC3000 cut-back bitumen at a nominal spray rate of 1.3 litres/m2 as first seal coat.	litre	209,610	25.81	5,410,034.10
15.08	As for Item 15.07 but at a nominal rate of 0.3 litre/m2 as second seal coat.	litre	48,370	25.81	1,248,429.70
15.09	Provide,transport,lay and roll 10/14mm chippings at a rate of 69 m2/m3.	m3	2,340	800.77	1,873,801.80
15.10	As for Item 15.09 but 3/6mm chippings at a rate of 250 m2/m3.	m3	645	880.84	568,141.80
(Single Surface Dressing)					
15.11	Provide,heat and spray MC3000 cut-back bitumen at a nominal spray rate of 0.6 litres/m2.	litre	3,170	25.81	81,817.70
15.12	Provide,transport,lay and roll 3/6mm chippings at a rate of 189 m2/m3.	m3	28	880.84	24,663.52
Sub total (15)					33,868,886.32





**BILL OF QUANTITIES No.16  
BITUMINOUS BINDER COURSE AND WEARING COURSE**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
No haulage shall be paid for in respect of any of the items or materials contained in this Bill of Quantities and the cost of such haulage shall be deemed to be included in the rates entered below.					
16.01	Provide, lay and compact Asphalt Concrete Binder Course using 5.5% nominal bitumen content by weight of total mix for main road.	m3	32,930	3280.85	108,038,390.50
16.02	As for Item 16.01 but for slip road.	m3	3,430	3280.85	11,253,315.50
16.03	As for Item 16.01 but for approach road.	m3	460	3280.85	1,509,191.00
16.04	Provide, lay and compact Asphalt Concrete Wearing Course using 6.5% nominal bitumen content by weight of total mix for main road.	m3	16,460	3530.19	58,106,927.40
16.05	As for Item 16.04 but for slip road.	m3	2,230	3530.19	7,872,323.70
16.06	As for Item 16.04 but for approach road.	m3	230	3530.19	811,943.70
16.07	80/100 penetration bitumen binder variation.	litre	Rate only	10.80	
16.08	Supply and mix in mineral filler for variation as directed by the Engineer.	tonne	100	3639.73	363,973.00
16.09	As for Item 16.08 but to sand.	tonne	50	331.20	16,560.00
Sub total (16)					187,972,624.80



**BILL OF QUANTITIES No.17  
CONCRETE WORKS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<b>BRIDGES</b>					
<b>Concrete:</b>					
Provide, place and compact the following classes of concrete for insitu works as specified.					
17.01	Class 15/40 for blinding concrete on all structures.	m3	180	2099.03	377,825.40
17.02	Class 25/20 for structural concrete in:				
	(1) Bridges for Mombasa Road Junction, Uhuru Monument Junction and Railway.	m3	2,880	2453.62	7,066,425.60
	(2) Vehicle bridges.	m3	1,090	2453.62	2,674,445.80
	(3) Pedestrian bridges.	m3	90	2453.62	220,825.80
17.03	Class 30/20 for structural concrete.	m3	2,120	2514.88	5,331,545.60
17.04	Provide UF2 finish to concrete surface.	m2	5,830	42.70	248,941.00
<b>Formwork:</b>					
Provide, erect and afterwards dismantle and remove the items specified below:					
17.05	Formwork to achieve class F1 finish:				
	(1) Sloping	m2	86	374.61	32,216.46
	(2) Vertical	m2	2,660	352.43	937,463.80
17.06	Formwork to achieve class F2 finish:				
	(1) Horizontal	m2	3,450	505.29	1,743,250.50
	(2) Sloping	m2	218	404.24	88,124.32
	(3) Vertical	m2	9,050	427.08	3,865,074.00
17.07	Provide and fix in position high tensile steel reinforcement bars to BS 4461 of diameter equal to or less than 16mm.	tonne	202.0	24337.40	4,916,154.80
17.08	As for Item 17.07 but of diameter greater than 16mm.	tonne	482.0	23779.90	11,461,911.80
17.09	Provide and place 200mm wide waterstops as specified in the Drawings.	m	57	426.83	24,329.31
17.10	Provide and place 20mm thick joint filler	m2	36	573.60	20,649.60



BILL OF QUANTITIES No.17  
CONCRETE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
BOX CULVERTS					
Concrete:					
Provide, place and compact the following classes of concrete for insitu works as specified.					
17.11	Class 15/40 for blinding concrete on all structures.	m3	588	2099.03	1,234,229.64
17.12	Class 25/20 for structural concrete.				
	(1) Box culverts for road.	m3	7,820	2453.62	19,187,308.40
	(2) Box culverts for drainage.	m3	6,320	2453.62	15,506,878.40
	(3) Box culverts for footpath.	m3	646	2453.62	1,585,038.52
17.13	Provide UF2 finish to concrete surface.	m2	9,880	42.70	421,876.00
Formwork:					
Provide, erect and afterwards dismantle and remove the Items specified below:					
17.14	Formwork to achieve class F1 finish:				
	(1) Vertical	m2	12,120	352.43	4,271,451.60
17.15	Formwork to achieve class F2 finish:				
	(1) Horizontal	m2	4,000	505.29	2,021,160.00
	(2) Vertical	m2	7,450	427.08	3,181,746.00
17.16	Provide and fix in position high tensile steel reinforcement bars to BS 4461 of diameter equal to or less than 16mm.	tonne	215.0	24337.40	5,232,541.00
17.17	As for Item 17.16 but of diameter greater than 16mm.	tonne	1,225.0	23779.90	29,130,377.50
17.18	Provide and place 200mm wide waterstops as specified in the Drawings.	m	909	426.83	387,988.47
17.19	Provide and place 20mm thick joint filler	m2	712	573.60	408,403.20
Sub total (17)					121,578,182.52



BILL OF QUANTITIES No.20  
ROAD FURNITURE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
20.01	Provide and erect standard warning signs:				
	(1) Type W28,1200mm	No.	30	7000.00	210,000.00
	(2) Type W29,1200mm	No.	22	7000.00	154,000.00
	(3) Type W36,1200mm	No.	3	7000.00	21,000.00
	(4) Type W37,1200mm	No.	22	7000.00	154,000.00
20.02	Provide and erect standard priority signs:				
	(1) Type R1,1200mm	No.	10	7000.00	70,000.00
20.03	Provide and erect standard prohibitory signs:				
	(1) Type P1,1000mm	No.	1	6000.00	6,000.00
	(2) Type P25,1000mm	No.	30	6000.00	180,000.00
20.04	Provide and erect standard mandatory signs:				
	(1) Type M3,1000mm	No.	1	6000.00	6,000.00
	(2) Type M4,1000mm	No.	1	6000.00	6,000.00
20.05	Provide and erect non-standard informatory signs (advance direction signs,direction signs,route confirmatory signs):				
	(1) less than 1m2	No.	55	7000.00	385,000.00
	(2) 3m2-4m2	No.	1	18000.00	18,000.00
	(3) 4m2-5m2	No.	8	19000.00	152,000.00
	(4) 5m2-6m2	No.	10	23000.00	230,000.00
	(5) 6m2-7m2	No.	1	25000.00	25,000.00
	(6) 7m2-8m2	No.	12	27000.00	324,000.00
	(7) 8m2-9m2	No.	7	30000.00	210,000.00
	(8) 9m2-10m2	No.	1	40000.00	40,000.00
20.06	Road marking in yellow or white paint.	m2	3,430	175.10	600,593.00
20.07	Provide and fix flex beam guardrails, all in accordance with the Drawings.	m	8,590	1362.59	11,704,648.10
20.08	Provide and erect road edge marker post.	No.	87	799.85	69,586.95
20.09	Provide and erect road reserve boundary post where directed by the Engineer.	No.	230	799.85	183,965.50
20.10	Plant selected grasses in the central reserves,including the establishment of plant nurseries where required.	m2	32,000	18.91	605,120.00
20.11	Plant selected shrubs and bushes approved by the Engineer at locations in the central reserve and road reserve boundary,including the establishment of plant nurseries where required.	No.	8,120	83.21	675,665.20
20.12	As for Item 20.11 but to selected trees.	No.	226	124.82	28,209.32





BILL OF QUANTITIES No.20  
ROAD FURNITURE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
20.13	Provide and erect kilometer posts as directed by the Engineer.	No.	58	1252.00	72,616.00
20.14	Provide and lay flush kerb,150 x 100mm, Type A	m	119,160	124.29	14,810,396.40
20.15	Provide and lay flush kerb,150mm x 80mm, Type B.	m	6,380	104.85	668,943.00
20.16	Provide and lay flush kerb,150mm x 80mm, Type C.	m	3,300	136.35	449,955.00
20.17	Provide and lay flush kerb,150mm x 80mm, Type D.	m	3,900	94.37	368,043.00
20.18	Provide and lay flush kerb,150mm x 80mm, Type E.	m	1,300	134.24	174,512.00
20.19	Quadrant for flush kerb,main road and slip road: (1) in-situ 0.5m radius,Type A. (2) in-situ 0.5m radius,Type B.	No. No.	25 4	117.35 108.95	2,933.75 435.80
20.20	Provide and lay raised kerb,125mm x 250mm,slip road. (1) straight. (2) radius 5m to 1m.	m m	1,530 72	278.00 305.23	425,340.00 21,976.56
20.21	Provide and lay raised kerb,125mm x 250mm,main road. (1) straight. (2) radius 5m to 1m.	m m	256 114	296.90 324.12	76,006.40 36,949.68
20.22	Provide and lay ramped kerb.	No.	64	305.97	19,582.08
20.23	Provide and erect permanent five strand wire fencing including intermediate and straining posts in areas specifically directed by the Engineer.	m	1,500	149.88	224,820.00
20.24	Provide and erect gates as directed and approved by the Engineer.	No.	8	2447.54	19,580.32
20.25	Provide and erect double headed guardrail,all in accordance with the Drawings.	m	3,660	2397.91	8,776,350.60
20.26	Provide stairways for bus stops as specified in the Drawings.	m	53	1698.50	90,020.50
	Sub total (20)				42,297,249.16



BILL OF QUANTITIES No.21  
MISCELLANEOUS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
21.01	Supply and apply, in accordance to manufacturer's instructions waterproofing materials to top of bridge decks, approach slabs and all structural concrete surfaces in contact with fill material prior to backfilling.	m2	20,050	281.99	5,653,899.50
21.02	Supply and install in position elastomeric bearings including mortar mortar plinth, fixed.				
	(1) 406 x 279 x 18mm	No.	12	2563.58	30,762.96
	(2) 432 x 203 x 18mm	No.	37	2147.60	79,461.20
21.03	Supply and install in position elastomeric bearings including mortar plinth, movable:				
	(1) 229 x 152 x 56mm	No.	8	2339.34	18,714.72
	(2) 279 x 229 x 37mm	No.	16	2753.79	44,060.64
	(3) 279 x 229 x 46mm	No.	22	3332.44	73,313.68
	(4) 279 x 229 x 65mm	No.	18	4554.06	81,973.08
	(5) 432 x 203 x 65mm	No.	12	5851.93	70,223.16
21.04	Supply and install joint filler for expansion joint:				
	(1) 30mm thick.	m2	69	849.15	58,591.35
	(2) 25mm thick.	m2	62	710.72	58,279.04
	(3) 20mm thick.	m2	23	573.60	13,192.80
21.05	Supply and install sealant for expansion joint:				
	(1) 30 x 50mm deep.	m	66	473.56	31,254.96
	(2) 25 x 50mm deep.	m	75	395.19	29,639.25
21.06	Provide, lay and compact Asphalt Concrete Wearing Course for bridge decks.	m3	134	3530.19	473,045.46
21.07	Supply and install flex beam guardrails including post for vehicle bridge as detailed on the Drawings.	m	244	1319.43	321,940.92
21.08	Provide and erect in position parapet handrails to railway bridge as detailed on the Drawings.	m	114	664.58	75,762.12
21.09	Provide and erect in position pedestrian parapets to footbridges as detailed on the Drawings.	m	282	811.39	228,811.98
21.10	Provide and install 100mm dia. drain pipe through deck slabs.	No.	36	155.90	5,612.40
21.11	Provide and place 75mm dia. PVC weep holes.	No.	62	75.37	4,672.94
21.12	Provide and place 200mm dia. perforated PVC pipes.	m	1,770	425.11	752,444.70
21.13	Provide and install 20mm dia. dowel bars with caps as specified on the Drawings.	No.	152	540.64	82,177.28
21.14	As for Item 21.13 but 40mm dia.	No.	98	1455.43	142,632.14



**BILL OF QUANTITIES No.21**  
**MISCELLANEOUS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
21.15	Provide,spread and compact graded crushed stone to base for box culverts.	m3	132	908.82	119,964.24
21.16	Provide,lay and compact Asphalt Concrete Wearing Course for box culverts.	m3	142	3530.19	501,286.98
21.17	Provide and place 200mm dia.PVC weep holes.	No.	30	596.75	17,902.50
Sub total (21)					8,969,620.00



BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
PLANT					
The rate inserted herein are to include all operational and maintenance cost, fuel, oil, grease, drivers and turnboys, wages, supervision, overheads and profits. Only time actually employed upon the works will be paid for and the rates should include for idle time, travelling and overtime. All items of plant must be priced.					
Items of Major Plant Employed on Dayworks.					
Where items of major plant listed in the Schedule of Dayworks are specified by type (e.g. D-6, D-8, CAT.14, etc.) the power ratings shall not be lower than the power ratings of such plant manufactured within the two years prior to the date of tender. Any items of major plant employed upon Dayworks which has a power rating lower than that specified above, shall be paid for at rates lower than those in the Schedule of Dayworks. The reduction in the rate payable shall be in proportion to the reduction in power rating below that specified above.					
22.01	D6 tractor or equivalent, including blade and ripper.	hr	200	1591.22	318,244.00
22.02	D7 tractor or equivalent, including blade and ripper.	hr	200	2261.61	452,322.00
22.03	D8 tractor or equivalent, including blade and ripper.	hr	100	2828.01	282,801.00
22.04	Motor grader CAT140G or equivalent (complete with scarifier).	hr	300	1132.71	339,813.00
22.05	Heavy grid or sheeps foot roller.	hr	100	1189.17	118,917.00
22.06	Vibrating roller, 10 ton.	hr	100	1514.93	151,493.00
22.07	15 ton pneumatic self-propelled roller.	hr	100	676.42	67,642.00
22.08	16-18 ton smooth wheel roller.	hr	100	680.02	68,002.00
22.09	As for Item 22.08 but 6-8 ton.	hr	100	538.49	53,849.00
22.10	Small hand-propelled vibrating roller.	hr	200	203.23	40,646.00
22.11	Rammer and/or compactor.	hr	300	72.28	21,684.00
22.12	1.6 m3 class tractor shovel or equivalent.	hr	200	1316.91	263,382.00
22.13	2.3 m3 tractor shovel or equivalent.	hr	100	1571.52	157,152.00
22.14	0.7 m3 class mechanical excavator (backhoe) or equivalent.	hr	100	1339.54	133,954.00





BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
22.15	0.3 m3 class mechanical excavator (backhoe) or equivalent.	hr	200	856.29	171,258.00
22.16	2.3 m3 class wheel loader or equivalent.	hr	200	1571.52	314,304.00
22.17	3 m3 class wheel loader or equivalent.	hr	100	1957.66	195,766.00
22.18	6 ton tipper lorry.	hr	300	506.21	151,863.00
22.19	10 ton tipper lorry.	hr	300	653.64	196,092.00
22.20	6 ton lorry.	hr	300	322.16	96,648.00
22.21	10 ton lorry.	hr	300	395.66	118,698.00
22.22	0.7 to 1 ton pick up car.	hr	200	278.55	55,710.00
22.23	Land Rover.	hr	200	252.57	50,514.00
22.24	6 m3/min air compressor.	hr	100	346.73	34,673.00
22.25	10 m3/min air compressor.	hr	100	568.34	56,834.00
22.26	50mm delivery water pump and moter.	hr	200	45.39	9,078.00
22.27	As for item 22.26 but 75mm.	hr	200	76.02	15,204.00
22.28	Concrete mixer 14/10.	hr	100	297.10	29,710.00
22.29	Concrete vibrator,poker type.	hr	100	55.27	5,527.00
22.30	Self-propelled water tanker 9500 litre.	hr	200	662.79	132,558.00
22.31	Pressure bitumen distributor 4500 litre.	hr	100	1000.92	100,092.00
22.32	Lorry for Benkelman beam & plate bearing Tests.	hr	300	506.21	151,863.00

LABOR

The rates inserted herein are to include all costs of labor such as insurance, accommodation, travelling time, use and maintenance of small tools of the trade, supervision, overheads and profit. Only the actual time engaged upon the works will be paid for.

22.33	Unskilled labor	hr	50,000	19.00	950,000.00
22.34	Working ganger	hr	10,000	25.00	250,000.00
22.35	Artisans	hr	10,000	29.00	290,000.00



BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<b>MATERIALS</b>					
All materials are to comply with the Specifications. The rates inserted herein are to include for delivery to the site, storage, handling, overheads and profit.					
22.36	Ordinary Portland Cement.	tonne	40	3639.73	145,589.20
22.37	Mild steel (any diameter).	tonne	3	20498.40	61,495.20
22.38	High yield steel (any diameter).	tonne	3	21340.80	64,022.40
22.39	Fine aggregate for concrete.	m3	200	463.68	92,736.00
22.40	Coarse aggregate for concrete, maximum size 20mm.	m3	100	539.64	53,964.00
22.41	Coarse aggregate for concrete, maximum size 40mm.	m3	100	539.64	53,964.00
22.42	Graded crushed stone for subbase and base.	m3	100	578.20	57,820.00
22.43	Wrought shuttering timber.	m2	100	249.02	24,902.00
22.44	Unwrought shuttering timber.	m2	100	249.02	24,902.00
22.45	Timbering for trenches.	m2	100	249.02	24,902.00
22.46	Cut back bitumen, Grade MC 30.	litre	1,000	21.76	21,760.00
22.47	Cut back bitumen, Grade MC 3000.	litre	1,000	24.99	24,990.00
22.48	Emulsion, K1-60	litre	1,000	15.37	15,370.00
22.48	Straight-run bitumen, Grade 80/100.	litre	1,000	10.80	10,800.00
22.49	10/14mm nominal size chippings.	m3	200	614.80	122,960.00
22.50	3/6mm nominal size chippings.	m3	200	614.80	122,960.00
Sub total (22)					6,769,429.80



BILL OF QUANTITIES No.23  
PILING

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
23.01	Mobilization of all the necessary plant for the piling operation, setting up on the position of the first pile and removal on completion of the last pile.	L.S.			106,000.00
23.02	Move and set up each pile position.	No.	96	1108.52	106,417.92
23.03	Supply of steel pipe piles 500 mm dia., 9 mm thick.	m	816	4181.37	3,411,997.92
23.04	Driving piles of 500 mm dia. including positioning and pitching. include for cutting pile heads to correct level.	m	816	339.00	276,624.00
	Sub total (23)				3,901,039.84









**APPENDIX B      DETAILED DIRECT CONSTRUCTION COST  
(VAT EXEMPTION)**



# SUMMARY OF BILLS OF QUANTITIES

BILL NO.	DESCRIPTION	AMOUNT SHILLINGS CTS	FOREIGN CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT
1	General	64,827,272.00	10,408,772.00		54,418,500.00
4	Site Clearance and Topsoil Stripping	7,418,875.24	5,420,270.78		1,998,604.46
5	Earthworks	243,914,202.20	179,249,421.70		65,664,780.50
7	Excavation and Filling for Structures	8,801,239.40	5,904,449.70		2,896,789.70
8	Culverts and Drainage Works	37,341,822.07	19,897,191.58		17,444,630.39
9	Passage of Traffic	14,356,155.20	9,972,780.25		4,413,355.94
10	Gravel Wearing Course	1,880,286.70	1,473,607.80		406,678.90
13	Graded Crushed Stone Subbase and Base	122,584,856.90	92,157,301.00		30,337,555.90
14A	Lean Concrete	108,870,047.70	77,909,650.20		30,960,397.50
15	Bituminous Surface Treatment and Surface Dressing	29,506,778.30	28,353,056.29		1,243,712.61
15	Bituminous Binder Course and Wearing Course	160,506,087.00	133,463,081.20		27,443,005.80
17	Concrete Works	110,803,457.02	62,428,975.50		48,174,481.52
20	Road Furniture	40,328,724.27	23,253,031.75		15,465,692.51
21	Miscellaneous	8,792,184.77	7,788,119.56		1,004,065.21
22	Dayworks	5,460,973.20	2,812,430.00		3,648,443.80
23	Piling	3,893,706.88	3,477,342.24		416,364.64
	Total	971,536,521.05	684,599,491.87		306,937,029.38



BILL OF QUANTITIES No.1  
GENERAL

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
1.01	Provide, furnish and maintain the rented accommodation for the Engineer's Representative and his staff:				
	(1) Type I (senior staff house), 1No.	Month	30	22000.00	660,000.00
	(2) Type II (senior staff house), 5Nos.	Month	130	17000.00	2,210,000.00
	(3) Type III (junior staff house), 3Nos.	Month	90	12000.00	1,080,000.00
	(4) Type IV (junior staff house), 5Nos.	Month	150	7500.00	1,125,000.00
1.02	Provide, equip and maintain Main Office for the Engineer's Representative and his staff.	No.	1	1134000.00	1,134,000.00
1.03	Provide and maintain laboratory for the Engineer's Representative and his staff.	No.	1	694000.00	694,000.00
1.04	Provide and maintain furniture and office equipment for the Engineer's office and Laboratory as listed in the Special Specification, all to the satisfaction of the Engineer.	Lump Sum			1,006,800.00
1.05	Provide survey and laboratory equipment as listed in the Special Specification.	Lump Sum			8,747,472.00
1.06	Provide with driver and maintain one (1) new 504 Peugeot or equivalent with a minimum engine capacity of 1800 cc. approved by the Resident Engineer, inclusive of the first 3000 km travelled in any one month.	Veh. Month	30	40000.00	1,200,000.00
1.07	E.O. Item 1.06 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	100,000	6.00	600,000.00
1.08	As for Item 1.06 but three (3) new LWB 4WD Land Rovers or equivalent with a minimum engine capacity of 2300 cc., inclusive of the first 3000 km travelled in any one month.	Veh. Month	90	44000.00	3,960,000.00
1.09	E.O. Item 1.08 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	400,000	11.50	4,600,000.00
1.10	As for Item 1.06 but three (3) new Subaru or equivalent with a minimum engine capacity of 1800 cc., inclusive of the first 3000 km travelled in any one month.	Veh. Month	90	38000.00	3,420,000.00
1.11	E.O. Item 1.10 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	300,000	7.00	2,100,000.00



BILL OF QUANTITIES No.1  
GENERAL

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
1.12	Prime Cost Sum of Shs.22,100,000 for removals and alterations to following existing services;				
	(1) Telecommunication line	P.C. Sum			1,600,000.00
	(2) Electric line	P.C. Sum			8,900,000.00
	(3) Water pipe line	P.C. Sum			4,600,000.00
	(4) Railway	P.C. Sum			4,500,000.00
	(5) Sewerage pipe line	P.C. Sum			1,600,000.00
	(6) Existing street lighting	P.C. Sum			100,000.00
	(7) Electric fence of National Park	P.C. Sum			500,000.00
	(8) Fence of Kenya Rifles	P.C. Sum			300,000.00
1.13	Include percentage of P.C.Sum in Item 1.12 for Contractor's cost and profit.	% of Item 1.12	20		4,420,000.00
1.14	Prime Cost Sum of Shs.3,000,000 for the compensation and aquisition of land.	P.C. Sum			3,000,000.00
1.15	Include percentage of P.C.Sum in Item 1.14 for Contractor's cost and profit.	% of Item 1.14	40		1,200,000.00
1.16	Prime Cost Sum of Shs.600,000 for the Engineer's Miscellaneous Account.	P.C. Sum			600,000.00
1.17	Include percentage of P.C.Sum in Item 1.16 for Contractor's cost and profit.	% of Item 1.16	20		120,000.00
1.18	Provide and erect publicity signs as directed by the Engineer,all in accordance with MOW DRG.NO.SS/234.	No.	10	25000.00	250,000.00
1.19	Prime cost sum of K.Shs. 500,000 for the rectification of title deeds of acquired lands.	P.C. Sum			500,000.00
1.20	Include percentage of P.C Sum in Item 1.19 for Contractor's cost and profit.	% of Item 1.19	20		100,000.00
	Sub total (1)				64,827,272.00





**BILL OF QUANTITIES No.4  
SITE CLEARANCE AND TOPSOIL STRIPPING**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
4.01	Clear site in Open Country, including removal of trees, hedges, bushes and other vegetation and objectionable organic material, grub up roots and backfill to 95% MDD AASHTO T.99 with approved material all in accordance with the Specification.	ha	126.2	5247.50	662,234.50
4.02	As for Item 4.01 but to clear site in forest area.	ha	45.3	11235.80	508,981.74
4.03	Removal topsoil to a depth as directed by the Engineer and dispose of to spoil dump or stockpile for re-use as directed by the Engineer.	m3	106,700	49.37	5,267,779.00
4.04	Scarify and remove to stockpile existing pavement material as directed by the Engineer.	m3	2,720	129.00	350,880.00
4.05	Demolish existing railway bridge and remove debris to spoil over any distance, backfill voids and compact to 105% MDD as necessary.	Lump Sum			129,000.00
4.06	Allow a Provisional Sum to be expended on a daywork basis for the removal of existing structures, fences and other obstructions.	Prov. Sum			500,000.00
	Sub total (4)				7,418,875.24



BILL OF QUANTITIES No.5  
EARTHWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
5.01	Fill in soft material for main road and service road, and compact to at least 95% MDD AASHTO T.99.	m3	1,234,300	92.22	113,827,146.00
5.02	As for Item 5.01 but for slip roads and approach roads.	m3	196,400	92.22	18,112,008.00
5.03	As for Item 5.01 but hauling from drainage pond excavation works as shown on the Drawings.	m3	7,720	91.65	707,538.00
5.04	As for Item 5.01 but for new railway embankment.	m3	5,480	91.65	502,242.00
5.05	Fill in hard material for main road.	m3	104,900	246.40	25,847,360.00
5.06	Fill in soft material for central reserves as shown on the Drawings.	m3	11,400	156.62	1,785,468.00
5.07	Fill in soft material adjacent to shoulders as shown on the Drawings.	m3	3,310	156.62	518,412.20
5.08	Spoil in unsuitable material such as black cotton and rubbish.	m3	189,500	92.73	17,572,335.00
5.09	Spoil in soft material.	m3	5,000	92.73	463,650.00
5.10	Spoil in hard material.	m3	1,000	300.62	300,620.00
5.11	Overhaul earthworks in excess of 1.0 km free haul.	m3.km	3,432,300	9.63	33,053,049.00
5.12	Excavation in swamps.	m3	1,000	114.76	114,760.00
5.13	Provide and place rockfill in accordance with the Specification.	m3	1,000	245.15	245,150.00
5.14	Compact original ground below fills to at least 95% MDD AASHTO T.99 including all necessary scarifying and watering as directed by the Engineer, to a depth of 150mm below ground level.	m3	62,600	17.58	1,100,508.00
5.15	E.O. Item 5.01 to 5.05 for compaction of 300mm subgrade material to at least 100% MDD AASHTO T.99 in Fill area.	m3	121,700	8.79	1,069,743.00
5.16	Compact in-situ subgrade in Cut area to a depth of 300mm below formation level to at least 100% MDD AASHTO T.99.	m3	100,200	17.58	1,761,516.00
5.17	Compact in-situ subgrade material in Cut area between 150mm and 300mm below underside of imported subgrade material to at least 95% MDD AASHTO T.99.	m3	1,000	17.58	17,580.00
5.18	Compact in-situ subgrade material in Cut area between 0mm and 150mm below underside of imported subgrade material to at least 100% MDD AASHTO T.99.	m3	1,000	8.79	8,790.00
5.19	Provide, place and compact improved subgrade material in locations where directed by the Engineer.	m3	1,000	109.62	109,620.00



BILL OF QUANTITIES No.5  
EARTHWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
5.20	Rock formation levelling in Cut area below lean concrete base level or as directed by the Engineer.	m2	72,100	25.00	1,802,500.00
5.21	Haul from stockpile and spread on side-slopes and central reserves, lightly roll and compact 75mm thickness of topsoil.	m2	335,700	10.06	3,377,142.00
5.22	Haul from stockpile and spread on black cotton spoil area, lightly roll and compact 200mm thickness of topsoil in locations as directed by the Engineer.	m2	69,100	20.05	1,385,455.00
5.23	Haul from stockpile and spread on rubbish spoil area and side borrow area, and compact topsoil or as directed by the Engineer.	m3	15,400	96.99	1,493,646.00
5.24	Plant fillslopes and cutslopes with selected grass in accordance with the Specification, including the establishment of plant nurseries where required.	m2	773,000	18.29	14,138,170.00
5.25	Provide, place and compact filter material for drainage layer and sand mat in locations where directed by the Engineer.	m3	1,000	485.94	485,940.00
5.26	Fill for new national park boundary dike including demolishing existing dike.	m3	58,300	84.18	4,907,694.00
5.27	Filter fabric for rockfill.	m2	1,000	206.16	206,160.00
Sub total (5)					244,914,202.20



BILL OF QUANTITIES No.7  
EXCAVATION AND FILLING FOR STRUCTURES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
BRIDGES					
7.01	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	5,330	108.05	575,906.50
7.02	E.O. Item 7.01 at any location for excavation in hard materials.	m3	1,230	320.53	394,251.90
7.03	Backfilling with selected material behind bridge abutment, wing walls and around structures.	m3	4,980	141.08	702,578.40
7.04	Provide and place porous filter material behind bridge abutments and wing walls.	m3	300	485.94	145,782.00
7.05	Provide and place selected granular fill material.	m3	200	429.67	85,934.00
BOX CULVERTS					
7.06	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	15,680	108.05	1,694,224.00
7.07	E.O. Item 7.06 at any location for excavation in hard materials.	m3	300	320.53	96,159.00
7.08	Backfilling with selected material behind box culvert walls and around structures.	m3	22,670	141.08	3,198,283.60
7.09	Provide and place porous filter material behind box culvert walls.	m3	1,990	485.94	967,020.60
7.10	Provide and place selected granular fill material.	m3	1,420	429.67	610,131.40
7.11	Excavation and backfilling for gabions in soft material.	m3	275	90.95	25,011.25
7.12	Provide and place gabion mesh, 0.5m thick as shown Drawings or directed by the Engineer.	m2	550	350.70	192,885.00
7.13	Provide and place rockfill to gabions.	m3	275	411.17	113,071.75
Sub total (7)					8,801,239.40





BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
No separate payment shall be made the haulage of surplus or unsuitable excavated material and the cost of such haulage shall be included in the rates and prices.					
8.01	Excavate in soft material for pipe culverts below existing ground level or road formation level including support of trench sides, backfilling and compaction at least 95% MDD AASHTO T.99 up to new road formation level or ground level whichever is the lower, dewatering, and carting surplus material to spoil dump.	m3	3,970	135.64	538,490.80
8.02	As for Item 8.01 but for inlets and outlets of culverts.	m3	2,970	135.64	402,850.80
8.03	Excavate in soft material for earth channel, drain type I.	m3	5,650	108.05	610,482.50
8.04	Excavate in soft material for stone pitching channel, drain type II.	m3	3,900	108.05	421,395.00
8.05	Excavate in soft material for concrete channel, drain type III.	m3	3,690	108.05	398,704.50
8.06	Excavate in soft material for concrete channel with cascade, drain type VII.	m3	5,600	108.05	605,080.00
8.07	Excavate and backfill for gulley pots in soft material.	m3	180	135.64	24,415.20
8.08	Excavate and backfill for concrete ditch type VI, in soft material.	m3	540	135.64	73,245.60
8.09	Excavate and backfill for gabions in soft material.	m3	580	90.95	52,751.00
8.10	Excavate for subsoil drains in soft material.	m3	460	90.95	41,837.00
8.11	E.O. Item 8.01 to 8.10 at any location for excavation in hard materials.	m3	500	320.53	160,265.00
8.12	Provide and place filter fabric to subsoil drains.	m2	3,040	103.08	313,363.20
8.13	Provide and place crushed rock backfill to subsoil drains.	m3	420	429.67	180,461.40
8.14	Provide and place perforated 200mm dia. PVC pipe to subsoil drains.	m	1,265	425.11	537,764.15
8.15	Provide, lay and joint 300mm I.D. concrete pipes ogee jointed.	m	155	413.07	64,025.85
8.16	As for Item 8.15 but 600mm I.D.	m	1,031	1402.00	1,445,462.00
8.17	As for Item 8.15 but 750mm I.D.	m	90	1885.54	169,698.60
8.18	As for Item 8.15 but 900mm I.D.	m	1,067	2630.01	2,806,220.67



BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
8.19	As for Item 8.15 but 1200mm I.D.	m	294	4085.42	1,201,113.48
8.20	Provide,place and compact class 15/20, concrete bed and surround to concrete pipes, including formwork.	m3	2,520	2620.18	6,602,853.60
8.21	As for Item 8.20 but concrete facing for drain ditch on berm, drain type VIII.	m2	1,280	96.59	123,635.20
8.22	Provide,place and compact class 25/20 concrete for headwalls, wingwalls, aprons and toewalls to pipe culverts including all formwork and provision and placing of fabric mesh reinforcement as shown in the Drawings.	m3	924	3982.94	3,680,236.56
8.23	As for Item 8.22 but class 15/20 for concrete channel, drain type III and VII.	m3	1,330	2406.59	3,200,764.70
8.24	Provide,place and compact class 20/20 concrete for concrete ditch, drain type VI including all formwork and placing of reinforcement as shown in the Drawings.	m3	94	8926.96	839,134.24
8.25	Provide,place and compact class 20/20 concrete for gully pot including all formwork.	m3	63	6267.55	394,855.65
8.26	As for Item 8.24 but concrete cover of gully pot.	No.	168	485.77	81,609.36
8.27	Provide and place 50mm dia. PVC weep holes.	No.	45	18.42	828.90
8.28	Excavate as necessary, provide all materials and construct 150mm thick grouting stone pitching to bed and side-slopes of drains, ditches, channels, ground faces, inlets and outlets of culverts, including carting of excavated material to spoil, as directed by the Engineer.	m2	26,090	248.27	6,477,364.30
8.29	As for Item 8.28 but 250mm building stone at concrete channel with cascade.	m2	1,730	235.29	407,051.70
8.30	Cement screen on building stone.	m2	1,730	53.07	91,811.10
8.31	Provide and place gabion mesh, 1m thick, as shown on Drawings or directed by the Engineer.	m2	430	425.19	182,831.70
8.32	Provide and place mattresses, 0.3m thick, as shown on Drawings or directed by the Engineer.	m2	467	220.53	102,987.51
8.33	Provide and place rockfill to gabions and mattresses.	m3	570	411.17	234,366.90
8.34	Provide and place filter fabric under and/or behind gabions.	m2	335	103.08	34,531.80
8.35	Excavate trench, provide, lay and joint 450 x 225mm P.C.C. invert block drains (I.B.D.) having 300mm dia. channel.	m	507	274.27	139,054.89



BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
8.36	Provide and lay 75mm thick P.C.C. side slabs to I.B.D.Channel.	m2	477	277.68	132,453.36
8.37	Excavate trench,provide,lay and joint 375 x 250mm P.C.C.invert block drain, drain type IV.	m	15,440	261.04	4,030,457.60
8.38	As for Item 8.37 but for on berm,drain type VIII.	m	740	261.04	193,169.60
8.39	Excavate,provide all materials and construct kerb inlet at busbays as detailed on the Drawings.	No	32	105.63	3,380.16
8.40	Excavate,provide all materials and construct intake block channel at busbays as detailed on the Drawings.	No	32	114.66	3,669.12
8.41	Provide and place concrete class 15 for 250 x 150mm in-situ gutters.	m	48	643.88	30,906.24
8.42	Provide and place selected granular fill material for gravel bedding.	m3	79	429.67	33,943.93
8.43	Plant channel slopes with selected grass in accordance with the Specification.	m2	11,330	18.29	207,225.70
8.44	Earth dike of drainage pond.	m3	710	91.65	65,071.50
	Sub total (8)				37,341,822.07



BILL OF QUANTITIES No.9  
PASSAGE OF TRAFFIC

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
9.01	Provide and maintain signs and barriers in locations as directed by the Engineer.	km	19.0	35000.00	665,000.00
9.02	Construct and maintain 7.0m wide deviations including drainage, pavement type Deviation-1(Mombasa Road Junction).	km	1.0	2974940.00	2,974,940.00
9.03	As for Item 9.02 but pavement type Deviation-1(Uhuru Monument Junction).	km	0.3	2974940.00	892,482.00
9.04	As for Item 9.02 but pavement type Deviation-2(Ngong Road Junction and Dagoretti Forest Junction).	km	1.3	598640.00	778,232.00
9.05	Construct and maintain 6.0m wide deviations including drainage, pavement type Deviation-3.	km	0.9	289560.00	260,604.00
9.06	Construct and maintain 3.0m wide deviations including drainage, pavement type Deviation-4.	km	2.5	146270.00	365,675.00
9.07	Reinstatement of deviations and existing drainages.	Lump Sum			510,800.00
9.08	Reinstatement of existing road after the completion of cross drainage works, Mombasa Road Junction.	m2	70	701.72	49,120.40
9.09	Reinstatement of existing road after the completion of cross drainage works, Kikuyu Junction.	m2	35	226.60	7,931.00
9.10	Maintenance of the project road (main road, slip road, approach road and service road) used for the deviation purpose as specified.	Lump Sum			711,300.00
9.11	Improvement of the existing road as instructed and approved by the Engineer.				
	(1) Improved subgraded material.	m3	100	109.62	10,962.00
	(2) Gravel wearing course.	m3	600	325.06	195,036.00
	(3) Graded crushed stone base.	m3	50	849.91	42,495.50
	(4) MC3000 first seal coat.	litre	150	22.41	3,361.50
	(5) Chippings, 3/6mm.	m3	2	836.40	1,672.80
9.12	Maintenance of Existing Roads used for heavy construction traffic as specified when and where directed by the Engineer.	km	30	50000.00	1,500,000.00
9.13	Re-carpeting of Existing Roads 6m wide or pro rata as specified when and where directed by the Engineer.	m3	1,800	3009.18	5,416,524.00
	Sub total (9)				14,386,136.20





BILL OF QUANTITIES No.10  
GRAVEL WEARING COURSE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
10.01	Clear site of the material site.	ha	1.0	5247.50	5,247.50
10.02	Construct access road to the material site in excess of 200m in length.	km	1.0	273300.00	273,300.00
10.03	Excavate and spoil topsoil and overburden in the material site.	m3	4,000	49.37	197,480.00
10.04	Excavate gravel wearing course material, transport, spread and compact to at least 95% MDD AASHTO T.180 for service roads.	m3	4,320	325.06	1,404,259.20
Sub total (10)					1,880,286.70



BILL OF QUANTITIES No.13  
GRADED CRUSHED STONE FOR SUBBASE AND BASE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
13.01	Provide,spread and compact graded crushed stone to subbase for main road.	m3	84,490	790.24	66,767,377.60
13.02	As for Item 13.01 but for slip road.	m3	14,020	790.24	11,079,164.80
13.03	As for Item 13.01 but for approach road and service road.	m3	3,030	790.24	2,394,427.20
13.04	Provide,spread and compact graded crushed stone to base for slip road, approach road and service roads.	m3	2,150	849.91	1,827,306.50
13.05	Provide,spread and compact graded crushed stone to shoulder for main road.	m3	43,810	790.24	34,620,414.40
13.06	As for Item 13.05 but for slip road.	m3	6,360	790.24	5,025,926.40
13.07	As for Item 13.05 but for approach road and service road.	m3	1,000	790.24	790,240.00
Sub total (13)					122,504,856.90



BILL OF QUANTITIES No.14A  
LEAN CONCRETE FOR BASE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
14.01	Provide, process, mix, transport, spread and compact lean concrete base material for main road at 4% nominal cement content by weight of total mix.	m3	90,340	1045.67	94,465,827.80
14.02	As for Item 14.01 but for slip road.	m3	11,150	1045.67	11,659,220.50
14.03	As for Item 14.01 but for approach road.	m3	1,020	1045.67	1,066,583.40
14.04	Protecting and curing lean concrete base.	m2	515,500	2.00	1,031,000.00
14.05	Variation in cement content (Provisional).	tonne	200	3236.93	647,386.00
	Sub total (14A)				108,870,017.70



**BILL OF QUANTITIES No.15  
BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
No haulage will be paid for bitumen or chippings and this shall be included in the following rates and prices.					
PRIME COAT					
15.01	Prepare surface of base, provide, transport, heat as specified and spray MC 30 prime coat at a nominal spray rate of 1.0 litre/m <sup>2</sup> for main road.	litre	411,550	19.56	8,049,918.00
15.02	As for Item 15.01 but for slip road.	litre	55,740	19.56	1,090,274.40
15.03	As for Item 15.01 but for approach road.	litre	4,600	19.56	89,976.00
TACK COAT					
15.04	Prepare surface of binder course, provide, transport, heat as specified and spray MC 3000 cut-back bitumen tack coat at nominal spray rate of 0.6 litre/m <sup>2</sup> for main road.	litre	493,860	22.41	11,067,402.60
15.05	As for Item 15.04 but for slip road.	litre	44,220	22.41	990,970.20
15.06	As for Item 15.04 but for approach road.	litre	5,520	22.41	123,703.20
SURFACE DRESSING					
(Double Surface Dressing)					
15.07	Provide, heat and spray MC3000 cut-back bitumen at a nominal spray rate of 1.3 litres/m <sup>2</sup> as first seal coat.	litre	209,610	22.41	4,697,360.10
15.08	As for Item 15.07 but at a nominal rate of 0.3 litre/m <sup>2</sup> as second seal coat.	litre	48,370	22.41	1,083,971.70
15.09	Provide, transport, lay and roll 10/14mm chippings at a rate of 69 m <sup>2</sup> /m <sup>3</sup> .	m <sup>3</sup>	2,340	760.37	1,779,265.80
15.10	As for Item 15.09 but 3/6mm chippings at a rate of 250 m <sup>2</sup> /m <sup>3</sup> .	m <sup>3</sup>	645	836.40	539,478.00
(Single Surface Dressing)					
15.11	Provide, heat and spray MC3000 cut-back bitumen at a nominal spray rate of 0.6 litres/m <sup>2</sup> .	litre	3,170	22.41	71,039.70
15.12	Provide, transport, lay and roll 3/6mm chippings at a rate of 189 m <sup>2</sup> /m <sup>3</sup> .	m <sup>3</sup>	28	836.40	23,419.20
Sub total (15)					29,606,778.90





**BILL OF QUANTITIES No.16  
BITUMINOUS BINDER COURSE AND WEARING COURSE**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<p>NOTE:</p> <p>No haulage shall be paid for in respect of any of the items or materials contained in this Bill of Quantities and the cost of such haulage shall be deemed to be included in the rates entered below.</p>					
16.01	Provide, lay and compact Asphalt Concrete Binder Course using 5.5% nominal bitumen content by weight of total mix for main road.	m3	32,930	2814.62	92,685,436.60
16.02	As for Item 16.01 but for slip road.	m3	3,430	2814.62	9,654,146.60
16.03	As for Item 16.01 but for approach road.	m3	460	2814.62	1,294,725.20
16.04	Provide, lay and compact Asphalt Concrete Wearing Course using 6.5% nominal bitumen content by weight of total mix for main road.	m3	16,460	3009.18	49,531,102.80
16.05	As for Item 16.04 but for slip road.	m3	2,230	3009.18	6,710,471.40
16.06	As for Item 16.04 but for approach road.	m3	230	3009.18	692,111.40
16.07	80/100 penetration bitumen binder variation.	litre	Rate only	8.45	
16.08	Supply and mix in mineral filler for variation as directed by the Engineer.	tonne	100	3236.93	323,693.00
16.09	As for Item 16.08 but to sand.	tonne	50	288.00	14,400.00
Sub total (16)					160,906,087.00



BILL OF QUANTITIES No.17  
CONCRETE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
BRIDGES					
Concrete:					
Provide, place and compact the following classes of concrete for insitu works as specified.					
17.01	Class 15/40 for blinding concrete on all structures.	m3	180	1921.39	345,850.20
17.02	Class 25/20 for structural concrete in:				
	(1) Bridges for Mombasa Road Junction, Uhuru Monument Junction and Railway.	m3	2,000	2239.41	6,449,500.80
	(2) Vehicle bridges.	m3	1,090	2239.41	2,440,956.90
	(3) Pedestrian bridges.	m3	90	2239.41	201,546.90
17.03	Class 30/20 for structural concrete.	m3	2,120	2291.59	4,858,170.80
17.04	Provide WF2 finish to concrete surface.	m2	5,830	41.56	242,294.80
Formwork:					
Provide, erect and afterwards dismantle and remove the Items specified below:					
17.05	Formwork to achieve class F1 finish:				
	(1) Sloping	m2	86	366.53	31,521.58
	(2) Vertical	m2	2,660	344.11	915,332.60
17.06	Formwork to achieve class F2 finish:				
	(1) Horizontal	m2	3,450	492.07	1,697,641.50
	(2) Sloping	m2	218	393.66	85,817.88
	(3) Vertical	m2	9,050	415.64	3,761,542.00
17.07	Provide and fix in position high tensile steel reinforcement bars to BS 4461 of diameter equal to or less than 16mm.	tonne	202.0	21501.50	4,343,303.00
17.08	As for Item 17.07 but of diameter greater than 16mm.	tonne	482.0	21018.20	10,130,772.40
17.09	Provide and place 200mm wide waterstops as specified in the Drawings.	m	57	426.83	24,329.31
17.10	Provide and place 20mm thick joint filler	m2	36	573.60	20,649.60



BILL OF QUANTITIES No.17  
CONCRETE WORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	BOX CULVERTS				
	Concrete:				
	Provide, place and compact the following classes of concrete for insitu works as specified.				
17.11	Class 15/40 for blinding concrete on all structures.	m3	588	1921.39	1,129,777.32
17.12	Class 25/20 for structural concrete.				
	(1) Box culverts for road.	m3	7,820	2239.41	17,512,186.20
	(2) Box culverts for drainage.	m3	6,320	2239.41	14,153,071.20
	(3) Box culverts for footpath.	m3	646	2239.41	1,446,658.86
17.13	Provide UF2 finish to concrete surface.	m2	9,880	41.56	410,612.80
	Formwork:				
	Provide, erect and afterwards dismantle and remove the items specified below:				
17.14	Formwork to achieve class F1 finish:				
	(1) Vertical	m2	12,120	344.11	4,170,613.20
17.15	Formwork to achieve class F2 finish:				
	(1) Horizontal	m2	4,000	492.07	1,968,280.00
	(2) Vertical	m2	7,450	415.64	3,096,518.00
17.16	Provide and fix in position high tensile steel reinforcement bars to BS 4461 of diameter equal to or less than 16mm.	tonne	215.0	21501.50	4,622,822.50
17.17	As for Item 17.16 but of diameter greater than 16mm.	tonne	1,225.0	21018.20	25,747,295.00
17.18	Provide and place 200mm wide waterstops as specified in the Drawings.	m	909	426.83	387,988.47
17.19	Provide and place 20mm thick joint filler	m2	712	573.60	408,403.20
	Sub total (17)				110,603,457.02



**BILL OF QUANTITIES No.20**  
**ROAD FURNITURE**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
20.01	Provide and erect standard warning signs:				
	(1) Type W28,1200mm	No.	30	7000.00	210,000.00
	(2) Type W29,1200mm	No.	22	7000.00	154,000.00
	(3) Type W36,1200mm	No.	3	7000.00	21,000.00
	(4) Type W37,1200mm	No.	22	7000.00	154,000.00
20.02	Provide and erect standard priority signs:				
	(1) Type R1,1200mm	No.	10	7000.00	70,000.00
20.03	Provide and erect standard prohibitory signs:				
	(1) Type P1,1000mm	No.	1	6000.00	6,000.00
	(2) Type P25,1000mm	No.	30	6000.00	180,000.00
20.04	Provide and erect standard mandatory signs:				
	(1) Type M3,1000mm	No.	1	6000.00	6,000.00
	(2) Type M4,1000mm	No.	1	6000.00	6,000.00
20.05	Provide and erect non-standard informatory signs (advance direction signs, direction signs, route confirmatory signs):				
	(1) less than 1m2	No.	55	7000.00	385,000.00
	(2) 3m2-4m2	No.	1	18000.00	18,000.00
	(3) 4m2-5m2	No.	8	19000.00	152,000.00
	(4) 5m2-6m2	No.	10	23000.00	230,000.00
	(5) 6m2-7m2	No.	1	25000.00	25,000.00
	(6) 7m2-8m2	No.	12	27000.00	324,000.00
	(7) 8m2-9m2	No.	7	30000.00	210,000.00
	(8) 9m2-10m2	No.	1	40000.00	40,000.00
20.06	Road marking in yellow or white paint.	m2	3,430	174.32	597,917.60
20.07	Provide and fix flex beam guardrails, all in accordance with the Drawings.	m	8,590	1341.56	11,524,000.40
20.08	Provide and erect road edge marker post.	No.	87	759.95	66,115.65
20.09	Provide and erect road reserve boundary post where directed by the Engineer.	No.	230	759.95	174,788.50
20.10	Plant selected grasses in the central reserves, including the establishment of plant nurseries where required.	m2	32,000	18.29	585,280.00
20.11	Plant selected shrubs and bushes approved by the Engineer at locations in the central reserve and road reserve boundary, including the establishment of plant nurseries where required.	No.	8,120	76.58	621,829.60
20.12	As for Item 20.11 but to selected trees.	No.	226	116.95	26,430.70





BILL OF QUANTITIES No.20  
ROAD FURNITURE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
20.13	Provide and erect kilometer posts as directed by the Engineer.	No.	58	1139.48	66,089.84
20.14	Provide and lay flush kerb,150 x 100mm, Type A	m	119,160	112.63	13,420,990.80
20.15	Provide and lay flush kerb,150mm x 80mm, Type B.	m	6,380	95.52	609,417.60
20.16	Provide and lay flush kerb,150mm x 80mm, Type C.	m	3,300	124.35	410,355.00
20.17	Provide and lay flush kerb,150mm x 80mm, Type D.	m	3,900	85.92	335,088.00
20.18	Provide and lay flush kerb,150mm x 80mm, Type E.	m	1,300	122.42	159,146.00
20.19	Quadrant for flush kerb,main road and slip road: (1) in-situ 0.5m radius,Type A. (2) in-situ 0.5m radius,Type B.	No. No.	25 4	109.71 102.02	2,742.75 408.08
20.20	Provide and lay raised kerb,125mm x 250mm,slip road. (1) straight. (2) radius 5m to 1m.	m m	1,530 72	253.60 277.30	388,008.00 19,965.60
20.21	Provide and lay raised kerb,125mm x 250mm,main road. (1) straight. (2) radius 5m to 1m.	m m	256 114	270.90 294.59	69,350.40 33,583.26
20.22	Provide and lay ramped kerb.	No.	64	270.06	17,283.84
20.23	Provide and erect permanent five strand wire fencing including intermediate and straining posts in areas specifically directed by the Engineer.	m	1,500	141.77	212,655.00
20.24	Provide and erect gates as directed and approved by the Engineer.	No.	8	2213.20	17,705.60
20.25	Provide and erect double headed guardrail,all in accordance with the Drawings.	m	3,660	2375.37	8,693,854.20
20.26	Provide stairways for bus stops as specified in the Drawings.	m	53	1598.45	84,717.85
	Sub total (20)				40,328,724.27



BILL OF QUANTITIES No.21  
MISCELLANEOUS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
21.01	Supply and apply, in accordance to manufacturer's instructions waterproofing materials to top of bridge decks, approach slabs and all structural concrete surfaces in contact with fill material prior to backfilling.	m2	20,050	281.99	5,653,899.50
21.02	Supply and install in position elastomeric bearings including mortar mortar plinth, fixed.				
	(1) 406 x 279 x 18mm	No.	12	2561.57	30,738.84
	(2) 432 x 203 x 18mm	No.	37	2145.59	79,386.83
21.03	Supply and install in position elastomeric bearings including mortar plinth, movable:				
	(1) 229 x 152 x 56mm	No.	8	2338.33	18,706.64
	(2) 279 x 229 x 37mm	No.	16	2752.28	44,036.48
	(3) 279 x 229 x 46mm	No.	22	3330.93	73,280.46
	(4) 279 x 229 x 65mm	No.	18	4552.55	81,945.90
	(5) 432 x 203 x 65mm	No.	12	5850.42	70,205.04
21.04	Supply and install joint filler for expansion joint:				
	(1) 30mm thick.	m2	69	849.15	58,591.35
	(2) 25mm thick.	m2	82	710.72	58,279.04
	(3) 20mm thick.	m2	23	573.60	13,192.80
21.05	Supply and install sealant for expansion joint:				
	(1) 30 x 50mm deep.	m	66	473.56	31,254.96
	(2) 25 x 50mm deep.	m	75	395.19	29,639.25
21.06	Provide, lay and compact Asphalt Concrete Wearing Course for bridge decks.	m3	134	3009.18	403,230.12
21.07	Supply and install flex beam guardrails including post for vehicle bridge as detailed on the Drawings.	m	244	1297.57	316,607.08
21.08	Provide and erect in position parapet handrails to railway bridge as detailed on the Drawings.	m	114	627.21	71,501.94
21.09	Provide and erect in position pedestrian parapets to footbridges as detailed on the Drawings.	m	282	754.45	212,754.90
21.10	Provide and install 100mm dia. drain pipe through deck slabs.	No.	36	155.90	5,612.40
21.11	Provide and place 75mm dia. PVC weep holes.	No.	62	75.37	4,672.94
21.12	Provide and place 200mm dia. perforated PVC pipes.	m	1,770	425.11	752,444.70
21.13	Provide and install 20mm dia. dowel bars with caps as specified on the Drawings.	No.	152	540.64	82,177.28
21.14	As for Item 21.13 but 40mm dia.	No.	98	1455.43	142,632.14



**BILL OF QUANTITIES No.21  
MISCELLANEOUS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
21.15	Provide, spread and compact graded crushed stone to base for box culverts.	m3	132	849.91	112,188.12
21.16	Provide, lay and compact Asphalt Concrete Wearing Course for box culverts.	m3	142	3009.18	427,303.56
21.17	Provide and place 200mm dia.PVC weep holes.	No.	30	596.75	17,902.50
Sub total (21)					8,792,184.77



BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
NOTE:					
PLANT					
The rate inserted herein are to include all operational and maintenance cost, fuel, oil, grease, drivers and turnboys, wages, supervision, overheads and profits. Only time actually employed upon the works will be paid for and the rates should include for idle time, travelling and overtime. All items of plant must be priced.					
Items of Major Plant Employed on Dayworks.					
Where items of major plant listed in the Schedule of Dayworks are specified by type (e.g. D-6, D-8, CAT.14, etc.) the power ratings shall not be lower than the power ratings of such plant manufactured within the two years prior to the date of tender. Any items of major plant employed upon Dayworks which has a power rating lower than that specified above, shall be paid for at rates lower than those in the Schedule of Dayworks. The reduction in the rate payable shall be in proportion to the reduction in power rating below that specified above.					
22.01	D6 tractor or equivalent, including blade and ripper.	hr	200	1507.28	301,456.00
22.02	D7 tractor or equivalent, including blade and ripper.	hr	200	2141.69	428,338.00
22.03	D8 tractor or equivalent, including blade and ripper.	hr	100	2677.69	267,769.00
22.04	Motor grader CAT140G or equivalent (complete with scarifier).	hr	300	1073.38	322,014.00
22.05	Heavy grid or sheeps foot roller.	hr	100	1126.81	112,681.00
22.06	Vibrating roller, 10 ton.	hr	100	1435.08	143,508.00
22.07	15 ton pneumatic self-propelled roller.	hr	100	641.57	64,157.00
22.08	16-18 ton smooth wheel roller.	hr	100	641.57	64,157.00
22.09	As for Item 22.08 but 6-8 ton.	hr	100	511.05	51,105.00
22.10	Small hand-propelled vibrating roller.	hr	200	193.78	38,756.00
22.11	Rammer and/or compactor.	hr	300	69.86	20,958.00
22.12	1.6 m3 class tractor shovel or equivalent.	hr	200	1247.69	249,538.00
22.13	2.3 m3 tractor shovel or equivalent.	hr	100	1488.64	148,864.00
22.14	0.7 m3 class mechanical excavator	hr	100	1269.11	126,911.00





BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
22.15	0.3 m3 class mechanical excavator (backhoe) or equivalent.	hr	200	811.79	162,358.00
22.16	2.3 m3 class wheel loader or equivalent.	hr	200	1488.64	297,728.00
22.17	3 m3 class wheel loader or equivalent.	hr	100	1854.05	185,405.00
22.18	6 ton tipper lorry.	hr	300	480.50	144,150.00
22.19	10 ton tipper lorry.	hr	300	620.02	186,006.00
22.20	6 ton lorry.	hr	300	306.33	91,899.00
22.21	10 ton lorry.	hr	300	375.88	112,764.00
22.22	0.7 to 1 ton pick up car.	hr	200	265.06	53,012.00
22.23	Land Rover.	hr	200	240.47	48,094.00
22.24	6 m3/min air compressor.	hr	100	329.58	32,958.00
22.25	10 m3/min air compressor.	hr	100	543.08	54,308.00
22.26	50mm delivery water pump and moter.	hr	200	44.41	8,882.00
22.27	As for item 22.26 but 75mm.	hr	200	73.40	14,680.00
22.28	Concrete mixer 14/10.	hr	100	282.62	28,262.00
22.29	Concrete vibrator,poker type.	hr	100	53.76	5,376.00
22.30	Self-propelled water tanker 9500 litre.	hr	200	627.19	125,438.00
22.31	Pressure bitumen distributor 4500 litre.	hr	100	948.66	94,866.00
22.32	Lorry for Benkelman beam & plate bearing Tests.	hr	300	480.50	144,150.00

LABOR

The rates inserted herein are to include all costs of labor such as insurance, accommodation, travelling time, use and maintenance of small tools of the trade, supervision, overheads and profit. Only the actual time engaged upon the works will be paid for.

