KENYA URBAN ROADS AUTHORITY
Efficient & Safe Urban Roads

UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS

TENDER No.: KURA/DEV/HQ/302/2019-2020

BID DOCUMENT

1. FORM OF BID
2. APPENDIX TO FORM OF BID
3. STANDARD FORMS & SCHEDULES OF SUPPLEMENTARY INFORMATION
4. INSTRUCTIONS TO BIDDERS
5. QUALIFICATION CRITERIA
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9. BILLS OF QUANTITIES
10. DRAWINGS

MARCH 2020

DIRECTOR (URD) **KENYA URBAN ROADS AUTHORITY** **P.O. Box 41727 - 00100** **NAIROBI.**	**DIRECTOR GENERAL** **KENYA URBAN ROADS AUTHORITY** **P.O. Box 41727 - 00100** **NAIROBI.**

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SECTION 1: FORM OF BID

FORM OF BID

(NOTE: The Appendix forms part of the Bid. Bidders are required to fill all the blank spaces in this form of Bid and Appendix)

UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS
TENDER No.: KURA/DEV/HQ/302/2019-2020

TO: The Director General
Kenya Urban Roads Authority
P. O. Box 41727 - 00100,
NAIROBI.

Sir,

1. Having examined the Conditions of Contract, Specifications, Bills of Quantities, and Drawings for the execution of the above named works we, the undersigned, offer to construct and install such works and remedy any defects therein in conformity with the said Bills of Quantities, Conditions of Contract, Specifications and Drawings for the sum of

(Insert amount in words)

……

……

……

……

(Insert amount in

figures)……

……

As specified in the Appendix to Bid or such other sums as may be ascertained in accordance with the said Conditions.

2. We undertake, if our bid is accepted, to commence the works within twenty-eight (28) days of receipt of the Engineer's Order to Commence, and to complete and deliver the whole of the works comprised in the contract within the time stated in the Appendix to Form of Bid.

3. If our bid is accepted we will, when required, obtain the guarantee of a Bank or other sureties (to be approved by you) to be jointly and severally bound with us in a sum not

exceeding 5% of the above named sum for the due performance of the contract under the terms of a Bond to be approved by you.

4. We agree to abide by this bid for the period of one hundred and twenty (120) days from the date fixed for receiving the same and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

5. We understand that you are not bound to accept the lowest or any bid you may receive.

6. On the basis of our previous experience we are fully experienced and competent in the type of work included in this BID and we have adequate financial resources to carry out the works described within the period for completion. We are in a position to fulfil the contract for which we have Bided.

Dated this …….. Day of …… 20 ……..

Signature:……in the capacity of ……..……..

Duly authorized to sign bids on behalf of (Name of Bidder) …… …….

……..…….

(Address of Bidder): ……

(Name of Witness): ……

(Signature of Witness): ……

(Address of Witness): ……

(Occupation of Witness): ……

SECTION 2: APPENDIX TO FORM OF BID

APPENDIX TO FORM OF BID

(This appendix forms part of the bid)

DESCRIPTION	Conditions of Contract Clause	DETAILS
Bid Security (Bank Guarantee Only)		Kshs. 1,000,000.00
Employer	1.1 (a) (i)	Director General Kenya Urban Roads Authority.
Engineer	1.1 (a) (iv)	Director (Urban Roads Development), Kenya Urban Roads Authority.
Engineer's Authority to Issue Variations	2.1(d)	15% of the Contract Price
Contract Documents	5.1 (a)	The language of the contract is English
	5.1 (b)	The law in force is that of the Republic of Kenya
Amount of Performance Security (Unconditional Bank Guarantee)	10.1	The performance security shall be in the form of an unconditional bank guarantee in the amount of 5 (5) per cent of the Contract Price
Access to Data	11.1	Data made available by the Employer under Subclause 11.1 is open for inspection at the offices of the Director (Urban Roads Development), Kenya Urban Roads Authority
Programme to be submitted	14.1	Not later than 21 (twenty one) days after issuance of Order to Commence
Cash Flow Estimate	14.3	Not later than 21 (twenty one) days after issuance of Order to Commence
Minimum Amount of Third Party Insurance	23.2	KShs. 5,000,000 (Kenya Shillings Five Million only) per occurrence, with the number of occurrences unlimited.0
Period for commencement, from Engineer's Order to Commence	41.1	Not later than 28 (Twenty Eight) days after Notice of Order to Commence
Time for Completion	43.1	Twenty Four (24) Months
Amount of Liquidated Damages	47.1	0.05% of the Contract Price per day
Limit of Liquidated Damages	47.1	5% (Five percent) of the Contract Price.
Defects Liability Period	49.1	Twelve (12) Months
Advance Payment	60.1	The Employer **MAY** pay any amount up to a maximum of Ten percent (10%) of the Contract Price subject to availability of funds
Advance Payment Guarantee	60.1	Full amount of the Advance Payment in the form of Unconditional Bank Guarantee (Bank Guarantee Only)
Minimum Amount of Interim Payment Certificates	60.2	Kshs. 40,000,000.00
Retention Money	60.5	5% (five percent) of Interim Payment Certificates

Signature of Bidder……. Date ……

(Failure to sign this appendix will imply the bidder doesn't accept the above conditions and hence disqualified)

DESCRIPTION	**Conditions of Contract CLAUSE**	**DETAILS**
Limit of Retention Money	60.2	5 (five) percent of the Contract Price
Number of Copies of monthly Statement and statements of Completion and Final Statement	60.2 60.3 60.11 60.12	3 copies
Time within which payment to be made after Interim Payment Certificate signed by Engineer	60.4	90 days
Time within which payment to be made after Final Payment Certificate signed by the Engineer	60.4	90 days
Currency of Payment	60.6	Kenya Shillings only
Appointer of Arbitrator	67.3	The Chartered Institute of Arbitrators (Kenya)
Notice to Employer and Engineer	68.2	The Employer's address is: Director General Kenya Urban Roads Authority BARABARA PLAZA, BLOCK D, 2nd Floor Airport Road P.O. Box 41727 – 00100 NAIROBI. Tel. +254 020 8013844 Email: info@kura.go.ke, Web:www.kura.go.ke The Engineer's address is: Director (Urban Roads Planning & Design) Kenya Urban Roads Authority Barabara Plaza, Block D, Airport Road P.O. Box 41727 – 00100 NAIROBI. Tel. +254 020 8013844 Email: info@kura.go.ke, Web:www.kura.go.ke

Signature of Bidder……..…… Date ……

(Failure to sign this appendix will imply the bidder doesn't accept the above conditions and hence disqualified)

CONDITIONS OF CONTRACT	AMOUNT/DESCRIPTION	CONDITIONS OF CONTRACT CLAUSE
Approximate Weightings for Price Adjustment Formula	See Table A below	70.3
Weightings and Indices	Where necessary, in the table B below, bidders shall (a) indicate their amounts of local currency payment, (b) indicate their proposed source and base values of indices for the different foreign currency elements of cost, (c) derive their proposed weightings for local and foreign currency payment as indicated in table B below, and (d) list the exchange rates used in the currency conversion	70.3 , 70.4 and 70.5

Table A Approximate Weightings for Price Adjustment

Description of Index	*% Range of Weighting* [a]
(a) Fixed ("A")	8
(b) Labour	8 – 12
(c) Fuels and Lubricants	12 – 22
(d) Equipment and Spares	35 – 40
(e) Cement	8 – 12
(f) Reinforcement and Steel products	1 – 3
(g) Explosives	1 – 5
(h) Bitumen and Bituminous products	15 - 25
Total	100

NOTE: [a] Denotes that this should be used as guidance to bidders and for purpose of checking their submissions, the Employer has estimated and provided a range of acceptable weightings for related major construction inputs in accordance with the potential range of construction methodologies, based on estimated cost in a common currency.

Table B:Bidder's proposed weighting

Index Code	*Index Description*	*Source of Index*	*Base value and date*	*Bidder's proposed weighting*
	Non adjustable	Civil Engineering Cost Indices from Kenya National Bureau of Statistics. For equipment & spares, the official indices from source country shall apply	The Indices prevailing at 28days before tender submission deadline shall apply	a:_____ b: _____ c: _____ d: _____ e: _____ f: _____ g: _____ h: _____
			Total	1.00

Signature of Bidder……..……Date ……

(Failure to sign this appendix will imply the bidder doesn't accept the above conditions and hence disqualified)

SECTION 3: STANDARD FORMS AND SCHEDULES OF SUPPLEMENTARY INFORMATION

STANDARD FORMS & SCHEDULES OF SUPPLEMENTARY INFORMATION

STANDARD FORMS

3.1 BANK GUARANTEE FOR ADVANCE PAYMENT

To: Director General,
Kenya Urban Roads Authority,
Barabara Plaza, Block D, Airport Road
P.O. Box 41727 - 00100
NAIROBI

_____ *(Date)*

Gentlemen,

UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS
TENDER No.: KURA/DEV/HQ/302/2019-2020

In accordance with the provisions of the Conditions of Contract of the above-mentioned Contract, We,_____*[name and Address of Contractor]* (hereinafter called "the Contractor") shall deposit with _____*[name of Employer]* a bank guarantee to guarantee his proper and faithful performance under the said Contract in an amount of KShs._____*[amount of Guarantee in figurers]* Kenya Shillings_____*[amount of Guarantee in words].*

We, _____[*bank or financial institution*], as instructed by the Contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as Surety merely, the payment to _____[*name of Employer*] on his first demand without whatsoever right of objection on our part and without his first claim to the Contractor, in the amount not exceeding Kshs_____[*amount of Guarantee in figures*] Kenya Shillings
_____
[*amount of Guarantee in words*], such amount to be reduced periodically by the amounts recovered by you from the proceeds of the Contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between _____[*name of Employer*] and the Contractor, shall in any way release us from any liability under this guarantee, and we hereby waive notice of any such change, addition or modification.

No drawing may be made by you under this guarantee until we have received notice in writing from you that an advance payment of the amount listed above has been paid to the Contractor pursuant to the Contract.

This guarantee shall remain valid and in full effect from the date of the

advance payment under the Contract until _____(*name of Employer*) receives full payment of the same amount from the Contract.

Yours faithfully,

Signature and Seal _____

Name of the Bank or financial institution _____

Address _____

Date _____

Witness: Name: _____

Address: _____

Signature: _____

Date: _____

3.2 FORM OF BANK BID SECURITY

Note: The bidder shall complete only this Form of Bank guarantee. No other Form of Bid Bond or any other forms of security will be accepted. Bidders who fail to comply with this requirement will be disqualified.

WHEREAS [Name of bidder]

……

……

(herein after called "the Bidder") has submitted his bid dated ……..……

for the UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS ALONG IMENTI FOREST EDGE :

TENDER No.: KURA/DEV/HQ/302/2019-2020

hereinafter called "the bid"

KNOW ALL MEN by these presents that we [*Name of Bank*]

……...……

……

of [Name of Country]

……
having our registered offices at

……
(hereinafter called the Bank) are bound unto the Director General, Kenya Urban Roads Authority (hereinafter called "The Employer") in the sum of

(in words KShs)…….

……..……

(In figures KShs)……

for which payment will be well and truly made to the said Employer the Bank binds itself, its successors and assigns by these presents.

Signed for the said Bank this …….day of ……20…….

THE CONDITIONS of this obligation are:

1. If the bidder withdraws his Bid during the period of bid validity specified by the Bidder on the Bid Form; or

2. If the Bidder refuses to accept the correction of errors in his bid; or

3. If the Bidder having been notified of the acceptance of his bid by the Employer during the period of Bid Validity

   (i) fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders when required or

   (ii) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders.

   We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by him is due to him owing to the occurrence of any of the above conditions, specifying the occurred condition or conditions.

   This guarantee will remain in force up to and including thirty (30) days after the date of expiration of the bid validity, as stated in the Instructions to Bidders.

At the request of the Employer the Bid validity period may be extended by mutual agreement between the Employer and the Bidder and we undertake to extend the validity of this surety accordingly without you having to inform us of such an extension of the Bid validity period if within this period the Bidder has been notified of the acceptance of his Bid. This Surety shall remain valid up to the time the Contract Agreement has been executed.

AUTHORIZED SIGNATURE OF THE BANK

……..

NAME OF SIGNATORY

…… DATE……

TITLE OF SIGNATORY ……..

NAME OF THE WITNESS ……..

SIGNATURE OF THE WITNESS …… DATE …….

ADDRESS OF THE WITNESS ……

3.3 FORM OF INVITATION FOR BIDS

See Web: www.kura.go.ke

3.4 LETTER OF ACCEPTANCE

[Letter head paper of the Employer]

_____ *[date]*

To: _____*[name of the Contractor]*

_____

_____

_____ *[address of the Contractor]*

Dear Sir,

This is to notify you that your Bid dated _____for the execution of

UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS

TENDER No.: KURA/DEV/HQ/302/2019-2020

For the Contract Price of Kshs._____*[amount in figures]* Kenya Shillings_____*(amount in words)* in accordance with the Instructions to Bidders is hereby accepted.

You are hereby instructed to proceed with the execution of the said Works in accordance with the Contract documents.

Authorized Signature

……..

Name and Title of Signatory

……..

Attachment: Agreement

3.5 FORM OF AGREEMENT

THIS AGREEMENT, made the_____ day of_____20_____ between the **Director General, Kenya Urban Roads Authority, Barabara Plaza, Block D, Airport Road P.O. Box 41727 – 00100 NAIROBI., Nairobi** (hereinafter called "the Employer") of the one part AND

_____of [or whose registered office is situated at]

_____

(hereinafter called "the Contractor") of the other part.

WHEREAS THE Employer is desirous that the Contractor executes *UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS*

TENDER No.: KURA/DEV/HQ/302/2019-2020

(hereinafter called "the Works") located in Nairobi County and the Employer has accepted the bid submitted by the Contractor for the execution and completion of such Works and the remedying of any defects therein for the Contract Price of Kshs. _____[*Amount in figures*], Kenya Shillings_____[*Amount in words].*

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.

2. The following documents shall be deemed to form and shall be read and construed as part of this Agreement:

   (i) Letter of Acceptance
   (ii) Form of Bid and Appendix to Form of Bid
   (iii) Conditions of Contract, Part I
   (iv) Conditions of Contract, Part II
   (v) Specifications
   (vi) Drawings
   (vii) Priced Bill of Quantities

   All aforesaid documents are hereinafter referred to as "The Contract".

3. In consideration of the payment to be made by the Employer to the Contractor, the Contractor hereby covenants with the Employer to execute, complete and maintain the works in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution, completion and maintenance of the works the Contract Price at the times and in the manner prescribed by the Contract.

IN WITNESS WHEREOF the parties hereto have caused their respective common seals to be hereto affixed (or have hereunto set their respective hands and seals) on the day and year first above written.

SIGNED AND DELIVERED

By the said Employer: ……..
(Director General, Kenya Urban Roads Authority)
For and on behalf of the said Employer.

In the presence of: ……..
(Name and Designation of Witness)

……..
(Signature of Witness)

……..
(Address of witness)

By the said Contractor: ……..

In the presence of: ……..
(Name and Designation of Witness)

……..
(Signature of Witness)

……..
(Address of witness)

3.6 PERFORMANCE BANK GUARANTEE (UNCONDITIONAL)

To: Director General
Kenya Urban Roads Authority
P.O. Box 41727 - 00100
NAIROBI

Dear Sir,

WHEREAS _____ (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. …….. dated …… to execute UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS

TENDER No.: KURA/DEV/HQ/302/2019-2020 (hereinafter called "the Works");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognised bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Kshs. _____ (*amount of Guarantee in figures*) Kenya Shillings_____
_____ (*amount of Guarantee in words*), and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of Kenya Shillings _____
_____ (*amount of Guarantee in words*) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change, addition or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any change, addition, or modification.

This guarantee shall be valid until the date of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR _____

Name of Bank: _____

Address: _____

Date: _____

3.7 FORM OF LETTER OF NOTIFICATION OF AWARD

Director General
Kenya Urban Roads Authority
P.O. Box 41727 - 00100
NAIROBI

To: ……..
……..
……..

RE: Bid No. ……..

UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS
TENDER No.: KURA/DEV/HQ/302/2019-2020

This is to notify that the contract (s) stated below under the above mentioned Bid have been awarded to you.
…….

…….

…….

1. Please acknowledge receipt of this letter of notification signifying your acceptance.

2. The contract/contracts shall be signed by the parties within 30 days of the date of this letter but not earlier than 14 days from the date of the letter.

3. You may contact the officer(s) whose particulars appear below on the subject matter of this letter of notification of award.

(FULL PARTICULARS):

General Manger (Design & Construction)
Kenya Urban Roads Authority
P. O. Box 41727 - 00100
Nairobi

Telephone: +254 020 8013844

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

……
SIGNED FOR DIRECTOR GENERAL

SCHEDULES OF SUPPLEMENTARY INFORMATION

3.8 BID QUESTIONNAIRE

Please fill in block letters.

1. Full names of Bidder…..…….
   ……..

2. Full address of Bidder to which Bid correspondence is to be sent (unless an agent has been appointed below)……..
   ……..

3. Telephone number (s) of Bidder…….....
   ……..

4. Telex address of Bidder……...…….
   ……..

5. Name of Bidder's representative to be contacted on matters of the Bid during the Bid period……
   ……..

6. Details of Bidder's nominated agent (if any) to receive Bid notices. This is essential if the Bidder does not have his registered address in Kenya (name, address, telephone, telex)…….....
   ……..
   ……..
   ……..

   Signature of Bidder ….…….

Make copy and deliver to ***the Director General, Kenya Urban Roads Authority.***

3.9 CONFIDENTIAL BUSINESS QUESTIONNAIRE

You are requested to give the particulars indicated in Part 1 and either Part 2 (a), 2 (b) or 2 (c) and 2 (d) whichever applies to your type of business.

You are advised that it is a serious offence to give false information on this Form.

Part 1 – General:

Business Name: ……...

Location of business premises: ……Country/Town……

Plot No……Street/Road …….

Postal Address……. Tel No……

Nature of Business……...

Current Trade Licence No…… Expiring date…….……..……

Maximum value of business which you can handle at any time: Kshs. ……..

Name of your bankers…….....……..

Branch……

Part 2 (a) – Sole Proprietor:

Your name in full…….…… Age…….

Nationality……..…… Country of Origin……

*Citizenship details ……

Part 2 (b) – Partnership:

Give details of partners as follows:

	Name in full	*Nationality*	**Citizenship Details*	*Shares*
1	……	……..…	……	……
2	……	……	……	……
3	……	……..	……	……

Part 2(c) – Registered Company:

Private or public……

State the nominal and issued capital of the Company

Nominal Kshs……

Issued Kshs……...

Give details of all directors as follows:

	Name in full	*Nationality*	**Citizenship Details*	*Shares*
1	……	……..…	……	……
2	……	……	……	……
3	……	……..	……	……
4	……	……..	……	……

Part 2(d) – Interest in the Firm:

Is there any person/persons in **Kenya Urban Roads Authority** who has interest in this firm?

Yes**	

No**	

** Tick (√) to agree as necessary (Compulsory)

I certify that the information given above is correct.

……	……	……
(Title)	*(Signature)*	*(Date)*

* *Attach proof of citizenship (Certified Copy of National ID or Passport)* ***(Compulsory)***
* *Attach certified copy of Form CR 12* ***(Compulsory)***

3.10 SCHEDULE OF MATERIALS BASIC PRICES
(Ref: Clause 70 of Conditions of Contract)

Item No.	Description	Country of Origin	Name of Supplier	unit	Unit Price Kshs.
1.	Cut-back Bitumen MC 30 in bulk			Litre	
2.	Cut-back Bitumen MC 30 in drums			Litre	
3.	Bitumen 80/100 in bulk			Kg	
4.	Bitumen 80/100 in drums			Kg	
5.	Bitumen Emulsion K1-60 in bulk			Litre	
6.	Bitumen Emulsion K1-60 in drums			Litre	
7.	Cut-back Bitumen MC 70 in bulk			Litre	
8.	Cut-back Bitumen MC 70 in drums			Litre	
9.	Petrol, Regular Grade			Litre	
10	Petrol, Premium/ super Grade			Litre	
11	Automotive Diesel Fuel			Litre	
12	Industrial Diesel Oil			Litre	
13	Kerosene Fuel			Litre	
14	Cement			Tonne	
15	Flex beam Guardrail			Metre	
16	Gabion Mesh			M^2	
17	Reinforcing Steel			Tonne	
18	Lime			Tonne	

I certify that the above information is correct.

…… …… ……
(Title) *(Signature)* *(Date)*

The prices inserted above shall be those prevailing 28 days before the submission of Bids and shall be quoted in Kenya Shillings using the exchange rates specified in the Appendix to Form of Bid.

Prices of imported materials to be quoted CIF Mombasa or Nairobi, as appropriate, depending on whether materials are imported by the Bidder directly or through a local agent.

Transportation costs for imported materials to be quoted from Mombasa or Nairobi as appropriate to mid-point of ***UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS***
TENDER No.: KURA/DEV/HQ/302/2019-2020 depending on whether materials are imported directly by the Bidder or through a local agent.

3.11 MAJOR ITEMS OF CONSTRUCTION PLANT AND EQUIPMENT

Description Type, Model, Make	No. of each	Year of Manufacture	New or Used	Capacity t or m cu	Estimated CIF Mombasa Value (If to be Imported)	Source	Owned/ Leased/ Imported	Power Rating	Date of Arrival on Project (Days after commence)

The Bidder shall enter in this schedule all major items of plant and equipment which he proposes to bring to site. Only reliable plant in good working order and suitable for the work required of it shall be shown on this Schedule. Summary of the same shall be entered in Section 5: Qualification Criteria, Part 7.

I certify that the above information is correct.

…… …… ……

(Title) *(Signature)* *(Date)*

3.12 SCHEDULE OF LABOUR BASIC RATES
(Reference: Clause 70 of Conditions of Contract)

LABOUR CATEGORY	(MONTH/SHIFT/HOUR)	RATES

Categories to be generally in accordance with those used by the Kenya Building Construction and Engineering and Allied Trades Workers' Union.

…… …… ……
(Title) *(Signature)* *(Date)*

3.13 DETAILS OF SUBCONTRACTORS

If the Bidder wishes to sublet any portions of the Works under any heading, he must give below details of the subcontractors he intends to employ for each portion.

Failure to comply with this requirement may invalidate the bid.

(1) Portion of Works to be sublet: ……

(i) Full name of Subcontractor and address of head office:
……
……
……
……
……

(ii) Subcontractor's experience of similar works carried out in the last 3 years with contract value:

	Similar Works	Contract Value
1	……	……
2	……..	……
3	……	……

(2) Portion of Works to sublet: ……..…..

(i) Full name of sub-contractor and address of head office:
……
……
……
……
……

(ii) Sub-contractor's experience of similar works carried out in the last 3 years with contract value:

	Similar Works	Contract Value
1	……	……
2	……..	……
3	……	……

……. ……
[*Signature of Bidder*) (*Date*)

Note: Bidders shall attach certified copies of letters of award (for each listed project), certified copies of completion certificates or evidence of executed works (for non-completed projects) performed by subcontractors listed above.

3.14 CERTIFICATE OF BIDDER'S VISIT TO SITE

This is to certify that

[*Name/s*]……

……

Being the authorized representative/Agent of [*Name of bidder*]

……

……

Voluntary inspected the site of the works for the **UPGRADING OF ROADS IN MERU COUNTY HEADQUARTERS**
TENDER No.: KURA/DEV/HQ/302/2019-2020 on

……..day of……20……..

3.15 FORM OF WRITTEN POWER OF ATTORNEY

The Bidder shall state here below the name(s) and address of his representative(s) who is/are authorized to sign the document and receive on his behalf correspondence in connection with the Bid.

(The Bidder consisting of a joint venture shall state here below the name and address of his representative who is authorised to receive on his behalf correspondence in connection with the Bid.)

……..
(Name of Bidder's Representative in block letters)

……..
(Address of Bidder's Representative)

……..
(Signature of Bidder's Representative)

Alternate:

……..
(Name of Bidder's Representative in block letters)

……..
(Address of Bidder's Representative)

……..
(Signature of Bidder's Representative)

*To be filled by all Bidders.

**Both representative and alternate must attach a certified copy of National Identification card or Passport.*

KEY PERSONNEL

DESIGNATION	NAME	NATIONALITY	SUMMARY OF QUALIFICATIONS AND EXPERIENCE		
			Qualifications	General experience (Yrs)	Specific experience (Yrs)
Headquarters: 1. Director 2. 3. Etc.					
Site Office: 1. Site Agent 2. 3. 4. 5. etc.					

Note: The Bidder shall list in this schedule the key personnel he will employ from the Contractor's headquarters and from the Contractor's site office to direct and execute the work together with their qualifications, experience, position held and nationality in accordance with Clause 15.2 and 16.3 of the Conditions of Contract Part II (where required, use separate sheets to add extra data for column 4). Bidders shall attach certified copies of academic certificates, and CVs of all key staff.

I certify that the above information is correct.

…… …… …….
(*Title*) (*Signature*) (*Date*)

3.16 SCHEDULE OF COMPLETED CIVIL WORKS CARRIED OUT BY THE BIDDER IN THE LAST FIVE YEARS

DESCRIPTION OF WORKS AND CLIENT	TOTAL VALUE OF WORKS (KSHS)*	CONTRACT PERIOD (YEARS)	YEAR COMPLETED
A. Non-completed Works			
B. Completed Works			
C. Specific Construction Experience			

Note: Bidders shall attach certified copies of letters of award (for each listed project), certified copies of completion certificates or evidence of executed works (for non-completed projects).

I certify that the above Civil Works were successfully carried out and completed by ourselves.

…… …… ……
(*Title*) (*Signature*) (*Date*)

*Value in Kshs. using Central Bank of Kenya mean exchange rate at a reference date 28 days before the date of bid opening.

3.17 SCHEDULE OF PROJECTS CURRENTLY IN PROGRESS

DESCRIPTION OF WORK AND CLIENT	CONTRACT PERIOD	DATE OF COMMENCE-MENT	DATE OF COMPLETION	TOTAL VALUE OF WORKS (KSHS.)	PERCENTAGE COMPLETED TO DATE

Note:
1. Bidders shall attach certified copies of letters of award (for each listed project) and any certified evidence for executed works e.g copy of recent payment certificate.

2. Bidders must indicate all their on-going works as at the time of bidding. Any non-disclosure shall constitute non-responsiveness)

I certify that the above Civil Works are being carried out by ourselves and that the above information is correct.

…… …… ……
(Title) *(Signature)* *(Date)*

3.18 FINANCIAL STANDING

1 Submit copies of audited profit and loss statements and balance sheet for the last five calendar years and estimated projection for the next two years with certified English translation where appropriate.

2 Give turnover figures for each of the last Three (3) financial years. Quote in millions and decimal thereof.

	Year (2016)	Year (2017)	Year (2018)
	KShs. '000,000	KShs. '000,000	KShs. '000,000
Road works			
Other civil Engineering works			
Other (specify)			
Total			

SUMMARY OF ASSETS AND LIABILTIES OF THE AUDITED FINANCIAL STATEMENTS OF THE LAST THREE (3) FINANCIAL YEARS.

	Year (2016)	Year (2017)	Year (2018)
	KShs. '000,000	KShs. '000,000	KShs. '000,000
1. Total Assets			
2. Current Assets			
3. Bank Credit Line Value			
4. Total Liabilities			
5. Current Liabilities			
6. Net Worth (1-4)			
7. Working capital (2+3-4)			

(a) Name/Address of Commercial Bank providing credit line

……

……

(b) Total amount of credit line KShs……

Attach certified copies of financial bank statements of the last three (3) months.

Attach a certified copy of Undertaking of the Bank to providing the credit.

3.19 OTHER SUPPLEMENTARY INFORMATION

1. Financial reports for the last five years, balance sheets, profit and loss statements, auditors' reports etc. List them below and attach copies.
   ……
   ……
   ……
   ……
   ……
   ……

2. Evidence of access to financial resources to meet the qualification requirements. Cash in hand, lines of credit etc. List below and attach copies of supporting documents
   ……
   ……
   ……
   ……
   ……
   ……

3. Name, address, telephone, telex, fax numbers of the Bidder's Bankers who may provide reference if contacted by the Employer.
   ……
   ……
   ……
   ……
   ……
   ……

4. Information on current litigation in which the Bidder is involved.

OTHER PARTY (IES)	CAUSE OF DISPUTE	AMOUNT INVOLVED (KSHS)

I certify that the above information is correct.

…… ……..…… ……
(Title) *(Signature)* *(Date)*

3.20 DECLARATION FORM

Date: ……

To: Director General
Kenya Urban Roads Authority
P.O. Box 41727 - 00100
NAIROBI

The Bidder (name and address) ……..
……
……
……
……
declares the following:

(a) Has not been debarred from participating in public procurement.

(b) Has not been involved in and will not be involved in corrupt and fraudulent practices regarding public procurement.

……	……	……
(*Title*)	(*Signature*)	(*Date*)

Official Stamp: ……..

(To be signed by authorized representative and officially stamped)

3.21 ANTI CORRUPTION DECLARATION / COMMITMENT / PLEDGE FORM

I/We …… of Post Office Box ……. declare that I/ We recognize that Public Procurement is based on a free, fair and competitive tendering process which should not be open to abuse.

I/We …….. Declare that I/We will not offer or facilitate, directly or indirectly, any inducement or reward to any public officer, their relations or business associates, in connection with tender No. ……. for or in the subsequent performance of the contract if I/We am/are successful.

Signed by …… C.E.O. or Authorized Representative.

Name ……..

Designation……..

Signature…….

Date……..

In case of sub-contracting

Signed by …….. CEO of the firm to be subcontracted

Name……

Designation……..

Signature…….

Date……..

SECTION 4: INSTRUCTIONS TO BIDDERS

SECTION 4: INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

CONDITIONS OF BID AND INSTRUCTIONS TO BIDDERS

A. GENERAL

1 SCOPE OF BID

1.1 The Employer, as defined in the Conditions of Contract Part II hereinafter "the Employer" wishes to receive bids for the construction of works as described in Section 1, clause 101 and 102 of the Special Specifications –"Location and extent of the Works"

1.2 The successful bidder will be expected to complete the Works within the period stated in the Appendix to Bid from the date of commencement of the Works.

1.3 Throughout these bidding documents, the terms bid and BID and their derivatives (bidder/Bidder, bid/Bided, bidding/Bidding etc.) are synonymous, and day means calendar day. Singular also means plural.

2 SOURCE OF FUNDS

2.1 The source of funding is the Government of Kenya (Development Vote)

3 CORRUPT PRACTICES

3.1 The Government requires that the bidders, suppliers, sub-contractors and supervisors observe the highest standard of ethics during the procurement and execution of such contracts. in this pursuit of this policy, the government;

(a) Defines for the purposes of this provision, the terms set forth below as follows:
   (i) "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in the execution, and
   (ii) "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Employer, and includes collusive practices among bidders (prior to or after bid submission) designed to establish bid prices at artificial, non-competitive levels and to deprive the Employer of the benefits of free and open competition

(b) Will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the Contract, and

(c) Will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a government contract if it at any times determines that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Government financed contract.

4 ELIGIBLE BIDDERS

4.1 This invitation to bid is open to all Bidders who are legally registered or incorporated in the Republic of Kenya as of the time of bid submission. Registration with the National Construction Authority (NCA) in category 1 as a Contractor is mandatory.

4.2 Bidders shall not have a conflict of interest. Bidders shall be considered to have conflict of interest, if they participated as a consultant in the preparation of the design, documentation or technical specifications of the works that are the subject of this bidding other than as far as required by the Employer.

4.3 A firm that is under a declaration of ineligibility by the Employer in accordance with clause 3, at the date of submission of the bid or thereafter, shall be disqualified.

4.4 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

5 QUALIFICATION OF THE BIDDER

5.1 Bidders shall as part of their bid:

(a) Submit a written power of attorney authorizing the signatory of the bid to commit the bidder; and

(b) Update any information submitted with their bids and update in any case the information indicated in the schedules and continue to meet the minimum threshold criteria set out in the bid documents.

5.2 As a minimum, Bidders shall provide latest information set out below:

(a) evidence of access to lines of credit and availability of other financial resources

(b) financial predictions for the current year and the two subsequent years, including the effect of known commitments

(c) current work commitments

(d) current litigation information; and

(e) availability of critical equipment

(f) Availability of key technical personnel

(g) Similar work experience

(h) History of non performing contracts

(i) Details of sub-contractors if any

5.3 Bidders shall also submit proposals of work methods and schedule in sufficient detail to demonstrate the adequacy of the bidder's proposals to meet the technical specifications and the completion time referred to in Clause 1.222.

5.4 In case of a joint venture, the following shall apply:

(a) The bid, and in case of a successful bid, the Form of Agreement, shall be signed so as to be legally binding on all partners.

(b) One of the partners shall be nominated as being in charge, and this authorization shall be evidenced by submitting of a power of attorney signed by legally authorized signatories of all the partners

(c) The partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture and the entire execution of the contract including payment shall be done exclusively with the partner in charge

(d) All partners in a joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms, and a relevant statement to this effect shall be included in the authorization mentioned under (b) above as well as in the Form of Bid and the Form of Agreement (in case of a successful tender)

(e) A copy of the agreement entered into by the joint venture partners shall be submitted with the tender.

6 ONE BID PER BIDDER

6.1 Each bidder shall submit only one bid. A bidder who submits or participates in more than one bid will be disqualified.

7 COST OF BIDDING

7.1 The bidder shall bear all costs associated with the preparation and submission of his bid and the Employer will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

7.2 The price to be charged for the bid document shall be Kshs. 1,000 (Kenya Shillings One Thousand Only) in form of a Bankers Cheque payable to the Kenya Urban Roads Authority. However, the same document in soft may be accessed in our website at www.kura.go.ke/tenders free of charge. Bidders who purchase documents will be required to attach a copy of an official receipt as proof of payment. For those who will download the document, they will be required to provide their details by registering at the procurement office immediately after the site visit.

8 SITE VISIT

8.1 The bidder is informed that **pre-BID conference and site visit** is not mandatory. Bidders are advised to appraise themselves on site conditions before bidding and obtain for himself all information that may be necessary for preparing the bid and entering into a contract for construction of the Works.

B. BIDDING DOCUMENTS

9 CONTENTS OF BIDDING DOCUMENTS

9.1 The set of documents comprising the BID includes the following together with any addenda issued in accordance with Clause 11:

(a) Invitation to Bid/Tender notice
(b) Instructions to bidders
(c) Qualification Criteria
(d) Conditions of Contract - Part II
(e) Conditions of Contract - Part I
(f) Standard Specifications
(g) Special Specifications
(h) Form of Bid, Appendix to Form of Bid and Bid Security
(i) Bills of Quantities
(j) Schedules of Supplementary information
(k) Form of Contract Agreement
(l) Form of Performance Security
(m) Drawings
(n) BID addenda (BID notices)
(o) Confidential Business Questionnaire
(p) Details of Sub-contractors

10 CLARIFICATION OF BIDDING DOCUMENTS

10.1 The prospective bidder requiring any clarification of the bidding documents may notify the Employer in writing or by cable (hereinafter the term cable is deemed to include telex and facsimile) at the Employer's mailing address indicated in the Bidding Data.

10.2 The Employer will respond in writing to any request for clarification that he receives earlier than 7 days prior to the deadline for the submission of bids. Copies of the Employer's response to queries raised by bidders (including an explanation of the query but without identifying the sources of the inquiry) will be sent to all prospective bidders who will have purchased the bidding documents.

11 AMENDMENT OF BIDDING DOCUMENTS

11.1 At any time prior to the deadline for submission of bids, the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by issuing subsequent Addenda.

11.2 The Addendum thus issued shall be part of the bidding documents pursuant to Sub-Clause 10.1 and shall be communicated in writing or cable to all purchasers of the bidding documents and will be binding upon them. Prospective bidders shall promptly acknowledge receipt of each Addendum in writing or by cable to the Employer.

11.3 In order to afford prospective bidders reasonable time in which to take an Addendum into account in preparing their bids, the Employer may, at his discretion, extend the deadline for the submission of bids in accordance with Clause 1.2.

C. PREPARATION OF BIDS

12 LANGUAGE OF BID

12.1 The bid prepared by the bidder and all correspondences and documents relating to the bid exchanged by the bidder and the Employer shall be written in the English Language. Supporting documents and printed literature furnished by the bidder may be in another language provided they are accompanied by an appropriate translation of pertinent passages in the above stated language. For the purpose of interpretation of the bid, the English language shall prevail.

13 DOCUMENTS COMPRISING THE BID

13.1 The bid to be prepared by the bidder shall comprise:

(a) Duly filled-in Form of Bid and Appendix to form of bid;
(b) Bid security;
(c) Priced Bills of Quantities;
(d) Schedules of information;
(e) Qualification Criteria;
(f) Any other materials required to be completed and submitted in accordance with the Instructions to Bidders embodied in these bidding documents.

13.2 These Forms, Bills of Quantities and Schedules provided in these bidding documents shall be used without exception (subject to extensions of the Schedules in the same format).

14 BID PRICES

14.1 Unless explicitly stated otherwise in the bidding documents, the contract shall be for the whole works as described in Sub-Clause 1.11.1, based on the basic unit rates and prices in the Bill of Quantities submitted by the bidder.

14.2 All the insertions made by the bidder shall be made in INK and the bidder shall clearly form the figures. The relevant space in the form of bid and bills of quantities shall be completed accordingly without interlineations or erasures except those necessary to correct errors made by the bidder in which case the erasures and interlineations shall be initialled by the person(s) signing the bid.

14.3 The bidder shall fill in rates and prices for all items of Works described in the Bills of Quantities, whether quantities are stated or not. Items against which no rate of price is entered by the tenderer will not be paid for by the employer when executed and shall be deemed covered by the rates for other items and prices in the Bills of Quantities.

The prices and unit rates in the Bills of Quantities are to be the full (all inclusive) value of the work described under the items, including all costs and expenses which may be necessary and all general risks, liabilities and obligations set forth or implied in the documents on

which the tender is based. All duties, taxes and other levies payable by the contractor under the contract, or for any other cause prior to the deadline for the submission of tenders, shall be included in the rates and prices and the total tender price submitted by the bidder.

Each price or unit rate inserted in the Bill of Quantities should be a realistic estimate for completing the activity or activities described under that particular item and the bidder is advised against inserting a price or rate against any item contrary to this instruction.

Every rate entered in the Bill of Quantities, whether or not such a rate is associated with the quantity, shall form part of the contract. The employer shall have the right to call for any item of work contained in the Bills of Quantities, and such items of work to be paid for at the rate entered by the bidder and it is the intention of the Employer to take full advantage of the unbalanced low rates.

14.4 All duties, taxes (excluding VAT) and other levies payable by the Contractor under the Contract, or for any other cause as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total Bid Price submitted by the bidder.

14.5 Unless otherwise provided in the Bidding Data and Conditions of Particular Application, the rates and prices quoted by the bidder are subject to adjustment during the performance of the contract in accordance with the provisions of Clause 70 of the Conditions of Contract. The bidder shall furnish with his bid written confirmation from his suppliers or manufacturers of basic unit rates for the supply of items listed in the Conditions of Contract clause 70 where appropriate. The Employer may require the bidder to justify such rates so obtained from the suppliers or manufacturers.

15 CURRENCIES OF BID AND PAYMENT

15.1 Bids shall be priced in Kenya Shillings.

16 BID VALIDITY

16.1 The bid shall remain valid and open for acceptance for a period of **120 days** from the specified date of bid opening specified in Clause 22 or from the extended date of tender opening, whichever is later.

16.2 In exceptional circumstances prior to expiry of the original bid validity period, the Employer may request that the bidders extend the period of validity for a specified additional period. The request and the responses thereto shall be made in writing or by cable. A bidder may refuse the request without forfeiting his bid security. A bidder agreeing to the request will not be required nor permitted to modify his bid, but will be required to extend the validity of his bid security for the period of the extension, and in compliance with Clause 17 in all respects.

17 BID SECURITY

17.1 The bidder shall furnish, as part of his bid, a bid security in the amount shown in the **Appendix to Form of Bid.**

17.2 The bid security shall be in the form of unconditional bank guarantee from a reputable bank selected by the bidder and located in Kenya (Insurance bonds shall not be accepted). The format of the bank guarantee shall be in accordance with bid security included in Section 1. The bid security shall remain valid for a period of 30 days beyond the original validity period for the bid, and beyond any period of extension subsequently requested under Sub-Clause 16.2.

17.3 Any bid not accompanied by an acceptable bid security will be rejected by the Employer as non-responsive.

17.4 The bid securities of unsuccessful bidders will be discharged/ returned as promptly as possible, but not later than 28 days after the expiration of the period of bid security validity.

17.5 The bid security of the successful bidder will be discharged upon the bidder signing the Contract Agreement and furnishing the required performance security.

17.6 The bid security may be forfeited:

(a) if a bidder withdraws his bid, except as provided in Sub-Clause 24.2.

(b) if the bidder does not accept the correction of any errors, pursuant to Clause 29 or in accordance with Sub-Clause 28.2 or

(c) in the case of a successful bidder, if he fails within the specified time limit to:

1. sign the Contract Agreement or
2. furnish the necessary performance security

18 NO ALTERNATIVE OFFERS

18.1 The bidder shall submit one offer, which complies fully with the requirements of the bidding documents unless otherwise provided in the appendix.

18.2 The bid submitted shall be solely on behalf of the bidder and only one bid may be submitted by each bidder either by himself or as a partner in a joint venture. A bidder who submits or participates in more than one bid will be disqualified.

18.3 A price or rate shall be entered in indelible ink against every item in the Bills of Quantities with the exception of items which already have Prime Cost or Provisional sums affixed thereto. The bidders are reminded that no "nil" or "included" rates or "lump-sum" discounts will be accepted. The rates for various items should include discounts if any. Bidders who fail to comply will be disqualified.

18.4 A bidder shall not attach any conditions of his own to his bid. The bid price must be based on the bid documents. The bidder is not required to present alternative construction options and he shall **use without exception, the Bills of Quantities as provided,** with the amendments as notified in the tender notices, if any, for the calculation of the bid price. Any bidder who fails to comply with the clause will be disqualified.

19 PRE-BID MEETING

19.1 The bidder is informed that **pre-BID conference and site visit** is not mandatory. Bidders are advised to appraise themselves on site conditions before bidding and obtain for himself all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. In case bidders require clarification, please send your inquiries as per the details given in the tender notice.

20 FORMAT AND SIGNING OF BIDS

20.1 The bidder shall prepare one (1) original of the documents comprising the bid as described in Clause 13 of these Instructions to Bidders, bound with the section containing the Form of Bid and Appendix to Bid, and clearly marked **"ORIGINAL".** In addition, the bidder shall submit two (2) replica copies of the bid clearly marked **"COPIES".** In the event of discrepancy between them, the original shall prevail.

20.2 The original and copies of the bid shall be typed or written in indelible ink (in the case of copies, photocopies are also acceptable) and shall be signed by a person or persons duly authorized to sign on behalf of the bidder pursuant to Sub-Clause 5.1(a). The person or persons signing the bid shall initial all pages of the bid where entries or amendments have been made.

20.3 The bid shall be without alterations, omissions or conditions except as necessary to correct errors made by the bidder, in which case such corrections shall be initialled by the person or persons signing the bid. Non-initialization shall constitute non-responsiveness

20.4 The bid shall serialize all pages of the document using indelible ink. **Non-serialization shall constitute non-responsiveness.**

D. SUBMISSION OF BIDS

21 SEALING AND MARKING OF BIDS

21.1 The bidder shall seal the original and each copy of the bid in separate envelopes duly marking the envelopes **"ORIGINAL"** and **"COPY".** The envelopes shall then be sealed in an outer separate envelope.

21.2 The inner and outer envelopes shall:

(a) be addressed to the Employer at the address provided in the Appendix to Form of Bid.

(b) bear the name and identification number of the contract. In addition to the identification required in sub-Clause 21.1, the inner envelopes shall indicate the name and address of the bidder to enable the bid to be returned unopened in case it is declared "late" pursuant to Clause 23.1, and for matching purposes under Clause 24.

(c) Provide a warning not to open before the time and date for bid opening, as specified in the Bidding Data.

21.3 If the outer envelope is not sealed and marked as instructed above, the Employer will assume no responsibility for the misplacement or premature opening of the bid. A bid opened prematurely for this cause will be rejected by the Employer and returned to the bidder.

22 DEADLINE FOR SUBMISSION OF BIDS

22.1 Bids must be received by the Employer at the address specified in Sub Clause 21.2 not later than **the time and date indicated in the Tender Notice or any subsequent Addenda as the case may be.**

22.2 Bids delivered by hand must be placed in the 'tender box' provided in the office of the employer

22.3 Proof of posting will not be accepted as proof of delivery and any bid delivered after the above stipulated time, from whatever cause arising will not be considered.

22.4 The Employer may, at his discretion, extend the deadline for the submission of bids through the issue of an Addendum in accordance with Clause 11 in which case all rights and obligations of the Employer and the bidders previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

23 LATE BIDS

23.1 Any bid received by the Employer after the deadline for submission of bids prescribed in Clause 22 will be returned unopened to the bidder.

24 MODIFICATION, SUBSTITUTION AND WITHDRAWAL OF BIDS

24.1 The bidder may modify, substitute or withdraw his bid after bid submission, provided that written notice of modification or withdrawal is received by the Employer prior to the prescribed deadline for submission of bids.

24.2 The bidder's modification, substitution or withdrawal notice shall be prepared, sealed, marked and delivered in accordance with the provisions of Clause 21, with the outer and inner envelopes additionally marked **"MODIFICATION"** or **"WITHDRAWAL"** as appropriate.

24.3 No bid may be modified subsequent to the deadline for submission of bids, except in accordance with Sub-Clause 28.1.

24.4 Any withdrawal of a bid during the interval between the deadline for submission of bids and expiration of the period of bid validity specified in Clause 17 may result in the forfeiture of the bid security pursuant to Sub-Clause 17.6.

E. BID OPENING AND EVALUATION

25 BID OPENING

25.1 The Employer will open the bids, including withdrawals and modifications made pursuant to Clause 24, in the presence of bidders' designated representatives who choose to attend, **the time and date indicated in the Tender Notice or any subsequent Addenda as the case may be**. The bidders' representatives who are present shall sign a register evidencing their attendance.

25.2 Envelopes marked "**WITHDRAWAL**" and "**SUBSTITUTION**" shall be opened first and the name of the bidder shall be read out. Bids for which an acceptable notice of withdrawal has been submitted pursuant to Clause 24 shall not be opened.

25.3 The bidder's name, the Bid Prices, including any bid modifications and withdrawals, the presence (or absence) of bid security, and any such details as the Employer may consider appropriate, will be announced by the Employer at the opening. Subsequently, all envelopes marked "**MODIFICATION**" shall be opened and the submissions therein read out in appropriate detail. No bid shall be rejected at bid opening except for late bids pursuant to Clause 23.

25.4 The Employer shall prepare minutes of the bid opening, including the information disclosed to those present in accordance with Sub-Clause 25.3.

25.5 Bids not opened and read out at bid opening shall not be considered further for evaluation, irrespective of the circumstances.

26 PROCESS TO BE CONFIDENTIAL

26.1 Information relating to the examination, evaluation and comparison of bids, and recommendations for the award of contract shall not be disclosed to bidders or any other persons not officially concerned with such process until the award to the successful bidder has been announced. Any effort by a bidder to influence the Employer's processing of bids or award decisions may result in the rejection of the bidder's bid.

27 CLARIFICATION OF BIDS AND CONTACTING OF THE EMPLOYER

27.1 To assist in the examination, evaluation, and comparison of bids, the Employer may, at his discretion, ask any bidder for clarification of their bid, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, but no change in the price or substance of the bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids in accordance with Clause 28.

27.2 Subject to Sub-Clause 26.1, no bidder shall contact the Employer on any matter relating to its bid from the time of the bid opening to the time the contract is awarded. If the bidder wishes to bring additional information to the notice of the Employer, it should do so in writing.

27.3 Any effort by the bidder to influence the Employer in the Employer's bid evaluation, bid comparison or contract award decisions may result in the rejection of the bidder's bid.

28 EXAMINATION OF BIDS AND DETERMINATION OF RESPONSIVENESS

28.1 Prior to the detailed evaluation of bids, the Employer will determine whether each bid (a) has been properly signed; (b) is accompanied by the required securities; (c) is substantially responsive to the requirements of the bidding documents; and (d) provides any clarification and/or substantiation that the Employer may require to determine responsiveness pursuant to Sub-Clause 28.2.

28.2 A substantially responsive bid is one that conforms to all the terms, conditions, and specifications of the bidding documents without material deviation or reservation and has a valid BID bank guarantee. A material deviation or reservation is one (a) which affects in any substantial way the scope, quality, or performance of the works; (b) which limits in any substantial way, inconsistent with the bidding documents, the Employer's rights or the bidder's obligations under the contract; or (c) whose rectification would affect unfairly the competitive position of other bidders presenting substantially responsive bids.

28.3 Each price of unit rate inserted in the Bills of Quantities shall be a realistic estimate of the cost of completing the works, described under the particular item including allowance for overheads, profits and the like. Should a tender be seriously unbalanced in relation to the Employer’s estimate of the works to be performed under any item or groups of items, the tender shall be deemed not responsive.

28.4 If a bid is not substantially responsive, it will be rejected by the Employer and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.

29 CORRECTION OF ERRORS

29.1 Bids determined to be substantially responsive will be checked by the Employer for any arithmetic errors in the computations and summations. Any bid found to have an arithmetic error **SHALL** be disqualified.

30 EVALUATION AND COMPARISON OF BIDS

30.1 The Employer will then evaluate and compare only the bids determined to be substantially responsive in accordance with Clauses 27 and 28.

30.2 In evaluating bids, the employer will determine for each bid the evaluated bid price by adjusting the bid price as follows

(a) Making any correction of errors pursuant to clause 29

(b) excluding provisional sums and provision, if any, for contingencies in the bills of Quantities, but including Dayworks where priced competitively

30.3 The Employer reserves the right to accept any variation, deviation or alternative offer other factors which are in excess of the requirements of the bid documents or otherwise result in the accrual of unsolicited benefits to the Employer, shall not be taken into account in tender evaluation.

30.4 Price adjustment provisions in the Conditions of Contract applied over the period of execution of the contract shall not be taken into account in the bid evaluation.

30.5 Preference where allowed in the evaluation of bids shall not exceed 15%

30.6 The procuring entity may at any time terminate procurement proceedings before contract award and shall not be liable to any person for the termination.

30.7 The procuring entity shall give prompt notice for the termination to the bidders and on request give its reasons for termination within 14days of receiving the request from any bidder.

30.8 A bidder who gives false information in the bid document about his qualification of who refuses to enter into a contract after notification of award shall be considered for debarment from participating in future public procurement.

30.9 If the bid, which results in the lowest Evaluated Bid Price is seriously unbalanced or front loaded in relation to the Engineer's estimate of the items of work to be performed under the contract, the Employer may require the bidder to produce detailed price analyses for any or all items of the Bills of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated contract payments, the Employer may

require that the amount of the Performance Security set forth in Clause 35 be increased at the expense of the bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the contract.

30.10 There will be preference for domestic bidders in accordance with section 39 (8) of the Public Procurement and Disposal Act, 2005 and section 28 of the Public Procurement and Disposal Regulations, 2006 all of the Laws of Kenya.

30.11 Poor past performance of the bidder shall be used as an evaluation criteria in accordance with section 5: *Qualification criteria*.

31 QUALIFICATION AND EVALUATION CRITERIA

31.1 Post-qualification will be based on meeting all of the following minimum point scale criteria regarding the Applicant's general and particular experience, personnel and equipment capabilities as well as financial position. The Employer reserves the right to waive minor deviations, if they do not materially affect the capacity of an applicant to perform the contract. Subcontractor's experience and resources shall not be taken into account in determining the Applicant's compliance with qualifying criteria.

31.2 General Experience.

The Applicant shall meet the following minimum criteria: -

(a) Average annual turnover for the last 2 years - KShs. 200,000,000/-.

(b) Successful completion as a prime contractor or sub-contractor in the execution of at least three roads rehabilitation/new construction projects of a similar nature and comparable in complexity to the proposed contract within the last three years, for which at least one was located in an urban environment in Kenya.

31.3 Personnel Capabilities. The Applicant should list down personnel of minimum qualification of Bsc in Civil Engineering (Registered with Engineer's Board of Kenya as a professional Engineer) for Site Agent, Ordinary Diploma for the surveyor and an Ordinary Diploma in Civil Engineering for other supervisory staff.

31.4 Equipment Capabilities. The Applicant should list down, the plants and equipment that are in his ownership and the ones proposed for hire which should be suitable for executing contract works. – Applicants must attaché evidence of ownership or hiring arrangements.

31.5 Cash flow statement. The Applicant should demonstrate that he has access to or has available, liquid assets, unencumbered real assets, lines or credit, and other financial means sufficient to meet the construction cash flow for a period of 2 months, estimated at 20% of the estimated tender sum.

31.6 Balance Sheets. Signed and stamped Audited balance sheets for the last two years should be submitted and must demonstrate the soundness of the Applicant's financial position, availability of working capital and net worth

31.7 Financial position/Ratios. The applicant's financial information will be assessed in terms of ROCE, current ratio and return on equity, and the point scale criteria on their financial position given on this basis. Where necessary, the Employer may make inquiries with the Applicant's bankers.

31.8 Litigation History. The Applicant should provide accurate information on any litigation or arbitration resulting from contracts complete or under execution by him over the last five years. A consistent history of litigation against the Applicant may result in failure of the application.

31.9 Post-qualification criteria are as provided in the Appendix to instruction to tenderers.

The bidders who pass the technical criteria will be subjected to financial evaluation.

F. FINANCIAL EVALUATION

32 COMPARISON OF MAJOR RATES OF ITEMS OF CONSTRUCTION & CREDIBILITY OF TENDERERS RATES

The Employer will compare the tenderers' rates with the Engineer's estimates for major items of construction. If some bids are seriously unbalanced or front loaded in relation to the Engineer's estimates for the major items of work to be performed under the contract, the Employer may require the bidder to produce detailed price analyses for any or all items of the Bills of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated contract payments, the Employer may require that the amount of the Performance Security set forth in Clause 35 be increased at the expense of the bidder

to a level sufficient to protect the Employer against financial loss in the event of default of the successful bidder under the contract.

33 PREFERENCE FOR DOMESTIC BIDDERS

This will not be applicable for this bid.

G. AWARD OF CONTRACT

34 AWARD

34.1 Subject to Clause 32, the Employer will award the contract to the bidder whose bid has been determined to be substantially responsive to the bidding documents and who has offered the lowest Evaluated Bid Price pursuant to Clause 29, provided that such bidder has been determined to be (a) eligible in accordance with the provisions of Sub-Clause 4.1, and (b) qualified in accordance with the provisions of Clause 5.

35 EMPLOYER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

35.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids, at any time prior to award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders of the grounds for the Employer's action.

36 NOTIFICATION OF AWARD

36.1 Prior to expiration of the period of bid validity prescribed by the Employer, the Employer will notify the successful bidder in writing or by cable confirmed by registered letter that its bid has been accepted. This letter (hereinafter and in the Conditions of Contract called "**Letter of Acceptance**") shall specify the sum, which the Employer will pay the Contractor in consideration of the execution and completion of the works and the remedying of any defects therein by the Contractor as prescribed by the contract (hereinafter and in the Conditions of Contract called "the Contract Price").

36.2 At the same time that the Employer notifies the successful bidder that his bid has been accepted, the Employer shall notify the other bidders that their bids have been unsuccessful and that their bid securities will be returned as promptly as possible, in accordance with sub-clause 17.4.

37 SIGNING OF AGREEMENT

37.1 At the same time that the Employer notifies the successful bidder that its bid has been accepted, the Employer will send the bidder the Agreement in the form provided in the bidding documents, incorporating all agreements between the parties.

37.2 Within 14 days of receipt of the form of contract agreement from the employer, the successful bidder shall sign the form and return it to the employer together with the required performance security.

37.3 The parties to the contract shall have it signed within 30days from the date of notification of contract award unless there is an administrative review request.

38 PERFORMANCE SECURITY

38.1 Within twenty eight (28) days of receipt of the notification of award from the Employer, the successful bidder shall furnish the Employer with a performance security in the form stipulated in the Conditions of contract. The form of performance security provided in Section 9 of the bidding documents shall be used.

38.2 The successful bidder shall provide a performance security in the form of an Unconditional Bank Guarantee from a reputable bank approved by the employer and located in Kenya.

38.3 Failure by the successful Bidder to lodge the required Performance Guarantee shall constitute a breach of contract and sufficient grounds for the **annulment of the Award and forfeiture of the Bid Surety**; in which event the Employer may make the award to the next ranked bidder or call for new bids.

39 CONTRACT EFFECTIVENESS

39.1 The Contract will be effective only upon signature of the Agreement between the Contractor and the Employer.

40 ADVANCE PAYMENT

40.1 An advance payment, if approved by the Employer, shall be made under the contract, if requested by the contractor, in accordance with clause 60(1) of the conditions of contract. The advance payment guarantee shall be denominated in Kenya Shillings.

41 CORRUPT AND FRAUDULENT PRACTICES

41.1 The procuring entity requires that bidders observe the highest standard of ethics during the procurement process and execution of contracts. A bidder shall sign a declaration that he has not and will not be involved in corrupt or fraudulent practices.

SECTION 5: QUALIFICATION CRITERIA

SECTION 5: QUALIFICATION CRITERIA

This Section contains all the factors, methods and criteria that the Employer shall use to evaluate applications. The information to be provided in relation to each factor and the definitions of the corresponding terms are included in the respective Application Forms.

Contents

No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
5.1	Eligibility						
5.1.1	**Nationality**	Nationality in accordance with ITB Subclause 3.2.	Must meet requirement	Existing or intended JV must meet requirement	Must meet requirement	N / A	Section 3, Clause 31
5.1.2	**Conflict of interest**	No conflicts of interest as described in ITB Subclause 3.1(a) i & ii	Must meet requirement	Existing or intended JV must meet requirement	Must meet requirement	N / A	Section 3, Clause 31
5.1.3	**Employer Ineligibility**	Not having been declared ineligible by the Employer, as described in Subclause 3.1(a) i & ii	Must meet requirement	Existing JV must meet requirement	Must meet requirement	N / A	Section 3, Clause 31
5.1.4	**Incorporation & Registration**	Applicant required to meet conditions of ITB Clause 4. Pursuant to Clause 4, the following shall be submitted; Certified copies of; ▪ Certificate of Incorporation to show that the applicant is a registered company and legally authorized to do business in Kenya. ▪ - Proof of registration with the National Construction Authority class as per tender notice as a Paved Roads Contractor ▪ Tax Compliance Certificate	Must meet requirement	Must meet requirement	Must meet requirement	N / A	Section 3, Clause 31

No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
		(Valid) ▪ VAT Registration Certificate ▪ PIN number					
5.2	Historical Contract Non-Performance						
5.2.1	**History of Non-Performing Contracts**	Non-performance of a contract did not occur within the last three (3) years prior to the deadline for application submission based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract, and where all appeal instances available to the applicant have been exhausted.	Must meet requirement by itself or as party to past or existing JV	N / A	Must meet requirement by itself or as party to past or existing JV	N / A	Section 3, Clause 31
5.2.2	**Pending Litigation**	All pending litigation shall in total not represent **more than Fifty percent (50%)** of the Applicant's net worth and shall be treated as resolved against the Applicant. The applicant to provide Sworn affidavit.	Must meet requirement by itself or as party to past or existing JV	N / A	Must meet requirement by itself or as party to past or existing JV	N / A	Section 3, Clause 31

No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
5.3	Financial Situation						
5.3.1	**Financial Performance**	(a) Submission of audited financial statements or if not required by the law of the applicant's country, other financial statements acceptable to the Employer, for the last two [2] years to demonstrate: (b) The current soundness of the applicants financial position and its prospective long term profitability, and (c) Capacity to have and meet the construction cash flow equivalent to 20% of the tender sum (d) Bank statements for three (3) months for the period of three months ending at most one (1) week from the date of tender opening.	Must meet requirement (a) Must meet requirement (b) Must meet requirement	N / A (a) N / A (b) Must meet requirement	Must meet requirement (a) Must meet requirement (b) N / A	N / A (a) N / A (b) N / A	Section 3, Clause 31 (a) All pages must be initialized and stamped by both a practicing Auditor registered with ICPAK and one of the Directors. Auditor's practicing membership number from ICPAK must be indicated. Non-adherence to this to part a, b and c leads to disqualification. (b) All pages in the bank statement must be initialized and stamped by the issuing bank.
5.3.2	**Average Annual Construction**	Minimum average annual construction turnover	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3,

No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
	Turnover	calculated as total certified payments received for contracts in progress or completed, within the last Three(3) years: **KShs. 3.00 billion**					Clause 31

No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
5.4	Experience						
5.4.1	**General Construction Experience**	Experience under construction contracts in the role of contractor, subcontractor, or management contractor for at least the **last five (5) years** prior to the applications submission deadline	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31
5.4.2	**Specific Construction Experience**	Participation as contractor, management contractor or subcontractor, in at least **two (2) contracts** within the last **five (5) years** each of similar value that have been successfully and substantially completed and that are similar to the proposed works amounting to 3 billion. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Section 8, Special Specification	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31
5.4.3	**Work Methodology**	Submission of a brief work methodology in accordance with sub-clause 5.3	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Give a brief description of how you intend to carry out the work including traffic management and quality assurance of works, in not less than three (3) pages and not more than five (5) pages (typed, font 12 and single spaced).

No.		Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
					All Parties Combined	Each Party	One Party	
		5.5 Current Commitments						
5.5.1		On-going contracts	The total value of outstanding works on the on-going contracts must not exceed the average annual turnover for the last two years.	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31
		5.6 Personnel Capability						
5.6.1			The site staff shall possess minimum levels set below *NB: Attachment of CVs and certified copies of Annual Practicing Licenses (for Engineers) and Academic Certificates for all staff is mandatory;*					
(a)		Site Agent	Qualification: BSc. Civil Eng and/or equivalent Be Registered Eng. by EBK as a professional engineer. General Experience: 10 years Specific Experience in similar works: 7 years Specific Experience as manager of similar works: 3 years	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31

No.		Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
					All Parties Combined	Each Party	One Party	
(b)		Deputy Site Agent / Site Engineer	Qualification: B.Sc. Civil Eng and/or equivalent Be Registered by EBK as a graduate engineer. General Experience: 8 years Specific Experience in similar works: 5 years	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31
(c)		Site Surveyor	Qualification: Diploma in Surveying General Experience: 7 years Specific Experience in similar works: 5 years	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31
(d)		Foremen	Qualification: Diploma in Civil Engineering. General Experience: 7 years Specific Experience in similar works: 5 years	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 3, Clause 31
(e)		Materials Technologist	Qualification = Dip. Civil Eng General Experience = 6 yrs Specific Experience = 4 Yrs					Section 3, Clause 31

BIDDERS ARE INFORMED THAT APART FROM THE ABOVE THEY MUST MEET THE REQUIREMENTS OF THE PUBLIC PROCUREMENT AND DISPOSAL ACT, 2015.

Clauses 14.1 and 14.2

The currency of the bid shall be Kenya Shillings

Clause 17.1

There will be no alternative times for completion.

Clause 19.1

The number of replica copies of the bid to accompany the original shall be two (2).

Clauses 29.2 (a) and 29.2 (b)

The currency of the Employer's country at the selling rates established for similar transactions by the Central Bank shall be on the date 28 days prior to the date of opening the bids.

Clause 35.1

The Performance Security shall be in the form given in Section 3, Item 3.7.

Clause 35.3

Apart from the stipulation of Clause 35.1 of these Instructions to Bidders, there shall be no other form of Performance Security submission.

Clause 36.1

The method of dispute resolution shall be arbitration and the arbitrator shall be a person to be agreed between the parties or failing agreement. The arbitrator shall be appointed by The Chairman Institute of Arbitrators of Kenya.

5.7 Schedule of the Major Items of Plant to Be Used On the Proposed Contract.

The Bidder must indicate the core plant and equipment considered by the company to be necessary for undertaking the project together with proof ownership. (* Mandatory minimum number of equipment required by the Employer for the execution of the project that the bidder must make available for the Contract , 60% of the Mandatory Equipment must be owned by the Contractor and proof of ownership as per NCA list submitted.