22.33	Unskilled labor	hr	50,000	19.00	950,000.00
22.34	Working ganger	hr	10,000	25.00	250,000.00
22.35	Artisans	hr	10,000	29.00	290,000.00



BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<b>MATERIALS</b>					
All materials are to comply with the Specifications. The rates inserted herein are to include for delivery to the site, storage, handling, overheads and profit.					
22.36	Ordinary Portland Cement.	tonne	40	3236.93	129,477.20
22.37	Mild steel (any diameter).	tonne	3	17870.40	53,611.20
22.38	High yield steel (any diameter).	tonne	3	18604.80	55,814.40
22.39	Fine aggregate for concrete.	m3	200	403.20	80,640.00
22.40	Coarse aggregate for concrete, maximum size 20mm.	m3	100	515.23	51,523.00
22.41	Coarse aggregate for concrete, maximum size 40mm.	m3	100	515.23	51,523.00
22.42	Graded crushed stone for subbase and base.	m3	100	552.04	55,204.00
22.43	Wrought shuttering timber.	m2	100	217.09	21,709.00
22.44	Unwrought shuttering timber.	m2	100	217.09	21,709.00
22.45	Timbering for trenches.	m2	100	217.09	21,709.00
22.46	Cut back bitumen, Grade MC 30.	litre	1,000	18.97	18,970.00
22.47	Cut back bitumen, Grade MC 3000.	litre	1,000	21.79	21,790.00
22.48	Emulsion, K1-60	litre	1,000	13.40	13,400.00
22.48	Straight-run bitumen, Grade 80/100.	litre	1,000	8.45	8,450.00
22.49	10/14mm nominal size chippings.	m3	200	586.99	117,398.00
22.50	3/6mm nominal size chippings.	m3	200	586.99	117,398.00
Sub total (22)					6,460,873.80

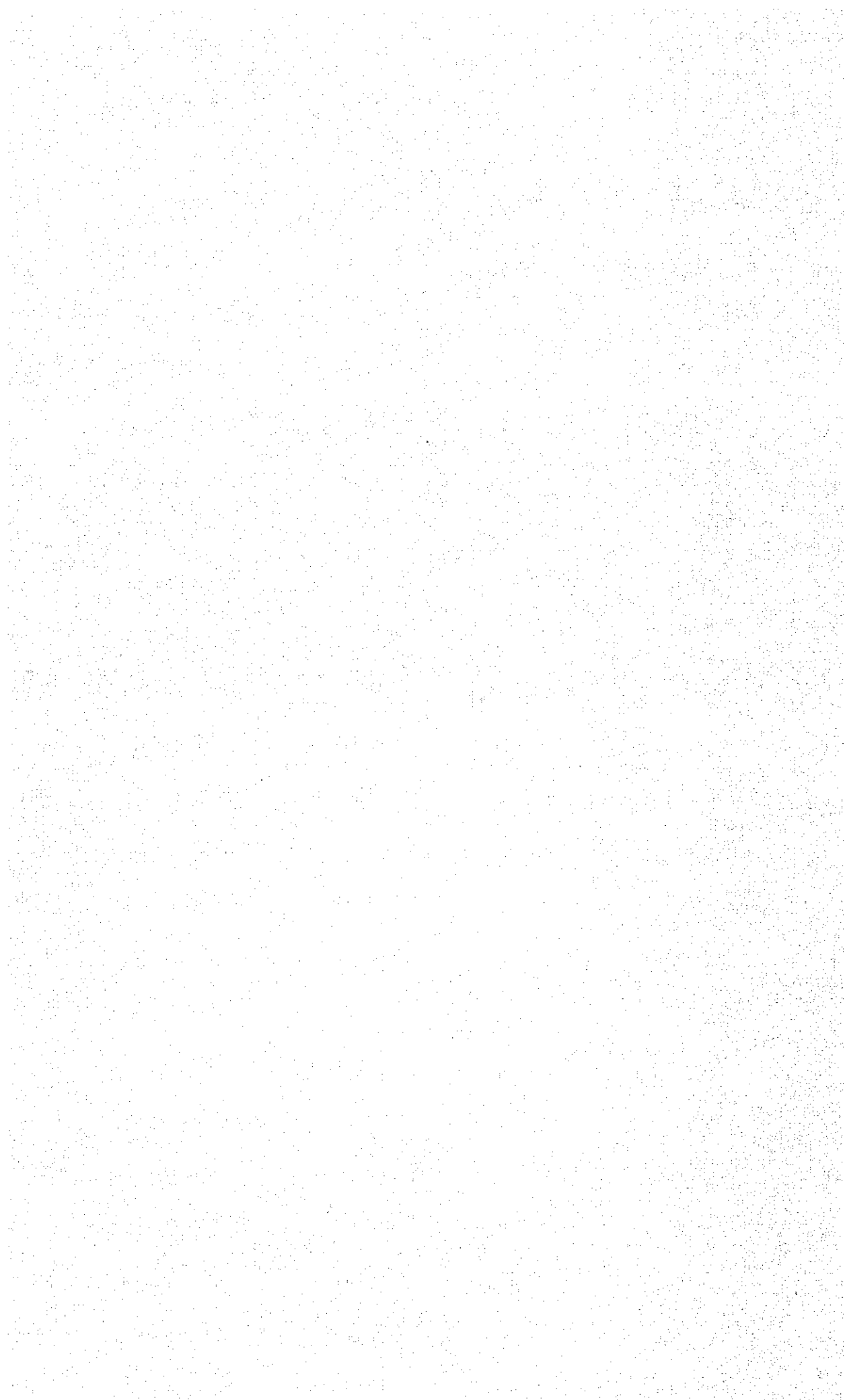


BILL OF QUANTITIES No.23  
PILING

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
23.01	Mobilization of all the necessary plant for the piling operation, setting up on the position of the first pile and removal on completion of the last pile.	L.S.			106,000.00
23.02	Move and set up each pile position.	No.	96	1087.30	104,380.80
23.03	Supply of steel pipe piles 500 mm dia., 9 mm thick.	m	816	4181.37	3,411,997.92
23.04	Driving piles of 500 mm dia. including positioning and pitching. Include for cutting pile heads to correct level.	m	816	332.51	271,328.16
	Sub total (23)				3,893,706.88









**APPENDIX C      DETAILED DIRECT CONSTRUCTION COST**  
**(FC, LC and VAT)**



# SUMMARY OF BILLS OF QUANTITIES

BILL NO.	DESCRIPTION	FOREIGN		LOCAL		VALU		TAX
		RATE	CURRENCY AMOUNT	RATE	CURRENCY AMOUNT	RATE	ADDED	
1	General		10,408,772.00		54,418,500.00			0.00
4	Site Clearance and Topsoil Stripping		5,420,270.78		1,998,604.46			425,593.76
5	Earthworks		179,249,421.70		65,664,780.50			15,694,224.10
7	Excavation and Filling for Structures		5,904,449.70		2,896,789.70			645,355.15
8	Culverts and Drainage Works		19,897,191.68		17,444,630.39			3,367,573.66
9	Passage of Traffic		9,972,780.26		4,413,355.94			1,669,026.73
10	Gravel Wearing Course		1,473,607.80		406,678.90			133,952.70
13	Graded Crushed Stone Subbase and Base		92,167,301.00		30,337,555.90			8,994,526.20
14A	Lean Concrete		77,909,650.20		30,960,367.50			8,412,572.80
15	Bituminous Surface Treatment and Surface Dressing		28,363,066.29		1,243,712.51			4,262,107.42
16	Bituminous Binder Course and Wearing Course		132,463,081.20		27,443,005.80			27,066,537.80
17	Concrete Works		62,428,975.50		48,174,481.52			10,974,725.50
20	Road Furniture		25,863,031.75		15,465,692.51			1,968,524.89
21	Miscellaneous		7,788,119.56		1,004,065.21			177,435.23
22	Dayworks		2,812,430.00		3,648,443.80			308,556.00
23	Piling		5,477,342.24		416,364.64			7,332.96
	Total		664,599,491.67		306,937,029.38			84,108,044.90



BILL OF QUANTITIES No.1  
GENERAL

Estimated at  
VAT included.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	Estimated at VAT included.	
								VALU RATE	TAX AMOUNT
1.01	Provide, furnish and maintain the rented accommodation for the Engineer's Representative and his staff:								
	(1) Type I (senior staff house), 1No.	Month	30	0.00	0.00	22000.00	660,000.00	0.00	0.00
	(2) Type II (senior staff house), 5Nos.	Month	130	0.00	0.00	17000.00	2,210,000.00	0.00	0.00
	(3) Type III (junior staff house), 3Nos.	Month	90	0.00	0.00	12000.00	1,080,000.00	0.00	0.00
	(4) Type IV (junior staff house), 5Nos.	Month	150	0.00	0.00	7500.00	1,125,000.00	0.00	0.00
1.02	Provide, equip and maintain Main Office for the Engineer's Representative and his staff.	No.	1	567000.00	567,000.00	567000.00	567,000.00	0.00	0.00
1.03	Provide and maintain laboratory for the Engineer's Representative and his staff.	No.	1	347000.00	347,000.00	347000.00	347,000.00	0.00	0.00
1.04	Provide and maintain furniture and office equipment for the Engineer's office and Laboratory as listed in the Special Specification, all to the satisfaction of the Engineer.	Lump Sum			747,300.00		259,500.00		0.00
1.05	Provide survey and laboratory equipment as listed in the Special Specification.	Lump Sum			8,747,472.00		0.00		0.00
1.06	Provide with driver and maintain one (1) new 504 Peugeot or equivalent with a minimum engine capacity of 1800 cc. approved by the Resident Engineer, inclusive of the first 3000 km travelled in any one month.	Veh. Month	30	0.00	0.00	40000.00	1,200,000.00	0.00	0.00
1.07	E.O. Item 1.06 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	100,000	0.00	0.00	6.00	600,000.00	0.00	0.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
1.08	As for Item 1.06 but three (3) new LWB 4WD Land Rovers or equivalent with a minimum engine capacity of 2300 cc., inclusive of the first 3000 km travelled in any one month.	Veh. Month	90	0.00	0.00	44000.00	3,950,000.00	0.00	0.00
1.09	E.O. Item 1.08 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	400,000	0.00	0.00	11.50	4,600,000.00	0.00	0.00
1.10	As for Item 1.06 but three (3) new Subaru or equivalent with a minimum engine capacity of 1800 cc., inclusive of the first 3000 km travelled in any one month.	Veh. Month	90	0.00	0.00	38000.00	3,420,000.00	0.00	0.00
1.11	E.O. Item 1.10 for distance in excess of 3000 km travelled in any one month, inclusive of fuels, lubricants, tyres and additional servicing.	km	300,000	0.00	0.00	7.00	2,100,000.00	0.00	0.00
1.12	Prime Cost Sum of Shs.22,100,000 for removals and alterations to following existing services:								
	(1) Telecommunication line	P.C. Sum		0.00			1,600,000.00		0.00
	(2) Electric line	P.C. Sum		0.00			8,900,000.00		0.00
	(3) Water pipe line	P.C. Sum		0.00			4,600,000.00		0.00
	(4) Railway	P.C. Sum		0.00			4,500,000.00		0.00
	(5) Sewerage pipe line	P.C. Sum		0.00			1,600,000.00		0.00
	(6) Existing street lighting	P.C. Sum		0.00			100,000.00		0.00
	(7) Electric fence of National Park	P.C. Sum		0.00			500,000.00		0.00





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALUE ADDED RATE	TAX AMOUNT
	(8) Fence of Kenya Rifles	P.C. Sum			0.00		300,000.00		0.00
1.13	Include percentage of P.C. Sum in Item 1.12 for Contractor's cost and profit.	% of Item 1.12	20		0.00		4,420,000.00		0.00
1.14	Prime Cost Sum of Shs.3,000,000 for the compensation and acquisition of land.	P.C. Sum			0.00		3,000,000.00		0.00
1.15	Include percentage of P.C. Sum in Item 1.14 for Contractor's cost and profit.	% of Item 1.14	40		0.00		1,200,000.00		0.00
1.16	Prime Cost Sum of Shs.600,000 for the Engineer's Miscellaneous Account.	P.C. Sum			0.00		600,000.00		0.00
1.17	Include percentage of P.C. Sum in Item 1.16 for Contractor's cost and profit.	% of Item 1.16	20		0.00		120,000.00		0.00
1.18	Provide and erect publicity signs as directed by the Engineer, all in accordance with MOW DRG.NO.SS/234.	No.	10	0.00	0.00	25000.00	250,000.00	0.00	0.00
1.19	Prime cost sum of K.Shs. 500,000 for the rectification of title deeds of acquired lands.	P.C. Sum			0.00		500,000.00		0.00
1.20	Include percentage of P.C Sum in Item 1.19 for Contractor's cost and profit.	% of Item 1.19	20		0.00		100,000.00		0.00
	Sub total (1)				10,408,772.00		54,418,500.00		0.00



**BILL OF QUANTITIES No.4  
SITE CLEARANCE AND TOPSOIL STRIPPING**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU ADDED RATE	TAX AMOUNT
4.01	Clear site in Open Country, including removal of trees, hedges, bushes and other vegetation and objectionable organic material, grub up roots and backfill to 95% MDD ASHTO T.99 with approved material all in accordance with the Specification.	ha	126.2	4160.60	525,067.72	1086.90	137,166.78	202.30	25,530.26
4.02	As for Item 4.01 but to clear site in forest area.	ha	45.3	8736.20	395,749.86	2499.60	113,231.88	607.00	27,497.10
4.03	Removal topsoil to a depth as directed by the Engineer and dispose of to spoil dump or stockpile for re-use as directed by the Engineer.	m3	106,700	38.62	4,120,754.00	10.75	1,147,025.00	3.20	341,440.00
4.04	Scarify and remove to stockpile existing pavement material as directed by the Engineer.	m3	2,720	101.36	275,699.20	27.64	75,180.80	8.87	24,126.40
4.05	Demolish existing railway bridge and remove debris to spoil over any distance, backfill voids and compact to 105% MDD as necessary.	Lump Sum			103,000.00		26,000.00		7,000.00
4.06	Allow a Provisional Sum to be expended on a daywork basis for the removal of existing structures, fences and other obstructions.	Prov. Sum			0.00		500,000.00		0.00
	Sub total (4)				5,420,270.78		1,998,604.45		425,593.76



**BILL OF QUANTITIES No. 5  
EARTHWORKS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
5.01	Fill in soft material for main road and service road, and compact to at least 95% MDD AASHTO T.99.	m3	1,234,300	71.89	88,733,827.00	20.33	25,093,319.00	6.03	7,442,829.00
5.02	As for Item 5.01 but for slip roads and approach roads.	m3	196,400	71.89	14,119,196.00	20.33	3,992,812.00	6.03	1,184,292.00
5.03	As for Item 5.01 but hauling from drainage pond excavation works as shown on the Drawings.	m3	7,720	71.41	551,285.20	20.24	156,252.80	6.03	46,551.60
5.04	As for Item 5.01 but for new railway embankment.	m3	5,480	71.41	391,326.80	20.24	110,915.20	6.03	33,044.40
5.05	Fill in hard material for main road.	m3	104,900	197.72	20,740,828.00	48.68	5,106,532.00	11.07	1,161,243.00
5.06	Fill in soft material for central reserves as shown on the Drawings.	m3	11,400	81.17	925,338.00	75.45	860,130.00	7.61	86,754.00
5.07	Fill in soft material adjacent to shoulders as shown on the Drawings.	m3	3,310	81.17	268,672.70	75.45	249,739.50	7.61	25,189.10
5.08	Spoil in unsuitable material such as black cotton and rubbish.	m3	189,500	72.50	13,738,750.00	20.23	3,833,585.00	6.51	1,233,645.00
5.09	Spoil in soft material.	m3	5,000	72.50	362,500.00	20.23	101,150.00	6.51	32,550.00
5.10	Spoil in hard material.	m3	1,000	242.36	242,360.00	58.26	58,260.00	14.97	14,970.00
5.11	Overhaul earthworks in excess of 1.0 km free haul.	m3.km	3,432,300	7.74	26,566,002.00	1.89	6,487,047.00	0.86	2,951,778.00
5.12	Excavation in swamps.	m3	1,000	89.16	89,160.00	25.50	25,600.00	6.14	6,140.00
5.13	Provide and place rockfill in accordance with the Specification.	m3	1,000	196.70	196,700.00	48.45	48,450.00	10.90	10,900.00
5.14	Compact original ground below fills to at least 95% MDD AASHTO T.99 including all necessary scarifying and watering as directed by the Engineer, to a depth of 150mm below ground level.	m3	62,600	13.30	832,580.00	4.28	267,928.00	0.56	35,056.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
5.15	E.O.Item 5.01 to 5.05 for compaction of 300mm subgrade material to at least 100% MDD AASHTO T.99 in Fill area.	m3	121,700	6.65	809,305.00	2.14	260,438.00	0.28	34,076.00
5.16	Compact in-situ subgrade in Cut area to a depth of 300mm below formation level to at least 100% MDD AASHTO T.99.	m3	100,200	13.30	1,332,660.00	4.28	428,856.00	0.56	56,112.00
5.17	Compact in-situ subgrade material in Cut area between 150mm and 300mm below underside of imported subgrade material to at least 95% MDD AASHTO T.99.	m3	1,000	13.30	13,300.00	4.28	4,280.00	0.56	560.00
5.18	Compact in-situ subgrade material in Cut area between 0mm and 150mm below underside of imported subgrade material to at least 100% MDD AASHTO T.99.	m3	1,000	6.65	6,650.00	2.14	2,140.00	0.28	280.00
5.19	Provide, place and compact improved subgrade material in locations where directed by the Engineer.	m3	1,000	85.55	85,550.00	24.07	24,070.00	7.60	7,600.00
5.20	Rock formation levelling in Cut area below lean concrete base level or as directed by the Engineer.	m2	72,100	14.44	1,041,124.00	10.56	761,376.00	1.56	112,476.00
5.21	Haul from stockpile and spread on side-slopes and central reserves, lightly roll and compact 75mm thickness of topsoil.	m2	335,700	5.52	1,853,064.00	4.54	1,524,078.00	0.50	167,850.00
5.22	Haul from stockpile and spread on black cotton spoil area, lightly roll and compact 200mm thickness of topsoil in locations as directed by the Engineer.	m2	69,100	13.35	922,485.00	6.70	462,970.00	1.17	80,847.00
5.23	Haul from stockpile and spread on rubbish spoil area and side borrow area, and compact topsoil or as directed by the Engineer.	m3	15,400	74.80	1,151,920.00	22.19	341,726.00	6.17	95,018.00
5.24	Plant fillslopes and cutslopes with selected grass in accordance with the Specification, including the establishment of plant nurseries where required.	m2	773,000	0.00	0.00	18.29	14,138,170.00	0.62	479,260.00





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU ADDED TAX RATE	TAX AMOUNT
5.25	Provide, place and compact filter material for drainage layer and sand mat in locations where directed by the Engineer.	m3	1,000	277.05	277,050.00	208.89	208,890.00	79.80	79,800.00
5.26	Fill for new national park boundary dike including demolishing existing dike.	m3	58,300	65.36	3,810,488.00	18.82	1,097,206.00	5.41	315,403.00
5.27	Filter fabric for rockfill.	m2	1,000	187.30	187,300.00	18.86	18,860.00	0.00	0.00
Sub total (5)					179,249,421.70		65,664,780.50		15,694,224.10



**BILL OF QUANTITIES No.7**  
**EXCAVATION AND FILLING FOR STRUCTURES**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
BRIDGES									
7.01	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	5,330	85.68	456,674.40	22.37	119,232.10	6.58	35,071.40
7.02	E.O. Item 7.01 at any location for excavation in hard materials.	m3	1,230	259.05	318,631.50	61.48	75,620.40	14.59	17,945.70
7.03	Backfilling with selected material behind bridge abutment, wing walls and around structures.	m3	4,980	85.90	427,782.00	55.18	274,796.40	8.13	40,487.40
7.04	Provide and place porous filter material behind bridge abutments and wing walls.	m3	300	277.05	83,115.00	208.89	62,667.00	79.80	23,940.00
7.05	Provide and place selected granular fill material.	m3	200	313.42	62,684.00	116.25	23,250.00	27.87	5,574.00
BOX CULVERTS									
7.06	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	15,680	85.68	1,343,462.40	22.37	350,751.60	6.58	103,174.40
7.07	E.O. Item 7.06 at any location for excavation in hard materials.	m3	300	259.05	77,715.00	61.48	18,444.00	14.59	4,377.00
7.08	Backfilling with selected material behind box culvert walls and around structures.	m3	22,670	85.90	1,947,353.00	55.18	1,250,930.60	8.13	184,307.10
7.09	Provide and place porous filter material behind box culvert walls.	m3	1,990	277.05	551,329.50	208.89	415,691.10	79.80	158,802.00
7.10	Provide and place selected granular fill material.	m3	1,420	313.42	445,056.40	116.25	165,075.00	27.87	39,575.40
7.11	Excavation and backfilling for gabions in soft material.	m3	275	0.00	0.00	90.95	25,011.25	0.00	0.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
7.12	Provide and place gabion mesh, 0.5m thick as shown Drawings or directed by the Engineer.	m2	550	194.72	107,096.00	155.98	85,789.00	46.89	25,789.50
7.13	Provide and place rockfill to gabions.	m3	275	303.82	83,550.50	107.35	29,521.25	22.95	6,311.25
	Sub total (7)				5,904,449.70		2,896,789.70		645,355.15



**BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
8.01	Excavate in soft material for pipe culverts below existing ground level or road formation level including support of trench sides, backfilling and compact-ion at least 95% MDD AASHTO T.99 up to new road formation level or ground level whichever is the lower, dewatering, and carting surplus material to spoil dump.	m3	3,970	94.98	377,070.60	40.66	161,420.20	7.71	30,608.70
8.02	As for Item 8.01 but for inlets and outlets of culverts.	m3	2,970	94.98	282,090.60	40.66	120,760.20	7.71	22,898.70
8.03	Excavate in soft material for earth channel, drain type I.	m3	5,650	85.68	484,092.00	22.37	126,390.50	6.58	37,177.00
8.04	Excavate in soft material for stone pitching channel, drain type II.	m3	3,900	85.68	334,152.00	22.37	87,243.00	6.58	25,662.00
8.05	Excavate in soft material for concrete channel, drain type III.	m3	3,690	85.68	316,159.20	22.37	82,545.30	6.58	24,280.20
8.06	Excavate in soft material for concrete channel with cascade, drain type VII.	m3	5,600	85.68	479,808.00	22.37	125,272.00	6.58	36,843.00
8.07	Excavate and backfill for gully pots in soft material.	m3	180	94.98	17,096.40	40.66	7,318.80	7.71	1,387.80
8.08	Excavate and backfill for concrete ditch type VI, in soft material.	m3	540	94.98	51,289.20	40.66	21,956.40	7.71	4,163.40
8.09	Excavate and backfill for gabions in soft material.	m3	580	0.00	0.00	90.95	52,751.00	0.00	0.00
8.10	Excavate for subsoil drains in soft material.	m3	460	0.00	0.00	90.95	41,837.00	0.00	0.00

**NOTE:**

No separate payment shall be made the haulage of surplus or unsuitable excavated material and the cost of such haulage shall be included in the rates and prices.





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALUE RATE	ADDED TAX AMOUNT
8.11	E.O.Item 8.01 to 8.10 at any location for excavation in hard materials.	m3	500	259.05	129,525.00	61.48	30,740.00	14.59	7,295.00
8.12	Provide and place filter fabric to subsoil drains.	m2	3,040	93.65	284,696.00	9.43	28,667.20	0.00	0.00
8.13	Provide and place crushed rock backfill to subsoil drains.	m3	420	313.42	131,636.40	116.25	48,825.00	27.87	11,705.40
8.14	Provide and place perforated 200mm dia. PVC pipe to subsoil drains.	m	1,265	389.85	493,160.25	35.26	44,603.90	0.00	0.00
8.15	Provide, lay and joint 300mm I.D. concrete pipes ogee jointed.	m	155	209.88	32,531.40	203.19	31,494.45	58.00	8,990.00
8.16	As for Item 8.15 but 600mm I.D.	m	1,031	619.81	639,024.11	782.19	806,437.89	178.88	184,425.28
8.17	As for Item 8.15 but 750mm I.D.	m	90	923.63	83,126.70	961.91	86,571.90	273.99	24,659.10
8.18	As for Item 8.15 but 900mm I.D.	m	1,067	1160.37	1,238,114.79	1469.64	1,568,105.88	343.51	366,525.17
8.19	As for Item 8.15 but 1200mm I.D.	m	294	1866.73	548,818.62	2218.69	652,294.86	560.32	164,734.08
8.20	Provide, place and compact class 15/20, concrete bed and surround to concrete pipes, including formwork.	m3	2,520	1499.31	3,778,261.20	1120.87	2,824,592.40	198.49	500,194.80
8.21	As for Item 8.20 but concrete facing for drain ditch on berm, drain type VIII.	m2	1,280	67.91	86,924.80	28.68	36,710.40	9.09	11,635.20
8.22	Provide, place and compact class 25/20 concrete for headwalls, wingwalls, aprons and toe walls to pipe culverts including all formwork and provision and placing of fabric mesh reinforcement as shown in the Drawings.	m3	924	1901.02	1,756,542.48	2081.92	1,923,694.08	271.88	251,217.12
8.23	As for Item 8.22 but class 15/20 for concrete channel, drain type III and VII.	m3	1,330	1504.61	2,001,131.30	901.96	1,199,633.40	204.34	271,772.20
8.24	Provide, place and compact class 20/20 concrete for concrete ditch, drain type VI including all formwork and placing of reinforcement as shown in the Drawings.	m3	94	3093.60	290,798.40	5833.36	548,335.84	514.36	48,349.84



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
8.25	Provide, place and compact class 20/20 concrete for gulley pot including all formwork.	m3	63	2182.53	137,499.39	4085.02	257,356.26	312.49	19,686.87
8.26	As for Item 8.24 but concrete cover of gulley pot.	No.	168	187.05	31,424.40	298.72	50,184.96	30.30	5,090.40
8.27	Provide and place 50mm dia. PVC weep holes.	No.	45	13.95	627.75	4.47	201.15	0.00	0.00
8.28	Excavate as necessary, provide all materials and construct 150mm thick grouting stone pitching to bed and side-slopes of drains, ditches, channels, ground faces, inlets and outlets of culverts, including carting of excavated material to spoil, as directed by the Engineer.	m2	26,090	129.78	3,385,960.20	118.49	3,091,404.10	16.71	435,963.90
8.29	As for Item 8.28 but 250mm building stone at concrete channel with cascade.	m2	1,730	0.00	0.00	235.29	407,051.70	27.00	46,710.00
8.30	Cement screen on building stone.	m2	1,730	25.39	43,924.70	27.68	47,886.40	5.37	9,290.10
8.31	Provide and place gabion mesh, 1m thick, as shown on Drawings or directed by the Engineer.	m2	430	242.19	104,141.70	183.00	78,690.00	58.48	25,146.40
8.32	Provide and place mattresses, 0.3m thick, as shown on Drawings or directed by the Engineer.	m2	467	111.77	52,196.59	108.76	50,790.92	26.91	12,566.97
8.33	Provide and place rockfill to gabions and mattresses.	m3	570	303.82	173,177.40	107.35	61,189.50	22.95	13,081.50
8.34	Provide and place filter fabric under and/or behind gabions.	m2	335	93.65	31,372.75	9.43	3,159.05	0.00	0.00
8.35	Excavate trench, provide, lay and joint 450 x 225mm P.C.C. invert block drains (I.B.D.) having 300mm dia. channel.	m	507	124.14	62,938.98	150.13	76,115.91	35.66	18,079.62
8.36	Provide and lay 75mm thick P.C.C. side slabs to I.B.D. Channel.	m2	477	114.49	54,611.73	163.19	77,841.63	40.48	19,308.96
8.37	Excavate trench, provide, lay and joint 375 x 250mm P.C.C. invert block drain, drain type IV.	m	15,440	116.90	1,804,936.00	144.14	2,225,521.60	44.00	679,360.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU ADDED TAX RATE	TAX AMOUNT
8.38	As for Item 8.37 but for on berm, drain type VIII.	m	740	116.90	86,506.00	144.14	106,663.60	44.00	32,560.00
8.39	Excavate, provide all materials and construct kerb inlet at busbays as detailed on the Drawings.	No	32	46.00	1,472.00	59.63	1,908.16	14.40	460.80
8.40	Excavate, provide all materials and construct intake block channel at busbays as detailed on the Drawings.	No	32	46.00	1,472.00	58.66	2,197.12	14.40	460.80
8.41	Provide and place concrete class 15 for 250 x 150mm in-situ gutters.	m	48	279.57	13,419.36	364.31	17,486.88	36.89	1,770.72
8.42	Provide and place selected granular fill material for gravell bedding.	m3	79	313.42	24,760.18	116.25	9,183.75	27.87	2,201.73
8.43	Plant channel slopes with selected grass in accordance with the Specification.	m2	11,330	0.00	0.00	18.29	207,225.70	0.62	7,024.60
8.44	Earth dike of drainage pond.	m3	710	71.41	50,701.10	20.24	14,370.40	6.03	4,281.30
	Sub total (8)				19,897,191.68		17,444,630.39		3,367,573.66



**BILL OF QUANTITIES No.9  
PASSAGE OF TRAFFIC**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
9.01	Provide and maintain signs and barriers in locations as directed by the Engineer.	km	19.0	0.00	0.00	35000.00	665,000.00	0.00	0.00
9.02	Construct and maintain 7.0m wide deviations including drainage, pavement type Deviation-1(Mombasa Road Junction).	km	1.0	2356270.00	2,356,270.00	618670.00	618,670.00	326850.00	326,850.00
9.03	As for Item 9.02 but pavement type Deviation-1(Uhuru Monument Junction).	km	0.3	2356270.00	706,881.00	618670.00	185,501.00	326850.00	98,055.00
9.04	As for Item 9.02 but pavement type Deviation-2(Ngong Road Junction and Dagoretti Forest Junction).	km	1.3	497150.00	646,295.00	101490.00	131,937.00	53790.00	69,927.00
9.05	Construct and maintain 6.0m wide deviations including drainage, pavement type Deviation-3.	km	0.9	226690.00	204,021.00	62870.00	56,583.00	21350.00	19,215.00
9.06	Construct and maintain 3.0m wide deviations including drainage, pavement type Deviation-4.	km	2.5	114840.00	287,100.00	31430.00	78,575.00	10670.00	26,675.00
9.07	Reinstatement of deviations and existing drainages.	Lump Sum			407,100.00		103,700.00		52,300.00
9.08	Reinstatement of existing road after the completion of cross drainage works, Mombasa Road Junction.	m2	70	554.08	38,785.60	147.64	10,334.80	86.20	6,034.00
9.09	Reinstatement of existing road after the completion of cross drainage works, Kikuyu Junction.	m2	35	175.50	6,142.50	51.10	1,788.50	17.61	616.35
9.10	Maintenance of the project road (main road, slip road, approach road and service road) used for the deviation purpose as specified.	Lump Sum			590,000.00		121,300.00		113,000.00
9.11	Improvement of the existing road as instructed and approved by the Engineer.								
	(1) Improved subgraded material.	m3	100	85.55	8,555.00	24.07	2,407.00	7.60	760.00
	(2) Gravel wearing course.	m3	600	255.21	153,126.00	69.85	41,910.00	23.72	14,232.00





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU ADDED TAX RATE	TAX AMOUNT
	(3) Graded crushed stone base.	m3	50	638.87	31,943.50	211.04	10,552.00	58.91	2,945.50
	(4) MC3000 first seal coat.	litre	150	21.84	3,276.00	0.57	85.50	3.40	510.00
	(5) Chippings, 3/6mm.	m3	2	640.33	1,280.66	196.07	392.14	44.44	88.88
9.12	Maintenance of Existing Roads used for heavy construction traffic as specified when and where directed by the Engineer.	km	30	0.00	0.00	50000.00	1,500,000.00	0.00	0.00
9.13	Re-carpeting of Existing Roads 6m wide or pro rata as specified when and where directed by the Engineer.	m3	1,800	2517.78	4,532,004.00	491.40	884,520.00	521.01	937,818.00
	Sub total (9)				9,972,780.26		4,413,355.94		1,669,026.73