Item No.	Equipment Details	*Minimum Number Required for the Contract Execution	Maximum Score	No of Equipment Owned by the Bidder	No. of equipment to be hired/ purchased by the Bidder	No. of equipment to be made available for the Contract by the Bidder
A	**Bituminous Plants**					
	Bitumen Pressure distributor	1	YES/NO			
	Asphalt concrete paver	2	YES/NO			
B	**Compactors**					
	Crusher And Associated Power Screens 150t/Hr	1	YES/NO			
	Subtotal for B	1				
	Concrete Equipment					
C	Pugmill, Capacity 450-500 Tons/Hr With 3 No 48-Ton Bins And Full Logic Control	1	YES/NO			
	Concrete vibrators	1	YES/NO			
	Subtotal for C	2				
D	**Transport (Tippers, dumpers, water tankers)**					
	Low Loader 30t Capacity	2	YES/NO			
	Tip Truck 16-25t Gross Capacity	20	YES/NO			
	Subtotal for D – tippers & dumpers					
	Water tankers (18,000 – 20,000 litres capacity)	4	YES/NO			
	Subtotal for D	26				

Item No.	Equipment Details	*Minimum Number Required for the Contract Execution	Maximum Score	No of Equipment Owned by the Bidder	No. of equipment to be hired/ purchased by the Bidder	No. of equipment to be made available for the Contract by the Bidder
E	**Earth – Moving Equipment** Wheeled loaders					
	Motor graders (93 - 205kW)	1	YES/NO			
	Subtotal for E	1				
F	**Excavators** Hydraulic Excavator Cat 322 Or Equivalent With Rock Hammer	2	YES/NO			
	Crane 20t Capacity	1	YES/NO			
	Subtotal for F	3				
G	**Rollers** Self propelled single drum vibrating (various types) Pneumatic rubber tyre (1-2 tonnes/wheel)	1	YES/NO			
	Sheep's foot roller	1	YES/NO			
	Subtotal for G	1	YES/NO			
		3				

(Bidders must provide proof of ownership or lease arrangements for all plants and equipment.

All lease agreements must be certified including those from MCTE)

We hereby certify that **notwithstanding** the list of plant detailed above, we will provide sufficient, suitable and adequate plant in good working order for the successful completion of works as specified under the contract.

…… …….
(Signature of Bidder) (Date)

APPENDIX TO QUALIFICATION CRITERIA

TABLE 1: PRE- QUALIFICATION CHECKLIST FOR COMPLETENESS AND RESPONSIVENESS

S/No.	Completeness and Responsiness Criteria	References	Requirement
1.	Form of Bid	Section 1 Clause 20.2	- Amount must be indicated - Properly fill and sign
2.	Appendix to Form of Bid	Clause 20.2 Section 2	- Form properly sign
3.	Bid Security	Section 3 Clause 16/17	- Unconditional bank guarantee - In the format provided with all conditions
4.	Confidential Business Questionnaire	Section 3; Item 3.9	- Properly fill and sign - Provide all required information
5.	Form of Power of Attorney	Section 3; Item 3.15 Clause 5.1(a)	- Properly fill and sign - Provide copies of National Identification card or Passport.
6.	Tax Compliance Certificate	Employer's notice	- Copy of certificate Certified by Commissioner of Oaths - Valid
7.	Registration with National Construction Authority	Employer's notice Item 5.1.4 of QC	- As per tender notice - Copy of certificate Certified by Commissioner of Oaths
8.	Certificate of Incorporation	Employer's notice Item 1.4 of QC	- Copy of certificate Certified by Commissioner of Oaths
9.	Priced Bill of Quantities	Section 9	- Fill all rates, prices and amounts
10.	Eligibility	Section 3; Item 3.9 Clause 4.1/4.2	- Copies of National ID or passport for all directors - Certified copy of Form CR12
11.	Conflict of interest	Section 3; item 3.9 Clause 4.2	- to state explicitly
12.	Debarment	Section 3; item 3.21 Item 1.3 of QC	- Properly fill and sign
13.	Pending Litigation	Item 2.2 of QC	- Provide Sworn affidavit
14.	Litigation History	Section 3; item 3.20	- Fill in information and sign
15.	Non-completed works beyond completion date	Section 3; Item 5.2.1 of QC	- Fill information on non-completed works
16.	Certificate of Tenderers Visit to Site	Clause 8.1/8.3 Section 3; Item3.14	- Bidders to appraise themselves on site condition before bidding and show evidence by filling the form provided.
17.	Schedule of Major Items of Plant	Item 3.11 of QC Section 3;	- Properly fill and sign
18.	Schedule of Key Personnel	Item 3.16 of QC Section 3;	- Properly fill and sign

19.	Roadwork Completed Satisfactorily	Item 3.17 of QC Section 3;	- Properly fill and sign
20.	Schedule of Ongoing Projects	Item 3.18 of QC Section 3;	- Properly fill and sign
21.	Schedule of other Supplementary Information / Financial Standings	Item 3.19/3.20 of QC Section 3;	- Properly fill and sign
22.	Anti-Corruption Declaration / Commitment / Pledge Form	Item 3.21 Section 3;	- Properly fill and sign
23.	Copies of Bid Document	Clause 20.1	- Replica of the original - Provide 2No.
REMARKS		Clause 13.1/20.2	- Bid document to be complete, properly filled and signed.

Key: QC – Qualification Criteria

TABLE 2: POST- QUALIFICATION SCORE

ITEM		DESCRIPTION	POINT SCORE SCALE
1		FINANCIAL CAPACITY	
	a	Audited Statements	YES/NO
	b	Cash flow statement (forecasts)	YES/NO
	c	Financial position/Ratios	YES/NO
	d	Bank statement	YES/NO
	e	Turnover	YES/NO
2		EXPERIENCE	
		General Experience	YES/NO
		Specific experience in related works	YES/NO
3		CURRENT COMMITMENTS	
		On-going works	YES/NO
4		KEY PERSONNEL	
		Site Agent	YES/NO
		Deputy Site Agent / Site Engineer	YES/NO
		Surveyor	YES/NO
		Foremen - 4 No. (General, Earthworks, Concrete, Bituminous Works)	YES/NO
		Materials Technologist	YES/NO
5		PLANT AND EQUIPMENT	
		Equipment capabilities	YES/NO

ITEM		DESCRIPTION	POINT SCORE SCALE
6		WORK METHODOLOGY	YES/NO
7		COUNTRY BASED	YES/NO
		TOTAL	REMARKS ALL PARAMETERS MUST BE MET

SECTION 6: CONDITIONS OF CONTRACT

SECTION 6A - CONDITIONS OF CONTRACT PART I: GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract, Part I: General Conditions shall be those forming Part I of the "Conditions of Contract for Works of Civil Engineering Construction," fourth edition 1987, reprinted in 1992 with further amendments, prepared by the *Fédération Internationale des Ingénieurs-Conseils* (FIDIC). These Conditions are subject to the variations and additions set out in Part II hereof entitled "Conditions of Particular Application.".

Copies of the FIDIC Conditions of Contract can be obtained from:

FIDIC Secretariat
P.O. Box 86
1000 Lausanne 12
Switzerland
Facsimile: 41 21 653 5432
Telephone: 41 21 653 5003

SECTION 6B ~ CONDITIONS OF CONTRACT PART II: (CONDITIONS OF PARTICULAR APPLICATION)

The following Conditions of Particular Application shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The Particular Condition is preceded by the corresponding clause number of the General Conditions to which it relates.

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Clause and Description Page

CONDITIONS OF CONTRACT PART II (CONDITIONS OF PARTICULAR APPLICATION)

NOTES:

The Conditions of Particular Application (Conditions of Contract, Part II) modify and compliment like-numbered clauses in the General Conditions of Contract (Conditions of Contract, Part I). Both parts shall be read together, with the Conditions of Particular Application prevailing in case of conflict or discrepancy. Clauses of the General Conditions of Contract not specifically modified and supplemented shall remain in effect.

DEFINITIONS AND INTERPRETATION

1.1 Definitions

(a) (i) The "Employer" shall be The Director General, Kenya Urban Roads Authority.
(iv) The "Engineer" shall be The General Manager (Design and Construction), Kenya Urban Roads Authority or any other competent person appointed by the Employer, and notified to the Contractor, to act in replacement of the Engineer.

(b) (i) Insert in line 2 after "the Bill of Quantities", the following, "the rates entered by the Contractor (whether or not such rate be employed in computation of the Contract Price)".
(v) The word "Tender" and its derivatives are synonymous with the word 'Bid,' and its derivatives, and the words 'Tender Documents' with 'Bidding Documents'. The words "Appendix to Tender" and the words "Appendix to Bid" shall have the same meaning as the words 'Appendix to the Form of Bid'."

Add the following paragraph at the end of Subclause 1.1 (f) (vii):

The aforesaid includes lands waters, river beds and other places on, under, in through which the Works are to be carried out including all offices, workshops or places where materials are to be stored or used for the purposes of the Contract. It also includes quarries; borrow pits, stock pile areas and spoil areas"

Add Subclause 1.1 (g) (v):

Dates shall be construed in accordance with the Gregorian Calendar.

Add the following Subclause 1.6:

1.6 Gender Specific Words

Wherever in the Contract Documents the word 'man' or 'men' is used directly or as a suffix it means 'woman' or 'women' also. The Word 'he' includes 'she' also.

ENGINEER AND ENGINEER'S REPRESENTATIVE

2.1 Engineer's Duties and Authority

With reference to Sub-Clause 2.1(b): Add the following

The Engineer shall obtain specific approval of the Employer before taking any of the following actions specified in the General Conditions of Contract:

(a) Consenting to the sub-letting of any part of the Works under Clause 4.
(b) Certifying additional cost determined under Clause 12
(c) Determining an extension of time under Clause 44
(d) Issuing a variation under Clause 52

(e) Certifying payment if the Contract Price will be exceeded
(f) Authorising the use of provisional sums in excess of the monetary limit for variations
(g) Issuing any Taking-over Certificate
(h) Certifying additional payment/costs under Clause 65;
(i) Issuing a Defects Liability Certificate under Clause 62
(j) Fixing rates or prices under Clause 52.

Notwithstanding the provisions set out above, to obtain approval of the employer, if in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 52 and shall notify the Contractor accordingly, with a copy to the Employer."

ASSIGNMENT AND SUBCONTRACTING

4.1 Subcontracting

Delete the second and third sentence and substitute:

No single subcontract may be for more than 10 percent of the Contract Price nor shall the sum of all subcontracts exceed 25 percent of the Contract price. No one subcontractor may be awarded subcontracts to a total value greater than 10 percent of the Contract Price. All subcontracts greater than 2 percent of the Contract Price are to have the prior consent of the Engineer. The Contractor shall however, not require such consent for purchases of materials or to place contracts for minor details or for any part of the Works of which the manufacturer or supplier is named in the Contract. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any subcontractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen.

Add the following:

The Engineer should satisfy whether:

(a) The circumstances brought out warrant such subcontracting; and
(b) The subcontractors so proposed for the Work possess the necessary experience, qualifications and equipment for the job proposed to be entrusted to them in proportion to the quantum of work to be subcontracted.

If the contractor proposes payments to be made directly to that subcontractor, this should be subject to specific authorization by the Contractor so that such consent does not relieve him from any liability or obligations under the contract.

CONTRACT DOCUMENTS

5.1 Language and Law

(a) The language governing this Contract shall be English.

The "Ruling Language" which shall be used to interpret this Contract shall be English. Communication between the Contractor and Engineer or Engineer's representative shall be in English.

(b) The laws applicable to this Contract shall be the laws of the Republic of Kenya. Except to the extent otherwise provided by the Contract, the Kenyan courts shall have exclusive jurisdiction to hear and to determine all actions and proceedings in connection with and arising out of the Contract and the Contractor shall submit to the jurisdiction of Kenyan courts for the purpose of any such actions and proceedings.

5.2 Priority of Contract Documents

Delete the documents listed as (1) to (6) and substitute with the following:

(1) The Contract Agreement (if completed)
(2) The Letter of Acceptance
(3) Minutes of Pre-Contract Award Discussion
(3) Bid and Appendix to Form of Bid
(4) The Conditions of Contract, Part II; Conditions of Particular Application
(5) The Conditions of Contract, Part I; General Conditions of Contract
(6) The Special Specifications
(7) The Standard Specifications for Road and Bridge Construction, Ministry of Transport and Communications, 1986
(8) Clarifications and Rectifications accepted by the Employer
(9) The Drawings
(10) The priced Bill of Quantities
(11) Schedules and other documents forming part of the Contract.

Add to Clause 6 the following Subclauses 6.6 to 6.10:

6.6 Metric Units

All units used in the Contract shall be metric and for measurement of angles the 360 degrees circles systems shall be used

6.7 Intent of Drawings and Specifications

The intent of Drawings and Specifications is to describe the details for the complete construction and maintenance of the Works which the Contractor undertakes to perform in accordance with the terms of the Contract.

Where the Drawings or Specifications describe portions of the Works in general terms, but not in complete detail, it is understood that only materials and workmanship of the first quality are to be used. First quality refers to the quality as approved by the Engineer.

Unless otherwise specified, the Contractor shall furnish all labour, material, tools, equipment and incidentals, and do all the work involved in executing the Contract in a satisfactory and workman-like manner.

6.8 Design, Drawings and Specifications Prepared by the Contractor

No payment will be made to the Contractor for undertaking any kind of design work, preparation of drawings and specification, other than that specifically required by the terms of the Contract. Payment for design work, preparation of drawings and specifications, specifically required by the terms of the Contract shall be deemed to be included in the Rates and Lump Sums entered in the Bill of Quantities.

6.9 Submissions of Designs and Drawings

All detailed working drawings/shop drawings, design calculations and fabrication drawings for Temporary Works (such as formwork, staging, centring, scaffolding, specialized constructional, handling and launching equipment and the like) as well as bar bending and cutting schedules for reinforcement, material lists for structural fabrication including detailed drawings for templates, end anchorage and temporary support details for pre-stressing cables shall be prepared by the Contractor at his own cost and forwarded in triplicate to the Engineer at least six weeks in advance of actual constructional requirements. The Engineer will check and return one copy of the same for the Contractor's use with amendments, if any, noted in red

ink. Such approval shall not relieve the Contractor of any of his responsibilities in connection with temporary works.

The Contractor will supply four copies of the approved drawings for the Engineer's use. The cost of preparing all such items of work shall be deemed to have been included in the respective rates/prices quoted by the Contractor in the Bill of Quantities.

6.10 As-Built Drawings

On completion of the Works, the Contractor shall arrange to furnish to the Employer two (2) bound sets of all "As Built" drawings for every component of the Works at his own cost, all such copies being on Polyester film of quality to be approved by the Engineer or his Representative and digitized copy (2 No.) in a Compact Discs (CDs) of quality approved by the Engineer or his Representative. The Taking-over Certificate of the Works, as per the provisions of Clause 48.1 herein, shall not be issued by the Engineer in the event of the Contractor's failure to furnish the aforesaid "As Built" drawings for the entire works."

Add to Clause 7 the following Sub-clauses 7.4 to 7.6:

7.4 Drawings for Temporary Works

Drawings for Temporary works to be carried out by the Contractor shall be submitted to the Engineer for approval.

Working drawings of concrete structures consisting of such details as may be reasonably required for the successful execution of the work and which are not included in the plans furnished by the Employer, shall be prepared by the Contractor. Three sets of working drawings shall be submitted to the Engineer for approval.

7.5 Size of Drawings

All drawings submitted by the Contractor shall for convenience in filing be as far as possible of a uniform size, and not more than 1010 mm x 680 mm. The drawings shall be numbered and dated, and shall include the title of the Contract at the bottom of the drawing followed by the title of the drawing. All drawings shall have the appropriate scales drawn on them and notes shall be in English. All amendments to such drawings shall be noted and dated on the drawing.

7.6 Submission to the Engineer

Whenever the Contractor is required to submit to the Engineer proposals, details, drawings, calculations information, literature, materials, test report and certificates, the Engineer will consider each submission and, if appropriate, will reply to the Contractor in accordance with the relevant provision of the Conditions of Contract. Unless a defined period of time is stated in the contract, each submission shall be made by dates to be agreed with the Engineer having regard to the approved programme and the need to give the Engineer adequate time to consider each submission.

The approval of the Engineer of any submission shall not relieve the Contractor of his responsibilities under the Contract.

GENERAL OBLIGATIONS

Add to Subclause 8.1 the following:

8.1 Contractors General Responsibilities

Add to Subclause 8.1 the following:

(a) Within 28 days after receipt of the Engineer's Order to Commence the Works, the Contractor shall establish an office at the Site duly equipped for the Contractor's representative and his superintending personnel.

The Contractor shall maintain this office throughout the Contract period. The said office shall be the legal domicile of the Contractor, and all correspondence sent to this office shall be deemed to have been sent to the Contractor's head office.

(b) A foreign Contractor or a Kenya-foreign joint venture, if not registered in Kenya under the applicable laws of Kenya, shall undertake registration upon receipt of the Letter of Acceptance and prior to signing of the Contract.

Add to Clause 8 the following Subclause 8.3:

8.3 General Requirements

(a) Materials delivered to the site by Contractor or materials made available or supplied by the Employer shall be used solely for the execution of the Works.

(b) The Contractor shall minimise the pollution of and disturbance of lands, roads and other places on and around the Site. No trees or other vegetation shall be removed except to the extent necessary for the works.

(c) The Contractor shall comply with the current Government regulations with regard to the transport, storage and use of explosives and radio-active materials and use of radio communication equipment.

(d) The Contractor shall take all reasonable precautions:

(i) In connection with any rivers, streams, waterways, drains, water courses, lakes and the like to prevent as a consequence of the works, silting, erosion of beds and banks and pollution of the water that may adversely affect the quality or appearance thereof or cause injury or death to human, animal or plant life.

(ii) In connection with underground water resources, including percolating water, to prevent any interference as a consequence of the work with the supply to or abstraction from such sources and to prevent pollution of water that may adversely affect the quality thereof.

(e) The Contractor shall provide, maintain and remove on completion of the Works, settling lagoons and other facilities to minimise pollution due to the Contractor's operations including but not limited to quarrying, aggregate washing, concrete mixing and grouting.

(f) The Contractor shall provide, maintain and remove on completion of the Works, fencing around the site installations including housing, camps, offices and laboratories, providing free access to the Employer, the engineer, other Contractors and any other persons entitled to such access and provide appropriate security measures on such access roads.

(g) All buildings erected by the Contractor upon the site and camp sites, and the layout of the buildings and the sites, shall comply with the Laws of the country and all local By-laws in so far as they are applicable.

(h) The Contractor shall be absolutely and solely responsible for the safety and security of Temporary Works including, but not limited to, all work yards, pilings, staging, dams, coffer dams, trenches, fencing or other works and for the Plant and Contractor's Equipment in connection therewith which may be erected or provided for the execution of the Contract Works.

This provision shall be applicable to all temporary Works, Plant and Contractor's Equipment whenever provided and erected by the Contractor or his Subcontractor(s) for the purpose of or in connection with the Contract Works.

(i) The contractor shall keep in close contact with the police, Labour officers and all other officials as appropriate regarding their requirements for the control of workmen, restricted area permits or other matters and shall provide all assistance and facilities which may be required by such officials in the execution of their duties.

10.1 Performance Security

Replace the text of Subclause 10.1 with the following:

The Contractor shall provide security for his proper performance of the Contract to the Employer within 28 days after the receipt of the Letter of Acceptance. The Performance Security shall be as stipulated in the Appendix to the Form of Bid. The Performance Security shall normally be in the currency or currencies requested for payment by the Contractor and in the same proportions as those requested for payment in the Contract. The Contractor shall notify the Engineer when providing the Performance Security to the Employer.

The Performance Security shall be a bank guarantee which shall be issued either:

(a) By a bank located in Kenya or a foreign bank through a correspondent established and reputable bank located in Kenya or;

Without limitation to the provisions of the preceding paragraph, whenever the Engineer determines an addition to the Contract Price as a result of a change in cost and/or legislation or as a result of a variation amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor, at the Engineer's written request, shall promptly increase the value of the Performance Security in that currency by an equal percentage.

The performance security of a joint venture shall be in the name of the joint venture.

10.2 Period of Validity of Performance Security

The performance security shall be valid until a date 28 days from the date of issue of the Taking-Over Certificate for the last section in case of partial handover. The security shall be returned to the Contractor within 28 days of expiration.

10.3 Claims under Performance Security

Delete sub-clause 10.3

Add the following Subclause 10.4:

10.4 Cost of Performance Security

The cost of complying with the requirements of this clause shall be borne by the Contractor.

11.1 Inspection of Site

Add the words "and the Contractor shall be deemed to have based his tender on all the aforementioned" after the words "affect his tender".

Delete the last paragraph completely and replace with the following:

The Employer in no way guarantees completeness nor accuracy of the soil, materials, subsurface and hydrological information made available to the Contractor at the time of bidding or at any other time during the period of the Contract, and the Contractor shall be responsible for ascertaining for himself all information as aforesaid for the execution of Works and his bid shall be deemed to have been priced accordingly.

Add a new Subclause 11.2:

11.2 Access to Data

Data made available by the Employer in accordance with Subclause 11.1 shall be deemed to include data listed elsewhere in the Contract as open for inspection at the address stipulated in Appendix to the Form of Bid.

14.1 Programme to be Submitted

Delete Subclause 14.1 and replace with the following:

The time within which the Programme shall be submitted shall be twenty eight (28) days .This detailed Programme shall be based upon the programme submitted by the Contractor as part of his bid and shall, in no material manner, deviate from the said programme.

The Contractor shall allow in his Programme for the following 11 public holidays per calendar year in Kenya upon which the Contractor shall not be permitted to work:

- New Year's Day (1st January)
- Good Friday
- Easter Monday
- Labour Day (1st May)
- Idd-Ul-Fitr
- Madaraka Day (1st June)
- Idd-Ul-Adha
- Mashujaa Day (20th October)
- Jamhuri Day (12th December)
- Christmas Day (25th December)
- Utamaduni Day (26th December)

The Contractor should also allow per calendar year for a further two (2) unspecified public holidays which may be announced by the Government of Kenya with no prior notification, and upon which he shall not be permitted to work.

The Programme shall be submitted in two copies in the form of a Critical Path Method Network (CPM Network) showing the order of procedure and description of the construction methods and arrangements by which he proposes to carry out the Works. In addition, the aforesaid critical path programme should be supplemented by:

(i) A Gantt/time-bar chart detailing each construction activity, showing for each construction activity; the periods of construction activity planned; the percentage completion anticipated per month; the total estimated quantity of work; the average monthly production planned, and

(ii) A detailed work method statement in respect of each construction activity. It should also be supplemented by a time-bar chart of the same programme. The programme shall be coordinated with climatic, groundwater and other conditions to provide for the completion of the works in the order and by the time specified. The Programme shall be revised at quarterly intervals and should include a chart of the principal quantities of the forecast for execution monthly.

The detailed work method statement of each particular construction activity shall list by category/type and quantity the labour, skilled labour, supervisors, plant, equipment and materials to be employed on the particular construction activity; together with: the estimated average daily production anticipated, the estimated equipment availability and utilisation factor anticipated and a detailed step description of the way in which resources are to be utilised to achieve the required rate of construction/production.

The Contractor's attention is particularly drawn to the need to familiarise himself with customs procedures in connection with importation and to allow sufficient time in its programme for these to be completed.

During the execution of Works, the Contractor shall submit to the Engineer detailed particulars of any proposed amendments to the arrangements and methods submitted in accordance to the foregoing.

If details of the Contractor's proposals for Temporary Works are required by the Engineer for his own information the Contractor shall submit such detail within fourteen days of being requested to do so.

The various operations pertaining to the Works shall be carried out in such a progressive sequence so as to achieve a continuous and consecutive output of fully completed road works inclusive of bridge works and culverts within the time limits specified in the Contract.

The Contractor shall, wherever required by the Engineer, also provided in writing for information a detailed description of the arrangements and methods which the Contractor proposes to adopt for the execution of any particular part of the Works as directed by the Engineer.

Progress reporting by the Contractor should be supported on a monthly basis with an up-to-date analysis of the progress including a statement on items which are or are about to become critical to the Progress of Works, along with proposals on how the Contractor intends to address the situation.

The consent by the Engineer on any programme shall have no contractual significance other than that the Engineer would be satisfied if the work is carried out according to such programme, and that the Contractor undertakes to carry out the work in accordance with the programme, nor shall it limit the right of the Engineer to instruct the Contractor to vary the programme should circumstances make this necessary. The above shall not be taken to limit the right of the Contractor to claim for damage or extension of time to which he may be fairly entitled to in terms of the General Conditions of the Contract for delay or disruption of his activities.

Notwithstanding the General Conditions of Contract Clause 14.1, the programme to be submitted for the execution of the Works shall, in addition to the programme of pure construction activities, include an alleviation programme for Site staff and labour in respect of Sexually Transmitted Disease (STD) including HIV/AIDS. The STD and HIV/AIDS alleviation programme shall indicate when, how and what cost the Contractor plans to satisfy the requirements of Subclause 19.1 herein and the related Technical Specifications. For each component, the programme shall detail the resources to be provided or utilized and any related sub-contracting proposed. The programme shall also include provision of a detailed cost estimate with supporting documentation.

14.2 Revised Programme

Add the following at the end of this subclause:

The Contractor shall, when instructed by the Engineer, amend, correct or modify the Programme of the Works so as to take into account any delays and/or advances and modifications designs or for other reasons considered necessary by the Engineer.

If, during the progress of the work, the quantities of work performed per month fall below those shown in the Programme, or if the sequence of operations is altered, or if the Programme is deviated from in any other way, the Contractor shall, within two weeks after being notified by the Engineer, submit a revised Programme necessary to ensure completion of the Works or any part thereof within the Time for Completion, or any extended time granted pursuant to Clause 43 and Clause 44 of the General Conditions of Contract or so as to take into account any delays or advances or for other reasons considered necessary by the Engineer without prejudice to the Employer's right under Clause 63 of the General Conditions of Contract.

Any proposal to increase the tempo of work must be accompanied by positive steps to increase production by providing more labour and plant on Site, or by using the available labour and plant in a more efficient manner.

Should the Employer request and the Contractor undertake to finish the whole or part of the Works ahead of the time originally required by the Contract, payment for accelerating the work shall only be made if agreed to beforehand in writing and according to the terms of such agreement.

If the Programme is to be revised by reason of the Contractor falling behind his Programme, he shall produce a revised Programme showing the modifications to the original Programme to complete the Works within the time as defined in Clause 43 of the General Conditions of Contract.

The Employer shall have the right to withhold payment at any time if the Contractor fails to submit the contractual construction programmes in accordance with Subclause 14.1 above or revise construction programmes due to his negligence, failure or omission.

14.3 Cash Flow Estimate to be Submitted

The time limit within which a detailed cash flow estimate is to be submitted shall be twenty eight (28) days.

In preparing the estimates, the Contractor shall make provision for Advance payment, repayment of advance, retention, payment for services provided by the Employer and timing implications of Clause 60 Certificates and Payments.
A schedule of Payments for both local and foreign currency expected to be made to the Contractor by the Employer, shall be provided.

The cash flow estimate submitted with the bid shall be revised each time the construction Programme is submitted, and revised, under Subclauses 14.1 and 14.2 above.

15.1 Contractor's Superintendence

Add the following at the end of the first paragraph of Subclause 15.1:

The Contractor shall, within seven (7) days of receipt of the Engineer's Order to Commence the Works, inform the Engineer in writing, the name of the Contractor's representative and the anticipated date of his arrival on Site.

15.2 Contractor's Agent or Representative

Add the following Subclause 15.2:

The Contractor's agent or representative on the Site shall be an Engineer registered by the Engineer's Registration Board of Kenya in accordance with the Laws of Kenya cap. 530 or have equivalent status approved by the Engineer and shall be able to read, write and speak English fluently.

16.2 Engineer at Liberty to Object

At the end of this clause add "by a competent substitute approved by the Engineer at the Contractor's own expense".
Add the following Subclauses 16.3 and 16.4:

16.3 Language Ability of Superintending Staff

A reasonable proportion of the Contractor's superintending staff shall have a working knowledge of the language specified in the Appendix to Form of Bid pursuant to Subclause 5.1(a), or the Contractor shall have available on site at all times a number of competent interpreters, as required by the Engineer, to ensure proper transmission of instructions and information.

16.4 Employment of Local Personnel

The Contractor is encouraged to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications who are Kenyan citizens.

17.1 Setting Out

The following additional paragraph shall apply to the provisions of the Subclause 17.1:

(d) The checking of all the setting-out of the proposed works relative to existing ground features, to be undertaken prior to the commencement of fabrication of structural steelworks for superstructures. This preparation is to include providing the facility for the Engineer to undertake a timely check on this setting-out and alerting the Engineer to any likely problems foreseen.

The contractor shall give to the Engineer not less than 48 hours of notice of his intention to set out or give layout for any part of the works so that timely assignment can be made for checking the same.

Add the following new Subclause 17.2:

17.2 Notice to Engineer

The Contractor shall give to the Engineer not less than 48 (Forty eight) hours notice of his intention to set out or give levels for any part of the works so that timely arrangement may be made for checking or issuing instructions. He shall indicate therein by which date the information, if any, is required by him."

19.1 Safety, Security and Protection of the Environment

Add Subclauses 19.1 (d), (e), (f), (g), (h), (i), (j), (k), (l) and (m) and the subsequent text as follows:

(d) Notwithstanding the Contractor's obligation under Subclauses 19.1 (a), (b) and (c) of the Conditions of Contract, the Contractor shall carry out, without limitation, the following measures with a view to reducing or eliminating adverse environmental effects by the site Works:

(i) All quarries, borrow pits, diversions and detours shall be filled and landscaped, as far as practical, to their original condition after extraction of construction material.

(ii) Soil erosion and sedimentation due to the surface runoff or water from culverts or other drainage structures should be avoided by putting in place proper erosion control measures.

(iii) Long traffic diversion roads shall be avoided so as to minimise the effect of dust on the surrounding environment. In any case, all diversions shall be kept damp to reduce dust.

(iv) Haulage routes shall be kept as short as possible and watered as necessary.

(v) Spillage of oil, fuel, and lubricants shall be avoided. If spilt, they shall be collected and disposed of in such a way that there do not adversely affect the natural environment.

(vi) Rock blasting near settlement areas shall be properly coordinated with the relevant officers of the Kenya government in an attempt to minimise levels of noise pollution and community interference.

(e) The formulation and enforcement of an adequate safety programme shall be the obligation of the Contractor with respect to all the works under this Contract, regardless of whether performed by the Contractor or his Subcontractors. The Contractor shall, within 14 days after commencement of the Works, meet the Engineer to present and discuss his plan for the establishment of such safety measures as may be necessary to provide against accidents, unsafe acts, and so forth.

Within 28 days after commencement of the Works, the Contractor shall submit a written safety, security and environmental protection programme to the Engineer covering the overall works and based on the laws and regulations of Kenya. In addition, he shall prepare special safety programmes for blasting and handling of explosives as may be stipulated in the Specifications.

(f) The Contractor shall take all due precautions to avoid soil and water contamination by spillage of oil, grease, fuel and paint in the equipment yard, workshop or the site of works. Lubricants should be recycled.

(g) The Contractor shall install pollution control device in his asphalt plant.

(h) The Contractor shall implement re-plantation and grading of steep slopes in quarries and borrow pits to prevent disfiguration of landscape.

(i) The Contractor shall implement compensatory afforestation plan to counteract destruction of vegetation when required to do so by the Engineer. The Contractor shall pay proper attention to the aspect of borrow pit drainage to prevent formation of stagnant pools of water and incidence of mosquito vectors. All borrow pits will be provided with efficient drains which shall be connected to the natural outfalls.

(j) Notwithstanding implementation of any other provision contained in the Conditions of Contract, the failure on the part of the Contractor or his staff in the cases listed bellow will be considered default on the part of the Contractor and will attract the terms of Subclause 63.1 for remedies.

- Poor sanitation and solid waste in the workers camp
- Possible transmission of communicable diseases, including HIV/AIDS, between local people and the Contractor's workers
- Poaching by the Contractor's workers
- Illegal invasion of indigenous people by the Contractor's labour.