BILL OF QUANTITIES NO.10  
GRAVEL WEARING COURSE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALUE ADDED TAX RATE	TAX AMOUNT
10.01	Clear site of the material site.	ha	1.0	4160.60	4,160.60	1086.90	1,086.90	202.30	202.30
10.02	Construct access road to the material site in excess of 200m in length.	km	1.0	212460.00	212,460.00	60340.00	60,340.00	18480.00	18,480.00
10.03	Excavate and spoil topsoil and overburden in the material site.	m3	4,000	38.62	154,480.00	10.75	43,000.00	3.29	12,800.00
10.04	Excavate gravel wearing course material, transport, spread and compact to at least 95% MDD AASHTO T.180 for service roads.	m3	4,320	255.21	1,102,507.20	69.85	301,752.00	23.72	102,470.40
Sub total (10)					1,473,607.80		406,678.90		133,952.70



**BILL OF QUANTITIES No.13**  
**GRADED CRUSHED STONE FOR SUBBASE AND BASE**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
13.01	Provide, spread and compact graded crushed stone to subbase for main road.	m3	84,490	594.55	50,233,529.50	195.69	16,533,848.10	58.07	4,906,334.30
13.02	As for Item 13.01 but for slip road.	m3	14,020	594.55	8,335,591.00	195.69	2,743,573.80	58.07	814,141.40
13.03	As for Item 13.01 but for approach road and service road.	m3	3,030	594.55	1,801,486.50	195.69	592,940.70	58.07	175,952.10
13.04	Provide, spread and compact graded crushed stone to base for slip road, approach road and service roads.	m3	2,150	638.87	1,373,570.50	211.04	453,736.00	58.91	126,656.50
13.05	Provide, spread and compact graded crushed stone to shoulder for main road.	m3	43,810	594.55	26,047,235.50	195.69	8,573,178.90	58.07	2,544,046.70
13.06	As for Item 13.05 but for slip road.	m3	6,360	594.55	3,781,338.00	195.69	1,244,588.40	58.07	369,325.20
13.07	As for Item 13.05 but for approach road and service road.	m3	1,000	594.55	594,550.00	195.69	195,690.00	58.07	58,070.00
Sub total (13)					92,167,301.00		30,337,555.90		8,994,526.20



BILL OF QUANTITIES No.14A  
LEAN CONCRETE FOR BASE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
14.01	Provide process mix, transport, spread and compact lean concrete base material for main road at 4% nominal cement content by weight of total mix.	m3	90,340	760.02	68,660,206.80	285.65	25,805,621.00	81.28	7,342,835.20
14.02	As for Item 14.01 but for slip road.	m3	11,150	760.02	8,474,223.00	285.65	3,184,997.50	81.28	906,272.00
14.03	As for Item 14.01 but for approach road.	m3	1,020	760.02	775,220.40	285.65	291,363.00	81.28	82,905.60
14.04	Protecting and curing lean concrete base.	m2	515,500	0.00	0.00	2.00	1,031,000.00	0.00	0.00
14.05	Variation in cement content (Provisional).	tonne	200	0.00	0.00	3236.93	647,386.00	402.80	80,560.00
Sub total (14A)					77,909,650.20		30,960,367.50		8,412,572.80





**BILL OF QUANTITIES No.15  
BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
<p><b>NOTE:</b></p> <p>No haulage will be paid for bitumen or chippings and this shall be included in the following rates and prices.</p>									
<b>PRIME COAT</b>									
15.01	Prepare surface of base, provide, transport, heat as specified and spray MC 30 prime coat at a nominal spray rate of 1.0 litre/m <sup>2</sup> for main road.	litre	411,550	19.06	7,844,143.00	0.50	205,775.00	2.97	1,222,303.50
15.02	As for Item 15.01 but for slip road.	litre	55,740	19.06	1,062,404.40	0.50	27,870.00	2.97	165,547.80
15.03	As for Item 15.01 but for approach road.	litre	4,600	19.06	87,676.00	0.50	2,300.00	2.97	13,662.00
<b>TACK COAT</b>									
15.04	Prepare surface of binder course, provide, transport, heat as specified and spray MC 3000 cut-back bitumen tack coat at nominal spray rate of 0.6 litre/m <sup>2</sup> for main road.	litre	493,860	21.84	10,785,902.40	0.57	281,500.20	3.40	1,679,124.00
15.05	As for Item 15.04 but for slip road.	litre	44,220	21.84	965,764.80	0.57	25,205.40	3.40	150,348.00
15.06	As for Item 15.04 but for approach road.	litre	5,520	21.84	120,556.80	0.57	3,146.40	3.40	18,768.00
<b>SURFACE DRESSING</b>									
<b>(Double Surface Dressing)</b>									
15.07	Provide, heat and spray MC3000 cut-back bitumen at a nominal spray rate of 1.3 litres/m <sup>2</sup> as first seal coat.	litre	209,610	21.84	4,577,882.40	0.57	119,477.70	3.40	712,674.00
15.08	As for Item 15.07 but at a nominal rate of 0.3 litre/m <sup>2</sup> as second seal coat.	litre	48,370	21.84	1,056,400.80	0.57	27,570.90	3.40	164,458.00
15.09	Provide, transport, lay and roll 10/14mm chippings at a rate of 69 m <sup>2</sup> /m <sup>3</sup> .	m <sup>3</sup>	2,340	582.12	1,362,160.80	178.25	417,105.00	40.40	94,536.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU ADDED TAX RATE	TAX AMOUNT
15.10	As for Item 15.09 but 3/6mm chippings at a rate of 250 m2/m3. (Single Surface Dressing)	m3	645	640.33	413,012.85	196.07	126,485.15	44.44	28,653.80
15.11	Provide, heat and spray MC3000 cut-back bitumen at a nominal spray rate of 0.6 litres/m2.	litre	3,170	21.84	69,232.80	0.57	1,806.90	3.40	10,778.00
15.12	Provide, transport, lay and roll 3/6mm chippings at a rate of 189 m2/m3.	m3	28	640.33	17,929.24	196.07	5,489.96	44.44	1,244.32
	Sub total (15)				28,363,066.29		1,243,712.61		4,262,107.42



**BILL OF QUANTITIES No.16  
BITUMINOUS BINDER COURSE AND WEARING COURSE**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY		LOCAL CURRENCY		VALUE ADDED TAX	
				RATE	AMOUNT	RATE	AMOUNT	RATE	AMOUNT
16.01	Provide, lay and compact Asphalt Concrete Binder Course using 5.5% nominal bitumen content by weight of total mix for main road.	m3	32,930	2330.98	76,759,171.40	483.64	15,926,265.20	466.23	15,352,953.90
16.02	As for Item 16.01 but for slip road.	m3	3,430	2330.98	7,995,261.40	483.64	1,658,885.20	466.23	1,599,168.90
16.03	As for Item 16.01 but for approach road.	m3	460	2330.98	1,072,250.80	483.64	222,474.40	466.23	214,465.80
16.04	Provide, lay and compact Asphalt Concrete Wearing Course using 6.5% nominal bitumen content by weight of total mix for main road.	m3	16,460	2517.78	41,442,658.80	491.40	8,088,444.00	521.01	8,575,824.60
16.05	As for Item 16.04 but for slip road.	m3	2,230	2517.78	5,614,649.40	491.40	1,095,822.00	521.01	1,161,852.30
16.06	As for Item 16.04 but for approach road.	m3	230	2517.78	579,089.40	491.40	113,022.00	521.01	119,832.30
16.07	80/100 penetration bitumen binder variation.	litre	Rate only						
16.08	Supply and mix in mineral filler for variation as directed by the Engineer.	tonne	100	0.00	0.00	3236.93	323,693.00	402.80	40,280.00
16.09	As for Item 16.08 but to sand.	tonne	50	0.00	0.00	288.00	14,400.00	43.20	2,160.00
	Sub total (16)				133,463,081.20		27,443,005.80		27,066,537.80

**NOTE:**

No haulage shall be paid for in respect of any of the items or materials contained in this Bill of Quantities and the cost of such haulage shall be deemed to be included in the rates entered below.



**BILL OF QUANTITIES No.17**  
**CONCRETE WORKS**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
<b>BRIDGES</b>									
<b>Concrete:</b>									
Provide, place and compact the following classes of concrete for insitu works as specified.									
17.01	Class 15/40 for blinding concrete on all structures.	m3	180	1251.52	225,273.60	669.87	120,576.60	177.54	31,975.20
17.02	Class 25/20 for structural concrete in:								
	(1) Bridges for Mombasa Road Junction, Uhuru Monument Junction and Railway.	m3	2,880	1572.10	4,527,648.00	667.31	1,921,852.80	214.21	616,924.80
	(2) Vehicle bridges.	m3	1,090	1572.10	1,713,589.00	667.31	727,367.90	214.21	233,488.90
	(3) Pedestrian bridges.	m3	90	1572.10	141,489.00	667.31	60,057.90	214.21	19,278.90
17.03	Class 30/20 for structural concrete.	m3	2,120	1600.83	3,393,759.60	590.76	1,464,411.20	223.29	473,374.80
17.04	Provide UF2 finish to concrete surface.	m2	5,830	6.93	40,401.90	34.63	201,892.90	1.14	6,646.20
<b>Formwork:</b>									
Provide, erect and afterwards dismantle and remove the Items specified below:									
17.05	Formwork to achieve class F1 finish:								
	(1) Sloping	m2	86	95.69	8,229.34	270.84	23,292.24	8.08	594.88
	(2) Vertical	m2	2,660	70.52	187,583.20	273.59	727,749.40	8.32	22,131.20
17.06	Formwork to achieve class F2 finish:								
	(1) Horizontal	m2	3,450	118.42	408,549.00	373.65	1,289,092.50	13.22	45,609.00
	(2) Sloping	m2	218	94.74	20,653.32	298.92	65,164.55	10.58	2,306.44
	(3) Vertical	m2	9,050	69.33	627,436.50	346.31	3,134,105.50	11.44	103,532.00





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALUE ADDED TAX RATE	TAX AMOUNT
17.07	Provide and fix in position high tensile steel reinforcement bars to BS 4461 of diameter equal to or less than 16mm.	tonne	202.0	11776.80	2,378,913.60	9724.70	1,964,389.40	2835.90	572,851.80
17.08	As for Item 17.07 but of diameter greater than 16mm.	tonne	482.0	11468.80	5,527,961.60	9549.40	4,602,810.80	2761.70	1,331,139.40
17.09	Provide and place 200mm wide waterstops as specified in the Drawings.	m	57	371.93	21,200.01	54.90	3,129.30	0.00	0.00
17.10	Provide and place 20mm thick joint filler	m2	36	524.85	18,894.60	48.75	1,755.00	0.00	0.00
<b>BOX CULVERTS</b>									
<b>Concrete:</b>									
Provide, place and compact the following classes of concrete for insitu works as specified.									
17.11	Class 15/40 for blinding concrete on all structures.	m3	588	1251.52	735,893.76	669.87	393,883.56	177.64	104,452.32
17.12	Class 25/20 for structural concrete.								
	(1) Box culverts for road.	m3	7,820	1572.10	12,293,822.00	667.31	5,218,364.20	214.21	1,675,122.20
	(2) Box culverts for drainage.	m3	6,320	1572.10	9,935,672.00	667.31	4,217,399.20	214.21	1,353,807.20
	(3) Box culverts for footpath.	m3	646	1572.10	1,015,576.60	667.31	431,082.26	214.21	138,379.66
17.13	Provide UF2 finish to concrete surface.	m2	9,880	6.93	68,468.40	34.63	342,144.40	1.14	11,263.20
<b>Formwork:</b>									
Provide, erect and afterwards dismantle and remove the Items specified below:									
17.14	Formwork to achieve class F1 finish:	m2	12,120	70.52	854,702.40	273.59	3,315,910.80	8.32	100,838.40
	(1) Vertical								



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
17.15	Formwork to achieve class F2 finish:								
	(1) Horizontal	m2	4,000	118.42	473,680.00	373.65	1,494,600.00	13.22	52,880.00
	(2) Vertical	m2	7,450	69.33	516,508.50	346.31	2,580,009.50	11.44	85,228.00
17.16	Provide and fix in position high tensile steel reinforcement bars to BS 4461 of diameter equal to or less than 16mm.	tonne	215.0	11776.80	2,532,012.00	9724.70	2,090,810.50	2835.90	609,718.50
17.17	As for Item 17.16 but of diameter greater than 16mm.	tonne	1,225.0	11468.80	14,049,280.00	9549.40	11,698,015.00	2761.70	3,383,082.50
17.18	Provide and place 200mm wide waterstops as specified in the Drawings.	m	909	371.93	338,084.37	54.90	49,904.10	0.00	0.00
17.19	Provide and place 20mm thick joint filler	m2	712	524.85	373,693.20	48.75	34,710.00	0.00	0.00
	Sub total (17)				62,428,975.50		48,174,461.52		10,974,725.50



BILL OF QUANTITIES No.20  
ROAD FURNITURE

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	FOREIGN CURRENCY AMOUNT	LOCAL RATE	LOCAL CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
20.01	Provide and erect standard warning signs:								
	(1) Type W28,1200mm	No.	30	0.00	0.00	7000.00	210,000.00	0.00	0.00
	(2) Type W29,1200mm	No.	22	0.00	0.00	7000.00	154,000.00	0.00	0.00
	(3) Type W36,1200mm	No.	3	0.00	0.00	7000.00	21,000.00	0.00	0.00
	(4) Type W37,1200mm	No.	22	0.00	0.00	7000.00	154,000.00	0.00	0.00
20.02	Provide and erect standard priority signs:								
	(1) Type R1,1200mm	No.	10	0.00	0.00	7000.00	70,000.00	0.00	0.00
20.03	Provide and erect standard prohibitory signs:								
	(1) Type P1,1000mm	No.	1	0.00	0.00	6000.00	6,000.00	0.00	0.00
	(2) Type P25,1000mm	No.	30	0.00	0.00	6000.00	180,000.00	0.00	0.00
20.04	Provide and erect standard mandatory signs:								
	(1) Type M3,1000mm	No.	1	0.00	0.00	6000.00	6,000.00	0.00	0.00
	(2) Type M4,1000mm	No.	1	0.00	0.00	6000.00	6,000.00	0.00	0.00
20.05	Provide and erect non-standard informatory signs (advance direction signs,direction signs,route confirmatory signs):								
	(1) less than 1m2	No.	55	0.00	0.00	7000.00	385,000.00	0.00	0.00
	(2) 3m2-4m2	No.	1	0.00	0.00	18000.00	18,000.00	0.00	0.00
	(3) 4m2-5m2	No.	8	0.00	0.00	19000.00	152,000.00	0.00	0.00
	(4) 5m2-6m2	No.	10	0.00	0.00	23000.00	230,000.00	0.00	0.00
	(5) 6m2-7m2	No.	1	0.00	0.00	25000.00	25,000.00	0.00	0.00
	(6) 7m2-8m2	No.	12	0.00	0.00	27000.00	324,000.00	0.00	0.00
	(7) 8m2-9m2	No.	7	0.00	0.00	30000.00	210,000.00	0.00	0.00
	(8) 9m2-10m2	No.	1	0.00	0.00	40000.00	40,000.00	0.00	0.00
20.06	Road marking in yellow or white paint.	m2	3,430	155.03	531,752.90	19.29	66,154.70	0.78	2,675.40
20.07	Provide and fix flex beam guardrails, all in accordance with the Drawings.	m	8,590	1086.39	9,332,090.10	255.17	2,191,910.30	21.03	180,647.70



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY		LOCAL CURRENCY		VALU ADDED TAX	
				RATE	AMOUNT	RATE	AMOUNT	RATE	AMOUNT
20.08	Provide and erect road edge marker post.	No.	87	284.02	24,709.74	475.93	41,405.91	39.90	3,471.30
20.09	Provide and erect road reserve boundary post where directed by the Engineer.	No.	230	284.02	65,324.60	475.93	109,463.90	39.90	9,177.00
20.10	Plant selected grasses in the central reserves, including the establishment of plant nurseries where required.	m <sup>2</sup>	32,000	0.00	0.00	18.29	585,280.00	0.62	19,840.00
20.11	Plant selected shrubs and bushes approved by the Engineer at locations in the central reserve and road reserve boundary, including the establishment of plant nurseries where required.	No.	8,123	17.20	139,664.00	59.38	482,165.60	6.63	53,835.60
20.12	As for Item 20.11 but to selected trees.	No.	226	34.41	7,776.66	82.54	18,654.04	7.87	1,778.62
20.13	Provide and erect kilometer posts as directed by the Engineer.	No.	58	526.60	30,542.80	612.88	35,547.04	112.52	6,526.16
20.14	Provide and lay flush kerb, 150 x 100mm, Type A	m	119,160	44.10	5,254,956.00	68.53	8,166,034.80	11.66	1,389,405.60
20.15	Provide and lay flush kerb, 150mm x 80mm, Type B.	m	6,380	35.28	225,086.40	60.24	384,331.20	9.33	59,525.40
20.16	Provide and lay flush kerb, 150mm x 80mm, Type C.	m	3,300	54.06	178,398.00	70.29	231,957.00	12.00	39,600.00
20.17	Provide and lay flush kerb, 150mm x 80mm, Type D.	m	3,900	29.03	113,217.00	56.89	221,871.00	8.45	32,955.00
20.18	Provide and lay flush kerb, 150mm x 80mm, Type E.	m	1,300	52.80	68,640.00	69.62	90,506.00	11.82	15,366.00
20.19	Quadrant for flush kerb, main road and slip road: (1) in-situ 0.5m radius, Type A. (2) in-situ 0.5m radius, Type B.	No. No.	25 4	53.82 48.81	1,345.50 195.24	55.89 53.21	1,397.25 212.84	7.64 6.93	191.00 27.72
20.20	Provide and lay raised kerb, 125mm x 250mm, slip road. (1) straight. (2) radius 5m to 1m.	m m	1,530 72	111.46 122.75	170,533.80 8,838.00	142.14 154.55	217,474.20 11,127.60	24.40 27.93	37,332.00 2,010.96





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
20.21	Provide and lay raised kerb, 125mm x 250mm, main road.								
	(1) straight.	m	255	122.73	31,418.88	148.17	37,931.52	26.00	6,556.00
	(2) radius 5m to 1m.	m	114	134.01	15,277.14	160.58	18,306.12	29.53	3,366.42
20.22	Provide and lay ramped kerb.	No.	64	142.06	9,091.84	128.00	8,192.00	35.91	2,298.24
20.23	Provide and erect permanent five strand wire fencing including intermediate and straining posts in areas specifically directed by the Engineer.	m	1,500	43.57	65,355.00	98.20	147,300.00	8.11	12,165.00
20.24	Provide and erect gates as directed and approved by the Engineer.	No.	8	373.15	2,985.20	1840.05	14,720.40	234.34	1,874.72
20.25	Provide and erect double headed guardrail, all in accordance with the Drawings.	m	3,660	2061.59	7,545,419.40	313.78	1,148,434.80	22.54	82,496.40
20.26	Provide stairways for bus stops as specified in the Drawings.	m	53	762.52	40,413.56	835.93	44,304.29	100.05	5,302.65
	Sub total (20)				23,863,031.76		16,465,692.51		1,968,524.89



BILL OF QUANTITIES No.21  
MISCELLANEOUS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALUE RATE	ADDED TAX AMOUNT
21.01	Supply and apply, in accordance to manufacturer's instructions waterproofing materials to top of bridge decks, approach slabs and all structural concrete surfaces in contact with fill material prior to backfilling.	m2	20,050	261.54	5,243,877.00	20.45	410,022.50	0.00	0.00
21.02	Supply and install in position elastomeric bearings including mortar mortar plinth, fixed.	No.	12	2089.75	25,077.00	471.82	5,661.84	2.01	24.12
	(1) 406 x 279 x 18mm	No.	37	1693.58	62,662.46	452.01	16,724.37	2.01	74.37
21.03	Supply and install in position elastomeric bearings including mortar plinth, movable:	No.	8	1880.11	15,040.88	458.22	3,665.76	1.01	8.08
	(1) 229 x 152 x 56mm	No.	16	2272.87	36,365.92	479.41	7,670.56	1.51	24.16
	(2) 279 x 229 x 37mm	No.	22	2823.96	62,127.12	506.97	11,153.34	1.51	33.22
	(3) 279 x 229 x 46mm	No.	18	3987.41	71,773.38	585.14	10,172.52	1.51	27.18
	(4) 279 x 229 x 65mm	No.	12	5223.48	62,681.76	626.94	7,523.28	1.51	18.12
21.04	Supply and install joint filler for expansion joint:	m2	69	787.28	54,322.32	61.87	4,269.03	0.00	0.00
	(1) 30mm thick.	m2	82	655.44	53,746.08	55.28	4,532.96	0.00	0.00
	(2) 25mm thick.	m2	23	524.85	12,071.55	48.75	1,121.25	0.00	0.00
21.05	Supply and install sealant for expansion joint:	m	66	446.56	29,472.96	27.00	1,782.00	0.00	0.00
	(1) 30 x 50mm deep.	m	75	371.93	27,894.75	23.26	1,744.50	0.00	0.00
	(2) 25 x 50mm deep.	m	134	2517.76	337,382.52	491.40	65,847.60	521.01	69,815.34
21.06	Provide, lay and compact Asphalt Concrete Wearing Course for bridge decks.	m3	244	1054.88	257,390.72	242.69	59,216.36	21.86	5,333.84
21.07	Supply and install flex beam guardrails including post for vehicle bridge as detailed on the Drawings.	m							



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
21.08	Provide and erect in position parapet handrails to railway bridge as detailed on the Drawings.	m	114	155.01	17,671.14	472.20	53,830.80	37.37	4,260.18
21.09	Provide and erect in position pedestrian parapets to footbridges as detailed on the Drawings.	m	282	236.14	66,591.48	518.31	146,163.42	56.94	16,057.08
21.10	Provide and install 100mm dia.drain pipe through deck slabs.	No.	36	143.32	5,159.52	12.58	452.88	0.00	0.00
21.11	Provide and place 75mm dia.PVC weep holes.	No.	62	66.63	4,131.06	8.74	541.88	0.00	0.00
21.12	Provide and place 200mm dia.perforated PVC pipes.	m	1,770	389.85	690,034.50	35.26	62,410.20	0.00	0.00
21.13	Provide and install 20mm dia. dowel bars with caps as specified on the Drawings.	No.	152	435.24	66,156.48	105.40	16,020.80	0.00	0.00
21.14	As for Item 21.13 but 40mm dia.	No.	98	1306.47	128,034.06	148.96	14,598.08	0.00	0.00
21.15	Provide,spread and compact graded crushed stone to base for box culverts.	m3	132	638.87	84,330.84	211.04	27,857.28	58.91	7,776.12
21.16	Provide,lay and compact Asphalt Concrete Wearing Course for box culverts.	m3	142	2517.78	357,524.76	491.40	69,778.80	521.01	73,983.42
21.17	Provide and place 200mm dia.PVC weep holes.	No.	30	553.31	16,599.30	43.44	1,303.20	0.00	0.00
Sub total (21)				7,788,119.56		1,004,065.21		177,435.23	



BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
NOTE:									
PLANT									
The rate inserted herein are to include all operational and maintenance cost, fuel, oil, grease, drivers and turnboys, wages, supervision, overheads and profits. Only time actually employed upon the works will be paid for and the rates should include for idle time, travelling and overtime. All items of plant must be priced.									
Items of Major Plant Employed on Dayworks.									
Where items of major plant listed in the Schedule of Dayworks are specified by type (e.g. D-6, D-8, CAT 14, etc.) the power ratings shall not be lower than the power ratings of such plant manufactured within the two years prior to the date of tender. Any items of major plant employed upon Dayworks which has a power rating lower than that specified above, shall be paid for at rates lower than those in the Schedule of Dayworks. The reduction in the rate payable shall be in proportion to the reduction in power rating below that specified above.									
22.01	D6 tractor or equivalent, including brade and ripper.	hr	200	1032.47	206,494.00	474.81	94,962.00	83.94	16,788.00
22.02	D7 tractor or equivalent, including brade and ripper.	hr	200	1474.99	294,998.00	666.70	133,340.00	119.92	23,984.00
22.03	D8 tractor or equivalent, including brade and ripper.	hr	100	1859.55	185,955.00	818.14	81,814.00	150.32	15,032.00
22.04	Motor grader CAT140G or equivalent (complete with scarifier).	hr	300	738.65	221,595.00	334.73	100,419.00	59.33	17,799.00





ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
22.05	Heavy grid or sheeps foot roller.	hr	100	790.86	79,086.00	335.95	33,595.00	62.36	6,236.00
22.06	Vibrating roller, 10 ton.	hr	100	997.40	99,740.00	437.68	43,768.00	79.85	7,985.00
22.07	15 ton pneumatic self-propelled roller.	hr	100	441.83	44,183.00	199.74	19,974.00	34.85	3,485.00
22.08	16-18 ton smooth wheel roller.	hr	100	441.83	44,183.00	199.74	19,974.00	38.45	3,845.00
22.09	As for Item 22.08 but 6-8 ton.	hr	100	347.99	34,799.00	163.06	16,306.00	27.44	2,744.00
22.10	Small hand-propelled vibrating roller.	hr	200	120.87	24,174.00	72.91	14,582.00	9.45	1,890.00
22.11	Rammer and/or compactor.	hr	300	31.46	9,438.00	38.40	11,520.00	2.42	726.00
22.12	1.6 m3 class tractor shovel or equivalent.	hr	200	861.70	172,340.00	385.99	77,198.00	69.22	13,844.00
22.13	2.3 m3 tractor shovel or equivalent.	hr	100	1025.34	102,534.00	463.30	46,330.00	82.88	8,288.00
22.14	0.7 m3 class mechanical excavator (backhoe) or equivalent.	hr	100	871.36	87,136.00	397.75	39,775.00	70.43	7,043.00
22.15	0.3 m3 class mechanical excavator (backhoe) or equivalent.	hr	200	553.96	110,792.00	257.83	51,565.00	44.50	8,900.00
22.16	2.3 m3 class wheel loader or equivalent.	hr	200	1025.34	205,068.00	463.30	92,660.00	82.88	16,576.00
22.17	3 m3 class wheel loader or equivalent.	hr	100	1281.68	128,168.00	572.37	57,237.00	103.61	10,361.00
22.18	6 ton tipper lorry.	hr	300	320.05	96,015.00	160.45	48,135.00	25.71	7,713.00
22.19	10 ton tipper lorry.	hr	300	418.60	125,580.00	201.42	60,426.00	33.62	10,086.00
22.20	6 ton lorry.	hr	300	197.11	59,133.00	109.22	32,766.00	15.83	4,749.00
22.21	10 ton lorry.	hr	300	246.22	73,866.00	129.66	38,898.00	19.78	5,934.00
22.22	0.7 to 1 ton pick up car.	hr	200	167.44	33,488.00	97.62	19,524.00	13.49	2,698.00
22.23	Land Rover.	hr	200	150.08	30,016.00	90.39	18,078.00	12.10	2,420.00
22.24	6 m3/min air compressor.	hr	100	217.50	21,750.00	112.08	11,208.00	17.15	1,715.00
22.25	10 m3/min air compressor.	hr	100	418.59	41,859.00	124.49	12,449.00	25.26	2,526.00
22.26	50mm delivery water pump and moter.	hr	200	12.01	2,402.00	32.40	6,480.00	0.98	196.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
22.27	As for item 22.26 but 75mm.	hr	200	32.17	6,434.00	41.23	8,246.00	2.62	524.00
22.28	Concrete mixer 14/10.	hr	100	182.98	18,298.00	99.64	9,964.00	14.48	1,448.00
22.29	Concrete vibrator, poker type.	hr	100	19.96	1,996.00	33.80	3,380.00	1.51	151.00
22.30	Self-propelled water tanker 9500 litre.	hr	200	443.10	88,620.00	184.09	36,818.00	35.60	7,120.00
22.31	Pressure bitumen distributor 4500 litre.	hr	100	562.75	66,275.00	285.91	28,591.00	52.26	5,226.00
22.32	Lorry for Benkelman beam & plate bearing Tests.	hr	300	320.05	96,015.00	160.45	48,135.00	25.71	7,713.00
LABOR									
The rates inserted herein are to include all costs of labor such as insurance, accommodation, travelling time, use and maintenance of small tools of the trade, supervision, overheads and profit. Only the actual time engaged upon the works will be paid for.									
22.33	Unskilled labor	hr	50,000	0.00	0.00	19.00	950,000.00	0.00	0.00
22.34	Working ganger	hr	10,000	0.00	0.00	25.00	250,000.00	0.00	0.00
22.35	Artisans	hr	10,000	0.00	0.00	29.00	290,000.00	0.00	0.00
MATERIALS									
All materials are to comply with the Specifications. The rates inserted herein are to include for delivery to the site, storage, handling, overheads and profit.									
22.36	Ordinary Portland Cement.	tonne	40	0.00	0.00	3236.93	129,477.20	402.80	16,112.00
22.37	Mild steel (any diameter).	tonne	3	0.00	0.00	17870.40	53,611.20	2628.00	7,884.00
22.38	High yield steel (any diameter).	tonne	3	0.00	0.00	18604.80	55,814.40	2736.00	8,208.00



ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
22.39	Fine aggregate for concrete.	m3	200	0.00	0.00	403.20	80,640.00	60.48	12,096.00
22.40	Coarse aggregate for concrete, maximum size 20mm.	m3	100	0.00	0.00	515.23	51,523.00	24.41	2,441.00
22.41	Coarse aggregate for concrete, maximum size 40mm.	m3	100	0.00	0.00	515.23	51,523.00	24.41	2,441.00
22.42	Graded crushed stone for subbase and base.	m3	100	0.00	0.00	552.04	55,204.00	26.16	2,616.00
22.43	Wrought shuttering timber.	m2	100	0.00	0.00	217.09	21,709.00	31.93	3,193.00
22.44	Unwrought shuttering timber.	m2	100	0.00	0.00	217.09	21,709.00	31.93	3,193.00
22.45	Timbering for trenches.	m2	100	0.00	0.00	217.09	21,709.00	31.93	3,193.00
22.46	Cut back bitumen, Grade MC 30.	litre	1,000	0.00	0.00	18.97	18,970.00	2.79	2,790.00
22.47	Cut back bitumen, Grade MC 3000.	litre	1,000	0.00	0.00	21.79	21,790.00	3.20	3,200.00
22.48	Emulsion, KI-60	litre	1,000	0.00	0.00	13.40	13,400.00	1.97	1,970.00
22.48	Straight-run bitumen, Grade 80/100.	litre	1,000	0.00	0.00	8.45	8,450.00	2.35	2,350.00
22.49	10/14mm nominal size chippings.	m3	200	0.00	0.00	586.99	117,398.00	27.81	5,562.00
22.50	3/6mm nominal size chippings.	m3	200	0.00	0.00	586.99	117,398.00	27.81	5,562.00
Sub total (22)					2,812,430.00		3,648,443.80		308,556.00



BILL OF QUANTITIES No.23  
PILING

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT	VALU RATE	ADDED TAX AMOUNT
23.01	Mobilization of all the necessary plant for the piling operation, setting up on the position of the first pile and removal on completion of the last pile.	L.S.			79,800.00		26,200.00		0.00
23.02	Move and set up each pile position.	No.	96	855.82	82,158.72	231.48	22,222.08	21.22	2,037.12
23.03	Supply of steel pipe piles 500 mm dia., 9 mm thick.	m	816	3801.25	3,101,820.00	380.12	310,177.92	0.00	0.00
23.04	Driving piles of 500 mm dia. including positioning and pitching. Include for cutting pile heads to correct level.	m	816	261.72	213,563.52	70.79	57,764.64	6.49	5,295.84
Sub total (23)					3,477,342.24		416,364.64		7,332.96









**APPENDIX D      FURNITURE AND EQUIPMENT FOR THE ENGINEER'S  
OFFICE (GENERAL 1.04)**



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.04

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	Provide and maintain furniture and office equipment for the Engineer's office and laboratory as listed in the Special Specification, all to the satisfaction of the Engineer.				
	1. Resident Engineer's Main Office Furniture				
	- Writing desks (1.5 x 0.9m) with lockable drawers.	No.	5	5000.00	25,000.00
	- Writing desks (1.35 x 0.75m) with lockable drawers.	No.	3	4000.00	12,000.00
	- Office tables (1.8 x 0.9m).	No.	2	3000.00	6,000.00
	- Plan filing cabinets.	No.	2	5000.00	10,000.00
	- Chairs, standard desk type.	No.	12	1500.00	18,000.00
	- Chairs, executive swivel type.	No.	5	2500.00	12,500.00
	- Drawing table stools (0.7m high).	No.	2	1000.00	2,000.00
	- Typist desk.	No.	1	4000.00	4,000.00
	- Typist chairs.	No.	1	2500.00	2,500.00
	- Lockable steel cupboards.	No.	5	4000.00	20,000.00
	- Lockable steel filing cabinets (4-drawers).	No.	2	10000.00	20,000.00
	- Refrigerator of 220 litres capacity.	No.	1	25000.00	25,000.00
	- Bookshelves.	No.	5	2000.00	10,000.00
	- Conference table.	No.	1	8000.00	8,000.00
	- Chairs for conference table.	No.	8	1500.00	12,000.00
	- Drawing benches.	No.	6	2000.00	12,000.00
	2. Engineer's Laboratory Furniture				
	- Laboratory benches as specified.	No.	1	5000.00	5,000.00
	- Shelves along outside walls.	No.	1	5000.00	5,000.00
	- Writing desks (1.35 x 0.75m) with lockable drawers.	No.	2	4000.00	8,000.00
	- Chairs, standard desk type.	No.	2	1500.00	3,000.00
	- Laboratory stools (0.7m high).	No.	6	1000.00	6,000.00
	- Lockable steel filing cabinet (4-drawers).	No.	1	10000.00	10,000.00
	- Lockable steel cupboard.	No.	1	4000.00	4,000.00
	- Refrigerator of 220 litre capacity.	No.	1	25000.00	25,000.00
	- Bookshelves	No.	1	2000.00	2,000.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.04

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<b>3.Engineer's Main Office Equipment</b>					
	- Camera, single lens reflex type.	No.	1	15000.00	15,000.00
	- Electric type writer with self-collecting facilities.	No.	1	60000.00	60,000.00
	- Filing trays.	No.	12	200.00	2,400.00
	- Stapling machine (large).	No.	1	2500.00	2,500.00
	- Stapling machines (regular).	No.	6	500.00	3,000.00
	- Paper punches, heavy duty.	No.	2	2000.00	4,000.00
	- Paper punches, ordinary.	No.	6	500.00	3,000.00
	- Pairs of scissors.	No.	6	500.00	3,000.00
	- Waste paper bins.	No.	8	200.00	1,600.00
	- Desk mounted pencil sharpeners.	No.	6	500.00	3,000.00
	- Electric fans	No.	6	5000.00	30,000.00
	- Electric heaters.	No.	6	2500.00	15,000.00
	- Fire extinguishers.	No.	4	3000.00	12,000.00
	- First aid kits.	No.	2	4000.00	8,000.00
	- Cooker, 2 plate, electric.	No.	1	5000.00	5,000.00
	- A0 size drawing board on adjustable metal stand with parallel motion.	No.	1	16800.00	16,800.00
	- A0 size drawing board.	No.	2	6000.00	12,000.00
	- A0 size Tee squares.	No.	2	2700.00	5,400.00
	- 250mm Set squares 45 degree.	No.	6	150.00	900.00
	- 250mm Set squares 60 degree.	No.	6	150.00	900.00
	- Protractor for tachy plotting with interchangeable scales.	No.	2	6700.00	13,400.00
	- Fully divided scales (metric 1/1000, 1/2500, 1/500, 1/1200, 1/2000, 1/50, 1/250, 1/1500).	No.	6	500.00	3,000.00
	- Erasing shield.	No.	2	400.00	800.00
	- Circular template.	No.	2	400.00	800.00
	- Arrow template	No.	2	400.00	800.00
	- Complete compass set.	No.	1	3000.00	3,000.00
	- Set of drawing instruments steadler.	No.	3	2200.00	6,600.00
	- Set of Rotring pens complete with set of stencils.	No.	4	3600.00	14,400.00





BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.04

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Adjustable planimeter, ott 30010 or equivalent.	No.	1	17200.00	17,200.00
	- Protractor 360 degree.	No.	4	450.00	1,800.00
	- Electronic calculator with paper printout, 12 figures, with 10 rolls paper.	No.	1	4500.00	4,500.00
	- Electronic scientific calculator, 12 figures.	No.	10	2000.00	20,000.00
	- IBM compatible micro-computer with 40 MB hard disk, 3.5" floppy drive, monochrome display/graphics, alphanumeric keyboard, MS DOS 3.3, Basic, Lotus 1-2-3, Wordperfect, Wordstar, and 20 Nos. 3.5" diskettes.	No.	1	200000.00	200,000.00
	- Wide carriage 16-pin dot matrix printer including parallel cable (2m) and 20 spare ribbons.	No.	1	50000.00	50,000.00
	- Desk top photocopying machine A3/A4 size, reduction and enlargement facilities.	No.	1	200000.00	200,000.00
	Total				1,006,800.00







BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.04

Estimated at  
VAT exemption.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	Provide and maintain furniture and office equipment for the Engineer's office and laboratory as listed in the Special Specification, all to the satisfaction of the Engineer.						
	1. Resident Engineer's Main Office Furniture						
	- Writing desks (1.5 x 0.9m) with lockable drawers.	No.	5	0.00	0.00	5000.00	25,000.00
	- Writing desks (1.35 x 0.75m) with lockable drawers.	No.	3	0.00	0.00	4000.00	12,000.00
	- Office tables (1.8 x 0.9m).	No.	2	0.00	0.00	3000.00	6,000.00
	- Plan filing cabinets.	No.	2	0.00	0.00	5000.00	10,000.00
	- Chairs, standard desk type.	No.	12	0.00	0.00	1500.00	18,000.00
	- Chairs, executive swivel type.	No.	5	0.00	0.00	2500.00	12,500.00
	- Drawing table stools (0.7m high).	No.	2	0.00	0.00	1000.00	2,000.00
	- Typist desk.	No.	1	0.00	0.00	4000.00	4,000.00
	- Typist chairs.	No.	1	0.00	0.00	2500.00	2,500.00
	- Lockable steel cupboards.	No.	5	0.00	0.00	4000.00	20,000.00
	- Lockable steel filing cabinets (4-drawers).	No.	2	0.00	0.00	10000.00	20,000.00
	- Refrigerator of 220 litres capacity.	No.	1	25000.00	25,000.00	0.00	0.00
	- Bookshelves.	No.	5	0.00	0.00	2000.00	10,000.00
	- Conference table.	No.	1	0.00	0.00	8000.00	8,000.00
	- Chairs for conference table.	No.	8	0.00	0.00	1500.00	12,000.00
	- Drawing benches.	No.	6	0.00	0.00	2000.00	12,000.00
	2. Engineer's Laboratory Furniture						
	- Laboratory benches as specified.	No.	1	0.00	0.00	5000.00	5,000.00
	- Shelves along outside walls.	No.	1	0.00	0.00	5000.00	5,000.00
	- Writing desks (1.35 x 0.75m) with lockable drawers.	No.	2	0.00	0.00	4000.00	8,000.00
	- Chairs, standard desk type.	No.	2	0.00	0.00	1500.00	3,000.00
	- Laboratory stools (0.7m high).	No.	6	0.00	0.00	1000.00	6,000.00
	- Lockable steel filing cabinet (4-drawers).	No.	1	0.00	0.00	10000.00	10,000.00
	- Lockable steel cupboard.	No.	1	0.00	0.00	4000.00	4,000.00
	- Refrigerator of 220 litre capacity.	No.	1	25000.00	25,000.00	0.00	0.00
	- Bookshelves	No.	1	0.00	0.00	2000.00	2,000.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.04

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
3.Engineer's Main Office Equipment							
-	Camera,single lens reflex type.	No.	1	15000.00	15,000.00	0.00	0.00
-	Electric type writer with self-collecting facilities.	No.	1	60000.00	60,000.00	0.00	0.00
-	Filing trays.	No.	12	0.00	0.00	200.00	2,400.00
-	Stapling machine (large).	No.	1	0.00	0.00	2500.00	2,500.00
-	Stapling machines (regular).	No.	6	0.00	0.00	500.00	3,000.00
-	Paper punches,heavy duty.	No.	2	0.00	0.00	2000.00	4,000.00
-	Paper punches,ordinary.	No.	6	0.00	0.00	500.00	3,000.00
-	Pairs of scissors.	No.	6	0.00	0.00	500.00	3,000.00
-	Waste paper bins.	No.	8	0.00	0.00	200.00	1,600.00
-	Desk mounted pencil sharpeners.	No.	6	0.00	0.00	500.00	3,000.00
-	Electric fans	No.	6	5000.00	30,000.00	0.00	0.00
-	Electric heaters.	No.	6	2500.00	15,000.00	0.00	0.00
-	Fire extinguishers.	No.	4	0.00	0.00	3000.00	12,000.00
-	First aid kits.	No.	2	0.00	0.00	4000.00	8,000.00
-	Cooker,2 plate,electric.	No.	1	5000.00	5,000.00	0.00	0.00
-	A0 size drawing board on adjustable metal stand with parallel motion.	No.	1	16800.00	16,800.00	0.00	0.00
-	A0 size drawing board.	No.	2	6000.00	12,000.00	0.00	0.00
-	A0 size Tee squares.	No.	2	2700.00	5,400.00	0.00	0.00
-	250mm Set squares 45 degree.	No.	6	150.00	900.00	0.00	0.00
-	250mm Set squares 60 degree.	No.	6	150.00	900.00	0.00	0.00
-	Protractor for tachy plotting with interchangeable scales.	No.	2	6700.00	13,400.00	0.00	0.00
-	Fully divided scales (metric 1/1000, 1/2500,1/500,1/1200,1/2000,1/50,1/250, 1/1500).	No.	6	500.00	3,000.00	0.00	0.00
-	Erasing shield.	No.	2	400.00	800.00	0.00	0.00
-	Circular template.	No.	2	400.00	800.00	0.00	0.00
-	Arrow template	No.	2	400.00	800.00	0.00	0.00
-	Complete compass set.	No.	1	3000.00	3,000.00	0.00	0.00
-	Set of drawing instruments steadler.	No.	3	2200.00	6,600.00	0.00	0.00
-	Set of Rotring pens complete with set of stencils.	No.	4	3600.00	14,400.00	0.00	0.00





BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.04

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	FOREIGN CURRENCY AMOUNT	LOCAL CURRENCY RATE	LOCAL CURRENCY AMOUNT
-	Adjustable planimeter, ott 30010 or equivalent.	No.	1	17200.00	17,200.00	0.00	0.00
-	Protractor 360 degree.	No.	4	450.00	1,800.00	0.00	0.00
-	Electronic calculator with paper printout, 12 figures, with 10 rolls paper.	No.	1	4500.00	4,500.00	0.00	0.00
-	Electronic scientific calculator, 12 figures.	No.	10	2000.00	20,000.00	0.00	0.00
-	IBM compatible micro-computer with 40 MB No. hard disk, 3.5" floppy drive, monochrome display/graphics, alphanumeric keyboard, MS DOS 3.3, Basic, Lotus 1-2-3, Wordperfect, Wordstar, and 20 Nos. 3.5" diskettes.	No.	1	200000.00	200,000.00	0.00	0.00
-	Wide carriage 16-pin dot matrix printer including parallel cable (2m) and 20 spare ribbons.	No.	1	50000.00	50,000.00	0.00	0.00
-	Desk top photocopying machine A3/A4 size, reduction and enlargement facilities.	No.	1	200000.00	200,000.00	0.00	0.00
Total					747,300.00		259,500.00







**APPENDIX E      SURVEY AND LABORATORY EQUIPMENT**  
**(GENERAL 1.05)**



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
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Provide survey and laboratory equipment  
as listed in the Special Specification.

1. Survey Equipment

- Carl Zeiss NI3 Automatic Engineers level c/w tripod or similar.	No.	3	60000.00	180,000.00
- Carl Zeiss TH2 single second theodolite complete with tripod or similar.	No.	2	305000.00	610,000.00
- Survey umbrellas.	No.	2	4000.00	8,000.00
- 4m Levelling staves with bubble and case.	No.	5	4700.00	23,500.00
- 2.5m Ranging rods.	No.	20	300.00	6,000.00
- 1m Stainless steel straight edge.	No.	2	2300.00	4,600.00
- 3m aluminium straight edge.	No.	3	2800.00	8,400.00
- 30m steel white face tape.	No.	3	1600.00	4,800.00
- 100m steel band tape.	No.	2	6000.00	12,000.00
- 3m pocket tape.	No.	15	300.00	4,500.00
- Steel tape repair outfit.	No.	1	3000.00	3,000.00
Subtotal(Item 1, Survey Equipment)				864,800.00





BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
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NOTE:

The following equipment shall be purpose made for use in soils testing laboratory and shall comply with the relevant British (BS) or American (AASHTO) Standard.

2. Compaction Test (AASHTO T.99 and T.180)

- Compaction mould complete with base plate extension collar, 101.6mm internal diameter x 116.43mm high.	No.	10	2557.00	25,570.00
- 2.495 kg compaction hammer, drop regulated to 304.8mm.	No.	5	2685.00	13,425.00
- 4.536 kg compaction hammer, drop regulated to 457.2mm.	No.	5	3133.00	15,665.00
- Aggregate compaction mould to BS.5835 complete.	No.	10	3000.00	30,000.00
- Loading frame for the Kango hammer (to BS.5835).	No.	1	100000.00	100,000.00
- Electric vibrating Kango hammer with steel tamper.	No.	1	80986.00	80,986.00
- Steel straight edge 300mm long x 25mm wide x 3mm thick.	No.	6	492.00	2,952.00
- Compaction mould 152.4mm dia. x 116.43mm high complete with base plate and extension collar.	No.	10	3452.00	34,520.00

3. Density Test (Sand replacement method BS 1377)

- Galvanized metal tray 1m x 0.5m x 75mm deep.	No.	2	1304.00	2,608.00
- 75mm brush.	No.	6	153.00	918.00
- Semi-automatic balance, 25 kg capacity, accurate to 1 g, including weights.	No.	2	76588.00	153,176.00
- Metal containers, 450mm dia.	No.	6	500.00	3,000.00
- Stainless steel tray, 305mm dia.	No.	3	1854.00	5,562.00
- Metal tray with 100mm diameter hole in the centre, 300mm x 300mm square.	No.	3	1036.00	3,108.00
- Metal tray with 150mm diameter hole in the centre, 300mm x 300mm square.	No.	3	1227.00	3,681.00
- Metal tray with 200mm diameter hole in the centre, 457mm x 457mm square.	No.	3	1164.00	3,492.00
- Steel pegs for fixing tray in position.	No.	36	50.00	1,800.00
- Sand pouring cylinder, 100mm diameter.	No.	3	9014.00	27,042.00
- Sand pouring cylinder, 150mm diameter.	No.	3	11233.00	33,699.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Sand pouring cylinder, 200mm diameter.	No.	3	21097.00	63,291.00
	- Cold steel chisel, 25mm x 300mm long.	No.	6	300.00	1,800.00
	- Cold steel chisel, 10mm * 250mm long.	No.	6	250.00	1,500.00
	- 1.8 kg hammer.	No.	6	288.00	1,728.00
	- Scoop for removing excavated material from hole, 250mm long handle.	No.	6	500.00	3,000.00
	- 100mm brush, soft.	No.	6	256.00	1,536.00
	- Metal dibber	No.	6	577.00	3,462.00
	- Screper	No.	6	577.00	3,462.00
	- Steel pointed rod	No.	6	433.00	2,598.00
	- Density spoon	No.	6	87.00	522.00
	- 50mm brush, soft.	No.	6	153.00	918.00
	- Calibrating can, 100mm diameter x 150mm deep.	No.	3	2270.00	6,810.00
	- Calibrating can, 150mm diameter x 200mm deep.	No.	3	5050.00	15,150.00
	- Calibrating can, 200mm diameter x 250mm deep.	No.	3	6713.00	20,139.00
	- Polythene container jars, with neck 125mm diameter and 4 litre capacity.	No.	6	211.00	1,266.00
	- Standard sand 600/300 micron, 50kg bag.	No.	10	200.00	2,000.00
4. Density (Nuclear Density Method, AASHTO T238)					
	- Nuclear moisture/density gauge (Troxler 3411B or similar approved).	No.	1	500000.00	500,000.00
	- Hole forming device.	No.	1	10000.00	10,000.00
	- Guide for the above.	No.	1	6000.00	6,000.00
5. Atterberg Limits Apparatus to BS 1377					
	- Casagrande liquid limit apparatus.	No.	4	7352.00	29,408.00
	- Grooving tool.	No.	4	614.00	2,456.00
	- Liquid limit penetrometer.	No.	2	25892.00	51,784.00
	- Penetration test cone.	No.	2	1310.00	2,620.00
	- Penetration sample cap.	No.	2	102.00	204.00
	- Linear shrinkage mould.	No.	20	1227.00	24,540.00
	- Vernier caliper, 150mm x 0.1mm.	No.	2	1600.00	3,200.00
	- Stainless steel, 3mm dia. and 100mm long.	No.	4	400.00	1,600.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
<b>6.Sand Equivalent</b>					
	- Sand equivalent test set.	Set	2	16622.00	33,244.00
<b>7. Specific Gravity (BS.1377 and BS.812) and Water Absorption(Rice Test ASTM D2041-78)</b>					
	- Pycnometer for sands and fine aggregate, 1 kg capacity, complete with cone and rubber seal.	No.	10	462.00	4,620.00
	- Glass Plastic or metal bowl having a capacity of at least 1000 ml strong enough to withstand a full vacuum complete with cover fitted with rubber gasket and a hose connection.	No.	10	2283.00	22,830.00
	- Volumetric flask having a capacity of at least 1000 ml strong enough to withstand a full vacuum complete with rubber stopper and a hose connection.	No.	10	4566.00	45,660.00
	- An intermediate size heavy wall glass pycnometer having a capacity of approximately 4000 ml or a large size polycarbonate plastic pycnometer having a capacity of at least 10000 ml complete with a suitable vacuum connection assembly consisting of a vacuum gauge, release valve, and tubing connector, plus a tapered stopper device for maintaining consistent volume regulation.	No.	10	7990.00	79,900.00
	- A manometer or vacuum gauge suitable for measuring the specified vacuum.	No.	1	21918.00	21,918.00
	- Gay Lussac-specific gravity bottle, 25ml.	No.	10	1034.00	10,340.00
	- Gay Lussac-specific gravity bottle, 50ml.	No.	10	1034.00	10,340.00
	- Wire mesh basket with apertures not greater than 6.5mm large enough to take 2.5 kg of aggregate..	No.	1	5000.00	5,000.00
	- Stout watertight container in which the basket can be freely suspended under water.	No.	1	5000.00	5,000.00
	- End-over-end shaker	No.	1	231040.00	231,040.00
	- Gas jar, 300mm high x 75mm dia. with glass plate and rubber stopper.	No.	10	1964.00	19,640.00
	- Vaccume type dessicator, 200mm dia.	No.	2	10397.00	20,794.00
	- Vaccume pump, 1 HP	No.	1	29458.00	29,458.00
	- Rubber headed pestel	No.	2	635.00	1,270.00
	- Soft absorbent cloth (tee towel).	No.	20	230.00	4,600.00
	- Shallow tray of area not less than 0.065m <sup>2</sup> .	No.	2	500.00	1,000.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Airtight container of similar capacity to the basket.	No.	1	8000.00	8,000.00
	- 5 kg balance accurate to 0.1 g capable of suspending the basket plus sample in the watertight container.	No.	1	89195.00	89,195.00
	- Hair drier	No.	1	6000.00	6,000.00
	- Sand absorption cone and tamper	No.	2	2166.00	4,332.00
	- Picometer for the above.	No.	2	1300.00	2,600.00
8.Flakiness Index (BS.812)					
	- Flakiness sieve,4.9 x 30mm slot.	No.	2	2110.00	4,220.00
	- Flakiness sieve,7.2 x 40mm slot.	No.	2	2110.00	4,220.00
	- Flakiness sieve,10.2 x 50mm slot.	No.	2	2110.00	4,220.00
	- Flakiness sieve,14.4 x 60mm slot.	No.	2	2110.00	4,220.00
	- Flakiness sieve,19.7 x 80mm slot.	No.	2	2110.00	4,220.00
	- Flakiness sieve,26.3 x 90mm slot.	No.	2	2110.00	4,220.00
	- Flakiness sieve,33.9 x 100mm slot.	No.	2	2110.00	4,220.00
9.Sieve Analysis (BS.1377)					
	- BS sieve 300mm diameter in sizes 75,63, 50,37.5,28,20,14,6.3,5 and 3.35mm plus lid and receiver.	Set	4	40468.00	161,872.00
	- BS sieve 200mm diameter in sizes 2,1.18, 0.6,0.425,0.300,0.212,0.150, 0.075 and 0.063mm plus lid and receiver.	Set	4	19051.00	76,204.00
	- Electric sieve shaker.	No.	1	67766.00	67,766.00
	- BS sieve 200mm diameter,0.425 and 0.075mm.	Set	10	4571.00	45,710.00
	- Field rocker sieve set	Set	4	52995.00	211,980.00
10.CBR Test(AASHTO T.193)					
	- CBR mould,152mm dia. x 178mm high, complete with perforated base plate and extension collar 50.8mm high that can be fitted to either end of the mould.	No.	30	3548.00	106,440.00
	- Spacer disk.	No.	6	1630.00	9,780.00
	- Perforated swell plate with adjustable centre post of rust proofed steel provided with a lock nut.	No.	6	1694.00	10,164.00
	- Sliding weight rammer,2.49kg.	No.	3	1183.00	3,549.00
	- 2.27 kg annular surcharge weight.	No.	30	959.00	28,770.00





BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Static compaction press, 50 tonnes capa. with an adjustable platten speed between 1mm/min. and 50.8mm/min. (Hydraulic or mechanical operation and hand operated).	No.	1	112517.00	112,517.00
	- Set of guards.	No.	1	8694.00	8,694.00
	- CBR/Marshall motorised dual speed 60kN load frame, ASTM.	No.	1	92699.00	92,699.00
	- Stabilising bar for the above.	No.	1	20000.00	20,000.00
	- Proving ring for above, 10 kN and 50 kN capacity.	Set	1	27234.00	27,234.00
	- Penetration gauge range 0-25mm.	No.	1	2525.00	2,525.00
	- CBR piston, including bracket.	No.	1	3037.00	3,037.00
	- Swell measurement tripod complete with gauge calibrated in 0.01mm divisions.	No.	30	4187.00	125,610.00
	- Soaking tank for CBR mould sufficient for 200 moulds.	No.	1	23168.00	23,168.00
	- Tamping bar, steel 13mm diameter, 380mm long.	No.	1	448.00	448.00
<b>11. Miscellaneous Equipment</b>					
	- 1m x 1m x 75mm deep galvanised metal tray.	No.	10	2365.00	23,650.00
	- 1.5 kg hammer.	No.	4	288.00	1,152.00
	- Riffle box with 10mm slots (BS.1377).	No.	2	7543.00	15,086.00
	- Riffle box with 20mm slots (BS.1377).	No.	1	9114.00	9,114.00
	- Riffle box with 50mm slots (BS.1377).	No.	1	10633.00	10,633.00
	- Wheel barrow.	No.	4	2046.00	8,184.00
	- Dustpan brush.	No.	4	100.00	400.00
	- Plastic funnels, 65mm dia.	No.	2	52.00	104.00
	- Plastic funnels, 100mm dia.	No.	2	101.00	202.00
	- Plastic funnels, 140mm dia.	No.	2	173.00	346.00
	- Shovel.	No.	6	250.00	1,500.00
	- Pick-axe.	No.	6	479.00	2,874.00
	- Metal scoop, large, 150mm wide.	No.	4	600.00	2,400.00
	- Metal scoop, medium, 100mm wide.	No.	6	400.00	2,400.00
	- Schmidt concrete test hammer.	No.	1	12530.00	12,530.00
	- Jack, 20 tonne, lever, frame, sample extrud.	No.	1	7160.00	7,160.00
	- Garden trowel.	No.	4	250.00	1,000.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
-	Steel rule, 500mm long.	No.	3	300.00	900.00
-	Stop watch.	No.	1	3000.00	3,000.00
-	Steel tray, 0.3m x 0.3m x 0.01m deep.	No.	40	607.00	24,280.00
-	3.5 kg hammer.	No.	4	1022.00	4,088.00
-	7 kg hammer.	No.	3	4571.00	13,713.00
-	Complete sand patch test apparatus.	No.	1	0.00	0.00
-	Cold chisel.	No.	6	300.00	1,800.00
-	Oven, electric thermostatically controled to any temperature between 60 deg. and 149 deg.C, minimum capacity including dial thermometer range 0-160 deg.C (BS.1377).	No.	2	69684.00	139,368.00
-	Gas for the above oven.	No.	2	30000.00	60,000.00
-	Single plate electric cooker.	No.	4	3069.00	12,276.00
-	3 metre straight edge including calibrated wedges.	No.	1	12211.00	12,211.00
-	Dessicator, 300mm dia.	No.	2	13862.00	27,724.00
-	Streight edge, 300mm long, 25mm wide and 3mm thick.	No.	6	722.00	4,332.00
-	Moisture content tin, 75mm dia. cadmium plate or alminium.	No.	100	100.00	10,000.00
-	Concrete beam moulds 150 x 150 x 750mm.	No.	24	15663.00	375,912.00
-	450mm x 450mm x 9mm plate glass (BS.1377).	No.	4	1471.00	5,884.00
-	Refrigerator 250 litre capacity.	No.	1	30000.00	30,000.00
-	Palette knife 200mm blade.	No.	6	428.00	2,568.00
-	Palette knife 100mm blade.	No.	6	313.00	1,878.00
-	BS Sieve brush.	No.	8	211.00	1,688.00
-	200mm x 200mm x 20mm cadmium plated or aluminium tin.	No.	50	352.00	17,600.00
-	Electronic balance capacity 600 g, accurate to 0.001 g.	No.	1	98836.00	98,836.00
-	Electronic balance capacity 1600 g, accurate to 0.01 g.	No.	1	72880.00	72,880.00
-	Electronic balance capacity 5000 g, accurate to 0.1 g.	No.	1	58841.00	58,841.00
-	Balance (Chain dial) 250 g capacity to 0.01 g.	No.	1	21193.00	21,193.00
-	Balance 2000 g capacity accuracy to 0.1 g (manual), including weights.	No.	1	13873.00	13,873.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
-	Balance 4000 g capacity accuracy to 1.0 g (manual), including weights.	No.	1	30000.00	30,000.00
-	Balance 12000 g capacity accuracy to 1.0 g (manual), including weights.	No.	2	97653.00	195,306.00
-	Balance 50 kg capacity accurate to 20 g, including weights.	No.	1	28449.00	28,449.00
-	Load rings with dial gauges, 10kN	No.	1	13297.00	13,297.00
-	Load rings with dial gauges, 14kN	No.	1	13937.00	13,937.00
-	Load rings with dial gauges, 20kN	No.	1	13937.00	13,937.00
-	Load rings with dial gauges, 28kN	No.	1	13937.00	13,937.00
-	Load rings with dial gauges, 50kN	No.	1	14576.00	14,576.00
-	Still for producing distilled water.	No.	1	32093.00	32,093.00
-	Polythene or glass 20 litres storage vessel with tap at bottom.	No.	1	3197.00	3,197.00
-	Petrol driven core cutting machine with all accessories.	No.	1	247665.00	247,665.00
-	Core cutting compound.	kg	1,000	92.00	92,000.00
-	Vernier callipers, 250mm.	No.	2	1982.00	3,964.00
-	Benkelman beams.	No.	2	59135.00	118,270.00
-	Average least dimension gauge.	No.	2	3000.00	6,000.00
-	Lockable tool box containing: 1 pair "Molegrips", 2 x 150mm screwdriver 2 x 200mm screwdriver, 2 x 300mm screwdriver, (1 Standard and 1 phillips head of each) adjustable spanners 200mm and 300mm, 1 pair roundnosed pliers, 1 pair general purpose pliers, 1 plastic faced mallet (1 kg), 1 set imperial spanners 1/4" to 15/16", 1 set metric spanners 8mm to 20mm, 2 tyre pressure gauge range 0-100 p.s.i.	No.	1	9781.00	9,781.00
-	Plastic or metal bucket including lid, 10 litres capacity.	No.	20	256.00	5,120.00
-	Polythene wash bottle (500ml).	No.	10	150.00	1,500.00
-	A4 size clipboard.	No.	20	100.00	2,000.00
-	Mercury thermometer, range -10 deg.C to 150 deg.C, glass (BS.593).	No.	10	300.00	3,000.00
-	Laboratory thermometer, range +50 deg.C to 250 deg.C (BS.593).	No.	1	300.00	300.00
-	Maximum and minimum thermometer (BS.692)	No.	1	467.00	467.00
-	Rain gauge.	No.	3	2557.00	7,671.00