(k) All lights provided by the Contractor shall be screened so as not to interfere with any signal light on the railways or with any traffic or signal lights of any local or other authority.

(l) The Contractor shall be deemed to be in possession of, and ensure that the Contractor's personnel are fully aware of, relevant safety regulations.

(m) The Contractor shall ensure that all equipment, tools and other items used in accomplishing the Works, whether purchased, rented or otherwise provided by the Contractor are in safe, sound and good condition for performing the intending function.

Notwithstanding the terms of Clause 19.1 of the General Conditions of Contract, the Contractor shall throughout the contract (including the Defects Liability Period):

(i) Conduct Information, Education and Consultation (IEC) campaign, at least every other month, addressed to all the Site staff and labour (including all Contractor's Employees, all Subcontractors and Consultant's employees, and all truck drivers and crew marketing deliveries to Site) and to the immediate local communities, concerning the dangers and impact of Sexually Transmitted Diseases (STD) in general and HIV/AIDS in particular;

(ii) Provide male or female condoms for all Site staff and labour as appropriate; and

(iii) Provide for STD and HIV/AIDS professional screening, diagnosis, counselling and full treatment (except that in the case of HIV/AIDS cases treatment shall be limited to referral to a dedicated national or regional HIV/AIDS programme)of all Site staff and labour.

Amend Subclause 20.4 to read as follows:

20.4 Employer's Risks

The Employer's risks are:

(a) Insofar as they directly affect the execution of the Works in Kenya where the Permanent Works are to be executed:

(i) War and hostilities (whether war be declared or not), invasion, act of foreign enemies

(ii) Rebellion, revolution, insurrection, or military or usurped power, or civil war

(iii) Ionising radiations, or contamination by radioactivity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic

explosive or other hazardous properties of any explosive nuclear assembly or nuclear component thereof;

(iv) Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds

(v) Riot, commotion or disorder, unless solely restricted to the employees of the Contractor or of his Subcontractors and arising from the conduct of the Works.

(b) Loss or damage due to the use or occupation by the Employer of any section or part of the Permanent Works, except as may be provided for in the Contract

(c) Loss or damage to the extent that it is due to the design of the Works, other than any part of the design provided by the Contractor or for which the Contractor is responsible, and

(d) Any operation of the forces of nature (insofar as it occurs on the Site) which an experienced contractor:

(i) Could not have reasonably foreseen, or

(ii) Could reasonably have foreseen, but against which he could not reasonably have taken at least one of the following measures:

i. Prevent loss or damage to physical property from occurring by taking appropriate measures, or

ii. Insure against such loss or damage."

21.1 Insurance of Works and Contractor's Equipment

Delete the first sentence of this clause and replace with the following:

"Prior to commencement of the Works the Contractor shall, without limiting his or the Employer's obligations and responsibilities under Clause 20, insure to the satisfaction of the Employer."

Add the following words at the end of subparagraph (a) and immediately before the last word of subparagraph (b):

"it being understood the insurance shall provide for compensation to be payable in the types and proportions of the currencies required to rectify the loss or damage incurred."

In Subclause 21.1(b), delete the words "or as may be specified in Part II of these Conditions".

21.2 Scope of Cover

(a) Delete the words "from the start of Work at the Site" and substitute with the words "from the first working day after the commencement date"

Add the following Subclause 21.2 (c):

(c) It shall be the responsibility of the Contractor to notify the insurance company of any change in the nature and extent of the Works and to ensure the adequacy of the insurance coverage at all times during the period of the Contract.

Amend Subclause 21.4 to read as follows:

21.4 Exclusions

There shall be no obligation for the insurances in Subclause 21.1 to include loss or damage caused by the risks listed under Subclause 20.4 subparagraphs (a) (i) to (v) above.

Add the following Subclause 21.5:

21.5 Insurance of Goods

The Contractor shall insure or cause to be insured all imported goods financed out of the proceeds of the Contract against marine and other hazards incidental to the acquisition, transportation and delivery thereof to the place of use or installation and where appropriate against all usual risks pertaining to the construction of the Works.

23.1 Third Party Insurance (Including Employer's Property)

Add the following at the beginning of this Subclause:

Prior to commencement of the Works …

23.2 Minimum Amount of Insurance

Add the following at the end of this subclause:

… with no limits to the number of occurrences

25.1 Evidence of Terms of Insurance

Insert the words "as soon as practicable after the respective insurances have been taken out but in any case" before the words "prior to the start of Work at the Site"

Add the following Subclauses 25.5 to 25.8:

25.5 Source of Insurance

The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to, the insurance referred to in Clauses 21, 23, and 24) with insurers from any eligible source country which has been determined to be acceptable to the Employer.

25.6 Insurance Notices

Each policy of insurance effected by the Contractor for the purpose of the Contract shall include a provision to the effect that the Insurer shall have a duty to give notice in writing to the Contractor and Employer of the date when a premium becomes payable not more than thirty (30) days after the giving of such notice.

25.7 Insurance in Kenya

The risks against which the Contractor is obliged to insure under the Contract shall be insured through established and reputable companies approved by the Employer and located in Kenya and any cover against risks which the Contractor may enjoy shall be insured in Kenya by an approved Kenyan Insurance Company in respect of the Contractor's obligations under the Contract.

25.8 Notification to Insurers

It shall be the responsibility of the Contractor to notify the insurers under any of the insurances referred or event which by the terms of such insurances are required to be so notified and the Contractor shall indemnify and keep indemnified the Employer against all losses, claims, demands, proceedings, costs, charges and expenses whatsoever arising out of or in consequence of any default by the Contractor in complying with the requirements of this subclause whether as a result of avoidance of such insurance or otherwise.

Add the following Subclauses 26.2 and 26.3

26.2 Compliance with Statutes, Regulations

The Employer will repay or allow to the Contractor all such sums as the Engineer shall certify to have been properly payable and paid by the Contractor in respect of such fees, provided always that, without prejudice to Subclause 26.1, nothing contained in this sub clause shall be

deemed to render the Employer liable to all claims which may be considered to fall within the provisions of Subclause 22.1.

26.3 Inspection and Audit by the Funding Agency

The Contractor shall permit the funding agency to inspect the Contractor's accounts and records relating to the performance of the Contract and to have them audited by auditors appointed by the agency, if so required by the agency.

28.2 Royalties

Add the following at the end of Subclause 28.2:

The Contractor shall also be liable for all payments or compensation, if any, that are levied in connection with the dumping of part or all of any such material."

Add the following Subclauses 29.2 to 29.5:

29.2 Passage and Control of Traffic

The Contractor's attention is drawn to Specifications covering the Passage and Control of Traffic and in particular to the requirement for the submission of a detailed Programme for Passage of Traffic as required following the award of the Contract.

In case any operation connected with traffic which necessitates diversion, obstruction or closure of any road, railway or any other right of way, the approval of the Engineer or the Engineer's Representative and the concerned authorities shall be obtained well in advance by the Contractor.

29.3 Reinstatement and Compensation for Damage to Persons or Property

The Contractor shall reinstate all properties whether public or private which are damaged in consequence of the construction and maintenance of the Works to a condition at least equal to that prevailing before his first entry on them.

If in the opinion of the Engineer the Contractor shall have failed to take reasonable and prompt action to discharge his obligations in the matter of reinstatement, the Engineer will inform the Contractor in writing of his opinion, in which circumstances, the Employer reserves the right to employ others to do the necessary work of reinstatement and to deduct the cost thereof from any money due or to become due to the Contractor.

The Contractor shall promptly refer to the Employer all claims, which may be considered to fall within the provisions of Clause 22.1.

29.4 Protection of Existing Works and Services

The Contractor shall acquaint himself with the position of all existing services, such as sewers, surface water drains, cables for electricity, data and telephone, telephone and lighting poles, water mains, and the like before commencing any excavation or other works likely to affect the existing services.

The Contractor will be held liable for all damage to roads, irrigation ditches, mains pipes, electric cables, lines or services of any kind caused by him or his subcontractors in the execution of the Works. The Contractor must make good any damage without delay and, if necessary, carry out any further work ordered by the Engineer or Engineer's Representative, all at the Contractor's cost. Where work is to be carried out in the vicinity of overhead power lines, the Contractor shall ensure that all persons working in such areas are aware of the relatively large distance that high voltage electricity can "short" to earth when crane, or other large masses of steel, are in the vicinity of power lines. The Contractor's attention is drawn to appropriate standards which gives safe clearances for the various voltages.

The Contractor shall be held responsible for damage to existing works or services, and shall indemnify the Employer against any claims in this respect (including consequential damages). The Contractor shall be responsible for the reinstatement of the services, so affected, to the satisfaction of the Engineer.

In all cases where such works or services are exposed, they shall be properly shored, hung up or otherwise protected. Special care must be exercised in filling and compaction of the grounds under mains and cable. The exposed water meters, stopcock boxes and similar items shall be left uncovered.

As soon as any such existing works or services or structures are encountered on, over, under, in or through the Site during the performance of the Contract, the Contractor shall make a record of the location and description of such service or structure and shall send the same forthwith to the Engineer.

Installations adjacent to the Works shall be kept securely in place until the work is completed and shall then be made as safe and permanent as before.

Notwithstanding the foregoing requirements, and without reducing the Contractor's responsibility, the Contractor shall inform the Engineer immediately if any existing works or services are located, exposed or damaged.

29.5 Protection of Survey Beacons

The Contractor shall not remove, damage, alter or destroy in any way plot beacons. Should the Contractor consider that any beacons will be interfered with by the Work he shall notify the Engineer who, if he considers it necessary, will make arrangements for the removal and replacement of the beacons.

30.2 Transport of Contractor's Equipment or Temporary Works

Add the following at the end of this subclause.

If it is found necessary for the Contractor to move one or more loads of heavy constructional plant and equipment, materials or pre-constructed units of work over roads, highways, bridges on which such oversized and overweight items are not normally allowed to be moved, the Contractor shall obtain prior permission from the concerned authorities. Payments for complying with the requirements, if any, for protection of or strengthening of the roads, highways or bridges shall be made by the Contractor and such expenses shall be deemed to be included in his Contract Price.

Add the following Subclauses 30.5 and 30.6.

30.5 Complying with State Laws and Regulations

Nothing contained above shall excuse the Contractor or any of his Subcontractor(s) from complying with state laws regulating traffic on highways and bridges.

30.6 Effects of other Concurrent Construction Projects

The Contractor shall be deemed to have fully familiarised himself with planned construction operations or any other concurrent construction projects in Kenya which may have any material effect on the Contractor's own operations. In particular, the Contractor shall be deemed to have allowed for the effects of other concurrent construction contract(s) on any necessary transportation operations in connection with the Contract(s).

LABOUR

Add the following Subclauses 34.2 to 34.23

34.2 Labour Regulations

The Contractor and his Subcontractors shall, at all times, during the Contract period abide fully by the governing local laws and regulations.

The Contractor shall be responsible for making all arrangements for and shall bear all costs relating to recruitment, obtaining of all necessary visas, permits or other official permission for movements of staff and labour.

34.3 Engagement of Local Labour

The Contractor is encouraged to the extent practicable and reasonable to employ staff and labour with the required qualifications and experience from sources within Kenya, particularly in the vicinity of the Site.

34.4 Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages and observe conditions of labour not less favourable than those established for the trade or industry where the work is carried out. In the absence of any rates of wages or conditions of labour so established, the Contractor shall pay rates of wages and observe conditions of labour which are not less favourable than the general level of wages and conditions observed by other employers whose general circumstances in the trade or industry in which the Contractor is engaged are similar.

34.5 Repatriation of Labour

The Contractor shall be responsible for the return to the place where they were recruited or to their domicile of all such persons as he recruited and employed for the purposes of or in connection with the Contract, and shall maintain such persons as are to be so returned in a suitable manner until they shall have left the site or, in the case of persons who are not nationals of and have been recruited outside the Republic of Kenya shall have left Kenya or the site, as appropriate.

34.6 Housing for Labour

Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such accommodation and amenities as he may consider necessary for all his staff and labour, employed for the purposes of or in connection with the Contract, including all fencing, water supply (both for drinking and other purposes), electricity supply, sanitation, cookhouses, fire prevention and fire-fighting equipment, cookers, refrigerators, furniture, and other requirements in connection with such accommodation or amenities. On completion of the Contract, unless otherwise agreed with the Employer, the temporary camps or housing provided by the Contractor shall be removed and the site reinstated to its original condition, all to the approval of the Engineer.

34.7 Accident Prevention Officer

The Contractor shall have on his staff on Site an officer dealing only with questions regarding the safety and protection against accidents of all staff and labour. This officer shall be qualified for this work and shall have the authority to issue instructions and shall take protective measures to prevent accidents.

34.8 Health and Safety

Due precautions shall be taken by the Contractor, and at his own cost, to ensure the safety of his staff and labour and, in collaboration with and to the requirements of the local health authorities, to ensure that medical staff, first aid equipment and stores, sick bay and suitable ambulance services are available at the camps, housing, and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements. Workers shall always be transported using vehicles that meet the current transport regulations.

34.9 Life Saving Appliances and First Aid Equipment

The Contractor shall provide and maintain upon the Works sufficient, proper and efficient life-saving appliances and first-aid equipment to the approval of the Engineer. The appliances and equipment shall be available for use at all times.

34.10 Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect all staff and labour employed on the Site from insect nuisance, rats, and other pests and reduce the dangers to health and the general nuisance caused by the same. The Contractor shall provide his staff and labour with suitable prophylactics for the prevention of malaria, and shall take steps to prevent the formation of stagnant pools of water. He shall comply with all the regulations of the local health authorities in these respects and shall in particular arrange to spray thoroughly with approved insecticide all buildings erected on the Site. Such treatment shall be carried out at least once a year or as instructed by the Engineer. The Contractor shall warn his staff and labour of the dangers of bilharzias and wild animals.

34.11 Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders, and requirements as may be made by the Government or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

34.12 Burial of the Dead

The Contractor shall make any necessary arrangements for the transport, to any place as required for burial, of any of his expatriate employees or members of their families who may die in Kenya. The Contractor shall also be responsible, to the extent required by the local regulations, for making any arrangements with regard to burial of any of his local employees who may die while engaged upon the Works.

34.13 Supply of Foodstuffs

The Contractor shall arrange for the provision of a sufficient supply of suitable food at reasonable prices for all his staff, labour, and subcontractors for the purposes of or in connection with the Contract.

34.14 Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the Site an adequate supply of drinking and other water for the use of the Engineer and his staff, the Contractor's staff and labour.

34.15 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances, and Government Regulations or Orders for the time being in force, import, sell, give, barter, or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter, or disposal by his subcontractors, agents, staff, or labour.

34.16 Arms and Ammunition

The Contractor shall not give, barter, or otherwise dispose of, to any person or persons, any arms or ammunition of any kind or permit or suffer the same as aforesaid.

34.17 Festivals and Religious Customs

The Contractor shall, in all dealings with his staff and labour, have due regard to all recognised festivals, days of rest, and religious and other customs.

34.18 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous, or disorderly conduct by or among his staff and labour and take all reasonable precautions for the preservation of peace and protection of persons and property in the neighbourhood of the Works against the same.

34.19 Records of Labour

The Contractor shall keep proper wages books, in the language stipulated in the Appendix to the Form Bid, pursuant to Sub-Clause 5.1 (a) showing the time worked and wages paid to all employees in and about the execution of the Works, together with such other records as are required by any Statute, Ordinance, Law, Regulation or Bye-Law in force in Kenya governing the employment of labour. He shall be bound, whenever required, to produce such wages books and other records for the inspection of any persons authorized by the Engineer.

34.20 Trade Unions

The Contractor shall recognize the freedom of his employees to be members of trade unions.

34.21 Default in payment of Wages

In the event of default in payment of wages of any workmen employed on the Contract, and if a claim thereafter is filed in the office of the Engineer and satisfactory proof thereof is furnished, the Employer shall be notified forthwith and may, failing payment of such claim by the Contractor, arrange the payment out of monies at any time payable under the Contract and the amount so paid shall be deemed payment to the Contractor under the Contract.

34.22 Breach and Removal from List

Should the Contractor or any subcontractor be found to be in breach of any of the provisions of Clause 34, the Employer may recommend to the Government for his removal from the list of approved Contractors.

34.23 Observance by Subcontractors

The Contractor shall be responsible for the observance by his subcontractor of the foregoing provisions.

Add the following Subclauses 35.2 and 35.3:

35.2 Maintenance of Records

The Contractor shall maintain such records and make such reports concerning safety, health and welfare of persons and damage to property as the Engineer may prescribe from time to time.

35.3 Reporting of Accidents

The Contractor shall report to the Engineer details of any accident as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer immediately by the quickest available means. The Contractor shall also notify the relevant authority (ies) whenever such report is required by the law of Kenya.

MATERIALS, PLANT AND WORKMANSHIP

Rename Subclause 36.1 as below.

36.1 Quality of Materials, Equipment, Supplies, Plant, and Workmanship

Add the following paragraph at the end of this subclause.

The Contractor is encouraged, to the extent practicable and reasonable, to use materials, Contractor's Equipment, Plant, and supplies from sources within Kenya.

COMMENCEMENT AND DELAYS

41.1 Commencement of Works

Replace the words "as soon as reasonably possible" with the words "on Site within 28 days".

Add the following subclause:

41.2 Definition of Commencement

For the purposes of this subclause, the Works shall be deemed to have commenced when all of the following conditions are satisfied:

(a) The approved competent and authorized agent or representative of the Contractor is resident in the project area and is giving his whole time to the superintendence of the Works.

(b) The provision by the Contractor of evidence that all insurances required by the Contract are in force.

(c) The Contractor has an established an office in the project area with postal address for receipt of correspondence.

(d) The principal items of constructional plant have been brought to Site and put to work in the execution of the permanent Works.

42.1 Possession of Site and Access Thereto

At the end of Subclause 42.1, add the following:

The Contractor shall bear all costs and charges for such lands as the Contractor may reasonably require for camps, offices, workshops, diversion roads, borrow pits, and quarries and any additional facilities outside the site required by him for the purpose of works.

Add the following subclause:

42.4 Possession of Site and Access thereto

The Contractor shall not enter any part of the Site until he has requested and received permission to do so from the Employer or the Engineer.

The Contractor shall not use any portion of the Site for any purpose not connected with the Works.

45.1 Restriction on Working Hours

Delete Subclause 45.1 and substitute with the following:

If the Contractor requests for permission to work by day and night and if the Engineer shall grant such permission, the Contractor shall not be entitled to any additional payment for so doing.

All such work at night shall be carried out without unreasonable noise or other disturbance and the Contractor shall indemnify the Employer from and against any liability for damages on account of noise or other disturbance created while carrying out night work and from against all claims, demands, proceeding, costs, charges and expenses whatsoever in regard or in relation to such liability. In addition, the Contractor shall be required to provide, for any work carried out by night or recognised days of rest, adequate lighting and other facilities, so that the work is carried out safely and properly.

45.2 Overtime Hours

Working hours shall be observed by the Contractor as stipulated in the Labour Laws of Kenya. However when deemed necessary to expedite the Works, overtime, night time or holiday working may be allowed by the Engineer in accordance with the provisions of Subclause 46.1. The Contractor, in these cases, shall pay all costs of the Engineer and his staff for such overtime, night time or holiday working at site as stipulated under Subclause 46.1 of the General Conditions of Contract.

47.2 Reduction of Liquidated Damages

The following supplements this subclause.

There shall be no reduction in the amount of liquidated damages in the event that a part or a section of the Works within the Contract is certified as completed before the whole of the Works comprising that Contract.

No bonus for early completion of the Works shall be paid to the Contractor by the Employer.

The sum stated in the Appendix to Form of Bid as liquidated damages shall be increased by a sum equivalent to any amount payable by the Employer to the Contractor under clause 70.1 in respect of an increase in costs in such period that would not have been incurred by the Contractor if the Works had been completed by the due date for completion prescribed by Clause 43.
Add the following Subclause 47.3:

47.3 Currency of Liquidated Damages

Liquidated damages shall be paid by the Contractor to the Employer in the types and proportions of currencies as shall be payable to the Contractor under the Contract.

DEFECTS LIABILITY

49.2 Completion of Outstanding Work and Remedying Defects

Add at the end of this subclause the following sentence:

Any work ordered to be executed under this subclause shall be carried out at a time and in a manner as directed by the Engineer so as to interfere as little as possible with the operations of the Employer or of other contractors and no extension(s) of the defects liability period will be allowed for the execution of this work.

Add Subclause 49.5 as follows:

49.5 Defects Liability Period Replacements

The provisions of this clause shall apply to all replacements or renewals of Plant and equipment to be provided with respect to the utilities under the Contract, carried out by the Contractor to remedy defects and damages as if the replacements and renewals had been taken over on the date they were completed. The Defects Liability Period for the Works shall be extended by a period equal to the period during which the Works can not be used by reason of the defect or damage. If only part of the Works is affected the Defects Liability Period shall be extended only for that part.

ALTERATIONS, ADDITIONS AND OMISSIONS

52.1 Valuation of Variation

Add the following final sentences to this subclause:

The agreement, fixing or determination of any rates or prices as aforesaid shall include any foreign currency and the proportion thereof.

Where the Contract provides for the payment of the Contract Price in more than one currency, and varied work is valued at, or on the basis of, the rates and prices set out in the Contract, payment for such varied work shall be made in the proportions of various currencies specified in the Appendix to Form of Bid for payment of the Contract Price. Where the Contract provides for payment of the Contract Price in more than one currency, and new rates or prices are agreed, fixed, or determined as stated above, the amount or proportion payable in each of the applicable currencies shall be specified when the rates or prices are agreed, fixed, or determined, it being understood that in specifying these amounts or proportions the Contractor and the Engineer (or, failing agreement, the Engineer) shall take into account the actual or expected currencies of cost (and the proportions thereof) of the inputs of the varied work without regard to the proportions of various currencies specified in the Appendix to Form of Bid for payment of the Contract Price.

52.2 Power of Engineer to Fix rates

Add a final sentence to the first paragraph as follows:

Where the Contract provides for the payment of the Contract Price in more than one currency, the amount or proportion payable in each of the applicable currencies shall be specified when the rates or prices are agreed, fixed, or determined as stated above, it being understood that in specifying these amounts or proportions the Contractor and the Engineer (or, failing agreement, the Engineer) shall take into account the actual or expected currencies of cost (and the proportions thereof) of the inputs of the varied work without regard to the proportions of various currencies specified in the Appendix to Form of Bid for payment of the Contract Price.

52.3 Daywork

Add the following at the end of this subclause:

The Work so ordered shall immediately become part of the Works under the Contract. The Contractor shall, as soon as practicable after receiving the Daywork Order from the Engineer undertake the necessary steps for due execution of such Work. Prior to commencement of any work to be done on a Daywork basis, the Contractor shall give a notice to the Engineer stating the exact time of such commencement.

PROCEDURE FOR CLAIMS

53.1 Notice of Claims

Add the following at the end of this subclause:

The Contractor shall also state the references of the Contract Clauses and Subclauses on which he has based his claims.

CONTRACTOR'S EQUIPMENT, TEMPORARY WORKS AND MATERIALS

For the purpose of these subclauses, the term "Equipment" shall be read as "Contractor's Equipment" where the context so requires.

54.1 Contractor's Equipment, Temporary Works and Materials

Amend Subclause 54.1 as follows:

Line 5; add "written" between "the" and "consent".

Add a final sentence to this subclause as follows:

The Contractor shall every month give to the Engineer a statement showing the amount of plant and Contractor's equipment, which has been brought to the Site.

54.2 Employer not Liable for Damage

Delete this subclause entirely.

54.5 Conditions of Hire of Contractor's Equipment

Delete this subclause entirely.

Add Subclauses 54.9 and 54.10 as follows:

54.9 Contractor's Responsibilities for Licenses

The Contractor shall obtain his own information with regard to the granting of import and export licenses for materials, equipment and plant. The Contractor shall bear all expenses for Plant, Materials, Equipment and Maintenance required for the completion and maintenance of the works and shall be deemed to have satisfied himself with regard to all his liabilities under the laws and regulations governing the granting of these licenses. The Contractor shall ensure that requests for import and export licenses are submitted in sufficient time to clear all formalities before the said licenses are required.

54.10 Equipment and Plant

The Contractor shall identify each piece of his equipment, other than hand tools, by means of an identification number plainly stencilled or stamped on the equipment at a conspicuous location, and shall furnish to the Engineer a list giving the description of each piece of equipment and its identification number. In addition, the make, model number and empty gross weight of each unit of compaction equipment shall be plainly stamped or stencilled in a conspicuous place on the unit. The gross weight shall be either the manufacturer's rated weight or the scale weight. The make, model, serial number and manufacturer's rated capacity of each scale shall be clearly stamped on the load-receiving element and its indicator or indicators. All meters shall be similarly identified, rated and marked.

MEASUREMENT

55.1 Quantities

Add the following to this subclause:

The quality and quantity of the Work included in the Contract Price shall be deemed to be that which is set out in the Contract Bill of Quantities. The Bill of Quantities, unless otherwise expressly stated therein, shall be deemed to have been prepared in accordance with the principles of the latest edition of the Civil Engineering Standard Method of Measurement.

Any error in description or in quantity or any omission of items from the Contract Bill of Quantities or Specifications shall not vitiate this Contract but shall be corrected and deemed to be a variation required by the Engineer. Subject to the foregoing, any error whether arithmetical or not in the computation of the Contract Price shall be deemed to have been accepted by the parties hereto.

The Contract Price shall not be adjusted or altered in any way whatsoever otherwise than in accordance with the express provisions of these conditions.

Add the following new sub clause:

55.2 Bill of Quantities with no Rates

Any item of Work described in the Bill of Quantities for which no rate or price has been entered in the Contract shall be considered as included in other rates and prices in the Contract and will not be paid for separately by the Employer.

56.1 Works to be Measured

Delete Subclause 56.1 and replace with the following:

The Contractor shall prepare and submit to the Engineer all necessary field notes and other records taken and computations made for the purpose of quantity measurements, of which the forms shall be approved by the Engineer, for the monthly progress payment under Clause 60. The measurement of work quantities made by the Contractor shall be verified and certified by the Engineer based on the above mentioned documents.

The Contractor shall furnish all personnel, equipment and materials to make such surveys and computations as necessary to determine the quantities of work performed. Unless otherwise prescribed in the specifications or the drawings, all measurements for payment shall be made by the dimensions, lines and grades as shown on the drawings or by direct survey of which the methods shall be approved by the Engineer.

The documents submitted for measurement and payment shall become the property of the Employer and shall be used to the extent necessary to determine the monthly progress payment to be made to the Contractor under the Contract. Direct survey, if conducted, shall be subject to checking and verification by the Engineer and all errors in the said survey work and related computations as found during such checking shall be immediately corrected by the Contractor.

In case of any disagreement on an item of measurement, the Engineer's opinion will prevail during the assessment of the statement for monthly interim payments. Should the Contractor consider himself entitled to any form of claim with respect to the disagreement in measurement, the procedure for such is detailed under Clause 53 of the Conditions of Contract.

57.1 Method of Measurement

Delete this subclause and substitute with the following:

The Works shall be measured net with deductions made in accordance with the principles of the latest edition of the Civil Engineering Standard Method of Measurement. All measurements shall be given in metric (SI) units.

PROVISIONAL SUMS

Add the following Subclause 58.4:

58.4 Prime Cost Sum

Wherever an item in the Bill of Quantities has been referred to as a "P.C. Sum" (Prime Cost Sum), that item shall be construed as a Provisional sum and the provisions of Subclauses 58.1 to 58.3 will apply.

NOMINATED SUBCONTRACTORS

59.5 Certification of Payment to Nominated Subcontractors

Add the following paragraph at the end of Subclause 59.5:

If the Engineer desires to secure final payment to any nominated subcontractor before final payment is due to the Contractor and if such subcontractor has satisfactorily indemnified the Contractor against any latent defects, the Engineer may, in an interim certificate, include an amount to cover the said final payment, and thereupon the Contractor shall pay to such nominated subcontractor the amount so certified. Upon such final payment, the amount named in the Appendix to Form of Bid as Limit of Retention Money shall be reduced by the sum which bears the same ratio to the amount as does the subcontract and subcontractor shall be discharged from all liability for the Work, materials or goods executed or supplied by such subcontractor under the Contract to which the payment relates.

CERTIFICATES AND PAYMENTS

Delete Subclauses 60.1 to 60.10 entirely and substitute with the following:

60.1 Advance Payment

In the event that an Advance Payment is granted, the following shall apply:

(a) On signature of the Contract, the Contractor shall at his request, and without furnishing proof of expenditure, be entitled to an advance of upto maximum of 10% (ten percent) of the original amount of the Contract Sum. The advance shall not be subject to retention money.

(b) No advance payment may be made before the Contractor has submitted proof of the establishment of deposit or of a directly liable guarantee satisfactory to the Employer in the amount of the advance payment. The guarantee shall be in the same currency as the advance.

(c) Amortization of the advance shall be effected by deductions from monthly interim payments.

(d) Amortization of the lump sum advance shall be made by deductions from the Interim payments and where applicable from the balance owing to the Contractor.

The amortization shall begin when the amount of the sums due under the Contract reaches 20% of the original amount of the Contract. It shall have been completed by the time 80% of this amount is reached.

The amount to be amortized by way of successive deductions shall be calculated by means of the formula:

$$R = \frac{A\,(X^{1} - X^{11})}{80 - 20}$$

Where:

R = Amount to be amortized

A = Amount of the advance which has been granted

X^{1} = Amount of proposed cumulative payments as a percentage of the original amount of the Contract. This figure will exceed 20% but not exceed 80%.

X^{11} = Amount of the previous cumulative payments as a percentage of the original amount of the Contract. This figure will be below 80% but not less than 20%.

With each amortization, the counterpart of the directly liable guarantee may be reduced accordingly.

60.2 Interim Payment Certificate

The Contractor shall submit to the Engineer, in the manner required by the Engineer after the end of each month a statement showing the estimated total value of permanent Work properly executed and materials or goods for permanent works brought to Site up to the end of the previous month (if the value shall justify the issue of an interim certificate) together with any adjustments under Clause 70 and any outstanding claims and sums the Contractor considers may be due to him. The Contractor shall amend or correct his estimate as directed by the Engineer and the latter shall not accept it until he is satisfied that it is fair and reasonable. With respect to the said materials and goods, no payment for them shall be made unless:

(i) The materials are in accordance with the specifications for the Works.

(ii) The materials have been delivered to Site and are properly stored and protected against loss, damage or deterioration.

(iii) The Contractor's record of the requirements, orders, receipts and use of materials are kept in a form approved by the Engineer, and such records are available for inspection by the Engineer.

(iv) The Contractor has submitted a statement of his cost of acquiring and delivering the materials and goods to the Site, together with such documents as may be required for the purpose of evidencing such cost.

(v) The materials are to be used within a reasonable time.

The Contractor will be paid on the certificate of the Engineer the amount due to him on account of the estimated total value of the permanent Work executed up to the end of the previous month together with such amount (not exceeding 75% of the value) as the Engineer may consider proper on account of materials and goods for permanent Work delivered by the Contractor on Site and in addition, such amount as the Engineer may consider fair and reasonable for any Temporary Works for which separate amounts are provided in the Bill of Quantities, all of which shall be subject to a retention of the percentage named in the Appendix to Form of Bid until the amount retained (hereinafter and in all Contract documents called the "Retention Money") shall reach the "Limit of Retention Money" named in the said Appendix to the Form of Bid. Provided always that no interim certificate shall be issued for a sum [such sum always being the net amount thereof after all deductions for retention etc) less than that named in the Appendix to Form of Bid as "Minimum Amount of Interim Certificate" at one time.

Within 14 days after receiving a statement from the Contractor as aforesaid, and subject to the Contractor having made such further amendments and corrections as the Engineer may require, the Engineer shall issue a Certificate of Payment to the Employer showing the amount due, with a copy to the Contractor.

The Engineer shall not unreasonably withhold certifying an Interim Payment Certificate and where there is a dispute regarding an item for payment, the Engineer may delete this disputed item from the Interim Payment Certificate and certify the remainder for payment provided the said payment is in accordance with the preceding paragraph. In cases of difference in opinion as to the value of any item, the Engineer's view shall prevail.