**BILL OF QUANTITIES No.1**  
**GENERAL APPENDIX TO ITEM 1.05**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Portable dial thermometer +50 deg.C to 250 deg.C accurate to + - 3% with 0.6m long stem.	No.	2	4475.00	8,950.00
	- Pocket dial thermometer +50 deg.C to +250 deg.C accurate to + - 3% with 0.1m long stem.	No.	10	1084.00	10,840.00
	- 5 litre capacity steel storage container with leak and dust proof lids for storage of bitumen samples.	No.	100	400.00	40,000.00

**12. Standard Specifications**

NOTE:  
Copies of each of the following Standard Specifications:-

- BS.812	No.	1	30047.00	30,047.00
- BS.882	No.	1	1438.00	1,438.00
- BS.1377	No.	1	33371.00	33,371.00
- BS.1881	No.	1	29919.00	29,919.00
- BS.1924	No.	1	1694.00	1,694.00
- BS.5835, Part 1	No.	1	1694.00	1,694.00
- Standard Specifications for Transportation Material and Methods of Sampling and Testing (AASHTO) Part I and II, 13th Edition.	No.	1	23015.00	23,015.00

**13. Concrete: Slump and Cube Manufacture (BS 1881)**

- Slump cone, tamping rod and base.	Set	2	2122.00	4,244.00
- Concrete cube mould, 150mm.	No.	20	3452.00	69,040.00
- Soaking tank for cubes, capacity 50 Nos.	No.	1	37463.00	37,463.00
- Cube tamping bars for Item 1.252.	No.	1	230.00	230.00
- Water test set for concrete mixing water.	No.	1	74510.00	74,510.00
- Potential alkali reactivity of cement-aggregate combinations.	No.	1	0.00	0.00
- Mortar bar container.	No.	3	0.00	0.00

**14. Concrete: Cube Compression Testing and Lean Concrete Unconfined Compressive Strength Testing**

- Concrete compression machine, to BS.1610 Grade A with 300mm gauge, rectangular platens, capacity 1560 kN with load pacer.	No.	1	227655.00	227,655.00
- Safety guard for Item 1.255.	No.	1	4667.00	4,667.00





BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- 50mm distance piece.	No.	1	5000.00	5,000.00
	- 70mm distance piece.	No.	1	6500.00	6,500.00
	- 100mm distance piece.	No.	1	6500.00	6,500.00
	- Mechanical load pacer.	No.	1	30686.00	30,686.00
	- Tamping rod, 16mm dia. x 600mm long.	No.	2	578.00	1,156.00
	- Tamping bar, 380mm x 25mm square.	No.	2	1444.00	2,888.00
	- Tamping rod, 10mm dia. x 250mm long.	No.	2	578.00	1,156.00
	- Electric vibrating hammer 750 watt with tamping foot square.	No.	1	375440.00	375,440.00
15. Potential Alkali Reactivity of Cement-Aggregate Combination and Mortar Bar Container					
	- Comparator mould (25.4 x 25.4 x 285mm)	No.	3	20216.00	60,648.00
	- Length comparator	No.	1	98480.00	98,480.00
	- ASTM type flow table	No.	1	64691.00	64,691.00
	- Curing box (60 x 40 x 60cm)	No.	1	209669.00	209,669.00
	- Concrete consistency apparatus	No.	1	1444.00	1,444.00
	- Mortar mixer	No.	1	216600.00	216,600.00
16. Marshall Stability Test Equipment (AASHTO T 245)					
	- Specimen mould including base plate and extension collar.	No.	10	2397.00	23,970.00
	- Specimen extractor.	No.	1	4000.00	4,000.00
	- Compaction hammer.	No.	2	7352.00	14,704.00
	- Compaction pedestal and specimen mould holder.	No.	2	21896.00	43,792.00
	- Breaking head mould.	No.	1	9000.00	9,000.00
	- CBR/Marshall motorised dual speed 60 kN load frame, ASTM.	No.	1	101265.00	101,265.00
	- Electrically operated laboratory mixer 10 litre capacity.	No.	1	97813.00	97,813.00
	- Flowmeter.	No.	2	4603.00	9,206.00
	- Suitable mechanical mixer.	No.	1	60000.00	60,000.00
	- Water bath with cover at least 150mm deep thermostatically controlled to maintain the temperature of the water at 60 deg.C + - 1 deg.C. The tank shall have a perforated false bottom or be equipped with a shelf for supporting specimens 50mm above the bottom of the bath.	No.	2	24613.00	49,226.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Isomantle electric heater for bowl of laboratory mixer.	No.	1	59212.00	59,212.00
	- Thermometer with 50mm dia. and 180mm stainless steel stem (50 to 250 deg.C).	No.	1	4475.00	4,475.00
	- ASTM Marshall automatic compactor, electric.	No.	1	115074.00	115,074.00

17.Bitumen Extraction Test

(1) Extractor Bottle Method, B.S.598,  
Part 2

- Flat bottomed scoop.	No.	2	1634.00	3,268.00
- Steel garden trowel.	No.	2	720.00	1,440.00
- Large steel spoon.	No.	2	187.00	374.00
- Water resistant gloves.	Pair	3	290.00	870.00
- Foot pump for pressurising air-water assemblies upto a maximum of 700kN/m <sup>2</sup> and fitted with flexible hose approximately 1.2m long and connector.	No.	1	17450.00	17,450.00
- Steel bottle 600ml capacity with 49mm rubber stopper.	No.	1	1467.00	1,467.00
- Steel bottle 2500ml capacity with 71mm rubber stopper.	No.	2	1973.00	3,946.00
- Steel bottle 7000ml capacity with 71mm rubber stopper.	No.	1	2195.00	2,195.00
- Flash funnel for fitting to the 700ml steel bottles. The rim of the funnel retains a sieve 200mm nominal diameter.	No.	1	2195.00	2,195.00
- Bottle roller-A compact bench mounted unit designed to rotate two bottles simultaneously about their longitudinal axis.	No.	1	24436.00	24,436.00
- Pressure filter complete with cutting tool for making a hole in the filter paper.	No.	1	52307.00	52,307.00
- Filter funnel to take 200mm nominal diameter sieves.	No.	1	2195.00	2,195.00
- Centrifuge complying with as BS 598.	No.	1	24382.00	24,382.00
- Binder recovery apparatus.	No.	1	36732.00	36,732.00
- Volumetric flask 250ml, 500ml, 1000ml and 2000ml capacity of each.	No.	2	2561.00	5,122.00
- Recovery still for Dichloromethane.	No.	1	60000.00	60,000.00

(2) Hot Extractor Method, B.S.596,  
Part 2



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	- Hot extractor complete with wire gauze container, gasket, cork lid and support assembly.	No.	1	11936.00	11,936.00
	- Dean and Stark Receiver with condenser to suit Trichloroethylene.	No.	1	3461.00	3,461.00
18. Consumables					
	- Paraffin wax.	kg	50	15.00	750.00
	- Gas.	kg	1,600	26.00	41,600.00
	- Gunny sack.	No.	400	35.00	14,000.00
	- Plastic bag, 900 x 450mm x 1000 gauge.	No.	2,000	19.00	38,000.00
	- Plastic bag, 450 x 300mm x 1000 gauge.	No.	1,000	8.00	8,000.00
	- Filter paper 150mm dia., Whatman No.5 (Boxes of 100).	No.	10	346.00	3,460.00
	- Filter paper 400mm dia., Whatman No.5 (Boxes of 100).	No.	5	381.00	1,905.00
	- Filter paper 100mm dia., Whatman No.5 (Boxes of 100).	No.	5	346.00	1,730.00
	- Trichloroethylene (205 litre drum).	No.	2	25836.00	51,672.00
	- Dichloromethane (275 kg drum).	No.	2	16437.00	32,874.00
	- Cotton waste (or drying cloths).	kg	100	78.00	7,800.00
	- Filter paper 270mm dia., 33mm with dia. hole in centre, Whatman No.5 (Box of 100)	No.	15	346.00	5,190.00
	- Filter paper 400mm diameter Whatman No.54 (Box of 100).	No.	10	381.00	3,810.00
	- Registration paper for compaction test.	sheets	1,000	10.00	10,000.00
	- Moisture-density relation test plot paper.	sheets	1,000	10.00	10,000.00
	- Registration paper for Atterberg Limits.	sheets	1,000	10.00	10,000.00
	- Registration paper for Particle size analysis.	sheets	1,000	10.00	10,000.00
	- Registration paper for CBR.	sheets	1,000	10.00	10,000.00
Subtotal(Labo.Equipment, Item 2 to 18)					7,882,672.00
Total(Item 1 to 18)					8,747,472.00









BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

Estimated at  
VAT exemption.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	Provide survey and laboratory equipment as listed in the Special Specification.						
	1. Survey Equipment						
	- Carl Zeiss NI3 Automatic Engineers level c/w tripod or similar.	No.	3	60000.00	180,000.00	0.00	0.00
	- Carl Zeiss TH2 single second theodolite complete with tripod or similar.	No.	2	305000.00	610,000.00	0.00	0.00
	- Survey umbrellas.	No.	2	4000.00	8,000.00	0.00	0.00
	- 4m Levelling staves with bubble and case.	No.	5	4700.00	23,500.00	0.00	0.00
	- 2.5m Ranging rods.	No.	20	300.00	6,000.00	0.00	0.00
	- 1m Stainless steel straight edge.	No.	2	2300.00	4,600.00	0.00	0.00
	- 3m aluminium straight edge.	No.	3	2800.00	8,400.00	0.00	0.00
	- 30m steel white face tape.	No.	3	1600.00	4,800.00	0.00	0.00
	- 100m steel band tape.	No.	2	6000.00	12,000.00	0.00	0.00
	- 3m pocket tape.	No.	15	300.00	4,500.00	0.00	0.00
	- Steel tape repair outfit.	No.	1	3000.00	3,000.00	0.00	0.00
	Subtotal(Item 1, Survey Equipment)				864,800.00		0.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
<p>NOTE: The following equipment shall be purpose made for use in soils testing laboratory and shall comply with the relevant British (BS) or American (AASHTO) Standard.</p>							
2.Compaction Test (AASHTO T.99 and T.180)							
-	Compaction mould complete with base plate extension collar,101.6mm internal diameter x 116.43mm high.	No.	10	2557.00	25,570.00	0.00	0.00
-	2.495 kg compaction hammer,drop regulated to 304.8mm.	No.	5	2685.00	13,425.00	0.00	0.00
-	4.536 kg compaction hammer,drop regulated to 457.2mm.	No.	5	3133.00	15,665.00	0.00	0.00
-	Aggregate compaction mould to BS.5835 complete.	No.	10	3000.00	30,000.00	0.00	0.00
-	Loading frame for the Kango hammer (to BS.5835).	No.	1	100000.00	100,000.00	0.00	0.00
-	Electric vibrating Kango hammer with steel tamper.	No.	1	80986.00	80,986.00	0.00	0.00
-	Steel straight edge 300mm long x 25mm wide x 3mm thick.	No.	6	492.00	2,952.00	0.00	0.00
-	Compaction mould 152.4mm dia.x 116.43mm high complete with base plate and extension collar.	No.	10	3452.00	34,520.00	0.00	0.00
3.Density Test (Sand replacement method BS 1377)							
-	Galvanized metal tray 1m x 0.5m x 75mm deep.	No.	2	1304.00	2,608.00	0.00	0.00
-	75mm brush.	No.	6	153.00	918.00	0.00	0.00
-	Semi-automatic balance,25 kg capacity, accurate to 1 g,including weights.	No.	2	76588.00	153,176.00	0.00	0.00
-	Metal containers,450mm dia.	No.	6	500.00	3,000.00	0.00	0.00
-	Stainless steel tray,305mm dia.	No.	3	1854.00	5,562.00	0.00	0.00
-	Metal tray with 100mm diameter hole in the centre,300mm x 300mm square.	No.	3	1036.00	3,108.00	0.00	0.00
-	Metal tray with 150mm diameter hole in the centre,300mm x 300mm square.	No.	3	1227.00	3,681.00	0.00	0.00
-	Metal tray with 200mm diameter hole in the centre,457mm x 457mm square.	No.	3	1164.00	3,492.00	0.00	0.00
-	Steel pegs for fixing tray in position.	No.	36	50.00	1,800.00	0.00	0.00
-	Sand pouring cylinder,100mm diameter.	No.	3	9014.00	27,042.00	0.00	0.00
-	Sand pouring cylinder,150mm diameter.	No.	3	11233.00	33,699.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
-	Sand pouring cylinder, 200mm diameter.	No.	3	21097.00	63,291.00	0.00	0.00
-	Cold steel chisel, 25mm x 300mm long.	No.	6	300.00	1,800.00	0.00	0.00
-	Cold steel chisel, 10mm * 250mm long.	No.	6	250.00	1,500.00	0.00	0.00
-	1.8 kg hammer.	No.	6	288.00	1,728.00	0.00	0.00
-	Scoop for removing excavated material from hole, 250mm long handle.	No.	6	500.00	3,000.00	0.00	0.00
-	100mm brush, soft.	No.	6	256.00	1,536.00	0.00	0.00
-	Metal dibber	No.	6	577.00	3,462.00	0.00	0.00
-	Screper	No.	6	577.00	3,462.00	0.00	0.00
-	Steel pointed rod	No.	6	433.00	2,598.00	0.00	0.00
-	Density spoon	No.	6	87.00	522.00	0.00	0.00
-	50mm brush, soft.	No.	6	153.00	918.00	0.00	0.00
-	Calibrating can, 100mm diameter x 150mm deep.	No.	3	2270.00	6,810.00	0.00	0.00
-	Calibrating can, 150mm diameter x 200mm deep.	No.	3	5050.00	15,150.00	0.00	0.00
-	Calibrating can, 200mm diameter x 250mm deep.	No.	3	6713.00	20,139.00	0.00	0.00
-	Polythene container jars, with neck 125mm diameter and 4 litre capacity.	No.	6	211.00	1,266.00	0.00	0.00
-	Standard sand 600/300 micron, 50kg bag.	No.	10	200.00	2,000.00	0.00	0.00
4. Density (Nuclear Density Method, AASHTO T238)							
-	Nuclear moisture/density gauge (Troxler 3411B or similar approved).	No.	1	500000.00	500,000.00	0.00	0.00
-	Hole forming device.	No.	1	10000.00	10,000.00	0.00	0.00
-	Guide for the above.	No.	1	6000.00	6,000.00	0.00	0.00
5. Atterberg Limits Apparatus to BS 1377							
-	Casagrande liquid limit apparatus.	No.	4	7352.00	29,408.00	0.00	0.00
-	Grooving tool.	No.	4	614.00	2,456.00	0.00	0.00
-	Liquid limit penetrometer.	No.	2	25892.00	51,784.00	0.00	0.00
-	Penetration test cone.	No.	2	1310.00	2,620.00	0.00	0.00
-	Penetration sample cap.	No.	2	102.00	204.00	0.00	0.00
-	Linear shrinkage mould.	No.	20	1227.00	24,540.00	0.00	0.00
-	Vernier caliper, 150mm x 0.1mm.	No.	2	1600.00	3,200.00	0.00	0.00
-	Stainless steel, 3mm dia. and 100mm long.	No.	4	400.00	1,600.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
6.Sand Equivalent							
	- Sand equivalent test set.	Set	2	16622.00	33,244.00	0.00	0.00
7. Specific Gravity (BS.1377 and BS.812) and Water Absorption(Rice Test ASTM D2041-78)							
	- Pycnometer for sands and fine aggregate, 1 kg capacity, complete with cone and rubber seal.	No.	10	462.00	4,620.00	0.00	0.00
	- Glass Plastic or metal bowl having a capacity of at least 1000 ml strong enough to withstand a full vacuum complete with cover fitted with rubber gasket and a hose connection.	No.	10	2283.00	22,830.00	0.00	0.00
	- Volumetric flask having a capacity of at least 1000 ml strong enough to withstand a full vacuum complete with rubber stopper and a hose connection.	No.	10	4566.00	45,660.00	0.00	0.00
	- An intermediate size heavy wall glass pycnometer having a capacity of approximately 4000 ml or a large size polycarbonate plastic pycnometer having a capacity of at least 10000 ml complete with a suitable vacuum connection assembly consisting of a vacuum gauge, release valve, and tubing connector, plus a tapered stopper device for maintaining consistent volume regulation.	No.	10	7990.00	79,900.00	0.00	0.00
	- A manometer or vacuum gauge suitable for measuring the specified vacuum.	No.	1	21918.00	21,918.00	0.00	0.00
	- Gay Lussac-specific gravity bottle, 25ml.	No.	10	1034.00	10,340.00	0.00	0.00
	- Gay Lussac-specific gravity bottle, 50ml.	No.	10	1034.00	10,340.00	0.00	0.00
	- Wire mesh basket with apertures not greater than 6.5mm large enough to take 2.5 kg of aggregate..	No.	1	5000.00	5,000.00	0.00	0.00
	- Stout watertight container in which the basket can be freely suspended under water.	No.	1	5000.00	5,000.00	0.00	0.00
	- End-over-end shaker	No.	1	231040.00	231,040.00	0.00	0.00
	- Gas jar, 300mm high x 75mm dia. with glass plate and rubber stopper.	No.	10	1964.00	19,640.00	0.00	0.00
	- Vacuum type dessicator, 200mm dia.	No.	2	10397.00	20,794.00	0.00	0.00
	- Vacuum pump, 1 HP	No.	1	29458.00	29,458.00	0.00	0.00
	- Rubber headed pestel	No.	2	635.00	1,270.00	0.00	0.00
	- Soft absorbent cloth (tee towel).	No.	20	230.00	4,600.00	0.00	0.00
	- Shallow tray of area not less than 0.065m <sup>2</sup> .	No.	2	500.00	1,000.00	0.00	0.00





**BILL OF QUANTITIES No.1**  
**GENERAL APPENDIX TO ITEM 1.05**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	- Airtight container of similar capacity to the basket.	No.	1	8000.00	8,000.00	0.00	0.00
	- 5 kg balance accurate to 0.1 g capable of suspending the basket plus sample in the watertight container.	No.	1	89195.00	89,195.00	0.00	0.00
	- Hair drier	No.	1	6000.00	6,000.00	0.00	0.00
	- Sand absorption cone and tamper	No.	2	2166.00	4,332.00	0.00	0.00
	- Picometer for the above.	No.	2	1300.00	2,600.00	0.00	0.00
<b>8.Flakiness Index (BS.812)</b>							
	- Flakiness sieve,4.9 x 30mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
	- Flakiness sieve,7.2 x 40mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
	- Flakiness sieve,10.2 x 50mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
	- Flakiness sieve,14.4 x 60mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
	- Flakiness sieve,19.7 x 80mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
	- Flakiness sieve,26.3 x 90mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
	- Flakiness sieve,33.9 x 100mm slot.	No.	2	2110.00	4,220.00	0.00	0.00
<b>9.Sieve Analysis (BS.1377)</b>							
	- BS sieve 300mm diameter in sizes 75,63, 50,37.5,28,20,14,6.3,5 and 3.35mm plus lid and receiver.	Set	4	40468.00	161,872.00	0.00	0.00
	- BS sieve 200mm diameter in sizes 2,1.18, 0.6,0.425,0.300,0.212,0.150, 0.075 and 0.063mm plus lid and receiver.	Set	4	19051.00	76,204.00	0.00	0.00
	- Electric sieve shaker.	No.	1	67766.00	67,766.00	0.00	0.00
	- BS sieve 200mm diameter,0.425 and 0.075mm.	Set	10	4571.00	45,710.00	0.00	0.00
	- Field rocker sieve set	Set	4	52995.00	211,980.00	0.00	0.00
<b>10.CBR Test(AASHTO T.193)</b>							
	- CBR mould,152mm dia. x 178mm high, complete with perforated base plate and extension collar 50.8mm high that can be fitted to either end of the mould.	No.	30	3548.00	106,440.00	0.00	0.00
	- Spacer disk.	No.	6	1630.00	9,780.00	0.00	0.00
	- Perforated swell plate with adjustable centre post of rust proofed steel provided with a lock nut.	No.	6	1694.00	10,164.00	0.00	0.00
	- Sliding weight rammer,2.49kg.	No.	3	1183.00	3,549.00	0.00	0.00
	- 2.27 kg annular surcharge weight.	No.	30	959.00	28,770.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	- Static compaction press, 50 tonnes capa. with an adjustable platen speed between 1mm/min. and 50.8mm/min. (Hydraulic or mechanical operation and hand operated).	No.	1	112517.00	112,517.00	0.00	0.00
	- Set of guards.	No.	1	8694.00	8,694.00	0.00	0.00
	- CBR/Marshall motorised dual speed 60kN load frame, ASTM.	No.	1	92699.00	92,699.00	0.00	0.00
	- Stabilising bar for the above.	No.	1	20000.00	20,000.00	0.00	0.00
	- Proving ring for above, 10 kN and 50 kN capacity.	Set	1	27234.00	27,234.00	0.00	0.00
	- Penetration gauge range 0-25mm.	No.	1	2525.00	2,525.00	0.00	0.00
	- CBR piston, including bracket.	No.	1	3037.00	3,037.00	0.00	0.00
	- Swell measurement tripod complete with gauge calibrated in 0.01mm divisions.	No.	30	4187.00	125,610.00	0.00	0.00
	- Soaking tank for CBR mould sufficient for 200 moulds.	No.	1	23168.00	23,168.00	0.00	0.00
	- Tamping bar, steel 13mm diameter, 380mm long.	No.	1	448.00	448.00	0.00	0.00
<b>11. Miscellaneous Equipment</b>							
	- 1m x 1m x 75mm deep galvanised metal tray.	No.	10	2365.00	23,650.00	0.00	0.00
	- 1.5 kg hammer.	No.	4	288.00	1,152.00	0.00	0.00
	- Riffle box with 10mm slots (BS.1377).	No.	2	7543.00	15,086.00	0.00	0.00
	- Riffle box with 20mm slots (BS.1377).	No.	1	9114.00	9,114.00	0.00	0.00
	- Riffle box with 50mm slots (BS.1377).	No.	1	10633.00	10,633.00	0.00	0.00
	- Wheel barrow.	No.	4	2046.00	8,184.00	0.00	0.00
	- Dustpan brush.	No.	4	100.00	400.00	0.00	0.00
	- Plastic funnels, 65mm dia.	No.	2	52.00	104.00	0.00	0.00
	- Plastic funnels, 100mm dia.	No.	2	101.00	202.00	0.00	0.00
	- Plastic funnels, 140mm dia.	No.	2	173.00	346.00	0.00	0.00
	- Shovel.	No.	6	250.00	1,500.00	0.00	0.00
	- Pick-axe.	No.	6	479.00	2,874.00	0.00	0.00
	- Metal scoop, large, 150mm wide.	No.	4	600.00	2,400.00	0.00	0.00
	- Metal scoop, medium, 100mm wide.	No.	6	400.00	2,400.00	0.00	0.00
	- Schmidt concrete test hammer.	No.	1	12530.00	12,530.00	0.00	0.00
	- Jack, 20 tonne, lever, frame, sample extrud.	No.	1	7160.00	7,160.00	0.00	0.00
	- Garden trowel.	No.	4	250.00	1,000.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
-	Steel rule, 500mm long.	No.	3	300.00	900.00	0.00	0.00
-	Stop watch.	No.	1	3000.00	3,000.00	0.00	0.00
-	Steel tray, 0.3m x 0.3m x 0.01m deep.	No.	40	607.00	24,280.00	0.00	0.00
-	3.5 kg hammer.	No.	4	1022.00	4,088.00	0.00	0.00
-	7 kg hammer.	No.	3	4571.00	13,713.00	0.00	0.00
-	Complete sand patch test apparatus.	No.	1	0.00	0.00	0.00	0.00
-	Cold chisel.	No.	6	300.00	1,800.00	0.00	0.00
-	Oven, electric thermostatically controled to any temperature between 60 deg. and 149 deg.C, minimum capacity including dial thermometer range 0-160 deg.C (BS.1377).	No.	2	69684.00	139,368.00	0.00	0.00
-	Gas for the above oven.	No.	2	30000.00	60,000.00	0.00	0.00
-	Single plate electric cooker.	No.	4	3069.00	12,276.00	0.00	0.00
-	3 metre straight edge including calibrated wedges.	No.	1	12211.00	12,211.00	0.00	0.00
-	Dessicator, 300mm dia.	No.	2	13862.00	27,724.00	0.00	0.00
-	Streight edge, 300mm long, 25mm wide and 3mm thick.	No.	6	722.00	4,332.00	0.00	0.00
-	Moisture content tin, 75mm dia. cadmium plate or alminium.	No.	100	100.00	10,000.00	0.00	0.00
-	Concrete beam moulds 150 x 150 x 750mm.	No.	24	15663.00	375,912.00	0.00	0.00
-	450mm x 450mm x 9mm plate glass (BS.1377).	No.	4	1471.00	5,884.00	0.00	0.00
-	Refrigerator 250 litre capacity.	No.	1	30000.00	30,000.00	0.00	0.00
-	Palette knife 200mm blade.	No.	6	428.00	2,568.00	0.00	0.00
-	Palette knife 100mm blade.	No.	6	313.00	1,878.00	0.00	0.00
-	BS Sieve brush.	No.	8	211.00	1,688.00	0.00	0.00
-	200mm x 200mm x 20mm cadmium plated or aluminium tin.	No.	50	352.00	17,600.00	0.00	0.00
-	Electronic balance capacity 600 g, accurate to 0.001 g.	No.	1	98836.00	98,836.00	0.00	0.00
-	Electronic balance capacity 1600 g, accurate to 0.01 g.	No.	1	72880.00	72,880.00	0.00	0.00
-	Electronic balance capacity 5000 g, accurate to 0.1 g.	No.	1	58841.00	58,841.00	0.00	0.00
-	Balance (Chain dial) 250 g capacity to 0.01 g.	No.	1	21193.00	21,193.00	0.00	0.00
-	Balance 2000 g capacity accuracy to 0.1 g (manual), including weights.	No.	1	13873.00	13,873.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
-	Balance 4000 g capacity accuracy to 1.0 g (manual), including weights.	No.	1	30000.00	30,000.00	0.00	0.00
-	Balance 12000 g capacity accuracy to 1.0 g (manual), including weights.	No.	2	97653.00	195,306.00	0.00	0.00
-	Balance 50 kg capacity accurate to 20 g, including weights.	No.	1	28449.00	28,449.00	0.00	0.00
-	Load rings with dial gauges, 10kN	No.	1	13297.00	13,297.00	0.00	0.00
-	Load rings with dial gauges, 14kN	No.	1	13937.00	13,937.00	0.00	0.00
-	Load rings with dial gauges, 20kN	No.	1	13937.00	13,937.00	0.00	0.00
-	Load rings with dial gauges, 28kN	No.	1	13937.00	13,937.00	0.00	0.00
-	Load rings with dial gauges, 50kN	No.	1	14576.00	14,576.00	0.00	0.00
-	Still for producing distilled water.	No.	1	32093.00	32,093.00	0.00	0.00
-	Polythene or glass 20 litres storage vessel with tap at bottom.	No.	1	3197.00	3,197.00	0.00	0.00
-	Petrol driven core cutting machine with all accessories.	No.	1	247665.00	247,665.00	0.00	0.00
-	Core cutting compound.	kg	1,000	92.00	92,000.00	0.00	0.00
-	Vernier calipers, 250mm.	No.	2	1982.00	3,964.00	0.00	0.00
-	Benkelman beams.	No.	2	59135.00	118,270.00	0.00	0.00
-	Average least dimension gauge.	No.	2	3000.00	6,000.00	0.00	0.00
-	Lockable tool box containing: 1 pair "Molegrips", 2 x 150mm screwdriver 2 x 200mm screwdriver, 2 x 300mm screwdriver, (1 Standard and 1 phillips head of each) adjustable spanners 200mm and 300mm, 1 pair roundnosed pliers, 1 pair general purpose pliers, 1 plastic faced mallet (1 kg), 1 set imperial spanners 1/4" to 15/16", 1 set metric spanners 8mm to 20mm, 2 tyre pressure gauge range 0-100 p.s.i.	No.	1	9781.00	9,781.00	0.00	0.00
-	Plastic or metal bucket including lid, 10 litres capacity.	No.	20	256.00	5,120.00	0.00	0.00
-	Polythene wash bottle (500ml).	No.	10	150.00	1,500.00	0.00	0.00
-	A4 size clipboard.	No.	20	100.00	2,000.00	0.00	0.00
-	Mercury thermometer, range -10 deg.C to 150 deg.C, glass (BS.593).	No.	10	300.00	3,000.00	0.00	0.00
-	Laboratory thermometer, range +50 deg.C to 250 deg.C (BS.593).	No.	1	300.00	300.00	0.00	0.00
-	Maximum and minimum thermometer (BS.692)	No.	1	467.00	467.00	0.00	0.00
-	Rain gauge.	No.	3	2557.00	7,671.00	0.00	0.00





BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	- Portable dial thermometer +50 deg.C to 250 deg.C accurate to + - 3% with 0.6m long stem.	No.	2	4475.00	8,950.00	0.00	0.00
	- Pocket dial thermometer +50 deg.C to +250 deg.C accurate to + - 3% with 0.1m long stem.	No.	10	1084.00	10,840.00	0.00	0.00
	- 5 litre capacity steel storage container with leak and dust proof lids for storage of bitumen samples.	No.	100	400.00	40,000.00	0.00	0.00

12. Standard Specifications

NOTE:  
Copies of each of the following Standard Specifications:-

- BS.812	No.	1	30047.00	30,047.00	0.00	0.00
- BS.882	No.	1	1438.00	1,438.00	0.00	0.00
- BS.1377	No.	1	33371.00	33,371.00	0.00	0.00
- BS.1881	No.	1	29919.00	29,919.00	0.00	0.00
- BS.1924	No.	1	1694.00	1,694.00	0.00	0.00
- BS.5835, Part 1	No.	1	1694.00	1,694.00	0.00	0.00
- Standard Specifications for Transportation Material and Methods of Sampling and Testing (AASHTO) Part I and II, 13th Edition.	No.	1	23015.00	23,015.00	0.00	0.00

13. Concrete: Slump and Cube Manufacture (BS 1881)

- Slump cone, tamping rod and base.	Set	2	2122.00	4,244.00	0.00	0.00
- Concrete cube mould, 150mm.	No.	20	3452.00	69,040.00	0.00	0.00
- Soaking tank for cubes, capacity 50 Nos.	No.	1	37463.00	37,463.00	0.00	0.00
- Cube tamping bars for Item 1.252.	No.	1	230.00	230.00	0.00	0.00
- Water test set for concrete mixing water.	No.	1	74510.00	74,510.00	0.00	0.00
- Potential alkali reactivity of cement-aggregate combinations.	No.	1	0.00	0.00	0.00	0.00
- Mortar bar container.	No.	3	0.00	0.00	0.00	0.00

14. Concrete: Cube Compression Testing and Lean Concrete Unconfined Compressive Strength Testing

- Concrete compression machine, to BS.1610 Grade A with 300mm gauge, rectangular plattens, capacity 1560 kN with load pacer.	No.	1	227655.00	227,655.00	0.00	0.00
- Safety guard for Item 1.255.	No.	1	4667.00	4,667.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
-	50mm distance piece.	No.	1	5000.00	5,000.00	0.00	0.00
-	70mm distance piece.	No.	1	6500.00	6,500.00	0.00	0.00
-	100mm distance piece.	No.	1	6500.00	6,500.00	0.00	0.00
-	Mechanical load pacer.	No.	1	30686.00	30,686.00	0.00	0.00
-	Tamping rod,16mm dia.x 600mm long.	No.	2	578.00	1,156.00	0.00	0.00
-	Tamping bar,380mm x 25mm square.	No.	2	1444.00	2,888.00	0.00	0.00
-	Tamping rod,10mm dia.x 250mm long.	No.	2	578.00	1,156.00	0.00	0.00
-	Electric vibrating hammer 750 watt with tamping food square.	No.	1	375440.00	375,440.00	0.00	0.00
15.Potential Alkali Reactivity of Cement-Aggregate Combination and Mortar Bar Container							
-	Comparator mould(25.4 x 25.4 x 285mm)	No.	3	20216.00	60,648.00	0.00	0.00
-	Length comparator	No.	1	98480.00	98,480.00	0.00	0.00
-	ASTM type flow table	No.	1	64691.00	64,691.00	0.00	0.00
-	Curing box(60 x 40 x 60cm)	No.	1	209669.00	209,669.00	0.00	0.00
-	Concrete consistency apparatus	No.	1	1444.00	1,444.00	0.00	0.00
-	Mortar mixer	No.	1	216600.00	216,600.00	0.00	0.00
16.Marshall Stability Test Equipment(AASHTO T 245)							
-	Specimen mould including base plate and extension collar.	No.	10	2397.00	23,970.00	0.00	0.00
-	Specimen extractor.	No.	1	4000.00	4,000.00	0.00	0.00
-	Compaction hammer.	No.	2	7352.00	14,704.00	0.00	0.00
-	Compaction pedestal and specimen mould holder.	No.	2	21896.00	43,792.00	0.00	0.00
-	Breaking head mould.	No.	1	9000.00	9,000.00	0.00	0.00
-	CBR/Marshall motorised dual speed 60 kN load frame,ASTM.	No.	1	101265.00	101,265.00	0.00	0.00
-	Electrically operated laboratory mixer 10 litre capacity.	No.	1	97813.00	97,813.00	0.00	0.00
-	Flowmeter.	No.	2	4603.00	9,206.00	0.00	0.00
-	Suitable mechanical mixer.	No.	1	60000.00	60,000.00	0.00	0.00
-	Water bath with cover at least 150mm deep thermostatically controlled to maintain the temperature of the water at 60 deg.C + - 1 deg.C.The tank shall have a perforated false bottom or be equipped with a shelf for supporting specimens 50mm above the bottom of the bath.	No.	2	24613.00	49,226.00	0.00	0.00



BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	- Isomantle electric heater for bowl of laboratory mixer.	No.	1	59212.00	59,212.00	0.00	0.00
	- Thermometer with 50mm dia. and 180mm stainless steel stem (50 to 250 deg.C).	No.	1	4475.00	4,475.00	0.00	0.00
	- ASTM Marshall automatic compactor, electric.	No.	1	115074.00	115,074.00	0.00	0.00

17.Bitumen Extraction Test

(1) Extractor Bottle Method,B.S.598,  
Part 2

- Flat bottomed scoop.	No.	2	1634.00	3,268.00	0.00	0.00
- Steel garden trowel.	No.	2	720.00	1,440.00	0.00	0.00
- Large steel spoon.	No.	2	187.00	374.00	0.00	0.00
- Water resistant gloves.	Pair	3	290.00	870.00	0.00	0.00
- Foot pump for pressurising air-water assemblies upto a maximum of 700kN/m2 and fitted with flexible hose approximately 1.2m long and connector.	No.	1	17450.00	17,450.00	0.00	0.00
- Steel bottle 600ml capacity with 49mm rubber stopper.	No.	1	1467.00	1,467.00	0.00	0.00
- Steel bottle 2500ml capacity with 71mm rubber stopper.	No.	2	1973.00	3,946.00	0.00	0.00
- Steel bottle 7000ml capacity with 71mm rubber stopper.	No.	1	2195.00	2,195.00	0.00	0.00
- Flash funnel fpr fitting to the 700ml steel bottles. The rim of the funnel retains a sieve 200mm nominal diameter.	No.	1	2195.00	2,195.00	0.00	0.00
- Bottle roller-A compact bench mounted unit designed to rotate two bottles simultaneously about their longitudinal axis.	No.	1	24436.00	24,436.00	0.00	0.00
- Pressure filter complete with cutting tool for making a hole in the filter paper.	No.	1	52307.00	52,307.00	0.00	0.00
- Filter funnel to take 200mm nominal diameter sieves.	No.	1	2195.00	2,195.00	0.00	0.00
- Centrifuge complying with as BS 598.	No.	1	24382.00	24,382.00	0.00	0.00
- Binder recovery apparatus.	No.	1	36732.00	36,732.00	0.00	0.00
- Volumetric flask 250ml,500ml,1000ml and 2000ml capacity of each.	No.	2	2561.00	5,122.00	0.00	0.00
- Recovery still for Dichloromethane.	No.	1	60000.00	60,000.00	0.00	0.00

(2) Hot Extractor Method,B.S.596,  
Part 2



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM 1.05

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN CURRENCY RATE	CURRENCY AMOUNT	LOCAL CURRENCY RATE	CURRENCY AMOUNT
	- Hot extractor complete with wire gauze container, gasket, cork lid and support assembly.	No.	1	11936.00	11,936.00	0.00	0.00
	- Dean and Stark Receiver with condenser to suit Trichloroethylene.	No.	1	3461.00	3,461.00	0.00	0.00
18. Consumables							
	- Paraffin wax.	kg	50	15.00	750.00	0.00	0.00
	- Gas.	kg	1,600	26.00	41,600.00	0.00	0.00
	- Gunny sack.	No.	400	35.00	14,000.00	0.00	0.00
	- Plastic bag, 900 x 450mm x 1000 gauge.	No.	2,000	19.00	38,000.00	0.00	0.00
	- Plastic bag, 450 x 300mm x 1000 gauge.	No.	1,000	8.00	8,000.00	0.00	0.00
	- Filter paper 150mm dia., Whatman No.5 (Boxes of 100).	No.	10	346.00	3,460.00	0.00	0.00
	- Filter paper 400mm dia., Whatman No.5 (Boxes of 100).	No.	5	381.00	1,905.00	0.00	0.00
	- Filter paper 100mm dia., Whatman No.5 (Boxes of 100).	No.	5	346.00	1,730.00	0.00	0.00
	- Trichloroethylene (205 litre drum).	No.	2	25836.00	51,672.00	0.00	0.00
	- Dichloromethane (275 kg drum).	No.	2	16437.00	32,874.00	0.00	0.00
	- Cotton waste (or drying cloths).	kg	100	78.00	7,800.00	0.00	0.00
	- Filter paper 270mm dia., 33mm with dia. hole in centre, Whatman No.5 (Box of 100)	No.	15	346.00	5,190.00	0.00	0.00
	- Filter paper 400mm diameter Whatman No.54 (Box of 100).	No.	10	381.00	3,810.00	0.00	0.00
	- Registration paper for compaction test.	sheet	1,000	10.00	10,000.00	0.00	0.00
	- Moisture-density relation test plot paper.	sheet	1,000	10.00	10,000.00	0.00	0.00
	- Registration paper for Atterberg Limits.	sheet	1,000	10.00	10,000.00	0.00	0.00
	- Registration paper for Particle size analysis.	sheet	1,000	10.00	10,000.00	0.00	0.00
	- Registration paper for CBR.	sheet	1,000	10.00	10,000.00	0.00	0.00
	Subtotal(Labo.Equipment, Item 2 to 18)				7,882,672.00		0.00
	Total(Item 1 to 18)				8,747,472.00		0.00









**APPENDIX F      EXTERNAL LABORATORY TEST  
(GENERAL    )**



BILL OF QUANTITIES No.1  
GENERAL, APPENDIX TO ITEM

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT SHILLINGS CTS
	Item Prime Cost Sum of the external laboratory test as listed in the Special Specification.				
	(1) Los Angeles Abrasion (AASHTO T96 and ASTM C535).	No.	10	260.00	2,600.00
	(2) Aggregate Crushing Value (BS.812).	No.	10	280.00	2,800.00
	(3) Sodium Sulphate Soundness (AASHTO T104).	No.	10	220.00	2,200.00
	(4) Crushing Ratio.	No.	10	220.00	2,200.00
	(5) Soluble Chloride Content (BS.812).	No.	10	110.00	1,100.00
	(6) Organic Impurities in sand (AASHTO T21).	No.	20	110.00	2,200.00
	Total				13,100.00
	Item Overhead and profit, 40%				5,240.00









BILL OF QUANTITIES No.1  
GENERAL APPENDIX TO ITEM 1.06/1.07

Estimated at  
VAT exemption.

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	FOREIGN RATE	CURRENCY AMOUNT	LOCAL RATE	CURRENCY AMOUNT
Item 1.06							
Prime Cost Sum of the external laboratory test as listed in the Special Specification.							
(1)	Los Angeles Abrasion (AASHTO T96 and ASTM C535).	No.	10	0.00	0.00	260.00	2,600.00
(2)	Aggregate Crushing Value (BS.812).	No.	10	0.00	0.00	280.00	2,800.00
(3)	Sodium Sulphate Soundness (AASHTO T104).	No.	10	0.00	0.00	220.00	2,200.00
(4)	Crushing Ratio.	No.	10	0.00	0.00	220.00	2,200.00
(5)	Soluble Chloride Content (BS.812).	No.	10	0.00	0.00	110.00	1,100.00
(6)	Organic Impurities in sand (AASHTO T21).	No.	20	0.00	0.00	110.00	2,200.00
Total					0.00		13,100.00
Item 1.07							
Overhead and profit, 40%					0.00		5,240.00







## APPENDIX G ENGINEERING SERVICES



# ENGINEERING COST

	Foreign Currency (Japanese Yen)	Local Currency (Kenya Shillings)
<b>A.Foreign Currency Portion</b>		
1.Remuneration	271,400,000	0
2.Direct Cost	58,400,000	0
3.Contingency	16,490,000	0
<b>B.Local Currency Portion</b>		
1.Direct Cost	0	7,972,000
2.Contingency	0	398,600
<b>Total</b>	<b>346,290,000</b>	<b>8,370,600</b>
	(K.Shs.)	
	79,061,644	

## BREAKDOWN

		Foreign Currency (Japanese Yen)
<b>A.Foreign Currency Portion</b>		
1.Remuneration		271,400,000
1.1 Expatriate	2,700,000 x 32 2,200,000 x 58	86,400,000 127,600,000
1.2 Local	700,000 x 77	57,400,000
2.Direct Cost		58,400,000
2.1 International Travel Cost		
(1) International Airfair	1,000,000 x 11 trips	11,000,000
(2) Excess Baggage	10,000 x 20kg x 2 x 11 trips	4,400,000
(3) Mobilization Cost Passport,visa,etc.	100,000 x 11 trips	1,100,000
2.2 International Communication Cost	200,000 x 30 months	6,000,000
2.3 International Transportation cost		
(1) Air Cargo	2,200 x 500kg	1,100,000
(2) DHL Services	10,000 x 5kg x 1 x 30 months	1,500,000
2.4 Office Supplies	50,000 x 30 months	1,500,000
2.5 Printing Cost		2,000,000
2.6 Overseas Allowance	11,000 x 90 M/M x 30 days	29,700,000
2.8 Custom Clearance		100,000
3.Contingency (Remuneration+Direct cost,5%)		16,490,000
<b>Total(Foreign Currency)</b>		<b>346,290,000</b>



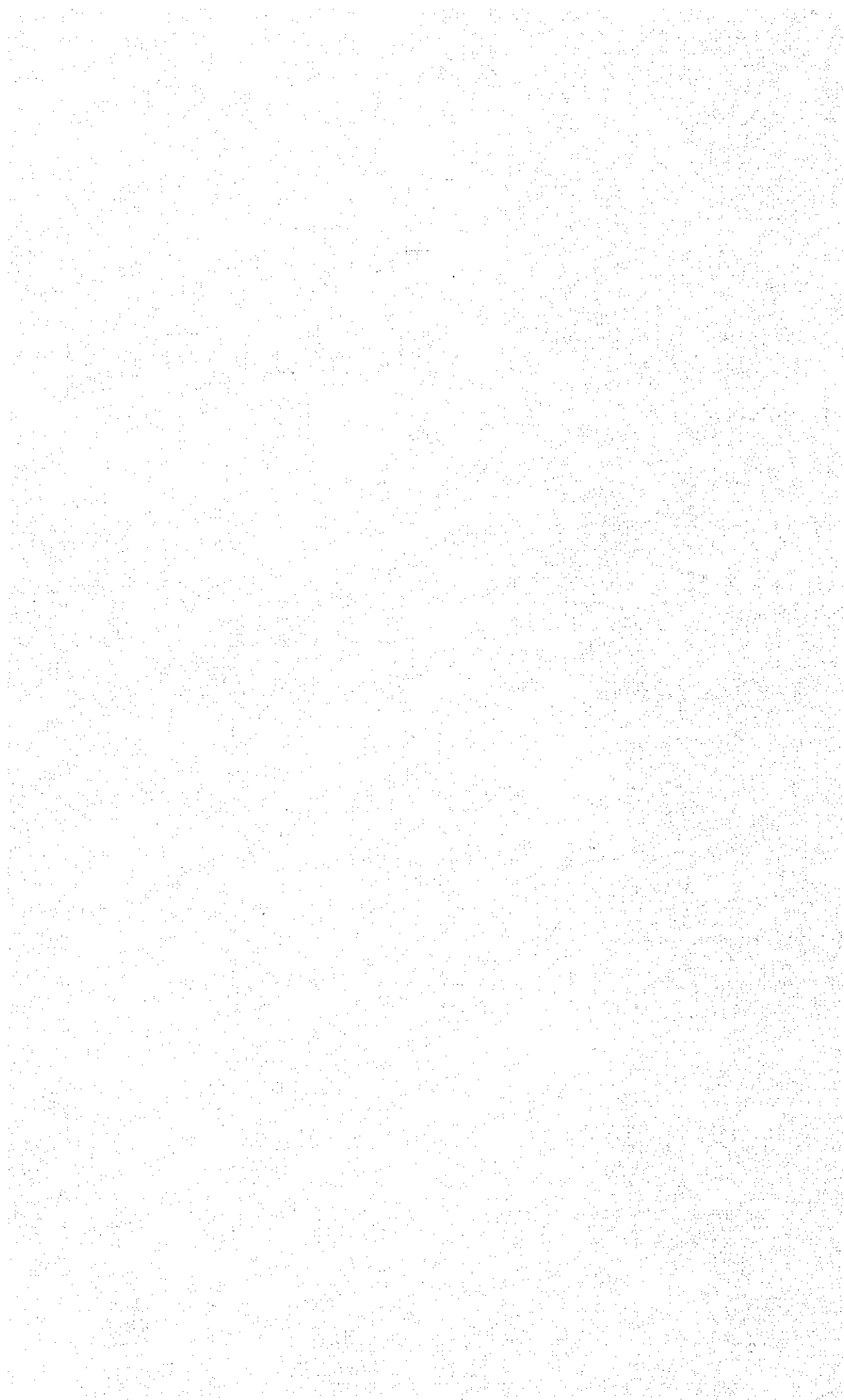


## B. Local Currency Portion

<b>1. Direct Cost</b>		<b>7,972,000</b>
1.1 Office Rental in Nairobi	K.22,000 x 4 months	88,000
1.2 Domestic Communication and Transportation Cost	K.5,000 x 30 months	150,000
1.3 Vehicle Rental Rate	K.40,000 x 1 units x 2 months	80,000
1.4 Office Supplies and Consumables	K.10,000 x 30 months	300,000
1.5 Procurement of Office Equipment in Kenya		200,000
1.6 Salary of Local Staff		
Chief inspector	50,000 x 30 M/M	1,500,000
Surveyor	20,000 x 2 x 26 M/M	1,040,000
Inspector	20,000 x 4 x 30 M/M	2,400,000
Draftman	8,000 x 1 x 28 M/M	224,000
Clerk	5,000 x 1 x 30 M/M	150,000
Typist	7,000 x 2 x 30 M/M	420,000
Office boy/Watchman	2,500 x 2 x 30 M/M	150,000
Admini. assist.	5,000 x 1 x 30 M/M	150,000
Admini. officer	10,000 x 1 x 30 M/M	300,000
Labo. technician	10,000 x 3 x 26 M/M	780,000
(Subtotal)		7,114,000
1.7 Cost of Work Permit	10,000 x 4 persons	40,000
2. Contingency (Direct cost, 5%)		398,600
<b>Total (Local Currency)</b>		<b>8,370,600</b>







## APPENDIX H LAND ACQUISITION AND COMPENSATION



## LAND AQUISITION AND COMPENSATION

The cost for land aquisition and compensation was estimated on the Preliminary Design stage.

Land value was obtained from Ministry of Land and Housing on September 3,1990. The detailed breakdown is shown in the Preliminary Design (COST ESTIMATE,October 1990) Report.

### 1. Preliminary Design

- Government land	: Free of charge.
- Private land	: K.Shs. 66,602,700
- Agricultural land	: K.Shs. 6,153,000
- Housing	: K.Shs. 26,468,000
- Others	: K.Shs. 2,468,800
Total	K.Shs.101,871,200

### 2. Detailed Design

Land value is reviewed and increased to about 30 % from the Preliminary Design stage.

Land aquisition and compensation

K.Shs.101,871,200 x 1.30= K.Shs.132,432,560  
(K.Shs.132,400,000)









## APPENDIX I      UNIT PRICE LIST



**BILL OF QUANTITIES No.1**  
**GENERAL**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (exc'l.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)	Unit:Kshs.
1.01	Representative and his staff houses:								
	(1) Type I (senior staff house), 1No.	Month	0.00	22000.00	22000.00	0.00	22000.00	22000.00	
	(2) Type II (senior staff house), 5Nos.	Month	0.00	17000.00	17000.00	0.00	17000.00	17000.00	
	(3) Type III (junior staff house), 3Nos.	Month	0.00	12000.00	12000.00	0.00	12000.00	12000.00	
	(4) Type IV (junior staff house), 5Nos.	Month	0.00	7500.00	7500.00	0.00	7500.00	7500.00	
1.02	Engineer's main office	No.	567000.00	567000.00	1134000.00	0.00	567000.00	1134000.00	
1.03	Laboratory	No.	347000.00	347000.00	694000.00	0.00	347000.00	694000.00	
1.04	Furniture and office equipment	L.S.	747300.00	259500.00	1006800.00	0.00	259500.00	1006800.00	
1.05	Survey and laboratory equipment	L.S.	8747472.00	0.00	8747472.00	0.00	0.00	8747472.00	
1.06	One (1) new 504 Peugeot	Veh.M	0.00	40000.00	40000.00	0.00	40000.00	40000.00	
1.07	E.O item 1.05 for distance in excess	km	0.00	6.00	6.00	0.00	6.00	6.00	
1.08	Three (3) new LWB 4WD Land Rovers	Veh.M	0.00	44000.00	44000.00	0.00	44000.00	44000.00	
1.09	E.O item 1.08 for distance in excess	km	0.00	11.50	11.50	0.00	11.50	11.50	
1.10	Three (3) new Subaru	Veh.M	0.00	38000.00	38000.00	0.00	38000.00	38000.00	
1.11	E.O item 1.10 for distance in excess	km	0.00	7.00	7.00	0.00	7.00	7.00	
1.12	P.C.Sum, removals and alterations								
	(1) Telecommunication line	P.C.	0.00	1600000.00	1600000.00	0.00	1600000.00	1600000.00	
	(2) Electric line	P.C.	0.00	8900000.00	8900000.00	0.00	8900000.00	8900000.00	
	(3) Water pipe line	P.C.	0.00	4600000.00	4600000.00	0.00	4600000.00	4600000.00	
	(4) Railway	P.C.	0.00	4500000.00	4500000.00	0.00	4500000.00	4500000.00	
	(5) Sewerage pipe line	P.C.	0.00	1600000.00	1600000.00	0.00	1600000.00	1600000.00	
	(6) Existing street lighting	P.C.	0.00	100000.00	100000.00	0.00	100000.00	100000.00	
	(7) Electric fence	P.C.	0.00	500000.00	500000.00	0.00	500000.00	500000.00	
	(8) Fence	P.C.	0.00	300000.00	300000.00	0.00	300000.00	300000.00	
1.13	Percentage of P.C.Sum in Item 1.12	% of							
1.14	P.C.Sum, compensation and acquisition	P.C.	0.00	3000000.00	3000000.00	0.00	3000000.00	3000000.00	
1.15	Percentage of P.C.Sum in Item 1.14	% of							
1.16	P.C.Sum, Miscellaneous account	P.C.	0.00	600000.00	600000.00	0.00	600000.00	600000.00	
1.17	Percentage of P.C.Sum in Item 1.16	% of							
1.18	Publicity signs	No.	0.00	25000.00	25000.00	0.00	25000.00	25000.00	
1.19	P.C.Sum, rectification of title deeds	P.C.	0.00	500000.00	500000.00	0.00	500000.00	500000.00	
1.20	Percentage of P.C.Sum in Item 1.19	% of							



BILL OF QUANTITIES No.4  
SITE CLEARANCE AND TOPSOIL STRIPPING

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl. VAT)	VAT(Kshs)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
4.01	Clear site in Open Country	ha	4160.60	1086.90	5247.50	202.30	1289.20	5449.80
4.02	Clear site in forest area	ha	8736.20	2499.60	11235.80	607.00	3106.60	11842.80
4.03	Removal topsoil	m3	38.62	10.75	49.37	3.20	13.95	52.57
4.04	Scarify and remove, pavement material	m3	101.36	27.64	129.00	8.87	36.51	137.87
4.05	Demolish existing railway bridge	L.S.	103000.00	26000.00	129000.00	7000.00	33000.00	136000.00
4.06	Allow for the removal of structures, fences and obstructions.	Prov.	0.00	500000.00	500000.00	0.00	500000.00	500000.00
	Sum	Sum						





**BILL OF QUANTITIES No.5**  
**EARTHWORKS**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs) (incl.VAT)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
5.01	Fill in soft material,main,service roads	m3	71.89	20.33	92.22	6.03	26.36	98.25
5.02	Fill in soft material,slip roads, approach roads	m3	71.89	20.33	92.22	6.03	26.36	98.25
5.03	As for Item 5.01 but hauling from drainage pond excavation works	m3	71.41	20.24	91.65	6.03	26.27	97.68
5.04	As for Item 5.01 but for new railway embankment.	m3	71.41	20.24	91.65	6.03	26.27	97.68
5.05	Fill in hard material for main road.	m3	197.72	48.68	246.40	11.07	59.75	257.47
5.06	Fill in soft material,central reserves	m3	81.17	75.45	156.62	7.61	83.06	164.23
5.07	Fill in soft material adjacent to shoulders	m3	81.17	75.45	156.62	7.61	83.06	164.23
5.08	Spoil in unsuitable material such as black cotton and rubbish.	m3	72.50	20.23	92.73	6.51	26.74	99.24
5.09	Spoil in soft material.	m3	72.50	20.23	92.73	6.51	26.74	99.24
5.10	Spoil in hard material.	m3	242.36	58.26	300.62	14.97	73.23	315.59
5.11	Overhaul earthworks in excess of 1.0km	m3.km	7.44	1.89	9.33	0.86	2.75	10.19
5.12	Excavation in swamps.	m3	89.16	25.60	114.76	6.14	31.74	120.90
5.13	Provide and place rockfill	m3	196.70	48.45	245.15	10.90	59.35	256.05
5.14	Compact original ground below fills	m3	13.30	4.28	17.58	0.56	4.84	18.14
5.15	E.O.Item 5.01 to 5.05 for compaction of 300mm subgrade material in fill area	m3	6.65	2.14	8.79	0.28	2.42	9.07
5.16	Compact in-situ subgrade in Cut area to a depth of 300mm below formation level	m3	13.30	4.28	17.58	0.56	4.84	18.14
5.17	Compact in-situ subgrade material in Cut area between 150mm and 300mm below underside of imported subgrade material	m3	13.30	4.28	17.58	0.56	4.84	18.14
5.18	Compact in-situ subgrade material in Cut area between 0mm and 150mm below underside of imported subgrade material	m3	6.65	2.14	8.79	0.28	2.42	9.07
5.19	Provide,place and compact improved subgrade material	m3	85.55	24.07	109.62	7.60	31.67	117.22
5.20	Rock formation levelling in Cut area below lean concrete base level or as directed by the Engineer.	m2	14.44	10.56	25.00	1.56	12.12	26.56
5.21	Haul from stockpile and spread on side-slopes and central reserves,lightly roll and compact 75mm thickness of topsoil.	m2	5.52	4.54	10.06	0.50	5.04	10.56
5.22	Haul from stockpile and spread on black cotton spoil area,lightly roll and compact 200mm thickness of topsoil	m2	13.35	6.70	20.05	1.17	7.87	21.22
5.23	Haul from stockpile and spread on rubbish spoil area and side borrow area, and compact topsoil.	m3	74.80	22.19	96.99	6.17	28.36	103.16



BILL OF QUANTITIES No.5  
EARTHWORKS

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl. VAT)	VAT(Kshs) (incl. VAT)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
5.24	Plant fill slopes and cut slopes with selected grass	m2	0.00	18.29	18.29	0.62	18.91	18.91
5.25	Provide, place and compact filter material for drainage layer and sand mat	m3	277.05	208.89	485.94	79.80	288.69	565.74
5.26	Fill for new national boundary dike including demolishing existing dike.	m3	65.36	18.82	84.18	5.41	24.23	89.59
5.27	Filter fabric for rockfill	m2	187.30	18.86	206.16	0.00	18.86	206.16



**BILL OF QUANTITIES NO.7  
EXCAVATION AND FILLING FOR STRUCTURES**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
<b>BRIDGES</b>								
7.01	Excavation, compaction at foundation levels, backfilling and removal of excavated material to spoil for structures foundations in soft materials.	m3	85.68	22.37	108.05	6.58	28.95	114.63
7.02	E.O. Item 7.01 in hard material	m3	259.05	61.48	320.53	14.59	76.07	335.12
7.03	Backfilling with selected material	m3	85.90	55.18	141.08	8.13	63.31	149.21
7.04	Porous filter material	m3	277.05	208.89	485.94	79.80	288.69	565.74
7.05	Selected granular fill material	m3	313.42	116.25	429.67	27.87	144.12	457.54
<b>BOX CULVERTS</b>								
7.06	As Item 7.01	m3	85.68	22.37	108.05	6.58	28.95	114.63
7.07	E.O. Item 7.06 in hard material	m3	259.05	61.48	320.53	14.59	76.07	335.12
7.08	Backfilling with selected material	m3	85.90	55.18	141.08	8.13	63.31	149.21
7.09	Porous filter material	m3	277.05	208.89	485.94	79.80	288.69	565.74
7.10	Selected granular fill material	m3	313.42	116.25	429.67	27.87	144.12	457.54
7.11	Excavation and backfilling for gabions in soft material.	m3	0.00	90.95	90.95	0.00	90.95	90.95
7.12	Provide and place gabion mesh, 0.5m	m2	194.72	155.98	350.70	46.89	202.87	397.59
7.13	Rockfill to gabions	m3	303.82	107.35	411.17	22.95	130.30	434.12



**BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
8.01	Excavate in soft material ,pipe culverts	m3	94.98	40.66	135.64	7.71	48.37	143.35
8.02	As for Item 8.01, inlets and outlets	m3	94.98	40.66	135.64	7.71	48.37	143.35
8.03	Excavate in soft earth channel,I	m3	85.68	22.37	108.05	6.58	28.95	114.63
8.04	Excavate in soft,pitching channel,II	m3	85.68	22.37	108.05	6.58	28.95	114.63
8.05	Excavate in soft,conc.channel,III	m3	85.68	22.37	108.05	6.58	28.95	114.63
8.06	Excavate in soft,conc.chan.cascade,VII	m3	85.68	22.37	108.05	6.58	28.95	114.63
8.07	Excav.backfill,gulley pot	m3	94.98	40.66	135.64	7.71	48.37	143.35
8.08	Excav.backfill,conc.ditch,VI	m3	94.98	40.66	135.64	7.71	48.37	143.35
8.09	Excav.backfill,gabions	m3	0.00	90.95	90.95	0.00	90.95	90.95
8.10	Excavate subsoil drain	m	0.00	90.95	90.95	0.00	90.95	90.95
8.11	Excav.hard material	m3	259.05	61.48	320.53	14.59	76.07	335.12
8.12	Filter fabric to subsoil drain	m2	93.65	9.43	103.08	0.00	9.43	103.08
8.13	Crushed rock to subsoil drain	m3	313.42	116.25	429.67	27.87	144.12	457.54
8.14	Perforated 200mm PVC pipe	m	389.85	35.26	425.11	0.00	35.26	425.11
8.15	Provide,lay and joint 300mm I.D. concrete pipes ogee jointed.	m	209.88	203.19	413.07	58.00	261.19	471.07
8.16	As for Item 8.15 but 600mm I.D.	m	619.81	782.19	1402.00	178.88	961.07	1580.88
8.17	As for Item 8.15 but 750mm I.D.	m	923.63	961.91	1885.54	273.99	1235.90	2159.53
8.18	As for Item 8.15 but 900mm I.D.	m	1160.37	1489.64	2650.01	343.51	1813.15	2973.52
8.19	As for Item 8.15 but 1200mm I.D.	m	1866.73	2218.69	4085.42	560.32	2779.01	4645.74
8.20	Class 15/20 concrete bed	m3	1499.31	1120.87	2620.18	198.49	1319.36	2818.67
8.21	Class 15/20, berm conc.	m2	67.91	28.68	96.59	9.09	37.77	105.68
8.22	Class 25/20, fabric mesh	m3	1901.02	2081.92	3982.94	271.88	2353.80	4254.82
8.23	As for Item 8.22 but 15/20,III	m3	1504.61	901.98	2406.59	204.34	1106.32	2610.93
8.24	Conc 20/20, reinf.VI	m3	3093.60	5833.36	8926.96	514.36	6347.72	9441.32
8.25	Conc 20/20,gulley pot	m3	2182.53	4085.02	6267.55	312.49	4397.51	6580.04
8.26	Concrete cover,gulley pot	No.	187.05	298.72	485.77	30.30	329.02	516.07
8.27	50mm dia.PVC weep holes	No.	13.95	4.47	18.42	0.00	4.47	18.42
8.28	150mm thick grouted stone pitching	m2	129.78	118.49	248.27	16.71	135.20	264.98
8.29	250mm building stone	m2	0.00	235.29	235.29	27.00	262.29	262.29
8.30	Cement screen	m2	25.39	27.68	53.07	5.37	33.05	58.44
8.31	Gabion mesh,1m thick,	m2	242.19	183.00	425.19	58.48	241.48	483.67
8.32	Mattresses,0.3m thick	m2	111.77	108.76	220.53	26.91	135.67	247.44
8.33	Rockfill to gabions and mattresses	m3	303.82	107.35	411.17	22.95	130.30	434.12
8.34	Filter fabric	m2	93.65	9.43	103.08	0.00	9.43	103.08
8.35	450 x 225mm P.C.C. invert block drains	m	124.14	150.13	274.27	35.66	185.79	309.93
8.36	75mm thick P.C.C. side slabs	m2	114.49	163.19	277.68	40.48	203.67	318.16
8.37	375x250mm inv.block drain,IV	m	116.90	144.14	261.04	44.00	188.14	305.04
8.38	As for Item 8.37 but berm,VIII	m	116.90	144.14	261.04	44.00	188.14	305.04
8.39	Kerb inlet	No	46.00	59.63	105.63	14.40	74.03	129.03
8.40	Intake block channel	No	46.00	59.63	105.63	14.40	83.06	129.06
8.41	Conc.gutter,250 x 150mm	m	279.57	364.31	643.88	36.89	401.20	680.77





BILL OF QUANTITIES No.8  
CULVERTS AND DRAINAGE WORKS

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
8.42	Selected granular fill, gravel bedding	m3	313.42	116.25	429.67	27.87	144.12	457.54
8.43	Selected grass	m2	0.00	18.29	18.29	0.62	18.91	18.91
8.44	Earth dike of drainage pond	m3	71.41	20.24	91.65	6.03	26.27	97.68



**BILL OF QUANTITIES No.9**  
**PASSAGE OF TRAFFIC**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (exc1.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
9.01	Sign and barrier	km	0.00	35000.00	35000.00	0.00	35000.00	35000.00
9.02	Construct/maintain deviation, 7m, type 1	km	2356270.00	618670.00	2974940.00	326850.00	945520.00	3301790.00
9.03	Construct/maintain deviation, 7m, type 1	km	2356270.00	618670.00	2974940.00	326850.00	945520.00	3301790.00
9.04	Construct/maintain deviation, 7m, type 2	km	497150.00	101490.00	598640.00	53790.00	155280.00	652430.00
9.05	Construct/maintain deviation, 6m, type 3	km	226690.00	62870.00	289560.00	21350.00	84220.00	310910.00
9.06	Construct/maintain deviation, 3m, type 4	km	114840.00	31430.00	146270.00	10670.00	42100.00	156940.00
9.07	Reinstatement of deviation	L.S.	407100.00	103700.00	510800.00	52300.00	156000.00	563100.00
9.08	Repair of exist. road, cross drainage, Momb	m2	554.08	147.64	701.72	86.20	233.84	787.92
9.09	Repair of exist. road, cross drainage, Kiku	m2	175.50	51.10	226.60	17.61	68.71	244.21
9.10	Maintenance of project road	L.S.	590000.00	121300.00	711300.00	113000.00	234300.00	824300.00
9.11	Improvement of existing road	m3	85.55	24.07	109.62	7.60	31.67	117.22
	(1) Improved subgrade material	m3	255.21	69.85	325.06	23.72	93.57	348.78
	(2) Gravel wearing course	m3	638.87	211.04	849.91	58.91	269.95	908.82
	(3) Graded crushed stone base	lit	19.06	0.50	19.56	2.97	3.47	22.53
	(4) MC 30 prime coat	lit	21.84	0.57	22.41	3.40	3.97	25.81
	(5) MC3000 sealing coat	m3	640.33	196.07	836.40	44.44	240.51	880.84
	(6) Chipping, 3/6mm	km	0.00	50000.00	50000.00	0.00	50000.00	50000.00
9.12	Maintenance of exist. roads, heavy const.	m3	2517.78	491.40	3009.18	521.01	1012.41	3530.19
9.13	Re-carpeting of exist. roads 6m wide							



BILL OF QUANTITIES No.10  
GRAVEL WEARING COURSE

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
10.01	Clear site of the material site.	ha	4160.60	1086.90	5247.50	202.30	1289.20	5449.80
10.02	Construct access road to the material site in excess of 200m in length.	km	212460.00	60840.00	273300.00	18480.00	79320.00	291780.00
10.03	Excavate and spoil topsoil and overburden in the material site.	m3	38.62	10.75	49.37	3.20	13.95	52.57
10.04	Excavate gravel wearing course material,	m3	255.21	69.85	325.06	23.72	93.57	348.78



**BILL OF QUANTITIES No.13  
GRADED CRUSHED STONE FOR SUBBASE AND BASE**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
13.01	Provide, spread and compact graded crushed stone to subbase for main road.	m3	594.55	195.69	790.24	58.07	253.76	848.31
13.02	As for Item 13.01 but for slip road.	m3	594.55	195.69	790.24	58.07	253.76	848.31
13.03	As for Item 13.01 but for approach road	m3	594.55	195.69	790.24	58.07	253.76	848.31
13.04	Base, slip, approach and service roads.	m3	638.87	211.04	849.91	58.91	269.95	908.82
13.05	Provide, spread and compact graded crushed stone to shoulder for main road.	m3	594.55	195.69	790.24	58.07	253.76	848.31
13.06	As for Item 13.05 but for slip road.	m3	594.55	195.69	790.24	58.07	253.76	848.31
13.07	As for Item 13.05 but for approach road	m3	594.55	195.69	790.24	58.07	253.76	848.31





BILL OF QUANTITIES No.14A  
LEAN CONCRETE FOR BASE

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs) (incl.VAT)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
14.01	Provide,process,mix,transport,spread and compact lean concrete base material for main road in accordance with the Specification.	m3	760.02	285.65	1045.67	81.28	366.93	1126.95
14.02	As for Item 14.01 but for slip road.	m3	760.02	285.65	1045.67	81.28	366.93	1126.95
14.03	As for Item 14.01 but for approach road.	m3	760.02	285.65	1045.67	81.28	366.93	1126.95
14.04	Protecting and curing lean concrete base	m2	0.00	2.00	2.00	0.00	2.00	2.00
14.05	Variation in cement content(Prov.)	tonne	0.00	3236.93	3236.93	402.80	3639.73	3639.73



**BILL OF QUANTITIES No.15  
BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
15.01	MC 30 prime coat	litre	19.06	0.50	19.56	2.97	3.47	22.53
15.02	As for Item 15.01 but for slip road.	litre	19.06	0.50	19.56	2.97	3.47	22.53
15.03	As for Item 15.01 but for approach road	litre	19.06	0.50	19.56	2.97	3.47	22.53
15.04	MC 3000 cut-back bitumen tack coat for main road	litre	21.84	0.57	22.41	3.40	3.97	25.81
15.05	As for Item 15.04 but for slip road.	litre	21.84	0.57	22.41	3.40	3.97	25.81
15.06	As for Item 15.04 but for approach road	litre	21.84	0.57	22.41	3.40	3.97	25.81
15.07	MC3000, first seal coat	litre	21.84	0.57	22.41	3.40	3.97	25.81
15.08	As for Item 15.07 but second seal coat	litre	21.84	0.57	22.41	3.40	3.97	25.81
15.09	Cipping, 10/14mm	m3	582.12	178.25	760.37	40.40	218.55	800.77
15.10	Cipping, 3/6mm	m3	640.33	196.07	836.40	44.44	240.51	880.84
15.11	MC3000, first seal coat	litre	21.84	0.57	22.41	3.40	3.97	25.81
15.12	Cipping, 3/6mm	m3	640.33	196.07	836.40	44.44	240.51	880.84



**BILL OF QUANTITIES No. 16**  
**BITUMINOUS BINDER COURSE AND WEARING COURSE**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (exc'l. VAT)	VAT(Kshs)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
16.01	Asphalt concrete binder course, main road	m3	2330.98	483.64	2814.62	466.23	949.87	3280.85
16.02	As for Item 16.01 but for slip road.	m3	2330.98	483.64	2814.62	466.23	949.87	3280.85
16.03	As for Item 16.01 but for approach road.	m3	2330.98	483.64	2814.62	466.23	949.87	3280.85
16.04	Asphalt concrete wearing course for main road	m3	2517.78	491.40	3009.18	521.01	1012.41	3530.19
16.05	As for Item 16.04 but for slip road.	m3	2517.78	491.40	3009.18	521.01	1012.41	3530.19
16.06	As for Item 16.04 but for approach road.	m3	2517.78	491.40	3009.18	521.01	1012.41	3530.19
16.07	80/100 penetration bitumen binder variation.	litre	0.00	8.45	8.45	2.35	10.80	10.80
16.08	Supply and mix in mineral filler	tonne	0.00	3236.93	3236.93	402.80	3639.73	3639.73
16.09	As for Item 16.08 but to sand.	tonne	0.00	288.00	288.00	43.20	331.20	331.20



**BILL OF QUANTITIES No.17  
CONCRETE WORKS**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl. VAT)	VAT(Kshs)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
<b>BRIDGES</b>								
<b>Concrete:</b>								
17.01	Class 15/40 for blinding concrete	m3	1251.52	669.87	1921.39	177.64	847.51	2099.03
17.02	Class 25/20 for structural concrete (1) Bridges for Mombasa Junction, Uhuru Junction and Railway. (2) Vehicle bridges. (3) Pedestrian bridges.	m3	1572.10	667.31	2239.41	214.21	881.52	2453.62
17.03	Class 30/20 for structural concrete.	m3	1572.10	667.31	2239.41	214.21	881.52	2453.62
17.04	Provide UF2 finish to concrete surface.	m2	1600.83	690.76	2291.59	223.29	914.05	2514.88
			6.93	34.63	41.56	1.14	35.77	42.70
<b>Formwork:</b>								
17.05	Formwork class F1 finish (1) Sloping (2) Vertical	m2	95.69	270.84	366.53	8.08	278.92	374.61
17.06	Formwork class F2 finish (1) Horizontal (2) Sloping (3) Vertical	m2	70.52	273.59	344.11	8.32	281.91	352.43
17.07	High tensile steel reinforcement bars equal to or less than 16mm	tonne	118.42	373.65	492.07	13.22	386.87	505.29
17.08	As for Item 17.07 but greater than 16mm	tonne	94.74	298.92	393.66	10.58	309.50	404.24
17.09	200mm wide waterstops	m	69.33	346.31	415.64	11.44	357.75	427.08
17.10	Joint filler, 20mm thick.	m2	11776.80	9724.70	21501.50	2835.90	12560.60	24337.40
<b>BOX CULVERTS</b>								
<b>Concrete:</b>								
17.11	Class 15/40 for blinding concrete	m3	1251.52	669.87	1921.39	177.64	847.51	2099.03
17.12	Class 25/20 for structural concrete. (1) Box culverts for road. (2) Box culverts for drainage. (3) Box culverts for footpath. Provide UF2 finish to concrete surface.	m3	1572.10	667.31	2239.41	214.21	881.52	2453.62
		m3	1572.10	667.31	2239.41	214.21	881.52	2453.62
17.13		m2	1572.10	667.31	2239.41	214.21	881.52	2453.62
			6.93	34.63	41.56	1.14	35.77	42.70
<b>Formwork:</b>								
17.14	Formwork class F1 finish (1) Vertical	m2	70.52	273.59	344.11	8.32	281.91	352.43
17.15	Formwork class F2 finish (1) Horizontal (2) Vertical	m2	118.42	373.65	492.07	13.22	386.87	505.29
17.16	High tensile steel reinforcement bars, equal to or less than 16mm	tonne	69.33	346.31	415.64	11.44	357.75	427.08
			11776.80	9724.70	21501.50	2835.90	12560.60	24337.40





BILL OF QUANTITIES No.17  
CONCRETE WORKS

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl. VAT)	VAT(Kshs)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
17.17	As for Item 17.16 but greater than 16mm	tonne	11468.80	9549.40	21018.20	2761.70	12311.10	23779.90
17.18	200mm wide waterstops	m	371.93	54.90	426.83	0.00	54.90	426.83
17.19	Joint filler, 20mm thick.	m2	524.85	48.75	573.60	0.00	48.75	573.60



**BILL OF QUANTITIES No. 20**  
**ROAD FURNITURE**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl. VAT)	VAT(Kshs)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
20.01	Warning signs	No.						
	Type W28, 1200mm	No.	0.00	7000.00	7000.00	0.00	7000.00	7000.00
	Type W29, 1200mm	No.	0.00	7000.00	7000.00	0.00	7000.00	7000.00
	Type W36, 1200mm	No.	0.00	7000.00	7000.00	0.00	7000.00	7000.00
	Type W37, 1200mm	No.	0.00	7000.00	7000.00	0.00	7000.00	7000.00
20.02	Priority signs	No.						
	Type R1, 1200mm	No.	0.00	7000.00	7000.00	0.00	7000.00	7000.00
20.03	Prohibitory signs	No.						
	Type P1, 1000mm	No.	0.00	6000.00	6000.00	0.00	6000.00	6000.00
	Type P25, 1000mm	No.	0.00	6000.00	6000.00	0.00	6000.00	6000.00
20.04	Mandatory signs	No.						
	Type M3, 1000mm	No.	0.00	6000.00	6000.00	0.00	6000.00	6000.00
	Type M4, 1000mm	No.	0.00	6000.00	6000.00	0.00	6000.00	6000.00
20.05	Non-standard informative signs	No.						
	less than 1m <sup>2</sup>	No.	0.00	7000.00	7000.00	0.00	7000.00	7000.00
	3m <sup>2</sup> -4m <sup>2</sup>	No.	0.00	18000.00	18000.00	0.00	18000.00	18000.00
	4m <sup>2</sup> -5m <sup>2</sup>	No.	0.00	19000.00	19000.00	0.00	19000.00	19000.00
	5m <sup>2</sup> -6m <sup>2</sup>	No.	0.00	23000.00	23000.00	0.00	23000.00	23000.00
	6m <sup>2</sup> -7m <sup>2</sup>	No.	0.00	25000.00	25000.00	0.00	25000.00	25000.00
	7m <sup>2</sup> -8m <sup>2</sup>	No.	0.00	27000.00	27000.00	0.00	27000.00	27000.00
	8m <sup>2</sup> -9m <sup>2</sup>	No.	0.00	30000.00	30000.00	0.00	30000.00	30000.00
	9m <sup>2</sup> -10m <sup>2</sup>	No.	0.00	40000.00	40000.00	0.00	40000.00	40000.00
20.06	Road marking	m <sup>2</sup>	155.03	19.29	174.32	0.78	20.07	175.10
20.07	Flex beam guardrail	m	1086.39	255.17	1341.56	21.03	276.20	1362.59
20.08	Road edge marker post	No.	284.02	475.93	759.95	39.90	515.83	799.85
20.09	Road reserve boundary post	No.	284.02	475.93	759.95	39.90	515.83	799.85
20.10	Plant selected grasses in the central reserves.	m <sup>2</sup>	0.00	18.29	18.29	0.62	18.91	18.91
20.11	Plant selected shrubs and bushes.	No.	17.20	59.38	76.58	6.63	66.01	83.21
20.12	Trees	No.	34.41	82.54	116.95	7.87	90.41	124.82
20.13	Provide and erect kilometer posts	No.	526.60	612.88	1139.48	112.52	725.40	1252.00
20.14	Flush kerb, 150mm x 100mm, type A	m	44.10	68.53	112.63	11.66	80.19	124.29
20.15	Flush kerb, 150mm x 100mm, type B	m	35.28	60.24	95.52	9.33	69.57	104.85
20.16	Flush kerb, 150mm x 100mm, type C	m	54.06	70.29	124.35	12.00	82.29	136.35
20.17	Flush kerb, 150mm x 100mm, type D	m	29.03	56.89	85.92	8.45	65.34	94.37
20.18	Flush kerb, 150mm x 100mm, type E	m	52.80	69.62	122.42	11.82	81.44	134.24
20.19	Quadrants	No.						
	Quadrants for kerb A, in-situ	No.	53.82	55.89	109.71	7.64	63.53	117.35
	Quadrants for kerb B, in-situ	No.	48.81	53.21	102.02	6.93	60.14	108.95
20.20	Raised kerb, 125mm x 250mm, slip road	m						
	(1) straight.	m	111.46	142.14	253.60	24.40	166.54	278.00
	(2) radius 5m to 1m.	m	122.75	154.55	277.30	27.93	182.48	305.23



BILL OF QUANTITIES No.20  
ROAD FURNITURE

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
20.21	Raised kerb, 125mm x 250mm, main road (1) straight.	m	122.73	148.17	270.90	26.00	174.17	296.90
	(2) radius 5m to 1m.	m	134.01	160.58	294.59	29.53	190.11	324.12
20.22	Provide and lay ramped kerb.	No.	142.06	128.00	270.06	35.91	163.91	305.97
20.23	Provide and erect permanent five strand wire fencing including intermediate and straining posts	m	43.57	98.20	141.77	8.11	106.31	149.88
20.24	Provide and erect gates	No.	373.15	1840.05	2213.20	234.34	2074.39	2447.54
20.25	Provide and erect double headed guardrail	m	2061.59	313.78	2375.37	22.54	336.32	2397.91
20.26	Stairway for bus stop	m	762.52	835.93	1598.45	100.05	935.98	1698.50



**BILL OF QUANTITIES No.21**  
**MISCELLANEOUS**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl. VAT)	VAT(Kshs)	LC(Kshs) (incl. VAT)	Total(Kshs) (incl. VAT)
21.01	Waterproofing	m2	261.54	20.45	281.99	0.00	20.45	281.99
21.02	Elastomeric bearings, fixed	No.	2089.75	471.82	2561.57	2.01	473.83	2563.58
	(1) 406 x 279 x 18mm	No.	1693.58	452.01	2145.59	2.01	454.02	2147.60
21.03	Elastomeric bearings, movable:	No.	1880.11	458.22	2338.33	1.01	459.23	2339.34
	(1) 229 x 152 x 56mm	No.	2272.87	479.41	2752.28	1.51	480.92	2753.79
	(2) 279 x 229 x 37mm	No.	2823.96	506.97	3330.93	1.51	508.48	3332.44
	(3) 279 x 229 x 46mm	No.	3987.41	565.14	4552.55	1.51	566.65	4554.06
	(4) 279 x 229 x 65mm	No.	5223.48	626.94	5850.42	1.51	628.45	5851.93
21.04	Joint filler, expansion joint	m2	787.28	61.87	849.15	0.00	61.87	849.15
	(1) 30mm thick	m2	655.44	55.28	710.72	0.00	55.28	710.72
	(2) 25mm thick	m2	524.85	48.75	573.60	0.00	48.75	573.60
21.05	Sealant, expansion joint	m	446.56	27.00	473.56	0.00	27.00	473.56
	(1) 30 x 50mm deep	m	371.93	23.26	395.19	0.00	23.26	395.19
	(2) 25 x 50mm deep	m3	2517.78	491.40	3009.18	521.01	1012.41	3530.19
21.06	Asphalt concrete surfacing, bridge deck	m	1054.88	242.69	1297.57	21.86	264.55	1319.43
21.07	Supply and install flex beam guardrails including post	m	155.01	472.20	627.21	37.37	509.57	664.58
21.08	Provide and erect in position parapet handrails to railway bridge	m	236.14	518.31	754.45	56.94	575.25	811.39
21.09	Provide and erect in position pedestrian parapet to footbridges	No.	143.32	12.58	155.90	0.00	12.58	155.90
21.10	100mm dia. drain pipe, deck slab	No.	66.63	8.74	75.37	0.00	8.74	75.37
21.11	75mm dia. PVC weep holes	m	389.85	35.26	425.11	0.00	35.26	425.11
21.12	Perforated 200mm dia. PVC pipe	No.	435.24	105.40	540.64	0.00	105.40	540.64
21.13	Dowel bar, movable, 20mm dia.	No.	1306.47	148.96	1455.43	0.00	148.96	1455.43
21.14	Dowel bar, fixed, 40mm dia.	m3	638.87	211.04	849.91	58.91	269.95	908.82
21.15	Graded crushed stone base, box culverts.	m3	2517.78	491.40	3009.18	521.01	1012.41	3530.19
21.16	Asphalt concrete wearing, box culverts.	No.	553.31	43.44	596.75	0.00	43.44	596.75
21.17	200mm dia. PVC weep holes							





BILL OF QUANTITIES No.22  
DAYWORKS

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
<b>PLANT</b>								
22.01	D6 tractor or equivalent, including blade and ripper.	hr	1032.47	474.81	1507.28	83.94	558.75	1591.22
22.02	D7 tractor or equivalent, including blade and ripper.	hr	1474.99	666.70	2141.69	119.92	786.62	2261.61
22.03	D8 tractor or equivalent, including blade and ripper.	hr	1859.55	818.14	2677.69	150.32	968.46	2828.01
22.04	Motor grader CAT140G or equivalent (complete with scarifier).	hr	738.65	334.73	1073.38	59.33	394.06	1132.71
22.05	Heavy grid or sheeps foot roller.	hr	790.86	335.95	1126.81	62.36	398.31	1189.17
22.06	Vibrating roller, 10t	hr	997.40	437.68	1435.08	79.85	517.53	1514.93
22.07	15 ton pneumatic self-propelled roller.	hr	441.83	199.74	641.57	34.85	234.59	676.42
22.08	15-18 ton smooth wheel roller.	hr	441.83	199.74	641.57	38.45	238.19	680.02
22.09	As for item 22.08 but 6-8 ton.	hr	347.99	163.06	511.05	27.44	190.50	538.49
22.10	Small hand-propelled vibrating roller.	hr	120.87	72.91	193.78	9.45	82.36	203.23
22.11	Rammer and/or compactor.	hr	31.46	38.40	69.86	2.42	40.82	72.28
22.12	1.6 m3 class tractor shovel or equivalent.	hr	861.70	385.99	1247.69	69.22	455.21	1316.91
22.13	2.3 m3 tractor shovel or equivalent.	hr	1025.34	463.30	1488.64	82.88	546.18	1571.52
22.14	0.7 m3 class mechanical excavator (backhoe) or equivalent.	hr	871.36	397.75	1269.11	70.43	468.18	1339.54
22.15	0.3 m3 class mechanical excavator (backhoe) or equivalent.	hr	553.96	257.83	811.79	44.50	302.33	856.29
22.16	2.3 m3 class wheel loader or equivalent.	hr	1025.34	463.30	1488.64	82.88	546.18	1571.52
22.17	3 m3 class wheel loader or equivalent.	hr	1281.68	572.37	1854.05	103.61	675.98	1957.66
22.18	6 ton tipper lorry.	hr	320.05	160.45	480.50	25.71	186.16	506.21
22.19	10 ton tipper lorry.	hr	418.60	201.42	620.02	33.62	235.04	653.64
22.20	6 ton lorry.	hr	197.11	109.22	306.33	15.83	125.05	322.16
22.21	10 ton lorry.	hr	246.22	129.66	375.88	19.78	149.44	395.66
22.22	0.7 to 1 ton pick up car.	hr	167.44	97.62	265.06	13.49	111.11	278.55
22.23	Land Rover.	hr	150.08	90.39	240.47	12.10	102.49	252.57
22.24	6 m3/min air compressor.	hr	217.50	112.08	329.58	17.15	129.23	346.73
22.25	10 m3/min air compressor.	hr	418.59	124.49	543.08	25.26	197.75	568.34
22.26	50mm delivery water pump and moter.	hr	12.01	32.40	44.41	0.98	45.39	76.02
22.27	As for item 22.26 but 75mm.	hr	32.17	41.23	73.40	2.62	43.85	76.02
22.28	Concrete mixer 14/10.	hr	182.98	99.64	282.62	14.48	114.12	297.10
22.29	Concrete vibrator, poker type.	hr	19.96	33.80	53.76	1.51	35.31	55.27
22.30	Self-propelled water tanker 9500 litre.	hr	443.10	184.09	627.19	35.60	219.69	662.79
22.31	Pressure bitumen distributor 4500 litre.	hr	662.75	285.91	948.66	52.26	338.17	1000.92
22.32	Lorry for Benkelman beam & plate bearing Tests.	hr	320.05	160.45	480.50	25.71	186.16	506.21



**BILL OF QUANTITIES No.22**  
**DAYWORKS**

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
<b>LABOR</b>								
22.33	Unskilled labor	hr	0.00	19.00	19.00	0.00	19.00	19.00
22.34	Working ganger	hr	0.00	25.00	25.00	0.00	25.00	25.00
22.35	Artisans	hr	0.00	29.00	29.00	0.00	29.00	29.00
<b>MATERIALS</b>								
22.36	Ordinary Portland Cement.	tonne	0.00	3236.93	3236.93	402.80	3639.73	3639.73
22.37	Mild steel (any diameter).	tonne	0.00	17870.40	17870.40	2628.00	20498.40	20498.40
22.38	High yield steel (any diameter).	tonne	0.00	18604.80	18604.80	2736.00	21340.80	21340.80
22.39	Fine aggregate for concrete.	m3	0.00	403.20	403.20	60.48	463.68	463.68
22.40	Coarse aggregate for concrete, maximum size 20mm.	m3	0.00	515.23	515.23	24.41	539.64	539.64
22.41	Coarse aggregate for concrete, maximum size 40mm.	m3	0.00	515.23	515.23	24.41	539.64	539.64
22.42	Graded crushed stone for subbase and base.	m3	0.00	552.04	552.04	26.16	578.20	578.20
22.43	Wrought shuttering timber.	m2	0.00	217.09	217.09	31.93	249.02	249.02
22.44	Unwrought shuttering timber.	m2	0.00	217.09	217.09	31.93	249.02	249.02
22.45	Timbering for trenches.	m2	0.00	217.09	217.09	31.93	249.02	249.02
22.46	Cut back bitumen, Grade MC 30.	litre	0.00	18.97	18.97	2.79	21.76	21.76
22.47	Cut back bitumen, Grade MC 3000.	litre	0.00	21.79	21.79	3.20	24.99	24.99
22.48	Emulsion, KI-60	litre	0.00	13.40	13.40	1.97	15.37	15.37
22.49	Straight-run bitumen, Grade 80/100.	litre	0.00	8.45	8.45	2.35	10.80	10.80
22.50	10/14mm nominal size chippings.	m3	0.00	586.99	586.99	27.81	614.80	614.80
	3/6mm nominal size chippings.	m3	0.00	586.99	586.99	27.81	614.80	614.80



BILL OF QUANTITIES No.23  
PILING

ITEM NO.	DESCRIPTION	UNIT	FC(Kshs)	LC(Kshs)	Total(Kshs) (excl.VAT)	VAT(Kshs) (incl.VAT)	LC(Kshs) (incl.VAT)	Total(Kshs) (incl.VAT)
23.01	Mobilization of all the necessary plant for the piling operation, setting up on the position of the first pile and removal on completion of the last pile.	L.S.	79800.00	26200.00	106000.00	0.00	26200.00	106000.00
23.02	Move and set up each pile position.	No.	855.82	231.48	1087.30	21.22	252.70	1108.52
23.03	Supply of steel pipe piles 500 mm dia., 9mm thick.	m	3801.25	380.12	4181.37	0.00	380.12	4181.37
23.04	Driving piles of 500 mm dia. including positioning and pitching. Include for cutting pile heads to correct level.	m	261.72	70.79	332.51	6.49	77.28	339.00