60.3 Final Account and Final Payment Certificate

As soon as possible after the issue of Taking - Over Certificate or the termination of the Contract and not later than the time of issue of Defects Liability Certificate, the Contractor shall prepare and submit to the Engineer (with a copy to the Employer), a Statement of Final Account showing in detail the total value of work done in accordance with the Contract together with all sums paid in previous payments. Within thirty (30) after receipt of such further information as may be reasonably required from the Contractor for its verification, the Engineer shall check the said statement, prepare and submit a Final Payment Certificate to the Employer (with a copy to the Contractor).

The Final Payment Certificate shall state:

(a) The (final) total value of all Work executed in accordance with the Contract

(b) After giving credit to the Employer for all amounts previously paid to the Contractor, the balance, if any, due from the Employer to the Contractor or the Contractor to the Employer, as the case may be.

Unless the Contractor notifies the Engineer of his objection to the Final Payment Certificate within twenty eight [28] days of delivery thereof, he shall be deemed to have agreed that he accepts the total Contract Price as set out in the Final Payment Certificate as full settlement for all work executed under the Contract including any claims, variations and omissions thereof.

However, a Final Certificate of Payment shall not be conclusive:

(i) To the extent that fraud or dishonesty relates to or affects any matter dealt with in the Certificate, or

(ii) If any arbitration or court proceedings under the Contract have been commenced by either party before the expiry of 90 days after the issue of the Final Certificate of Payment.

60.4 Payment of Certificates

Payment upon each of the Engineer's Certificates for Interim Payments shall be made by the Employer within the time stated in the Appendix to Form of Bid from the date of the Engineer's signature and issue of each Certificate of Payment to the Employer.

Payment upon the Engineer's Final Payment Certificate shall be made by the Employer within the time stated in the Appendix to Form of Bid from the date of issue of the Final Certificate of Payment signed by the Engineer and countersigned by the Contractor or his authorised agent or representative.

Payments to the Contractor by the Employer shall be made in the currencies in which the Contract Price is payable into a bank account or accounts nominated by the Contractor.

Making of a payment by the Employer shall be considered to have been duly executed on the day that the Employer has issued a cheque.

60.5 Retention Money

One half of the retention money shall become due upon the issue of a Taking – Over Certificate and shall be paid to the Contractor when the Engineer shall certify in writing that the last section of the whole of the Works has been substantially completed and the other half shall be paid to the Contractor after the expiration of the Defects Liability Period and the issue of a Certificate under Clause 62. Provided always that if such time there shall remain to be executed by the Contractor any Works ordered during such period pursuant to Clauses 49 and 50 thereof, the Employer shall be entitled to withhold payment [until the completion of such Works] of so much of the second half of the Retention Money as shall in the opinion of the Engineer represent the Costs of the Works so remaining to be executed. Provided further that in the event of different Defects Liability Periods having become applicable to different parts of the Works pursuant to clause 48 hereof the expression "expiration of the Defect Liability Period" shall for the purpose of this subclause be deemed to mean the expiration of the latest of such periods.

60.6 Currency of Payment

The Contract price shall be stated in Kenya Shillings. All payments to the Contractor shall be made in Kenya shillings.

60.7 Overdue Payments

Unless otherwise stated in the Appendix to the Form of Bid interest shall be paid on the overdue amounts and the interest to be paid shall be based on the rates of the Central Bank of Kenya 28 days prior to the opening of the bids.

60.8 Correcting and Withholding

The Engineer may by any interim certificate or through the final account make any correction or modification to any previous certified sum and shall have authority, if any work or part thereof is not being carried out to his satisfaction, to omit or reduce the value of such work in any Interim Payment Certificate.

60.9 Completion by Sections

If a Taking-Over Certificate shall be issued for any section or part of the Works separately, the payments herein provided for on or after issue of such a Certificate shall be made in respect of

such section or part and references to the Contract Price shall mean such part of the Contract Price as shall in the absence of agreement be apportioned thereto by the Engineer.

60.10 Statement at Completion

Not later than 14 days after the issue of the Taking-Over Certificate in respect of the whole of the works, the Contractor shall submit to the Engineer a statement at completion showing in detail and in a form approved by the Engineer:

(a) The final value of all work executed in accordance with the Contract up to the date stated in such Taking-Over Certificate.

(b) Any further sums which the Contractor considers to be due; and

(c) An estimate of amounts, which the Contractor considers, will become due to him under the Contract.

Estimated amounts at Completion shall be shown separately in the Statement. The Contractor shall amend and correct the Statement as directed by the Engineer who shall issue a Certificate at Completion to be processed in accordance with Subclause 60.4.

60.11 Final Statement

Not later than 56 days after the issue of the Defects Liability Certificate, the Contractor shall submit to the Engineer for consideration a draft final statement with supporting documents showing in detail and in the form approved by the Engineer:

(a) The final value of all work executed in accordance with the Contract, and

(b) Any further sums which the Contractor considers to be due to him.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonable require and shall make such changes in the draft as may be required.

60.12 Discharge

Upon submission of the Final Statement, the Contractor shall give to the Employer, with a copy to the Engineer, a written discharge confirming that the total of the Final Statement represents full and final settlement of all monies due to the Contractor arising out of or in respect of the Contract. Provided that such discharge shall become effective only after payment under the Final Payment Certificate issued pursuant to Subclause 60.14 has been made and the Performance Security referred to in Subclause 10.1 has been returned to the Contractor.

60.13 Final Payment Certificate

Upon acceptance of the Final Statement as given in Subclause 60.12, the Engineer shall prepare a Final Payment Certificate which shall be delivered to the Contractor's authorized agent or representative for his signature. The Final Payment Certificate shall state:

(a) The final value of all work executed in accordance with the Contract

(b) After giving credit to the Employer for all amounts previously paid by the Employer, the balance, if any, due from the Employer to the Contractor or the Contractor to the Employer as the case may be

Final Certificate shall be issued for any sum due to the Contractor even if such is less than the sum named in the Appendix to the Form of Bid.

60.14 Cessation of Employer's Liability

Unless the Contractor notifies the Engineer of his objection to the Final Certificate within 14 (fourteen) days of delivery thereof he shall be deemed to have agreed that he accepts the total Contract Price as set out in the Final Certificate as full settlement for all work executed under the Contract including any variations and omissions thereof.

62.1 Defects Liability Certificate

Delete the last sentence of this subclause beginning "Provided that the issue……in Sub-Clause 60.3".

REMEDIES

63.1 Default of Contractor

Delete the last paragraph of this subclause and substitute with the following:

then the Employer may, after giving 14 days' notice to the Contractor, enter upon the Site and expel the Contractor there from without thereby avoiding the Contract, or releasing the Contractor from any of his obligations or liabilities under the Contract, or affecting the rights and powers conferred on the Employer or the Engineer by the Contract, and may himself complete the Works or may himself complete the work or may employ any other contractor to complete the Works. The Employer or such other contractor may use for such completion so much of the Contractor's Equipment, Plant, Temporary Works and materials, which have been deemed to be reserved exclusively for the execution of the Works, under the provisions of the Contract, as he or they may think proper, and the Employer may, at any time, sell any of the said Contractor's Equipment, Temporary Works and unused Plant and materials and apply the proceeds of sale in or towards the satisfaction of any sums due or that may become due to him from the Contractor under the Contract."

63.2 Valuation of Date of Expulsion

Modify the heading of Subclause 63.2 by substituting "Valuation at Date of Termination" for "Valuation at Date of Expulsion." In Subclause 63.2, delete the word "termination" on the second and fifth lines and substitute "expulsion".

63. Valuation of Date of Expulsion

Modify the heading of Subclause 63.3 by substituting "Payment after Expulsion" for "Payment after Termination." In Subclause 63.3, delete the words "terminates the Contractor's employment" on the first line and substitute "shall enter and expel the Contractor".

63.4 Assignment of Benefit of Agreement

In Subclause 63.4, delete the word "termination" on the second line, and substitute "expulsion".

Add the following at the end of this subclause:

But on the terms that a supplier or subcontractor shall be entitled to make any reasonable objection to any further assignment thereof by the Employer and the Employer may pay the supplier or subcontractor for any such materials supplied or Works executed under such agreement, whether the same be assigned as aforesaid or not, before or after the said determination, the amount due by such arrangement in so far as it has not already been paid by the Contractor.

Add the following subclause 63.5:

63.5 Corrupt or Fraudulent Practices

If in the judgment of the Employer the Contractor has engaged in corrupt or fraudulent practices, in competing for or in executing the Contract, then the Employer may, after having given 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 63 shall apply as if such expulsion had been made under Subclause 63.1.

For the purpose of this Subclause:

"corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.

"fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition.

SPECIAL RISKS

Subclause 65.2 is amended to read as follows:

65.2 Special Risks

The Special Risks are the risks defined under paragraph (a), subparagraphs. (i) to (v) of Subclause 20.4 of the Conditions of Contract".

65.4 Projectile, Missile

Delete "whenever and wherever occurring" under line 2 and add "on or near the site" after "explosive of war" under line 3.

Add Subclause 65.9 as follows:

65.9 Special Risks

(a) In the event of the Employer unilaterally ordering the final cessation of performance of the Contract for reasons not specified elsewhere in the Conditions of Contract the Contract shall be considered to be frustrated and the Contractor shall be indemnified as provided for under Clause 65.1.

(b) In the event of the Employer ordering the adjournment of the Contract before or after commencement of the Works for reasons not specified elsewhere in the Conditions of Contract, the Contractor shall be entitled to indemnity for any injury which he may have suffered as a consequence of such adjournment.

The Engineer shall award the Contractor payment of such sum as in his opinion shall be reasonable giving regard to all material and relevant factors including the Contractor's on costs and overheads, and the nature of the instruction to adjourn the Contract.

SETTLEMENT OF DISPUTES

67.1 Engineers Decision

"If a dispute of any kind whatsoever arises between the Employer and the Contractor in any connection with, or arising out of, the Contract or the execution of the works, whether during the execution of the works or after their completion and whether before or after repudiation or other termination of the Contract including any dispute as to any opinion, instruction, determination, certificate or valuation of the Engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer, with a copy to the other party. Such reference shall state it is made pursuant to this clause. No later than 28 (twenty eight) day after the day on which he received such reference the Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state it is made pursuant to this clause.

Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the works with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided, in an Amicable Settlement, Adjudicator's or Arbitrator's award.

If either the Employer or the Contractor be dissatisfied with the any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before the 28th (twenty eighth) after the day on which he received the reference, then either the Employer or the Contractor may, on or before the 28th (twenty eighth) day after the day on which he received notice of such decision, or on or before the 28th (twenty eighth) day after the day on which the said period of 28 days expired, as the case may be, give notice to the other party, with a copy for information to the Engineer, of his intention to commence Adjudication, as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence Adjudication, as hereinafter provided, as to such dispute; no adjudication in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notice of intention to commence adjudication as to such dispute has been given by either the Employer or the Contractor on or before the twenty eighth day after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor. ".

67.2 Amicable Settlement

Where notice to of intention to commence adjudication as to a dispute has been given in accordance with sub clause 67.1, the parties shall attempt to settle such dispute amicably before the commencement of Adjudication; provided that, unless the parties otherwise agree, Adjudication may be commenced on or after the 14th (fourteenth) day after the day on which notice of intention to commence adjudication of such dispute was given, even if an attempt at amicable settlement thereto has been made
Subclause 67.3 is deleted and substituted with the following subclause:

67.3 Arbitration

by an arbitrator to be agreed upon between the parties or failing agreement to be nominated on the application of either party by the appointee designated in the Appendix to Form of Bid for the purpose and any such referee shall be deemed to be a submission to arbitration within the meaning of the Arbitration Laws of the Republic of Kenya.

NOTICES

68.1 Notices to Contractor

Add the following at the end of this subclause:

Notwithstanding the foregoing, the Contractor shall either maintain an address close to the Works or appoint an agent residing close to the Works for the purpose of receiving notices to be given to the Contractor under the terms of the Contract. This obligation shall be terminated upon the issue of the Certificate of Completion.

68.2 Notices to Employer and Engineer

Delete the words "nominated for that purpose in Part II of these Conditions" in this subclause and substitute with "given in the Appendix to Form of Bid".

DEFAULT OF EMPLOYER

Under Subclause 69.1, 69.4 and 69.5, substitute "Subclause 60.4 for "Subclause 60.10".

69.1 Default of Employer

In Subclause 69.1 (a), delete the words "28 days" in the second sentence and substitute with the words "60 days".

Delete Subclause 69.1 (d).

69.3 Payment on Termination

Delete from ", but in addition to the payments specified..." to the end of the Subclause.

69.4 Contractor's Entitlement to Suspend Work

Delete the words '28 days' and substitute with '60 days".

Delete sub-clause 69.4 (b) and substitute with the following:

the amount of such cost, which shall be added to the Contract Price. However, the costs due to idle time for plant, equipment and labour shall not be included in the said costs and shall be borne by the Contractor.

Add to Subclause 69.4 as follows:

Without prejudice to the Contractor's entitlement to interest under Subclause 60.7 (of these Conditions of Particular application) and to terminate under Subclause 69.1, the Contractor may suspend work or reduce the rate of work within 56 days after notification by the Foreign Funding Agency to the Kenya Government that the Financier has suspended disbursements from its loan, which finances in whole or in part the execution of the Works.

Add Subclause 69.6 as follows:

69.6 Suspension of Funding Agency Loan

In the event that the Foreign Funding Agency suspends the loan or credit to the Employer from which part of the payments to the Contractor are being made:

(a) The Employer shall notify the Contractor, with a copy to the Engineer, of such suspension within 7 days of having received the suspension notice from the Funding Agency, provided that:

  (i) The Employer shall state in such notification whether sufficient funds in the appropriate currencies are expected to be available to the Employer to continue making payments to the Contractor beyond a date 60 days after the date of the Funding Agency's notification of the suspension, and

  (ii) If such funds are not expected to be available, the Employer shall immediately inform the Engineer to instruct the Contractor to suspend progress of the Works pursuant to Subclause 40.1 of the General Conditions of Contract.

(b) If the Contractor has not received sums due to him upon the expiration of the 14 days from the time when the Foreign Funding Agency's loan or credit, from which part of the payments to the contractor is being made under Interim Certificates, is suspended, the Contractor may, without prejudice to the Contractor's entitlement to interest under Subclause 60.7, immediately take one or both of the following actions:

  (i) Suspend work or reduce the rate of work, and/or

  (ii) Terminate his employment under the Contract by giving notice to the Engineer. Such termination shall take effect 14 days after giving of the notice.

70 CHANGES IN COST AND LEGISLATION

Delete Clause 70 in its entirety, and substitute by 70.1 – 70.8 (inclusive):

70.1Price Adjustment "The amounts payable to the Contractor, in various currencies pursuant to Sub-Clause 60.1, shall be adjusted in respect of the rise or fall in the cost of labour,

Contractor's Equipment, Plant, materials, and other inputs to the Works, by comparing the Basic Rates at tendering stage and the current prevailing market prices.

70.2 Other Changes in Cost

To the extent that full compensation for any rise or fall in costs to the Contractor is not covered by the provisions of this or other Clauses in the Contract, the unit rates and prices included in the Contract shall be deemed to include amounts to cover the contingency of such other rise or fall of costs.

70.8 Subsequent Legislation

If, after the date 28 days prior to the latest date for submission of bids for the Contract, there occur in the country in which the Works are being or are to be executed changes to any National or State Statute, Ordinance, Decree, or other Law or any regulation or by-law of any local or other duly constituted authority, or the introduction of any such State Statute, Ordinance, Decree, Law, regulation or by-law which causes additional or reduced cost to the Contractor, other than under the preceding sub-clauses of this clause, in the execution of the Contract, such additional or reduced cost shall, after due consultation with the Employer and the Contractor, be determined by the Engineer and shall be added to or deducted from the Contract Price and the Engineer shall notify the Contractor accordingly, with a copy to the Employer. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same shall already have been taken into account in any inputs to the Price Adjustment in accordance with the provisions of Sub-Clauses 70.1.

CURRENCY AND RATES OF EXCHANGE

72 Currency Proportions

Delete clause 72 in its entirety and substitute the following:
"The currency of BID and payment is Kenya Shillings and rates of exchange requirements are not applicable."

73.4 Duties on Contractor's Equipment

Notwithstanding the provisions of Subclause 73.2, the Contractor's Equipment, including essential spare parts therefore, imported by the Contractor for the sole purpose of executing the Contract shall not be exempt from the payment of import duties and any other taxes upon initial importation.

ADDITIONAL CLAUSES

74.1 Illegal Payments

If the Contractor, or any of his Sub-Contractors, agents or servants gives or offers to give to any person any payment, gift, gratuity or commission as an inducement or reward for doing or forbearing to do any action in relation to the Contract or any other contract with the Employer, or for showing or forbearing to show favour or disfavour to any person in relation to the Contract or to any other contract with the Employer, then the Employer may enter upon the Site and the Works and expel the Contractor and the provisions of Clause 63 hereof shall apply as if such entry and expulsion had been made pursuant to that Clause.

75.1 Termination of Contract for Employer's Convenience

The Employer shall be entitled to terminate this Contract at any time for the Employer's convenience after giving 56 days prior notice to the Contractor, with a copy to the Engineer. In the event of such termination, the Contractor:

(a) Shall proceed as provided in Subclause 65.7, and

(b) Shall be paid by the Employer as provided in Subclause 65.8.

76.1 Restriction on Eligibility

(a) Any Plant, materials, or services which will be incorporated in or required for the Works, as well as the Contractor's Equipment and other supplies, shall have their origin in any of the countries and territories eligible under the Foreign Financier's Rules for Procurement.

(b) For the purposes of this clause, 'origin' means the place where the materials and equipment were mined, grown, produced, or manufactured or from which the services are provided.

(c) The origin of goods and services is distinct from the nationality of the supplier.

77.1 Joint and Several Liability

If the Contractor is a joint venture of two or more persons, all such persons shall be joint and severally bound to the Employer for the fulfilment of the terms of the Contract and shall designate one of such persons to act as a leader with authority to bind the joint venture. The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.

78.1 Details to be Confidential

The Contractor shall treat the details of the Contract as private and confidential, save insofar as may be necessary for the purposes thereof, and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere without the previous consent in writing of the Employer or the Engineer. If any dispute arises as to the necessity of any publication or disclosure for the purpose of the Contract the same shall be referred to the Employer whose determination shall be final.

78.2 Drawings and Photographs of the Works

The Contractor shall not disclose details of drawings furnished to him and works on which he is engaged without the prior approval of the Engineer in writing. No photograph of the work or any part thereof or equipment employed thereon shall be taken or permitted by the Contractor to be taken by any of his employees or any employees of his Subcontractors without the prior approval of the Engineer in writing and no such photographs shall be published or otherwise circulated without the approval of the Engineer in writing.

79.1 Official Visitors

The Contractor shall at all times when authorized by the Engineer give free and undisputed access of all facilities to any authorized employee of the Kenya Government or other authorized person wishing to view or inspect any part of the Site or Works or the materials therein.

80.1 Substantial Completion of the Works

The Contractor shall note that the Engineer reserves the right to certify the Works to be "substantially completed" in accordance with the provisions of Clause 48 of the General Conditions of Contract, unless the following portions of the Works are completed according to the Specifications:

(a) Works up to and including the bituminous wearing courses,
(b) All drains and drainage structures including bridges,
(c) Construction of the shoulders,
(d) Finishing of medians and slopes of cuts and fills and
(e) Reinstatement and environmental treatment of quarries and borrow pits.

81.1 Monthly Site Meetings

The Contractor or his authorised representative shall attend monthly meetings on the site with representatives of the Employer and the Engineer at dates and times to be determined by the Engineer. Such meetings will be held for evaluating the progress of the Contract and for discussion of matters pertaining to the Contract which any of the parties represented may

wish to raise. Such meetings are not intended for discussing matters concerning the normal day-to-day running of the Contract.
The Contractor shall prepare and submit to the Resident Engineer one week before the meeting a monthly report in the format approved by the Engineer giving all the information and details regarding its accomplishment against the prevailing approved programme.

81.2 Minutes of Site Meetings

Agreements recorded in the Minutes of the Site Meetings are binding to all parties, if objections to the minutes have not been given in due time.

The Minutes of the Site Meetings shall be issued within 7 days and shall be numbered consecutively. Minutes shall be deemed to have been received by the Contractor unless the Contractor gives notice at the following meeting that the Minutes were not received.

Any objections to the Minutes of the Site Meetings shall at the latest be raised at the succeeding Site Meeting or presented to the Engineer in writing not later than 2 weeks after the meeting. If the Contractor at this time has not received the Minutes of the Site Meeting, the objection must be given in writing to the Engineer not later than 2 working days after the subsequent receipt of the said Minutes.

82.1 Legal Provisions

The Contractor shall keep himself fully conversant with the latest enactment's, provisions and regulations of all legislative and statutory bodies, and, in all respects and at all times, shall comply with such enactment's, provisions and regulations in regard to executing the Contract.

83.1 Noise and Disturbance

All works shall be carried out without unreasonable noise and disturbance. The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages on account of noise or other disturbances created while or in carrying out the work and from and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in regard to or in relation to such liability.

83.2 Pollution

Subject, and without prejudice, to any other provision of the Contract and the law of the land and its obligations as applicable, the Contractor shall take all reasonable precautions in connection with:

(a) The rivers, streams, waterways, drains, water-course, lakes, reservoirs and the like to prevent:

  (i) Silting
  (ii) Erosion of their beds and banks, and
  (iii) Pollution of the water so as to affect adversely the quality or appearance thereof or cause injury or death to animal and plant life.

(b) The underground water resources including percolating water to prevent:

  (i) Any interference with the supply to or obstruction from such sources, and
  (ii) Pollution of the water which may adversely affect the quality thereof.

The Contractor shall further comply with any and all laws, rules and regulations of governmental agencies having jurisdiction which now exist or which may be promulgated during the course of the works contracted for herein, relating to the control, regulation and prevention of pollution. Not by way of limitation of the foregoing, but in furthermore thereof, the Contractor shall use the highest prevailing and approved standards of care and diligence to prevent and to take care of all waste, oil, water and other waste materials that may accumulate and be caused by the Contractor's operations and performance of this Contract so as to prevent pollution of any nature or kind resulting from the Works performed under this Contract.

SECTION 7: STANDARD SPECIFICATIONS

SECTION 7: STANDARD SPECIFICATIONS

Standard Specifications refers to the Standard Specifications for Road and Bridge Construction, 1986 Edition

SECTION 8: SPECIAL SPECIFICATIONS

SECTION 8: SPECIAL SPECIFICATIONS

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Clause and Description Page

100 GENERAL

Special Specification is supplementary to the Standard Specification and the two must be read in conjunction. In any case where there appears to be conflict between the two then the Special Specifications will take precedence.

In the absence of any definite provisions on any particular issue in the aforesaid Specifications, reference may be made to the latest codes and specifications of Design Manual for Roads and Bridges of the Ministry of Transport and communication of the Republic of Kenya, Kenya Bureau of Standards (KeBS), BS, ASTM, AASHTO and in that order. Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Engineer and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer shall be final and binding on the Contractor.

Where reference is made in the Contract to specific standards codes to be met by the materials, plant, and other supplies to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards as on the date of the bid and codes/design manual in effect shall apply, unless otherwise expressly stated in the contract. Where such standards and codes/design manual are national, or relate to a particular country or region, other internationally recognised standards which ensure a substantially equal or higher performance than the standards and codes/design manual specified will be accepted subject to the Engineer's prior review and written approval. The difference between the standards specified and the proposed alternative standards must be fully described in writing by the Contractor and submitted to the Engineer at least 28 days prior to the date when the Contractor desires the Engineer's approval. In the event that the Engineer determines that such proposed deviations do not ensure substantially equal performance, the Contractor shall comply with the standards specified in the documents.

101 **SPECIAL SPECIFICATION**

SECTION 1 – GENERAL

101 LOCATION AND EXTENT OF SITE

The works comprise *upgrading of roads in Meru county headquarters along Imenti Forest Edge*. The project roads traverse through existing earth roads and are approximately 13km in length. They are a total of 9 roads and each of their length are as tabulated in the table below.

No.	Start	End	Length (KM)
1	Eastern Bypass (at the junction of Hospital road and Kaaga road)	Kaithe Junction on Meru Maua road(C91)	5.6
2	Starts at Hospital road opp. Consolata girls secondary school	Terminates on B6 next to mosque	0.8
3	Starts at ch 0+300 on road 3A and passes thru cathedral church	Terminates at Hospital road	0.5
4	Museum	library	0.55
5	Starts at Cocacola on Mwandantu road and branches at	Terminates at Marvins Manyatta, Just at the back	0.8

No.	Start	End	Length (KM)
	YMCA/PCEA	entrance of county offices	
6	Down Town Filling station meru-Mikinduri Road	Terminates at Angaine Plaza, (Matatu stage) and Gakoromone fresh produce market.	0.55
7	Starts at B6(Meru-Nanyuki) at MSS Petrol station	Terminates on junction behind veterinary offices	0.8
8	Starts at Kinoru Kenya Power substation next to MEWAS water storage tank	Terminates at junction with western Bypass at the Imenti Forest Edge	0.8
9	B6 at Gitimbini – Irinda- Giantune	Western bypass	2.6
Total			**13**

The site of the works shall be the area within the road reserve and any other places as may be designated in the contract.

102 Extent of Contract

General

The works specified under this contract shall include all general and ancillary works and work of any nature that is deemed necessary for the due and satisfactory construction, completion and maintenance of the works to the full extent and meaning of the Drawings and Specifications, whilst complying with all general Conditions of Contract whether specifically mentioned or not in the clause of the specifications.

Scope of Works

The project includes the construction of approximately 3km of Meru town roads and a further 8km of Link Roads to the Meru Bypass along Imenti Forest Edge

The works to be executed under the contract comprise mainly, but are not limited to the following:

1. Maintenancee of Resident Engineer's Offices and Laboratory
2. Provision of Resident Engineer's Junior and Senior Staff Housing
3. Construction and Maintenance of deviation roads, improvement and maintenance of the existing road, passage of traffic through the works and rendering all possible assistance to the public when passing through the deviations or main works.

4. General Construction Work comprise *upgrading of roads in Meru County Headquaters* including but not limited to the following**:**

i). Site Clearance of working area within the road reserve

ii). Topsoil stripping

iii). Scarification and compaction of subgrade

iv). Earthworks comprised mainly of medium height embankment construction, excavation and backfilling of unsuitable material areas

v). Embankment protection works and provision of longitudinal drainage ditches (lined and unlined)

vi). Removal of all existing cross culverts including pipe and box culverts

vii). Provision of new box and pipe culverts, with appropriate inlet and outlet features and scour protection works

viii). 50mm Asphalt concrete surfacing throughout the main carriageway and shoulder, with a 150mm Cement Improved base, 175-200mm Cement Improved subbase and a 425mm of natural material improved subgrade Road pavement

ix). Provision of bus lay-byes.

x). Provision of road markings and reflectorised road studs, road signs, guard rail, and marker posts.

xi). Re-alignment of few sections, provision of vehicular accesses, and access culverts, from roadside properties.

xii). Any other operation ancillary to the main works

The Works detailed above are only indicative of the Scope of Works associated with this contract and the Engineer may, where necessary, substitute some of the Works with others within the project areas without substantially altering the overall Scope of the Works. Works shall be measured and paid using the relevant rates and prices in the Bill of Quantities.

The works will also include for any operations necessary for the safe and convenient passage of traffic at all times.

102.1 Compliance with Specification

All material, plant, labour and workmanship in and connected with the execution of the works shall be the best of their respective kinds without regard to any trade terms and the Contractor shall comply with these and all other respects with the relevant Clauses in the Specification and shall carry out the Contract in a proper and workmanship like manner and in strict accordance with Specifications, Working Drawings and Instructions of the Engineer.

103 Drawings

A set of Contract drawings has been bound in a book of drawings accompanying these Contract Documents as a separate volume. Additional copies of these drawings that may be required by the Contractor can be obtained from the Engineer, in which case the Contractor will be required to reimburse the cost of producing such additional copies.

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

104 Programme for Execution of the Works

The Contractor shall provide the works programme required under Clause 8.3 of the Conditions of Contract within twenty eight (28) days of receipt of the Engineer's order to commence work. The programme shall be in the form of a computerized critical path method, and shall be updated every two months to reflect all the circumstances affecting the progress of the works at that time.

The programme shall be coordinated with climatic and other conditions to provide for the completion of the works in the order and by the time specified.

The Contractor shall carry out the contract in accordance with the programme agreed with the Engineer, but he shall in no manner be relieved by the Engineer's approval of the programme, of his obligation to complete the works in the prescribed order and by the prescribed completion date and he shall from time to time review his progress and make such amendments to his rate of execution of the works as may be necessary to fulfill his obligation. The Contractor shall make allowance in his works program for the requirements of Clause 1506A of the Special Specifications, and any associated additional costs shall be included in his rates and prices generally. The contractor should cater for the construction of trial sections in his rates.

105 Order of Execution of the Works

In addition to Clause 105 of the Standard Specification the Contractor shall carry out the work such that a continuous and consecutive output of fully completed road is achieved.

107 Certificate of Completion

The minimum length of road for which a certificate will be issued is thirty (30) kilometres of continuous road when substantially completed.
The restoration of borrow pits and quarries is subject to the restoration requirements of Section 6 of these Specifications and the issue of certificate of substantial completion shall be subject to the satisfactory restoration of the borrow pits used.

108 Method of construction

The Engineer's normal working hours shall be 8 hours from Monday to Friday and 5 hours on Saturday with Sunday set aside for rest.

If the Contractor wishes to execute permanent works outside these hours, he shall meet any extra costs arising thereof in addition to giving a day's notice in writing.

109 Notice of Operations

Add the following Sub- Clauses:

109.1 Notification Terms

It shall be the Contractor's responsibility to notify the Engineer when any item of Works are completed and ready for approval, and the Contractor shall give sufficient notice to allow control test to be performed.

117 Health, Safety and Accidents

The Contractor shall prepare a specific Occupational Health and Safety Management Plan for the project, which shall be submitted to the Engineer not later than 4 weeks after the notice to commence the Works. This Management Plan shall incorporate but not be limited to, the requirements of Clause 117, and identify the risks and mitigation measures, and specify monitoring indicators and reporting requirements. The contractor shall set up, on site, a dispensary with qualified staff.

As part of the occupational health and safety program the Contractor shall provide training for all employees on how to ensure their own personal safety, and on ways to reduce the accident risk on site. The Safety Officer shall provide training in safe work practices and general awareness of potential danger situations to avoid injuries. In addition, all employees handling dangerous/toxic materials shall be trained on how to handle such substances.

All the Contractor's personnel shall, before commencing work, have an induction course on safety and health at the site. The information and training shall be on site and have duration of at least two (2) hours. It shall be conducted in a language which is appropriate for the personnel, to ensure that all personnel can understand the information and instruction. Follow-up training sessions shall be carried out during the course of the project.

There is no separate payment for these requirements and the costs should be included in the Contractor's rates and prices generally.

120 Protections of Existing Works and Services

a) The Contractor shall acquaint himself with the position of all existing services such as sewers, water drains, cables for electricity and telephone, lighting and telephone poles, water mains, etc., before commencing any excavation or other work likely to affect the existing services.

The cost of all plant, equipment and materials, labour, technical and professional staff, transport and the like necessary for determining the locations of existing services, including the making good of any damage caused to such services all to the satisfaction of the Engineer, shall be deemed to be included in the tender rates. No other payment shall be made for the costs of such operations or for the making good of damage caused thereby to the existing services.

b) The Contractor shall be held responsible for injury to existing structures, works or services and shall indemnify and keep indemnified the Employer against any claims in this respect (including consequential damages).

121 Diversion of services

a) The Contractor shall be responsible for arranging for the moving of services, subject to the approval of the Engineer, where necessitated by the Works and shall pay any charges arising from the moving of the services or alteration to services such as power lines, telephone lines, water pipes and the like. Prime Cost sums for this work have been included in the Bill of Quantities No.1. Subject to the approval of the Engineer and upon production of payment receipts from the service authorities, the Contractor shall be reimbursed in interim payment certificates the net cost of such moving or alteration, plus the percentage

inserted in the Bill of Quantities for the Contractor's overheads and profits in making the payment, which includes for the liaison and arranging of the moving of services.

b) Immediately after the Engineer's order to commence work, the Contractor shall identify all services along the project road, and following approval from the Engineer, shall arrange for their prompt relocation where necessitated by the Works. The Contractor's work programme shall allow adequate time for the identification and relocation of services.

124 Provision of land

The Employer will only provide land to accommodate the road reserve and roadside amenities, and all other land required by the Contractor for the execution of the contract is subject to the prior approval of the Engineer, but is the total responsibility of the Contractor. The Contractor will make all necessary arrangements with the property owners concerned and pay all charges arising there from, on or before the completion of the contract.

The Contractor shall remove all temporary works and shall restore all such land to the condition in which it was immediately prior to the occupation thereof as far as is reasonable and practicable. No separate payment will be made to the Contractor on account of these items and the Contractor must make due allowance for them in his rates.

The Contractor shall notify the Engineer of any encroachment into the road reserve at the earliest opportunity.

126 Materials and manufactured goods

Notwithstanding the provisions of Clause 126 of the Standard Specification, the Contractor's attention is drawn to his obligations with regard to quality and delivery schedule of materials and goods obtained from suppliers. Should the Engineer at any time be dissatisfied with any goods and materials intended for use by the Contractor upon the Works, he shall be empowered to reject the goods and materials and shall order that others of acceptable quality replace them. Any more work that may consequently have to be redone and the costs of the new supplies shall be borne by the Contractor.

127 Information from Exploratory Boring and Test Pits

Omit the content of Clause 127 and substitute the following Sub-Clauses: -

127.1 Factual Materials Report

The Factual Materials Report for this Contract does not form part of the Contract Documents. However, the Report will be made available for the ***Contractor's information only,*** and any conclusions on issues such as suitability of materials, location of borrow pits, material quantities etc., made by the Contractor on the basis of the Factual Materials Report, will be at his own risk.

127.2 Trial Sections

The Contractor shall allow in his programme for constructing trial sections and carrying out tests upon them as directed by the Engineer. Trials would normally be required at the start of each pavement layer and if changes of materials, method, or equipment deem it necessary, as directed by the Engineer. The time for completion of the Contract shall not be extended because of the time needed to construct trial sections and evaluate the tests on them.

At least fourteen days before the work of laying any pavement layer is commenced, the contractor shall construct trial sections of at least 100 m in length and to the full construction width and the specified pavement layer thickness. For each trial section, the Contractor shall use the materials, mix proportions, mixing, laying, compaction equipment and construction procedure that he proposes to use for the main work. The main work of laying the pavement layer shall not be commenced until this trial has been tested and approved by the Engineer.

No variation in the construction procedure, mix proportions, size, grading or source of any of the constituents shall be made without the agreement of the Engineer who may first require new trial sections to be carried out.

Trial sections, if found satisfactory, will be paid for under the rates in the Bill of Quantities for the appropriate items, as if the trial sections were part of the normal work. No separate payment will be made for trial sections and testing.

The Contractor shall make good, at his own expense; any trial sections that fail to meet the specified standards. The standards shall include, but not be limited to, material quality, layer thickness, levels and compaction.

130 Progress photographs

Add the following paragraphs (a) and (b):

Video Coverage of Progress of Works

Where instructed by the Engineer, the Contractor shall pay for professional video coverage of the works which shall be undertaken immediately upon handing over the site to the contractor and upon completion of works and at frequencies and intervals instructed. The video recording shall include voice track, text and subtitles of works before and during construction and shall be undertaken at intervals instructed by the Engineer.

Two copies of each set of recording in Digital Video Disk (DVD) or similar format shall be delivered to the Engineer within 14 days of recording.

(b) Processing of Digital Photographs

The contractor shall, in addition pay for production, processing and printing of ten (10) copies of digital photographs taken by the Engineer.

MEASUREMENT AND PAYMENT

Add Sub-Clause (o)

(o) Video Coverage of Progress of Works and Processing of Digital Photographs

Payment for Video Coverage and Processing of Digital Photographs shall be made from Prime Cost Sum for the items allowed in the Bills of Quantities

131 Signboards

The Contractor shall provide and erect two (2) publicity signboards on the site as directed. The minimum dimensions of the boards shall be as shown in the Drawings and as directed by the Engineer. The boards shall be prepared primed and painted cream and lettered in black. The boards shall be of stout construction, resistant to the effects of weather.

132.1 Engineer's representative Office

The Contractor shall construct, equip and maintain houses (one for type I and three for type II or equivalent) for the Engineer's senior staff. The Engineer's senior staff houses shall be separate from that of the Contractor's staff housing and shall be sited and constructed to the satisfaction of the Engineer as detailed in the Drawings.

Type I and II Houses shall be in accordance with the book of drawings, and shall be constructed with material to be approved by the Engineer. The Engineer shall approve the design and construction of the same. These houses shall revert to the Contractor at the end of the project. They shall be paid for in accordance with Clause 141 of the Standard Specification, under Bill 1 of the Bill of Quantities.

All material used shall be new, strong, durable and weatherproof. Ceilings and floor must be properly insulated against heat with approved insulated material. The floor shall have a level smooth finish. All windows shall be glass, able to be opened, and with mosquito nets. The building materials shall be mosquito and termite proofed and painted inside and outside with two coats of paint/varnish, all to the approval of the Engineer.

The ceilings of houses and verandas shall be lined with ceiling board. All doors are to be fitted with mortise locks, which must be heavy duty on external doors. All windows shall be fitted with burglar bars.

The roof cladding shall be with G.I. corrugated sheets or equivalent material. The lounge, bedroom, bathroom, toilet and kitchen floor will have cement mortar finish floors. The workbenches in kitchen shall have approved cover. All the sanitary ware shall be vitreous China or equivalent of approved quality.

All houses are to be provided with a fire extinguisher and fire axe. Fire axes are to be secured to the outside of the buildings.

All storerooms shall be fitted with at least 3 substantial shelves and kitchens shall be fitted with shelves, drawers and cupboards as instructed.

The Contractor shall provide new furniture, equipment and fittings as listed herein below. The Contractor should obtain approval of the Engineer for the type and quality of the furniture, fittings and equipment before ordering.

All houses shall be provided with a piped supply of clean, unpolluted drinkable water suitable for bathing and for the washing of clothes. Bottled drinking water shall be provided as required on a daily basis. Electricity, gas and kerosene for the consumption of the Engineer and his staff shall be provided and the Contractor shall provide all necessary waterborne sanitation and disposal systems to the satisfaction of the Engineer.

The Contractor shall pay for water, electricity, gas and kerosene consumed, and for the statutory charges associated therewith. The Contractor shall be responsible for rubbish disposal by providing outside bins and daily collection and disposal to a central area located to the satisfaction of the Engineer.

Each type I and II house shall be erected separately. A barbed wire topped chain link wire fence 2 metres high with a chain and padlock lockable gate shall be provided around the general perimeter of the types I and II houses.

Each type I and II house shall be provided with day and night watchmen and security lights, the cost of which shall be deemed to have been included in the rates for the houses.

The senior staff will generally comprise the following:

Designation	Number
Resident Engineer	1
Assistant Resident Engineer/Highway Engineer	1
Materials Engineer	1
Project Surveyor	1

Alternatively, the Contractor, subject to the approval of the Engineer, may rent equivalent housing for the Engineer's Senior Staff.

132.2 Engineer's Office and Laboratory Furniture

The Contractor shall construct, equip, furnish and maintain 4 No. Type IV and 6No. type V houses or equivalent for the Engineer's Junior staff, to be located adjacent to the Engineer's offices and laboratory, the location of which will be subject to Engineer's approval.

Junior staff houses shall be temporary and made in durable and weatherproof materials and to a similar standard as the senior staff houses.

House Types III, IV and V including furniture and fittings shall all revert to the Contractor on completion of contract. They shall be paid for in accordance with Clause 141 of the Standard

Specification under the relevant item in Bill 1 of the Bill of Quantities; the staff will generally comprise the following:

Designation	Number
Senior Inspector	1
Senior Lab Technician	1
CAD Technician	1
Administration Assistant	1
Secretary	1
Assistant Surveyor	2
Assistant CAD Technician	1
Inspectors	2
Lab Technicians	2
Leveler	2

132.3 Engineer's Laboratory and Survey Equipment

a) General

Each house shall be provided with new furniture, equipment and fittings to the approval of the Engineer.

All the houses and furniture mentioned below shall revert to the contractor after the completion of the contract.

Contractor to include in their rates for the houses purchase of all the furniture listed below.

Each house shall be provided with new furniture, equipment and fittings to the approval of the Engineer as listed below:

FURNITURE DESCRIPTION	QUANTITY OF ITEMS PER TYPE OF HOUSE				
	I	II		IV	V
1. FURNITURE *(reverts to contractor)*					
▪ Kitchen table (formica top)	1	1		1	1
▪ Kitchen chair	1	1		1	1
▪ Dining table	1	1		1	1
▪ Dining chairs	6	6		4	2
▪ Dining chairs with arms	2	2		1	1
▪ Writing desk (3 drawer)	1	1		0	0
▪ Book shelf	1	1		0	0
▪ Settee - 7 Seater	1	1		0	0
▪ Settee - 5 Seater	0	0		0	0
▪ Easy chairs	4	4		2	1

FURNITURE DESCRIPTION	QUANTITY OF ITEMS PER TYPE OF HOUSE				
	I	II		IV	V
▪ Coffee tables	1	2		0	0
▪ Side board	1	1		0	0
▪ Beds double 6x6 with inner spring mattresses	2	1		-	-
▪ Beds single 4x6 with inner spring mattresses	1	1		1	1
▪ Pillows	8	8		2	2
▪ Side tables	4	4		1	1
▪ Dressing tables with mirrors	1	2		0	0
▪ Dressing table stools	1	2		0	0
▪ Chest of drawers	3	2		1	1
▪ Bedside chairs	4	2		1	1
▪ Bathroom cabinet with mirror	1	1		1	1
▪ Bathroom stool	1	1		1	1
▪ Floor rags	4	4		4	2
2. EQUIPMENT					
▪ Air conditioner	5	4		2	1
▪ Refrigerator (at least 19 cu.ft.) including a freezer compartment of about 3 cu. ft. capacity	1	1		0	0
▪ Refrigerator (at least 7 cu.ft.) including a freezer compartment	0	0		1	0
▪ Electric & gas cooker with 4 burners, a grill and an oven	1	1		0	0
▪ Gas or Electric cooker with 2 elements	0	0		1	1
▪ Fume hood	1	1		0	0
▪ Water filter (hot and cold dispenser)	1	1		1	1
▪ Dust bin metal with lid(outdoor type)	1	1		1	1
▪ Door mats	2	2		2	2
▪ Vacuum cleaner	1	1		0	0
▪ Ceiling fans	2	1		1	1
▪ Set of 8 piece crockery, cutlery, glass wear	1	1		1	1
▪ Set of kitchen utensils	1	1		1	1
▪ Set of pots .pans etc	1	1		1	1
▪ Fire extinguisher	2	2		1	1
▪ Standard lamps	5	2		1	1
▪ Table lamps	1	1		0	0
▪ Toilet tissue holders	1	1		1	1
▪ Waste baskets	4	4		2	1
▪ Mixer electric (portable)	1	1		1	1
▪ Bedside lights	3	2		1	0
▪ Wall lights	5	12		3	2
▪ Pelmets and runners	LS	LS		LS	LS
▪ Curtains	LS	LS		LS	LS

FURNITURE DESCRIPTION	QUANTITY OF ITEMS PER TYPE OF HOUSE				
	I	II		IV	V
▪ Bed sheets	16	16		8	4
▪ Pillow cases	8	8		4	2
▪ Blankets	8	8		4	4
▪ Towel rails	2	2		1	1

132.4 Main Office

The Contractor shall provide, erect and maintain for the duration of the Contract, a furnished and equipped main office for the Engineer's Representative of weather-proof construction, provided with mosquito-proof and burglar-proof windows and lockable doors and suitably insulated against heat and cold, all to the satisfaction of the Engineer in respect of the Construction, design and siting. The office shall comply with the details shown in the drawings and shall have a clear height of not less than 2.6m. The floor shall be of floated concrete, and adequately damp and termite-proof. Each room of the main office shall be air-conditioned with a medium size air conditioner.

A telephone shall also be provided for the Resident Engineer's office for his exclusive use. The Contractor shall be responsible for paying all the charges and fees related to the use of the telephone and be reimbursed the same on production of proof of payment.

The office for the Engineer's Representative shall be completely separate from that of the Contractor and, if so required by the Engineer, shall be fenced with a 2m high chain linked fence and gate with padlock and chain.

Latrines and washrooms graded to staff seniority, together with drinkable water supply and water borne sewage disposal, shall be provided for the office. The Contractor shall also provide 24 hours a day electricity supply to the offices and shall allow for any water and electricity consumed and for any statutory charges associated.

Unless the offices are accessible via an existing paved road the Contractor shall, if so required by the Engineer's Representative, provide an access road at least 3m wide to the office, together with a 100 square meters covered car parking area. Both access road and car park shall be surfaced with at least 150mm of consolidated gravel properly graded, cambered, sealed, drained and fitted with culverts.

132.5 Main laboratory

The Contractor shall provide, erect and maintain for the duration of the Contract, a main laboratory complying with details shown on the standard drawing, to the satisfaction of the Engineer. The laboratory shall be sited adjacent to the Resident Engineer's main office.

The laboratory shall have piped potable water supply and a continuous electricity supply adequate for lighting, heating and operating the laboratory equipment.

The laboratory shall have a height from floor to ceiling of not less than 2.75 metres and all rooms shall be fitted with a medium size air conditioner, and electric lighting and power points as instructed by the Engineer's Representative and each door shall be fitted with a good quality mortise lock and provided with two keys.

Soaking tanks for CBR specimens shall be provided at floor level in the laboratory. Concrete cube curing tanks of adequate size shall also be provided. Both the CBR tanks and concrete cube

curing shall have drainage pipes built in. The following rooms and facilities shall be provided in the Laboratory:-

i) Main and Mobile Office

This room shall have a total floor area of not less than 14 square metres and a total window area of not less than 2 square meters. The door and windows shall be fitted with fly screens covered with mosquito gauze. The floor shall be of concrete with a float finish. The walls shall be lined and ceiling provided.

A display board of soft board or similar approved material, with a minimum surface area of 3 square metres shall be provided and securely fixed to the wall.

ii) Main Laboratory

This room shall have a total area of not less than 55 square meters and a total window area of not less than 7 square metres. The external entrance shall be a double door and single doors shall be provided for access to the adjacent offices. The external door and all windows shall be fitted with fly screens covered with mosquito gauze.

The floor shall be of concrete and float finished. The room shall be fitted out as indicated by the Engineer's Representative with three rigidly constructed work benches each minimum 2 metreslong by 1 metre wide by 1 metre high and with top comprising either metal lined hard wood or steel float finished concrete at least 75mm thick and suitably reinforced, with a sink minimum size 600mm long by 450mm wide by 300mm deep fitted with a tap and waste pipe. Wall shelves, 450mm in width and having a surface area of at least 6 square metres, shall be provided and securely fitted.

Two display boards of soft board or similar approved material, each with minimum area of 3 square metres, shall be securely affixed to the walls as directed by the Engineer's Representative.

iii) Small Laboratory Room

This room shall have a total floor area of not less than 20 square metres and a total window area of not less than 2 square metres. The windows shall be fitted with fly screens covered with mosquito gauze. A single door shall provide access to the main laboratory room. The floor shall be fitted out as indicated by the Engineer's Representative with two rigidly constructed work benches each of minimum dimensions 2 metres long by 1 metre wide by 1 metre high with a top comprising either metal lined hardwood or a steel float concrete finish of at least 75mm thickness and suitably reinforced, with a sink of minimum size 600mm long by 450mm wide by 300mm deep fitted with a tap and waste pipe and concreted to the water supply for the main laboratory room. An approved air extractor fan shall be fitted through an outside wall.

iv) Store Rooms

These rooms having a total floor area of not less than 20 square metres shall be provided adjacent to the main laboratory building in a position to be indicated by the Engineer's Representative.

v) Concrete Slab for Sample Drying

A reinforced concrete slab 150mm thick and of total area not less than 20 square metres shall be provided adjacent to the main laboratory building in a position to be indicated by the Engineer's Representative. The slab shall have a smooth finish to the satisfaction of the Engineer.

132.7 Engineers Office and Laboratory Furniture and Equipment

The Contractor shall provide, install and maintain in a good state of repair office furniture and equipment, and laboratory furniture and equipment, and survey equipment as outlined in this Clause 132 and in appendices to the Bill of Quantities with a dealer's certificate of warranty. It shall also be the Contractor's obligation to replenish consumables.

Engineer's Main Office Equipment

Facilities for tea and coffee making, with sufficient crockery for all Engineers' staff including a 15 piece tea set.

All furniture and equipment bought under the Contract for the Engineer's office shall revert to the Employer at the end of the Contract.

132.8 Engineer's Office, Laboratory, and Survey Equipment

Laboratory and Survey equipment shall be of approved manufacture, and shall be available for the Engineer's exclusive use throughout the contract within the following time periods

- *Survey equipment – not more than three (3) weeks after Engineer's order to supply*
- *Laboratory equipment – not more than sixty days after Engineer's order to supply*

All equipment shall be ready to use and complete to perform the tests.

Any delays to the Contractor or the Contractor's activities caused by the Engineer being unable to perform survey work, field or laboratory tests due to the Contractor's failure to supply and/or maintain the said equipment shall be deemed to have been caused entirely by the Contractors own actions, and any consequences of such delays shall be interpreted as such.

The equipment shall revert to the Employer on completion of the contract while the furniture shall revert to the Contractor.

132.9 Communication for the Engineer

(a) Mobile phones

The Contractor shall provide, connect and maintain mobile phones for the exclusive use by the Engineer for the duration of the contract. The Contractor shall include for the cost of providing the mobile units complete with charger unit, "hands free" headset for each unit, connection to the network and all service charges applicable all as directed by the Engineer. The Contractor shall provide air-time with each mobile phone which shall be paid for under prime cost sum allowed for in the bills of quantities. The mobile telephones shall be WAP enabled with e-mail capabilities and integrated camera of a minimum of 7.0 mega pixels. Payment for these mobiles and associated costs is included in the Bill of Quantities, and ownership of mobile phones will revert to the Contractor after completion of the Works.

133 Time for erection of the engineer's staff houses, offices and laboratory

The time for completion of all housing for the Engineer's office, laboratory, senior and junior staff housing shall be as specified in the Standard Specification.

During the duration from the possession of site until taking over of the Engineer's houses and office, the Contractor shall provide suitable hotel or rented accommodation and appropriately located temporary office space, all adequately furnished and equipped to the approval of the Engineer. The contractor shall be deemed to have allowed in his rates for the temporary accommodation of the Engineer, Materials Engineer, Highway Engineer, Senior Surveyor and three support staff during this mobilization period and no separate payment will be made.

135 Maintenance of the engineers staff houses, offices, laboratories, furniture and equipment

The Contractor shall provide adequate security 24 hours per day until expiry of the Period of Maintenance. The costs of staff required for security and to keep accommodation facilities, offices and laboratories in a well maintained, clean and fully habitable condition, plus the costs of consumables, shall be included in the relevant items for maintenance in the Bill of Quantities.

137 Attendance upon the Engineer and His staff

The costs, for attendance required by this Clause 137, shall be included in the items for maintenance as specified in Clause 135. Additional attendant staff, as required by the Engineer, shall be paid for under Item 1.23 of the Bill of Quantities.

138 Vehicles and drivers for the engineer and his staff and method of payment

All vehicles to be supplied will be brand new, right hand drive, diesel powered and fitted with air-conditioner and power steering as described below.

- 1 (One) new 4WD station wagon vehicles of minimum 3.0 litre diesel engine, or equivalent approved, 5 door Utility Vehicle or similar approved, fitted with air bags.

- 2(Two) new fully loaded 4WD double cabin Pick Up vehicles of minimum 2.8 litre diesel engine, or equivalent approved,.

The Contractor shall insure comprehensively the vehicles for any licensed drivers and shall provide competent drivers during normal working hours and whenever required by the Engineer.

Should any vehicle supplied not be in road worthy condition, the Contractor shall immediately provide an acceptable equivalent replacement vehicle until such time as the original vehicle is repaired to the satisfaction of the Engineer and returned to use.

Payment for the vehicles shall be by a rate per vehicle month for the provision of vehicles and inclusive of the first 4000 Km for the running cost per vehicle month and a rate per kilometre for the running costs, above the 4000 Km per month which shall include for all fuels, lubricants, servicing insurance, maintenance, driver and repairs. The km rate shall include for any overtime the driver might be due or any other allowances in addition to the normal working hours.

Ownership of all the vehicles mentioned above shall revert to the Contractor at the end of the contract.

In addition, the monthly rate for running costs of vehicles shall also include:

(i) Cost of any repairs necessary as shall be required to meet roadworthiness and compliance with registration requirements

(ii) Any other repairs as shall be instructed by the Engineer

139 Miscellaneous Accounts

The Contractor may be instructed by the Engineer to make payments of general receipted accounts for such items as stationery, stores, furniture and equipment, claims and allowances for supervision personnel and any miscellaneous claims or the Engineer may direct the Contractor

to purchase or pay for the above. The Contractor will, on provision of receipts, be paid under the Preliminaries and General Bill No. 1 item 1.17.

140 Payment of Overtime for Engineer's Junior Staff

Delete in the last line the words "shall be at the Contractor's own expense" and substitute with "including the specified percentage for administrative overheads shall be paid by the Contractor to the Engineer.

Add the following:

(i) If the Contractor wishes to execute permanent work outside the Engineer's normal working hours, as stated in Clause 108 of this Specification, then the payment for the overtime for Engineer's support staff shall be reimbursed in full by the Contractor to the Engineer.

(ii) If the Contractor wishes to execute permanent works on a regular basis outside the Engineer's normal working hour, (Clause 108 of this Specifications) over a prolonged period, the Engineer may, if he deems it necessary, employ additional supervisory staff for which the required salaries, shall be reimbursed in full by the Contractor to the Engineer and the Contractor shall provide the required accommodation facilities for such staff at his own cost.

(iii) Payment of Allowance on Duty Trips

The Contractor is required to pay for hotel accommodation and allowances for his staff seconded to the Engineer on official duty trips outside the base camp. The Contractor shall not be reimbursed any of these costs.

141 Measurement and Payment

Delete Sub-Clause 141 (a) entirely and substitute with:

(a) No Preliminary item has been included in this Contract. All Contractor's mobilization and general costs shall therefore be included in relevant rates in the Bill of Quantities.

(b) To **(e):** Provision and Maintenance of Housing, Office and Laboratory for the Engineer and his staff.

Replace b (i) and (ii) with the following:
The Contractor shall be paid in the following manner:

(i) 50% (fifty percent) of the sum when the housing, office and laboratory, as appropriate, have been erected, furnished, equipped, accepted and handed over to the Engineer.

(ii) 50% (fifty percent) of the sum in equal monthly installments spread over the period from the date when the houses, offices, or the laboratory as appropriate is taken over by the Engineer until the end of the Contract excluding the Maintenance Period.

This payment shall be deemed to cover servicing and maintenance of buildings, furniture, equipment and services and the Engineer may withhold or reduce any installments if the Contractor fails in his maintenance obligations. In the event of the Interim Certificate not being issued in any month, then the installment shall be added to the subsequent certificate.

(m) Item: Progress Photographs Delete this Sub-Clause

142 Protection of the Environment

The Contractor shall comply with the Statutory Regulations in force in Kenya regarding environmental protection and waste disposal, and shall liaise with the National Environmental Management Agency (NEMA).

Within four (4) weeks of the order to commence work, the Contractor shall prepare and submit a specific Environmental Management Plan for the project and his operations, relating to the approved Environmental Impact Assessment. The Environmental
Management Plan shall outline potential environmental hazards and risks, and provide an action plan to deal with the hazards, minimize the risks, and mitigate adverse environmental impacts, and include a general decommissioning plan covering all relevant aspects of the project. The Environmental Management Plan shall identify monitoring indicators and reporting requirements.

The Contractor shall be required to submit environmental progress reports to the Engineer every three (3) months.

The Contractor shall ensure so far as is reasonably practicable and to the satisfaction of the Engineer; that the impact of the construction on the environment shall be kept to a minimum and that appropriate measures are taken to mitigate any adverse effects during the construction.

(a) The Contractor shall exercise care to preserve the natural landscape and shall conduct his construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage by the Contractor's construction operations and equipment. All unnecessary destruction, scarring, damage or defacing resulting from the Contractor's operations shall be repaired, replanted, reseeded or otherwise corrected as directed by the Engineer, and at the Contractor's expense.

(b) The Contractor shall ensure that measures are in place to control soil erosion and water pollution, by use of berms, dykes, silt fences, brush barriers, dams, sediment basins, filter mats, netting, gravel, mulches, grasses, slope drains, contour banks, and other erosion control devices and methods. Temporary erosion control provisions shall be coordinated with permanent erosion control features to assure economical, effective and continuous measures throughout the period of the works. The Contractor's attention is drawn to the requirements of Clause 502, in that works need to be progressively finished so that permanent vegetation can establish quickly to mitigate soil erosion and erosion of drains.

(c) The Contractor shall provide all the labour, equipment, materials, and means required and shall carry out proper and efficient measures wherever and as often as necessary to minimize the dust nuisance.

(d) The Contractor shall comply with all applicable Kenyan laws, orders and regulations concerning the prevention, control and abatement of excessive noise. Blasting, use of jackhammers, pile driving, rock crushing, or any other activities producing high-intensity impact noise may be performed at night only upon approval of the Engineer.

(e) Immediately after extraction of materials, all borrows pits shall be backfilled to the satisfaction of the Engineer. In particular borrow pits near the project road shall be backfilled in such a way that no water collects in them.

(f) Spilling of bitumen fuels Oils and other pollutants shall be cleared up.

(g) The Contractor's attention is drawn to the requirements of the Standard Specification in regard to the environment and in particular to the following clauses:
Clause 115: Construction Generally

Clause 116:	Protection from Water
Clause 136:	Removal of Camps
Clause 605:	Safety and Public Health Requirements Clause
Clause 607:	Site Clearance and Removal of Topsoil and Overburden

(h) Payment in respect of this Clause 142 is included as a Lump Sum in the Bill of Quantities. Payment of the Lump Sum will be by equal monthly instalments over the period of the Contract excluding the Period of Maintenance. The total sum of the instalments shall not exceed the Lump Sum, and payment of the monthly instalment will only be made for that month if the Engineer is satisfied that the Contractor has fully complied with the requirements of Clause 142, otherwise the Contractor shall forfeit such instalment.

143 Extension of time arising from abnormal rainfall

Extension of time as provided in the General Conditions of Contract arising from abnormal rainfall shall be calculated separately for each calendar month or part thereof in accordance with the formula given below. It shall be calculated for the whole period for completion of the Contract including any extensions thereof:

$$V = \left(N_w - N_n\right) + \frac{\left(R_w - R_n\right)}{x}$$

If V is negative and its absolute value exceeds N_n the V shall be taken as equal to minus N_n.

The symbols shall have the following meanings:

V = Extension of time in calendar days in respect of the calendar month under consideration.

N_w = Actual number of days during the calendar month which a rainfall of Y mm or above has been recorded.

R_w = Actual rainfall in mm for the calendar month under consideration obtained from the Meteorological Department of the Ministry of Water, Lands and Environment, or from a source agreed to in writing by the Engineer.

N_n = Average number of days, as derived from the existing rainfall records of the Department of Meteorology provided in the Special Specifications, or as agreed to, in writing by the Engineer, on which a rainfall of Y mm or more has been recorded for the calendar month.

R_n = Average rainfall in mm for the calendar month, as derived from the rainfall records of the Department of Meteorology provided in the Special Specifications, or as agreed to, in writing, by the Engineer.

x = 20 unless otherwise provided in the Special Specifications.

Y = 10 unless otherwise provided in the Special Specifications.

The total extension of time shall be the algebraic sum of the monthly totals for the period under consideration. Extensions of time for part of a month shall be calculated using pro rata values of N_n and R_n.

The factor $(N_w - N_n)$ shall be considered to represent a fair allowance for variations from the average number of days during which rainfall exceeds Y mm.

The factor $(R_w - R_n)/x$ shall be considered to represent a fair allowance for variations from the average in the number of days during which rainfall does not exceed Y mm but wet conditions prevented or disrupted work.

Information regarding existing rainfall records, if available from a suitable rainfall station near the Site will be supplied in the Special Specifications together with calculations of extensions of the time for previous years in accordance with the above formula.

If no suitable rainfall records are available, the above formula will not apply, and rain gauges shall be installed by the Meteorological Department at locations approved by the Engineer. These shall include all sections where the Contractor is working including Borrow Pits. All readings shall be taken by the Meteorological Department and agreed jointly with the Engineer on a daily basis.

As soon as is practicable after the end of each month, the Contractor shall collect daily records for that month and shall calculate V for that month, as specified. The records and calculations shall be submitted to the Engineer without undue delay.

No separate payment shall be made to the Contractor in respect of, the requirements of this Clause, and the resultant extension of time, and the Contractor shall allow for any related costs elsewhere in his/her rates

In addition to the provisions of Clause 142 above and all other requirements of the Conditions of Contract, Standard and Special Specifications, the Employer and the National Environmental Management Authority (NEMA) may order certain environmental measures to be carried out which are off the road and not specifically covered under these provisions. The Contractor shall carry out such works with equipment, labour and plant provided under the Contract or shall make such arrangements for specialized works to be carried out by a specialized subcontractor.

The Contractor shall be paid for all direct expenses under a provisional Sum in the Bill of Quantities and a percentage (%) for his handling costs and profits.

200 MATERIALS AND TESTING OF MATERIALS

202 TESTING by the contractor

Add the following:

202.1 Contractor's Testing

The provision of the Engineer's laboratory and testing equipment, as specified in Section 1 of this Special Specification, does not relieve the Contractor of his obligation to provide laboratory and testing equipment and execute his own testing, in conformity with the specified requirements in the Standard Specification.

204 sieves

In the standard sieve series, delete the size of the greater sieve "75"mm and replace by a "100" mm size.

205 Soils and gravel

Whenever in the Contract Document a minimum California Bearing Ratio (CBR) is specified, the CBR of the material shall be determined at the specified state of compaction.

a) After four days soaking in the case of neat materials and,

b) After seven days curing plus seven days soaking in the case of cement/lime improved materials.

207 In addition to the requirements of clause 207 of the standard specifications, Ordinary and Rapid setting Portland cement shall be sampled and tested in accordance with, and shall comply with the latest equivalent revised standards.

211 Bituminous binders

a) **Requirements**

Straight run bitumen in addition to the requirements of the Standard Specification the ash content of penetration grade bitumen shall not exceed 5% by weight.

b) **Types of Bitumen**

Prime coat shall be type MC30 unless otherwise stated. Tack coat shall be K1-70 emulsion. For surface dressing the binder shall be 80/100 bitumen.

224 Trial sections

The Contractor shall allow in his programme for the construction of trial sections and carrying out tests upon them as directed by the Engineer. The time of completion of the contract shall not be extended because of the time taken to carry out tests and evaluate trial sections.

No variation in the construction procedure, mix proportions, spray or spread rates, size, grading or source of any constituents shall be made without the approval of the Engineer.

226 Frequency of testing

Add the following:

226.1 General Acceptance Criteria for Test Results

Conventional statistical techniques shall be used alongside the above said criteria where these are applicable.

227 Measurement and payment

No additional measurement and payment will be made for testing of materials, trials, etc, in conformity with the standard specification.

228 Workmanship and quality control

The Contractor shall, not later than 4 weeks after the notice to commence the Works, submit a project specific Quality Management System, including the Work Method Statements and Quality Audit for major items of work, showing how all the Contractor's systems will ensure that all the works will conform to the Contract documents. The onus rests with the Contractor to produce work which conforms in quality and accuracy of detail to all the requirements of the Specifications and Drawings, and the Contractor shall, at his/her own expense, institute a quality control system and provide experienced engineers, foremen, surveyors, materials technicians, other technicians and other technical staff, together with all transport, instruments and equipment, to ensure adequate supervision and positive control of the Works at all times. The Contractor shall provide chainmen and labourers as necessary for the Engineer to carry out checks on the Works.

The Contractor shall conduct tests or have them conducted continually on a regular basis, to check the properties of natural materials and processed natural materials and of products manufactured on the site, such as concrete and asphalt. The Contractor shall remain fully responsible for any defective material or equipment provided by him. Similarly, the quality of all elements of the Works shall be checked on a regular basis so as to ensure compliance with the specified requirements.

The intensity of control and of tests to be conducted by the Contractor in terms of these obligations shall be adequate to ensure that proper control is being exercised.

Where any natural materials or products made from natural materials are supplied, and upon completion of each element of the construction work, the Contractor shall test and check such materials, products and/or elements for compliance with the specified requirements and shall submit his results to the Engineer for approval. Such submission shall include all his measurements and test results and shall furnish adequate proof of compliance with the specified requirements.

No specific pay items are provided as compensation for the above obligations, including the provision of all samples delivered to the Engineer, the repair of places from which samples were taken, and the provision of the necessary personnel and testing apparatus and facilities, for which compensation shall be included in the bid rates of the Contractor for the various items of work to which these obligations apply.

The Contractor shall submit to the Engineer for examination, the results of all relevant tests, measurements and levels indicating compliance with the Specifications on completion of every part of the Work.

300 SETTING OUT AND TOLERANCES

301 Setting Out

(a) General

If the traverse points to be used for the setting out are close to the existing carriageway and interfere with construction works then the Contractor will have to relocate them to a location where they will not be disturbed. The co-ordinates and heights of all traverse points so located shall be listed and provided to the Engineer for checking and/or approval. The Contractor shall also monument the new centreline every 200m along straight and all salient points along curves by a pin in the concrete beacon before commencement of any works.

The reference points to define the road reserve shall have 12 mm diameter steel pins embedded in concrete, 200 mm long with 25 mm exposed to the air, sticking out from its top surface. This pin shall be co-ordinated and heighted and the result of the same shall be provided to the Engineer for approval. The cost of these works shall be included in the Contractor's unit rates for other items, as no separate payment item has been provided in the Bill of Quantities.

Commencement of the Works shall not be permitted until this basic survey data has been provided and approved by the Engineer for at least 5 km of the road.

(b) Detailed setting out

Reference pegs shall be 50 mm x 50 mm in cross section, 600 mm long driven 400 mm firmly into the ground and painted white above ground level. The offset from the centreline shall be indicated by a small nail, 20-25 mm long, with its head driven flush with the top of the peg. Chainages, chainage offsets and reference elevation shall be clearly marked on the sides of the peg to the satisfaction of the Engineer.

After cutting of benches and prior to commencement of earthworks or subgrade works, the Contractor shall take cross-sections again and submit the copy of the same to the Engineer for agreement. These cross-sections shall when agreed be used as the basis of measurement for all subsequent layers, unless otherwise stated.

302 Tolerances

Add the following:

(j) Pavement Widths
For Pavement widths for subbase, base and binder course, the allowable tolerances shall be -0 to +50 mm.

(k) Pipe Culverts

The maximum deviation from the specified line of a drainage pipe shall be: -

Horizontal	-	20 mm in 3.0 m
Vertical	-	30 mm in 10.0 m

305 As built drawings and maintenance manuals

Prior to the issue of a Taking Over Certificate the Contractor shall provide three (3) electronic copies of as built drawings, and where appropriate, maintenance manuals showing the Works as constructed, and details of the correct operation and maintenance of ancillary Works. No separate payment shall be made for this requirement, and costs for compliance shall be deemed to be included in the Contractor's general rates and prices.

400 SITE CLEARANCE AND TOP SOIL STRIPPING

401 Site Clearance

The Contractor's attention is drawn to the requirements of Clause 142 regarding preservation of existing trees and native shrubbery and vegetation, and environmental requirements generally.

Site clearance is to be confined within the road reserve, and site clearance is not required over the paved width of existing road and shoulders. The remaining area required for construction purposes, including sides of existing embankments and cuttings shall be cleared as instructed by the Engineer.

Site Clearance shall be carried out as directed by the Engineer, who shall determine whether areas to be cleared constitute (a) light bush, or (b) dense bush. Generally, light clearance shall be done on areas covered by grass, vegetative shrubs and scattered trees while heavy clearance shall cover sections in vegetative canopy and closely spaced trees.

Site clearance of areas necessary for the execution of the contract, outside the road reserve, and for quarries, borrow pits, stockpiles, spoil tips, haul roads and deviation roads, will be subject to the approval of the Engineer, but shall be the responsibility of the Contractor, and no separate payment will be made.

402 Removal of topsoil

Topsoil shall include removal of up to 200mm depth of any unsuitable material as directed by the Engineer.

403 Removal of structures, fences and obstructions

Items have been included in the Bill of Quantities for the removal of existing pipes, inlet and outlet structures for pipe and box culverts and existing concrete structures.

An item has been included in the Bill of Quantities for the removal of existing guardrail, plus loading, transport and stockpile as directed by the Engineer.

When instructed by the Engineer, the Contractor shall demolish or remove other additional structures or obstructions and payment for this shall be made on Daywork basis.

500 EARTHWORKS

501 Scope of section

The scope of this section includes all earthworks associated with the Contract, including roadside amenities, service roads, cycle paths and footpaths, and widenings at trading centres.

503 Classification of material

Add the following to (a) Hard material:

Hard materials include materials which require drilling and blasting to enable removal.

Add the following to (b) Soft material:

Unsuitable materials include:

(i) All material containing more than 5% by weight of organic matter (such as topsoil, material from swamps, mud, logs, stumps and other perishable material)

(ii) All material with a swell of more than 3%.

(iii) All clay of plasticity index exceeding 45 or of liquid limit exceeding 70.

(iv) All material having moisture content greater than 105% of optimum moisture content (AASHTO T99)

504 Preparation Prior to Forming Embankments

Add the following at the end:

Where benching is required to existing pavement to accommodate earthworks, subgrade or subbase for widening the road, the rate for compaction of existing ground shall be deemed to cover this activity.

Excavation in the pavement of the existing road shall be kept dry. In the event of water penetrating the underlying layer, construction of the subsequent layers shall be postponed until the underlying layers are dry enough to accommodate the construction plant without deforming or otherwise showing distress.

Step construction shall be carried out per layer at the joint where excavating both vertically and perpendicular to the direction of the travel. The step shall be 500mm perpendicular to the direction of the travel and 150mm vertical unless otherwise instructed by the Engineer.

Special care shall be taken when compacting the new material at the joint ensuring that specified density is achieved.

505 Construction of Embankments

Only material approved by the Engineer shall be used in embankments.

Fill material shall comply with the following requirements:

- *Organic matter less than 5% by weight*
- *Swell less than 2%*
- *Plasticity Index less than 50%*
- *CBR > 8%*

Removal and replacement of expansive soils

The requirements for the backfill material shall be as follows:

Permeability: Coefficient of saturated permeability (k) not to exceed 5x10-7 cm/sec at 95% AASHTO T99 or the anticipated or actual field density, when tested according to AASHTO T 215 or another approved method using a similar grading to that achieved on the road after compaction. The permeability shall also be checked on the road using a suitable field test at least at each change of material.

Atterberg limits and grading (after compaction):

- *Maximum Size: 75mm or 0.4 of compacted layer thickness, whichever is the greater*
- *Liquid limit: 25-45*
- *Plasticity Index: 10 (12 preferred) – 25 (20 preferred)*
- *Weighted Plasticity PI: 500-2000%*
- *Casagrande plot: above the A-line*
- *Material passing the 75µm: 8-15 minimum, depending on grading*
- *CBR at 100% AASHTO T99: >4%*
- *CBR swell at 100% AASHTO T99: <2%*

Compaction shall be in 150 or 200 mm lifts of compacted thickness to at least 95% (AASHTO T 99) in general and at least 100% in the upper 150-200mm. The maximum compacted thickness shall additionally be limited to two-thirds of the length of the feet of any tamping roller used.

Stockpiling of unsuitable materials

All unsuitable materials excavated from the road prism and from beneath embankment positions shall, insofar as practicable, be used for the flattening of slopes to embankments as shown on the drawings or as directed by the Engineer.

The Contractor shall not dispose of any excavated material from the road prism without the approval of the Engineer. Excavated material, which is unsuitable for use in any part of the works, shall be disposed of at points approved by the Engineer and in a manner satisfactory to him.

Unsuitable materials to be reserved for later use in flattening the slopes of the embankment shall be loaded, transported and temporary stockpiled longitudinally and on both sides of the proposed road in approximate equal quantities, as shown on the drawings and as ordered by the Engineer.

The Engineer will, in ordering the locations for temporary stockpiling of such materials, ensure that full and free access to the works area will be maintained at all times.

Improved Subgrade Material

Improved subgrade layer is defined on the Drawings and shall comply with the following requirements:

- CBR of not less than 15% measured after 4 day soak on a laboratory mix compacted to a

dry density of 100% (AASHTO T99)

- Plasticity Index less than 30%
- Swell less than 1% on the laboratory mix sample.
- Placed in layers not exceeding 150mm thick
- Where Native Subgrade Class is S1, S2 or S3, the subgrade shall be improved as per the table below to ensure a new class S4 (min CBR 15%) or as directed by the Engineer.

IMPROVED SUBGRADE				
Native Subgrade Class		S1	S2	S3
Improved Subgrade	Material	S4	S4	S4
	Thickness(mm)	450	350	300
New Class		S4	S4	S4

Subgrade shall mean the upper 300mm of earthworks, either in-situ or in fill and subgrade shall be provided as part of the earthwork operation, and payment shall be made as fill.

508 Compaction of Earthworks

At pipe culverts, all fill above ground level around the culverts shall be compacted to density of 100% MDD (AASHTO T99) up to the level of the top of the pipes or top of the surround(s), if any and for a width equal to the internal diameter of the pipe on either side of the pipe(s) or surround(s) as applicable.

At locations adjacent to structures, all fill above ground level up to the underside of the subgrade shall be compacted to density of 105% MDD (AASHTO T99). In case of fill around box culverts this should be carried out for the full width of the fill and for a length bounded by the vertical plane passing through the ends of the wing walls.

Where improved sub-grade material shall be required, this shall be compacted and finished to the same standards and tolerances as those required for normal subgrade. Clauses in the Specifications applying to normal subgrade shall also apply.

509 Mass Haul Diagram

Replace the first sentence of the last paragraph by the following:

The mass haul diagram is drawn in "cut" on the basis that 1m^3 of material obtained from cuttings will produce an equal volume of material when compacted in fill.

510 Spoil material

The Contractor's attention is drawn to the requirements of Section 6 of this Specification.

Where possible, spoil material is to be utilized in the backfill and restoration of borrow pits and quarry areas.

511 Borrow Pits

Replace the first two paragraphs by the following:

Fill material which is required in addition to that provided by excavation shall be obtained from borrow pits to be located and provided by the Contractor and approved by the Engineer.

514 Top Soiling and Grassing

Top soiling and grassing shall be to all areas instructed by the Engineer. Top soiling and grassing of spoil, borrow, stockpile and quarry areas, including payment thereof, shall be in accordance with Section 6 of these Specifications.

517 Measurement and payment

Notwithstanding the provisions of clause 517 of the Standard Specifications, the rate for compaction of fill in soft material shall allow for the requirements of Clause 508 of this Special Specification and no extra payment shall be made for compaction around pipe culverts.

(e) Re-place this sub-clause with the following:

No separate payment whatsoever shall be made for haulage or overhaul of materials, and the Contractor shall ensure that he has included in his unit rates for each and every item, as appropriate, for all necessary haulage and associated costs. The Contractor's unit rates shall be deemed to adequately cover for all materials handling and haulage necessary from/to borrow areas, spoil areas, and/or stockpiles, as appropriate.

The rate for cut to spoil shall also allow for cutting to spoil in any waterlogged areas.

The rates in the Bill of Quantities shall also include for earthworks associated with roadside amenities, service roads, cycle paths and footpaths, and widenings at trading centres.

600 QUARRIES, BORROW PITS, STOCKPILE AND SPOIL AREAS

603 General

Notwithstanding any indications to the contrary in the Standard specification the Engineer will not make available to the Contractor any land for, nor has identified any specific areas for, quarries, borrow pits, stockpiles and spoil areas, and for access thereto.

The Contractor will be entirely responsible for locating suitable sources of materials complying with the Standard and Special Specifications, and for the procurement, winning, haulage to site of these materials and all costs involved therein. Similarly the Contractor will be responsible for the provision and costs involved in providing suitable areas for stockpiling materials and spoil dumps. Should there be suitable sites for spoil dumps or stockpiles within the road reserve forming the site of the works, the Contractor may utilize these subject to the approval of the Engineer.

Quarries, borrow pits, stockpile and spoil areas shall be progressively restored as the works progress once their use is no longer required.

No additional payment will be made to the Contractor to cover costs arising from the requirements for this Section and the Contractor must include these costs in the rates inserted into the Bills of Quantities.

605 Safety and public health requirement

Add the following to Clause 605:

When working the material sites, the Contractor shall time and arrange his works in such a way that at no time is the public safety endangered in any way.

607 Site clearance and removal of topsoil and overburden

Add the following to Clause 607:

Faces of quarries being higher than 4 metres shall be shaped to 1:10 out of the face. All quarries and borrow pits shall be permanently fenced with 5 strand barbed wire which shall be located 5 metres off the edge of the face. After reinstatement, the bottom of a quarry shall be covered with 0.20 m of soil and 0.15 m of topsoil.

611 Obtaining of borrow materials

(a) Borrow Pit Locations

Borrow materials shall be located and obtained by the Contractor. Borrow materials shall comply with the requirements of the appropriate Specifications according to the use for which the material is intended.

The Contractor shall search for and test all possible sources of borrow material including any possible sources so designated by the Engineer, within an economic distance of the location where the borrow material is to be utilized.

The Contractor shall excavate the necessary trial holes, take such samples and perform such tests as are deemed necessary by the Engineer. The Contractor shall submit all the results to the Engineer in sufficient detail to satisfy him that the quality and quantity of material available in the proposed borrow area are acceptable for the intended use, all at the Contractor's expense.

The Contractor shall propose the use of those borrow pits which will be most economic to the Employer.

Approval of borrow pits or borrow areas shall apply only to those portions of the pit or area from which acceptable materials can be obtained or produced. The Contractor shall conduct his operations in any approved pit or borrow area or portions thereof so as to produce acceptable material.

Any approval given by the Engineer shall not relieve the Contractor of the responsibility of ensuring that material obtained from a borrow pit or area complies in all respects with the specification for the material.

The Contractor shall plan his exploitation of borrow pits in such a manner that the various materials excavated can be selected and either loaded directly for use or pushed to stockpile in a borrow area for later loading. When this is not feasible for reasons beyond the Contractor's control, material to be reserved for later use shall be loaded, transported and temporarily stockpiled as ordered by the Engineer at locations outside the borrow area indicated by him and such temporary stockpiling shall be measured and paid for as Daywork. No material reserved for a specific purpose shall be used for other purposes without the written approval of the Engineer.

612 Opening and working of borrow pits

a. Clearing and Grubbing, Topsoil and Overburden
The Contractor's rate for borrowed material must include for clearing and grubbing and the removal of topsoil and overburden. No separate payment will be made for this work.

(b) Excavation of Borrow Material
Where any borrow pit contains different types of materials, in separate layers which require to be mixed in order to produce a suitable product, the materials shall be excavated over the full depth of approved face in one operation without separation of the different types of material.

The Contractor shall exercise all reasonable care so as to avoid contamination of approved borrow material by the inclusion of clayey or otherwise unsuitable material from the floor of the borrow pit, from overburden, from unsuitable layers or from areas beyond the approved limits of the borrow area. During loading hard oversize material which will not break down during processing on the road shall be excluded as far as is practicable.

During the course of borrow operations and especially when excavating near the floor and outer boundaries of borrow areas, the Contractor shall plan his operations so as to reduce as far as possible the amount of earthmoving that will be necessary for the reinstating of borrow pits. Indiscriminate excavation without due regard for the desired final shape of the borrow pit will not be permitted.

The material in borrow pits shall be blasted or ripped and/or excavated in a manner that will ensure the effective breaking down of the material in the borrow pit before it is loaded. Rippable material which tends to break into large blocks shall be cross ripped.

(c) Quality Control at Borrow Pit
The Contractor shall be responsible for controlling his operations at every borrow pit where material is being excavated, to ensure compliance with the requirements of Sub-section (b) above.

He shall carry out sufficient tests on the material being excavated from the borrow pit in order to satisfy himself that the quality of the material will comply with the specified requirements for the particular layer for which it will be used.

(d) Protection of Borrow Pit

Borrow pits shall be continuously protected against the ingress of surface water and the Contractor shall construct such temporary banks as may be required to divert surface water and as far as possible his operations shall be planned in such a way that the borrow pit is self-draining. Where this is not possible, borrow pits shall be dewatered by pumping. The Contractor shall be solely responsible for keeping borrow areas dry and ensuring that borrow material is sufficiently dry when required for use.

613 Reinstatement of borrow areas

On completion of his operations in a borrow area, the Contractor shall reinstate the entire area so as to blend with the surrounding area and to permit the re-establishment of vegetation. For this purpose the borrow area shall be shaped to even contours. All material in and around the borrow area, whether spoil from road building operations, excess stock-piled material, oversize material left in the borrow pit, material resulting from clearing and grubbing operations and excess overburden, shall be used or disposed off as directed by the Engineer. Material not capable of supporting vegetation shall be buried and used in shaping the borrow area and subsequently covered with soft material. All available soft material shall be spread evenly to the thickness directed and where sufficient material is not available for this purpose to cover the entire area, the .remaining portions shall be scarified along the contours so as to avoid undue erosion.

All haul roads shall be obliterated and the surface scarified, earth banks constructed to prevent erosion and all damaged fences and other structures reinstated.

The shaping and reinstatement of the borrow pit shall be done in such a way that the borrow pit will be properly drained whenever practicable and where required, the Contractor shall place earth banks to divert any surface water away from the borrow area.

The reinstatement of any borrow pit shall be to the entire satisfaction of the Engineer and the Contractor shall submit to the Engineer a signed certificate from the landowner stating that he is fully satisfied with the reinstatement of any borrow area.

614 Disposal of borrow material

The Contractor shall not have the right to use material obtained from borrow pits for any purpose other than for the execution of this Contract. He shall not dispose off any borrow material whether processed or not either by sale or donation to any person without the written authority of the Employer.

615 Measurement and payment

Clause 610 of the Standard Specification shall apply.

700 EXCAVATION AND FILLING FOR STRUCTURES

703 Excavation of foundations for structures

Unless otherwise instructed by the Engineer, all excavated surfaces in material other than hard material, on which foundations for structures shall be placed, shall be compacted to 100% MDD (AASHTO T99) immediately before structures are constructed.

Paragraph 4, last line: - Replace "95%" with "100%".

707 Backfilling of Excavations and Filling for structures

All backfilling material shall be selected backfill complying with the requirements for a natural subbase material given in Clause 1203. Unless otherwise instructed by the Engineer, all backfilling material shall be compacted to a minimum of 100% MDD (AASHTO T99).

Porous filter material shall be clean, uniform, sand or crushed aggregate with a d50 between 0.4mm and 1.2mm and less than 5% particles finer than 75 micron sieve. The d100 must be lower than 5mm.

709 Excavations for River Training and New Watercourses

Add the following:

Payments for river training and establishment of new watercourses shall only be made where such work constitute permanent works. Works done for road deviation or other temporary works shall not qualify for payment.

710 Stone Pitching

Stone pitching shall be minimum 150mm thick bedded on 50mm mortar bedding with all joints grouted for the full depth of the joint.

The surface to receive the pitching shall be compacted and trimmed to slope and the stone hand laid, inter locked and bedded into the mortar bedding to give an even finished surface.

The in-situ material immediately behind the pitching shall be compacted to minimum density of 100% MDD compaction (AASHTO T99).

711 Protection of existing pier and or abutments

Where instructed by the Engineer, the Contractor shall install gabions as protection works to washout areas or bridge piers and or abutments. Gabions shall be constructed in accordance with Clause 711 of the Standard Specification.

712 RIP-RAP

Add the following at the end:

Quarry waste or similar approved material shall be used to backfill scoured and eroded side, outfall and cut-off drains. The material shall be compacted to form a flat or curved surface preparatory to stone pitching of drainage channels, existing and new scour checks as directed by the Engineer.

The surface to receive the pitching shall be compacted and trimmed to slope and the stone hand laid, interlocked and rammed into the material to give an even finished surface. The interstices of the pitching shall be rammed with insitumaterial. The in-situ material immediately behind the pitching shall be compacted to minimum density of 100% MDD compaction (AASHTO T99).

713 FILTER FABRIC

Where filter fabric is specified, it shall be durable non-woven Geotextiles or synthetic fibres, unaffected by soil acidity, soil alkalinity and bacteria. The fabric shall be made by an approved, reputable manufacturer and shall have a mass and strength at least equal to 280g/m^2.

The mesh size of the fabric shall be sufficient to effectively retain the material on which it is placed but shall not be greater than 150 microns. The fabric shall be installed in accordance with the manufacturer's instructions. The fabric shall be placed on levelled ground, with sharp rocks and other objects which are likely to damage the fabric being removed and all pits and depressions being backfilled and compacted.

The fabric shall be overlapped by a minimum of 300 mm and stitched at joints in such a manner that the strength of the joints is at least 50 per cent of the strength of the fabric.

Rip-rap or gabions or other materials, as applicable, shall be placed carefully on the filter fabric in such a way as to avoid damage to the fabric. In any event construction procedures shall ensure no damage to the filter fabric or impairment of its design function. Should the filter fabric be damaged, it shall be replaced, including removal of the overlay material, in a manner approved by the Engineer, and at the cost of the Contractor.

No mechanical plant shall traffic over filter fabric unless a minimum thickness of 200 mm of fill material has been placed over the fabric.

710 Measurement and payment

Add the following:
Measurement and payment for gabions boxes and gabion mattresses shall be by the cubic metre of rock fill contained within the boxes and mattresses, and the rate shall include for the cost of providing and fixing the mesh, and the cost of providing, hauling and placing the rock, and all the costs of complying with the requirements of Clause 711 of this Specification.

714 Backfill below structures

Where instructed this shall be carried out in compliance with the requirements of Clause 507 and 804 of the Standard Specification.

800 CULVERT AND DRAINAGE WORKS

801 Scope of section

The operations specified in this section apply to the installation of drainage works and reinstatement and improvement of the same.

In addition, this Section covers: -

- Replacement of all the existing 600mm cross pipe culverts with at least 900mm
- Installation of 900mm and 1200mm diameter culverts at new locations
- Provision of access culverts
- De-silting and cleaning of existing pipes and drains to make them free flowing.

804 Excavation for Culverts and Drainage Works

The Standard Specifications are amended as follows:

In paragraph 6, line 3, and in paragraph 7, line 5 and in paragraph 11, line 6, delete "95%" and insert "100%".

(b) Removal of Existing Drainage Structures

Where instructed by the Engineer, the Contractor shall demolish or remove any other structures and payment shall be made against on Daywork basis, under a Provisional Sum provided in Bill No 4 in the Bill of Quantities.

Regarding backfill reference is made to Clause 812

(c) Excavation for Culverts and Drainage Works

The Contractor shall carry out all excavations for new culverts and drainage works to the lines, levels, inclinations, and dimensions shown on the Drawings or as instructed by the Engineer.

805 Excavation in Hard Material

In the Standard Specifications, Sub-clauses 805(a) and 805 (b) delete "95%" and insert "100%".

In sub-clause 809(a), paragraph *2,* line 1, substitute "95%" with "100%".

In sub-clause 809(c), paragraph 2, line 4, between the words "compacted" and "and shaped" insert the words "to 100% MDD (AASHTO T99)".

Hard material is material, which can be excavated only after blasting with explosives and wedging or the use of a mechanical breaker fitted with a rock point in good condition and operated correctly. Boulders of more than 0.2m^3 occurring in soft material shall be classified as hard material.

807 Concrete pipes

Precast concrete pipes shall be reinforced, and shall comply with the requirements of AASHTO M170

809 Bedding and Laying of Pipe Culverts

The rates inserted shall allow for compaction of the bottom of excavation to 100%MDD (AASHTO T99). Where concrete beds and surrounds are not required, pipe culverts shall be bedded and haunched using a selected material equivalent to natural subbase gravel

complying with the requirements of Clause 1203. Bedding thickness shall be minimum 75mm. The rate in the Bill of Quantities shall allow for this work.

b) In addition to the requirements of the Standard Specification, where inflatable balloon method of casting culverts in-situ is used, thorough pre-construction trials shall be carried out to ensure, to the satisfaction of the Engineer, that the Contractor provides a suitable alternative to the provision of precast concrete pipe culverts, and that the inner concrete barrel surface will achieve a Class F3 finish. The pipe trench shall be excavated to the exact width required by the drawings and concrete surround and bedding shall extend to this width. Any over-excavation shall be filled with surround or bedding concrete, as appropriate, at the Contractor's expense.

810 Jointing Concrete Pipes

Amend as follows:

The concrete pipes for the culverts shall have ogee joints and will be jointed by 1:2 cement/ sand mortar and provided with fillets on the outside as described in clause 810 of the Standard Specification.

Payment shall be included in the relevant item under Bill of Quantity No. 8.

811 Concrete beds, surrounds and haunches

Concrete shall be Class 20/20 for surrounds and haunches for all methods of construction.

812 Backfill

In the Standard Specifications, Clause 812

a) delete paragraph 6 " for pipe culverts ... depth of 150mm", entirely.

b) Wherever the expression "dry density of 95% MDD (AASHTO T99)" occurs delete and replace with "dry density of 100% MDD (AASHTO T99)".

All material for backfilling shall be a natural gravel subbase material complying with the requirements of Clause 1203.

(a) The rates entered for laying of pipe culverts shall allow for backfilling to pipe culverts and compacting to 100% MDD (AASHTO T99) and these works shall not be measured and paid for separately.

813 Precast concrete open channels

Add the following to the Standard Specification clause 813:

813.1 Half Round Open Channels

These shall be provided as directed by the Engineer and in compliance with sections 813 and 820 of the Standard Specification.

Payment shall be according to Bill of Quantity No.8.

813.2 Invert Block Open Channels

These shall be provided as directed by the Engineer and in compliance with sections 813 and 820 of the Standard Specification.
Where and as directed by the Engineer, the Contractor shall excavate in any material provide and place concrete for the bedding, backfill and remove surplus material to spoil, provide, lay and joint precast concrete invert blocks, side slabs, slotted drains and gulley chambers.

Precast concrete invert block side drains and gulley chambers shall comply with the requirements of BS 338, and shall be laid in accordance with the drawings.

All slabs to be concrete Class 20/20

818 Scour checks

In the Standard Specifications, clause 818 paragraph 2, delete “Class 20/20” and insert "Class 25/20".

819 Cleaning and maintenance

Add the following:

819.1 De-silting of Pipe Culverts

The repair of drainage spouts shall be made by cleaning of the existing drainage pipes of all muck and replacing the broken pipes or by providing new drainage spouts in cases where the same have not been provided.

821 Invert block drains

Where instructed, the Contractor shall excavate, compact the excavated bed to 100% MDD AASHTO (T99), backfill as necessary with selected material compacted to 100% MDD AASHTO (T99) lay and joint invert block drains of 300mm diameter with two side slabs.

Payment for laying invert block drains of 300 mm diameter inclusive of two side slabs shall be by linear metre laid as instructed. The rate shall be inclusive of provision and transport of all materials, excavation, bed compaction and preparation, laying, jointing and disposal of spoil.

822 Replacing of 600mm diameter pipes

Where instructed, Contractor shall remove existing 600mm ∅ cross pipe culverts and replace them with 900mm ∅ pipes as instructed. The void left after removal of 600mm ∅ pipes shall be widened as necessary to accommodate new concrete bedding, pipe and haunching.

The installation of pipe culverts shall be done prior to commencement of any earthworks necessary for road widening.

Payment for the excavation shall be difference between the void left after removal and excavation necessary to accommodate new pipe culverts. If the pipe culverts are laid after the road widening then the widened length shall not be considered for the excavation payment.

900 PASSAGE OF TRAFFIC

901 Scope of the section

Add the following paragraphs (f) and (g): -

(f) Traffic Control Plan

Following the award of the contract, the Contractor shall submit to the Engineer a detailed Traffic Control Plan. Such plan shall be approved by the Engineer, and where necessary, by the appropriate statutory authority, before the Contractor commences work. The plan shall cover but shall not be limited to, the method of protection of the public and give details of the duration and hours of operation, location, type and numbers of traffic safety devices, barricades, warning signs, flag men equipped with two way radios and the like. The Traffic Control Plan shall be in accordance with and complimentary to the Programme of Works submitted under Clause 104.

In the preparation of this Traffic Control Plan, the Contractor shall take into consideration the following:

(i) The Contractor shall conduct his operations in such a manner that no greater length or amount of work is undertaken than he can efficiently carry out having due regard to the rights and conveniences of the public and the requirements of this Section.

(ii) If the Contractor proposes closure of a road, he shall provide an alternative routing of the traffic, which must be approved by the Engineer.

(iii) No revisions shall be made to the Traffic Control Plan without the prior written approval of the Engineer and the Contractor shall allow fourteen (14) days for the Engineer to review any request for revision of the Traffic Control Plan.

(iv) The Traffic Control Plan shall conform in all respects with the requirements of this Specification.

(g) Standard of Works

(i) The standard of all works carried out under this Section shall comply with the requirements of the appropriate sections of these Specifications.

(ii) All provisions for traffic and the standard of temporary traffic surfaces shall comply with the requirements of Clause 904, and Section 9 generally, of these Specifications and any damage caused by passing traffic through the works shall be made good at the Contractor's own cost.

902 Improvements to existing roads

Insert the following below the heading of section 902 of the Standard Specification: -

The employer shall hand over whole road described under section 101 for rehabilitation and reconstruction by the Contractor at the commencement of the contract.

Add the following paragraph (j) immediately below paragraph (i):-

Extent of Improvements to Existing Roads

Where instructed by the Engineer, Contractor shall improve the existing roads by:-

(i) Providing material similar to those used for earthworks and pavement layers, building up the shoulders so that any irregularities and drops between the edge of the shoulder and carriageway are eliminated. The Contractor shall scarify the existing shoulder, trim and compact the existing surface, and, where directed by the Engineer, bring in additional materials for pavement layers, spread and compact to required thicknesses and tolerances

(ii) Repairing of potholes and edge breaks in the existing road with cement stabilized natural gravel base material and asphalt concrete. The work shall include, but not limited to, building up existing shoulders and deviations with approved material, excavating and squaring around the pothole or edge break, removing deleterious material, compaction and priming of the exposed surface, compaction and filling with natural gravel base material as directed by the Engineer

(iii) Scarifying or removing sections of the existing pavement surface, where directed by the Engineer, bringing in additional natural subbase or base quality material where required, reshaping and compaction to required thicknesses and tolerances. The surface shall then be primed and blinded at the primer rate of 1.0 litre/sq. metre, and a single bituminous surface seal treatment application of 10/14mm chippings at $80m^2/m^3$ with bitumen rate of 1.4 litre/m^2 or such other rates as instructed by the Engineer

(iv) Providing standard warning and direction signs. Payment will only be made for traffic warnings and signs associated with the improvement of the existing road ahead of the works

The Contractor shall improve the existing road in a progressive and logical sequence to a standard acceptable by the Engineer. When a satisfactory standard of improvement has been achieved, the Contractor shall subsequently maintain the road to this standard in accordance with Clause 903 of the Specifications. The cost of maintenance thereof shall be paid for under the relevant item allowed in the Bills of Quantities for maintenance of passage of traffic.

903 Maintenance of Existing Road

The Contractor shall maintain the existing road described in section 101 at the commencement of the contract. The Contractor shall be responsible for maintenance of the existing road ahead of the works for the duration of the contract and shall regularly inspect the road and carry out repairs and maintenance to the satisfaction of the Engineer and ensure that appropriate resources are continuously available to satisfy the requirements of this Clause.

If at any time the Engineer draws the Contractor's attention to a road section which requires maintenance the contractor shall promptly repair and maintain the section. The Contractor shall be legally liable for any accident or third party damages attributable to his failure to maintain the road in accordance with instructions and provisions of this section.

904 Construction of Deviations

In addition to requirements of clause 904 of the Standard Specification, the following shall apply:

(a) General

The maximum length of deviation of road shall be restricted to 5 kilometres at any time unless otherwise instructed. The Contractor shall construct and complete 6.5m wide deviations to the satisfaction of the Engineer before commencing any permanent work on the existing road.

The Contractor shall be allowed to open further 5 kilometre section of deviation road only when 80% of permanent works have been completed on the first (or previous section) of the main road, provided further that the contractor will not be allowed to open to traffic deviations corresponding to the subsequent 5 kilometre section of the main road until he has completed permanent works on the previous 5 kilometres of the main road and has it opened to traffic.

Where an old road exists near the main road, Contractor shall use this road as the deviation road, following improvement in accordance with clause 902.

The Contractor shall continually maintain deviations such that a travel speed for all vehicular groups of at least 40km/hr is provided on a surface which is smooth, free from ruts, potholes, loose material, dust, and which is regularly graded and frequently watered to keep dust levels as low as possible.

(b) Geometry

For two-lane deviations of an existing road, the carriageway width of the temporary road shall be at least 6.5m wide. For the deviation of a minor public road or a private road, the width of the temporary carriageway shall be the same as the existing carriageway, or such lesser width as agreed by the Engineer,

Where in the opinion of the Engineer, it is impracticable to provide a two-lane deviation, a single-lane carriageway not less than 3.5 m wide with traffic control and passing places shall be provided if possible.

The verges of the deviation shall be cleared and maintained clear for a width of at least 1.5 m beyond the edge of the carriageway or such lesser width as the Engineer may agree.

The gradient of deviation shall not be greater than 7% except with the express approval of the Engineer, and any acute intersection of a gradient shall be properly graded to a smooth vertical curve, to the satisfaction of the Engineer.

Temporary ditches and culverts of adequate size and strength shall be provided alongside and under the temporary road to the satisfaction of the Engineer.

(c) Construction

Unless otherwise instructed gravel wearing course shall be used for the deviation and shall be minimum 150mm compacted thickness complying with Section 10 of the Standard Specification which is placed on a sound, prepared, trimmed and compacted base. The Contractor shall allow in his rates and prices for removal and replacement of any unsuitable material before placing of gravel wearing course as this will not be paid for separately.

The Contractor shall take all measures necessary to minimize the effects of dust, consistent with Clause 904(a) of the Standard Specification. The Contractor shall ensure sufficient resources are available at all times to mitigate the effects of dust, including, but not limited to, the sprinkling of water at the rate of 1.4 litres per m2 at least four (4) times per day or as instructed by the Engineer, with at least one round of sprinkling done before sunset.

(d) Drifts (Fords)

Where a road is deviated to cross a large watercourse which is impracticable to bridge or culvert, a drift shall be constructed of stones or small boulders with the intersections filled with spalls to make a firm bottom. This pitching shall be carried up the banks of the watercourse above the flood level of the stream. The dimension of the drift shall be such that there is less than 0.20 m of water over the road at all times, except in flood. The edge of the drift shall be defined with posts or other markers and a gauge installed to indicate the maximum depth of water over the road. The minimum width of the drift shall be 3.5 m.

The Contractor shall render to the public all possible assistance, particularly in times of flood, and if necessary shall provide a vehicle, labour and tow rope to extract vehicles immobilized in the drift.

(e) Maintenance of Surface

The maintenance shall aim at providing at all times a smooth, dust free surface safe for use by public and private traffic maintained to the satisfaction of the Engineer.

906 Passage of Traffic through the Works

The Contractor shall ensure passage of traffic through the works as shown in the drawings or as instructed by the Engineer. The Contractor shall be deemed to have inspected the site and satisfied himself as to the adequacy of his bid for these works and no additional payment shall be made for any other cost borne by the contractor for traffic control. Should the contractor propose other methods for passage of traffic, e.g. construction of deviations, use of existing roads etc, the contractor shall investigate the alternatives, construct and maintain them to the satisfaction of the Engineer. No traffic shall be diverted without the express authority of the Engineer. The Employer shall not be liable for investigations or costs arising from alternative methods of traffic control proposed by the Contractor. Deviations or other measures for traffic control where proposed by the contractor shall meet requirements of the Specifications and Drawings and shall be subject to approval by the Engineer.

The Contractor shall ensure that the workforce and site supervisory staff at all times wear high visibility garments when work is carried out on or adjacent to a section of the road open to traffic. In addition, the contractor shall provide a full-time traffic safety officer to coordinate all aspects of road safety for the whole site and ensure the continuous availability of appropriate resources to satisfy the requirements of this Clause.

907 Signs, barriers and lights

Contractor shall install signs, barriers and lights as shown in the drawing in the Drawings at the locations where the traffic is being carried off the existing road to the deviation and back. The Contractor shall provide ramps and carry out any measures as instructed by the Engineer to safely carry traffic from the road to deviation.

Notwithstanding any indications to the contrary, the road signs provided shall be fully reflectorised and in conformity with Clause 9.1 of the "Manual for Traffic Signs in Kenya Part II".

909 Assistance to public

Add the following:

The Contractor shall be responsible for safely maintaining and directing traffic through or around any part of the Works included in the Contract, with the maximum practical convenience, for the full twenty four hours of each day.

The Contractor shall render to the public all possible assistance when they are passing over roads maintained by him and over minor, private or temporary roads or bridges when used as deviation or when passing through the Works.

Whenever the Contractor's operations create a condition hazardous to traffic or to the public, he shall furnish, erect and maintain such fences, barricades, lights, signs and other services, as are necessary to prevent accidents or damage or injury to the public.

The Contractor shall also furnish such guards and flagmen as are necessary to give adequate warning to traffic or to the public of any dangerous conditions that might be encountered and shall provide prompt assistance to any vehicle experiencing difficulty in passing over the Works under construction, or through any diversions or roads maintained by the Contractor, if necessary by providing a towing vehicle, labour and tow rope to assist such vehicles.'

Should the Contractor appear to be neglectful or negligent in furnishing warning and protective measures, as above provided, the Engineer may direct attention to the existence of a hazard, and the necessary warning and protective measures shall be furnished and installed at the Contractor's expense. Should the Engineer point out the inadequacy of warning and protective measures, such action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or relieve him of his obligation to furnish and pay for these devices.

910 Access roads

Add the following Sub-Clause

910.1 Use of Minor Private Roads as Deviation

Where agreed by the Engineer that the Contractor may use a minor or private road as a deviation, the Contractor shall be entirely responsible for negotiating with and obtaining the prior consent of the Local Authority or owner, respectively. The Contractor shall pay for any additional maintenance costs or shall if necessary, himself maintain the minor road for the period it is used as a deviation. He shall reinstate the road afterwards to the satisfaction of the Local Authority or owner, and shall compensate the Local Authority or owner for any damage arising out of the use of the road as a deviation.

The standard of such minor or private road when used as a deviation shall at least comply with Clause 904 above for temporary roads and if necessary the Contractor shall, at his own expense improve the road to bring it to this standard before it is used as a deviation, and shall maintain it to that standard while it is used as a deviation. The length of the deviation shall not be excessive and shall be kept as short as practicable.

911 Contractor's construction traffic

Add the following new Clause 911.1 and 911.2.

911.1 Insurance

The Contractor's attention is particularly drawn to Article 16, "Insurance of the Conditions of Contract, and the Contractor shall indemnify the Employer against and shall insure against all losses and claims for injuries or damage to any person or any property which may occur due to the passing of traffic, whether through the Works, or on specially constructed deviations, or on existing public or private roads used as deviations.

912 Measurement and payment

(a) Item: Construction of Deviation

Amend as follows:

The rate for construction of deviation shall include provision, placing, forming and compaction of gravel sub-base, stone base and bituminous wearing courses.

(b) Item: Provide and Maintain Road Signages

Unit: Lump Sum

Payment of the lump sum shall be through equal monthly instalments over the period of the Contract on a pro rata basis subject to the approval of Engineer.

(b) Item: Maintain existing Roads and deviations

Unit: Lump Sum

Payment of the lump sum shall be paid per kilo metre length the period of the Contract, excluding the Defects Liability Period provided that the total sum of instalments paid shall not exceed the lump sum; and

(i) If any month the Engineer is not fully satisfied that the Contractor has fully complied with all the provisions of this sub-section, the Employer shall withhold the whole of the instalments due to the Contractor and the Engineer shall, in addition, deduct from any monies due to the Contractor a sum of Kshs 150,000 per day for the period of non compliance from the date of the Engineer's notice for that month.

(ii) Where notified by the Engineer the contractor shall complete maintenance on a section or sections of the road so notified within 14 days. Provided further that, if the Contractor fails to complete maintenance on any section within 14 days of the Engineer's notification thereof, the Engineer shall deduct Kshs. 200,000 for delay per day.

(c) Item: Reinstatement of Deviations

In the first paragraph of Clause 912 (h), delete the words "by the lump sum stated in the Special Specification' and replace with 'as described under Item 9.04 of the Bill of Quantities".

1100 SHOULDERS AND FOOTPATHS

Add the following to this section:

1101 GENERAL

Shoulders will be constructed in accordance with the typical pavement cross-section, shown on the drawings

1106 Measurement and payment

Measurement and payment shall be in accordance with the relevant bill items in the Bill of Quantities.

1200 NATURAL MATERIAL SUBBASE AND BASE

1201 GENERAL

Natural materials for base and subbase shall conform to the specifications given in Section 12 of the Standard Specifications for Road and Bridge Construction for cement and lime improved base and subbase.

1203 MATERIAL REQUIREMENTS

Natural materials for base and subbase shall conform to the specifications given in Section 12 of the Standard Specifications for cement or lime improved base and subbase.

1204 MEASUREMENT AND PAYMENT

Natural material for subbase and base shall be measured by the cubic metre placed and compacted upon the road calculated as the product of the compacted sectional area laid and the length.

No extra payment will be made for haulage of gravel material as the overhaul costs shall be deemed to have been factored in the rates inserted in the Bills of Quantities.

1400 CEMENT TREATED MATERIALS

1403 MATERIAL REQUIREMENTS

a) Cement

In variation to this Sub-Clause, cement for improvement shall be ORDINARY PORTLAND CEMENT (OPC) complying with KS 1725: 2001 CEM I 42.5 N or equivalent, subject to the Engineer's approval.

b) Lime

Sub-clause 1403 (b) part (ii) of the Standard Specification applies.

1409 PROTECTION AND CURING

Curing of treated material shall be by method **(i)** or method **(iii)**. Method **(ii)** is prohibited.

1500 BITUMINOUS SURFACE TREATMENTS AND SURFACE DRESSING

PART A – GENERAL

1501A bituminous surface treatment

Quality control, workmanship and equipment shall be to current international best practice. Bituminous surface treatments shall be carefully designed by the Contractor, taking into account traffic volumes, ALD of the chippings, surface conditions and requirements for specific locations.

Application rates of the bitumen spray and the chippings will be approved by the Engineer prior to any trial sections of the work, but the under listed is anticipated and can be used for guidance purpose:

a) Chippings

- 10/14mm size pre-coated chippings at a spread rate of 60-100m^2/m^3
- 6/10mm size pre-coated chippings at spread rate of 70-120m^2/m^3

b) Bitumen Spray Rates

- 1.0 - 1.4 l/m^2 for the single seal to main carriageway
- 0.8 - 1.0 l/m^2 for the single seal to shoulders and junctions.

1504A HEATING OF BITUMINOUS BINDER

Bitumen 80/100 shall be sprayed in the range of 140°C – 200°C and the maximum heating temperature is 180°C. Bituminous binder shall not be kept within spraying temperature range for periods exceeding 1 hour.

1505A ADHESION AGENT

For all surface dressing, an approved adhesion agent shall be added to the binder, unless otherwise instructed by the Engineer. Adhesion agent shall be added to, and well mixed with, the binder immediately before each spray run.

1506A CONSTRUCTION LIMITATIONS

No bituminous spray shall be applied to a surface with a road temperature of less than 25°C for surface dressing, and 15°C for prime coat, or with adverse weather conditions threatening. A minimum period of 6 weeks shall elapse between the placement of asphalt and the application thereon of bituminous surface dressing.

PART B - PRIME COAT AND TACK COAT

1502B Materials for Prime Coat and Tack Coat

(i) The binder for prime coat shall be MC-30 and shall be applied over the full width of the surface of the course to receive the first layer of bituminous material.

(ii) ii) The binder for the tack coat shall be K1-60. A tack coat shall be applied over the full width of the surface of each bituminous material to receive a further bituminous layer. A tack coat shall also be applied to any prime coat, which has lost its adhesive properties due to contamination or long exposure or weathering before receiving the bituminous layer. Such an application shall be made without additional expense to the Employer unless it is required due to reasons outside the Contractor's control.

1504B Spraying of Prime Coat and Tack Coat

Application rates of the bituminous prime coat shall be designed by the Contractor to take into account surface condition of the surface to be primed, expected traffic conditions, blinding, and the time duration before the subsequent bituminous treatment is applied

The rate of spray of bituminous prime coat refers to the gross volume of the cut-back bitumen, that is to say the volume of the bitumen plus dilutant.

iii) The rate of application of prime coat shall be 1.0 to 1.2 litres/m^2. The exact quantity to be applied may be varied within these limits to suit field conditions and will be determined from trials by the Engineer.

iv) The rate of application of the tack coat on bituminous surfaces shall be 0.5 to 0.8 litres/m^2. The exact quantity to be applied may be varied within these limits to suit field conditions and will be determined from trials by the Contractor and approved by the Engineer.

1506B TOLERANCES

Tolerance shall be +5% of the rate ordered. Work records are to be kept on a daily basis, with details recorded and calculated at the end of each distributor run. The Contractor shall prepare and use a suitable record sheet, which records details of weather and road temperature conditions, length and width of each run, binder dipping before and after each run of the distributor, calculation of actual application rate, under or overspray, and spray outside tolerance. Actual application rates shall be calculated immediately after each run, so that the operation of the distributor can be adjusted to ensure subsequent application rates are within tolerance.

PART C – SURFACE DRESSING

1502C Materials for Surface Dressing

The Contractor shall take full responsibility for the design and construction of all surface dressings. They shall, however, be constructed using the materials specified below. The proposed designs and construction procedures shall be presented to the Engineer for approval prior to the commencement of any surface dressing work on any section of the road.

a) Binder

The bituminous binder to be used shall be 80/100 Penetration grade bitumen with a provision for kerosene or diesel (cutter) to cut it back for application at the ambient temperatures. The selection of the grade of bituminous binder is temperature dependant and shall be in accordance with the guidelines of TRL ORN3.

b) Chippings

Chippings shall be of Class 1 materials and shall comply in all respects with clause 1502C of the Standard Specification. Should it prove necessary in the Engineer's opinion to wash chippings, no extra payment will be made to the Contractor for this operation.

1503C SPRAY AND SPREAD RATES OF BITUMEN AND CHIPPINGS

Spray and Spread Rates for bitumen and chippings cannot be calculated until samples of the chippings to be used are available for test. The tests shall be carried out and the rates shall be determined in accordance with the design method described in TRL ORN3 and approved by the Engineer.

After submission of samples and completion of laboratory tests on chippings and binder, and design of the surface dressing by the Contractor, the Contractor shall in the presence of the Engineer, lay trial sections of seal at various rates of spray and spread as approved by the Engineer and in accordance with Clause 1503C of the Standard Specification.

Should any change occur in nature of source of chippings or bitumen, the Contractor shall advise the Engineer accordingly who will then decide if any revisions are required to the spray and spread rates.

If any changes are required, the Contractor shall carry out further trials as instructed by the Engineer.

Payment for binder and chippings will be based on instructed rates

1505C Pre-coated chippings

Where shown on the drawings or instructed by the Engineer, chippings used for surface dressing shall be precoated. The bituminous binder used for precoating shall be anionic A3 bitumen emulsion.

The chippings shall be completely coated with the binder at a rate of about 0.8% by dry weight of chippings. The actual rate of application shall be as instructed by the Engineer following Contractor's field trials.

Mixing plant shall comply with the requirements of Clause 1603A, sub-clause (a) and (b) of the Specification.

The binder shall be heated so that it can be distributed uniformly and care shall be taken not to overheat it. The temperature shall at no time exceed 35^{0}C.

The chippings shall be washed (if necessary), dried and heated so that they are mixed at a temperature of between 20^{0}C and 35^{0}C. The binder shall be introduced in the mixer in the amount specified and the materials mixed until a complete and uniform coating of the chippings is obtained.

Should any change occur in the nature of source of chippings or binder, the Contractor shall advise the Engineer accordingly who will then decide if new field trials are necessary and if any revisions are required to the spray and spread rates.

1506C CONSTRUCTION PLANT FOR SURFACE DRESSING

Bitumen Distributor

The bitumen distributor shall have a calibrated dipstick able to accurately measure the contents of the distributor to the nearest 50 litres.

1508C Application of Surface Dressing

When commencing and stopping spraying, sheets of clean building paper at least 2m wide shall be spread across the full width to be sprayed to give a good sharp edge. Care shall to be taken at longitudinal joints to use appropriate end nozzles to ensure prevention of overlapping of bitumen spray.

1509C Aftercare and Control of Traffic

Surface dressing shall not be trafficked for at least seven days. Where the surface dressing is to be applied to a new Asphaltic concrete, a period of minimum 28 days must elapse before commencing the surface dressing

1510C TOLERANCES

Tolerance shall be +5% of the rate ordered. Work records are to be kept on a daily basis, with details recorded and calculated at the end of each distributor run The Contractor shall prepare and use a suitable record sheet, which records details of weather and road temperature conditions, length and width of run, binder dippings before and after each run of the distributor, calculation of actual application rate, under or overspray, and spray outside tolerance, chipping details and actual spread rate. Actual application rates shall be calculated immediately after each run, so that the operation of the distributor or aggregate spreader can be adjusted to ensure subsequent application rates are within tolerance.

1511C Measurement and Payment

(c) Item: Seal Coat
Unit: Litre (of medium cut bitumen used for each seal coat).

b) Item: Tack Coat
Unit: Litre of diluted emulsion.

c) Item: Precoated Chippings
Unit: m^3 of each nominal size for each class

Precoated chippings shall be measured by the cubic metre of each nominal size for each class calculated as the product of the area in square metres instructed to be covered and the reciprocal of the instructed rate of application in square metres/cubic metre or the actual rate of application in square metres/ cubic metrewhichever gives the lower volume.

The unit rate for pre-coated chippings shall include the cost of providing and hauling the chippings and bitumen, precoating the chippings at instructed rates, spreading and rolling the chippings at application rate falling within the specified range and complying with Parts A and C of Section 15 of this Specification.

The rate inserted for blending 80/100 penetration grade bitumen with kerosene shall be for the amount of cutter in litres used for cut-back.

The rate inserted for providing and adding adhesion agent to the bitumen binder shall be for the amount of adhesion agent in litres used.

1600 BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES

1600A GENERAL

This section covers different types of bituminous mixes for base and surface (wearing and binder courses) and is divided into the following parts:-

Part A	**General**
Part B	**Asphalt Concrete for Surfacing**
Part C	**Dense Bitumen Macadam for Base**

PART A

1601A SCOPE

Part A comprises all the general requirements for bituminous mixes which apply to Part B and C as well. Quality control, workmanship and equipment shall be to current international best practice.

1602A REQUIREMENTS FROM OTHER SECTIONS

The following sections of this Specification apply to Part B of this section and shall be read in conjunction therewith:-

Section 2	Materials and Testing of Materials
Section 3	Setting Out and Tolerances
Section 6	Quarries, Borrow Pits, Stockpile and Spoil Areas
Section 15	Bituminous Surface Treatments and Surface Dressing

1603A Construction Plant

a) General

c) Laying Plant

The self propelled spreader finisher shall be fitted with electronic level control devices, and level control shall be from tensioned wire supported at every 5m intervals or levelling beam, as tried on site and subsequently approved by the Engineer.

d) Compaction Plant

The Contractor shall provide sufficient rollers of adequate size and weight to achieve the specified compaction. Prior to commencing the laying of bituminous mixes in the permanent works, the Contractor shall carry out site trials in accordance with Section 2 of this Specification to demonstrate the adequacy of his plant and to determine the optimum method of use and sequence of operation of the rollers.

It is important to achieve as high a density as possible at the time of construction and it is expected that vibrating rollers will be required to produce the best results. However, it is essential that thorough pre-construction trials are carried out to ensure that:

i). The roller is set up to have the optimum amplitude and frequency of vibration for the particular material being laid.

ii). That the roller does not cause breakdown of the aggregate particles.

iii). That the optimum compaction temperatures are established which allow compaction without causing ripple effects or other distortions of the surfacing.

1605A DESIGN AND WORKING MIXES

The Contractor shall design a job-mix formula and carry out all appropriate laboratory tests and site trials to produce a working mix, which conforms in all respects to the requirements of this Specification, and is approved for use by the Engineer two months prior to commencing work using a bituminous mix,.

The mixes are to be designed in accordance with ORN19: A guide to the design of hot mix asphalt in tropical and sub-tropical countries.

A volumetric design shall be carried out using the Marshall Method as described in Appendix C of ORN19. The mixes must also satisfy the refusal density requirements. This test is to be carried out in accordance with Appendix G of ORN19. The voids in mix (VIM) must be >3% at refusal density at the optimum bitumen content from the Marshall design and also at the optimum plus and optimum minus the margin of tolerance permitted during mixing (bitumen content as percent of total mix + 0.3%).

Natural sand shall not be used in bituminous mixes.

1606A Site trials

Replace the second paragraph with the following:

The trials shall be carried out to:

(a) Test materials, designed in the laboratory, so that a workable mix which satisfies the specification requirements can be selected.

(b) To enable the Contractor to demonstrate the suitability of his mixing and compaction equipment to provide and compact the material to the specified density and to confirm that the other specified requirements of the completed asphalt pavement layer can be achieved.

1607A Mixing of Aggregates and Bitumen

The aggregates, minus the filler, prepared as specified above, shall be accurately weighed and conveyed into the mixer in proportionate amounts of each aggregate size required to meet the Job-Mix Formula. The required amount of bitumen for each batch shall be introduced into the mixer. In batch mixing, the bitumen shall be added after the aggregates have been introduced into the mixer and mixed for 5 to 10 seconds. The filler shall be added after the bitumen and mixing shall continue after addition of the filler for at least the time recommended by the plant manufacturer, or as much extra time as is necessary to obtain a homogeneous mixture, but for no longer.

Aggregate and bitumen shall each be heated to enter the mixing chamber at temperatures selected within the range 150°C to 170°C. The temperature of the stone at entry to the mixing chamber shall not be more than 15°C higher than that of the bitumen: the temperature of the bitumen shall be such that on entry to the mixer its kinematic viscosity is in the range 150 – 300 centistokes. The temperature of the aggregate and bitumen at entry into the mixing chamber shall be chosen within the above limits and having regard to the prevailing air temperature and haulage distance to ensure that the temperature of the mix is between 135°C and 165°C when it is laid and not less than 120°C when rolling is commenced. If excessive displacement occurs under the roller the minimum rolling temperature may be reduced at the sole discretion of the Engineer.

The volume of the aggregate and bitumen shall not be so great as to extend above the tips of the mixer blades when the blades are in vertical position. All overheated and carbonized mixtures, which foam or show indication of moisture, will be rejected. When moisture is detected in the finished mixture, all aggregates in the bins shall be removed and returned to the stockpiles.

1608A Transporting the Mixture

Add the following:

The mix shall be transported from the mixing plant to the spreader in trucks having tight, clean, smooth beds, which have been treated to prevent adhesion of the mixture to the truck bodies. Gasoline, kerosene, diesel fuel or other solvents shall not be used for this purpose. Loads shall be covered by waterproof canvas or metal sheets during wet weather. Vehicles shall be insulated when the air temperature and/or length of haul make this necessary to maintain the temperature between the specified limits. Any loads wetted excessively by rain will be rejected. Hauling over freshly laid material will not be permitted.

1609A Laying the Mixture

The speed of the spreader shall be adjusted to match the speed of mix supply to ensure a continuous paving operation giving a smooth surface. Paving lanes shall be parallel to the road centreline, and true to line and level.

Where possible laying plant capable of spreading the mixture over the required full paved width shall be used, which may require the use of at least two mechanical pavers working in echelon.

All joints shall present the same texture, density and smoothness as other areas of the surfacing. The joints between old and new lanes or sections shall be carefully formed in such manner as to ensure a continuous bond between the old and new pavement. All contact surfaces at cold joints, joints with manholes, pits, etc. shall be coated with a thin, uniform coat of MC70 or other medium curing bitumen or as directed by the engineer

1610A Compaction

Replace the 4th paragraph by the following:

Initial rolling with a pneumatic tyred roller shall follow the laying plant as closely as possible. The rollers shall be operated at a slow and uniform speed (not exceeding 5km/h).

Add the following at the end:

Tests for conformity with the smoothness and levels specified shall be made by the Contractor immediately after initial compaction and any deviations in excess of the specified tolerances shall be corrected by loosening the hot surface with rakes and removing or adding material as necessary before continuing the rolling. The speed of the rollers shall not exceed 5km/h and shall at all times be slow enough to avoid displacement of the hot mixture. Any displacement of the mixture occurring as a result of reversing the direction of the roller, or from any other

cause, shall be corrected at once by loosening the surface with rakes and re-rolling. Rolling of the surfacing shall be continued until all roller marks are eliminated and the required density is obtained.

The rollers shall not be permitted to stand on surfacing which has not been fully compacted. Precautions shall be taken to prevent the dropping of oil, grease, gasoline, or other foreign matter on any layer. The Contractor shall provide competent workmen who are capable of performing all work incidentals to the correction of all surfacing irregularities.

After final rolling, no vehicular traffic of any kind shall be permitted for at least 12 hours

1611A Finishing Joints and Edges

Amend the second paragraph as follows:

Spreading of the mixture shall be as continuous as possible. Transverse joints shall be formed by cutting neatly in a straight line across the previous run to expose the full depth of the course. The vertical face so formed shall be painted lightly with hot 60/70 penetration grade bitumen just before the additional mixture is placed against it.

Amend the fourth paragraph as follows:

When the abutting lane is not placed in the same day, or the joint is destroyed by traffic, the edge of the lane shall be cut back as necessary, trimmed to line and painted lightly with' hot 60/70 penetration grade bitumen just before the abutting lane is placed.

Any fresh mixture spread accidentally on the existing work at a joint shall be carefully removed by brooming it back on to uncompacted work, so as to avoid formation of irregularities at the joint. The finish at joints shall comply with the surface requirements and shall present the same uniformity of finish, texture and density as other sections of the work. The edges of the course shall be rolled concurrently with or immediately after the longitudinal joint. In rolling the edges, roller wheels shall extend 50 to 100mm beyond the edge.

Add the following:

The Contractor shall produce a plan showing the position of all pavement construction joints for approval by the Engineer before pavement construction commences.

Construction joints in the various pavement layers shall be staggered by at least the following distances:

Transverse joints in binder course shall be staggered by at least 500mm. The roller shall pass over the unprotected end of the freshly laid mixture only when laying of the surfacing is to be discontinued for such length of time as to permit the mixture to become cold. Otherwise 500mm at the end of the lane shall be left un-compacted.

Cold transverse joints shall be cut back to expose an even, vertical surface for the full compacted thickness of the course and painted with medium curing cutback bitumen as specified above. The fresh mixture shall be raked uniformly against the joint, and carefully compacted to ensure a good bond with the cold material.

The Contractor shall adjust any kerbs, gulley pots and chambers in accordance with final finished road level before laying the final Asphalt Concrete binder material 0/14 and 0/20 surfacing layer.

1600B ASPHALT CONCRETE FOR SURFACING

1601B INTRODUCTION

Some modifications, to the Standard Specification, which takes into account some aspects of the Superpave Mixture Design methods, have been made. This shall be in accordance with the procedures presented in Overseas Road Note 19, " A guide to the design of hot mix asphalt in tropical and subtropical countries" and detailed in the current manuals produced by the Asphalt Institute. The contractor shall be deemed to possess a copy of these publications and shall provide at least two copies of each on site, one for the Engineer and the other for the Contractor.

1602B Materials for Asphalt Concrete

(a) Penetration grade bitumen

Delete sub-section (a) and replace with:

Bitumen shall be penetration grade, and shall meet the requirements of Table 4.3 in ORN 19 as summarized below:

Minimum requirements for penetration grade bitumen (ORN19 Table 4.3)

Test		*Test method (ASTM)*	*Penetration grade*		
			40/50	60/70	80/100
Based on original bitumen					
Penetration at 25°C		D 5	40-50	60-70	80-100
Softening point (°C)		D 36	49-59	46-56	42-51
Flash point (°C)	Min	D 92	232	232	219
Solubility in trichloroethylene (%)	Min	D 2042	99	99	99
TFOT heating for 5h at 163 °C		D1754			
a. Loss by mass (%)	Max	-	0.5	0.5	0.8
b. Penetration (% of original)	Min	D 5	58	54	50
c. Ductility at 25°C	Min	D 113	-	50	75

The bitumen for asphalt concrete works shall be 60/70 grade.

(b) Aggregate

(i) In the standard specification rename Table 16B-1 as 16B-1(a)

(i) Add the following:

The coarse aggregate shall be entirely crushed rock, from a source known to give high values of stability (> 9kN) in the Marshall test. Crushed river gravel shall not be used. Aggregate shall be Class 'a' meeting the requirements given in Table 16B-1b below.

Table 16B-1(b) Requirements for aggregate

Property	Test	Property
Cleanliness	Sand equivalent:[1] for <4.75 mm fraction	>40
	(Material passing 0.425 sieve)	
	Plasticity Index[2]	<4
	Linear Shrinkage	<2

Property	Test	Property
Particle shape	Flakiness Index (FI)[3]	<25
Strength	Aggregate Crushing Value (ACV)[4]	<25
	Aggregate Impact Value (AIV)[4]	<25
	10%FACT (dry) kN[4]	>160
	Los Angeles Abrasion (LAA)[5]	<30
Abrasion	Aggregate Abrasion Value[4]	<12
Soundness[7] (5 cycles, % loss)	Sodium Sulphate Soundness (SSS):	
	Coarse aggregate	<10
	Fine aggregate	<16
	Magnesium Sulphate Soundness (MSS):	
	Coarse aggregate	<15
	Fine aggregate	<20
Polishing	Polished Stone Value	>60
Water absorption	Water Absorption[6]	<2
Bitumen affinity	Immersion Mechanical test: index of retained Marshall stability[8]	>75
	Static Immersion Test[9]	>95% coating retained
	Retained Indirect Tensile strength[10]	>79% (at 7% VIM)

1 AASHTO T176
2 British Standard 1377: Part 2
3 British Standard 812: Part 105
4 British Standard 812: Parts 110 to 114
5 ASTM C131 and C535
6 British Standard 812: Part 2
7 AASHTO T104
8 D Whiteoak (1990) (Shell Bitumen Handbook)
9 AASHTO T182
10 AASHTO T283

Unless otherwise instructed by the Engineer aggregates should satisfy the following Superpave aggregate consensus properties which requirements are presented in Table 16B-1(c):

- Coarse Aggregate Angularity (CAA) – ASTM D 5821
- Fine Aggregate Angularity (FAA) – AASHTO T 304
- Flat and elongated particles – ASTM D 4791
- Sand equivalent – AASHTO T 176

Table 16B-1(c) Superpave aggregate consensus property requirements

Cumulative Equivalent Standard Axles (CESA)[1] in Million	Fractured faces, Coarse Aggregate, Percent Minimum		Uncompacted Void Content of Fine Aggregate, Percent Minimum		Sand Equivalent, Percent Minimum	Flat and Elongated, Percent Maximum
	Depth from surface		Depth from surface			
	≤100mm	>100mm	≤100mm	>100mm		
3 to <10	85/80[2]	60/-	45	40	45	10

10 to <30	95/90	80/75	45	40	45	10

[1]The anticipated project traffic level expected over a 20 year design period
[2]85/80 denotes that 85 percent of the coarse aggregate has one fractured face and 80 percent has two or more fractured faces.

1603B GRADING REQUIREMENTS

The grading mixture of coarse and fine aggregate shall meet the requirements given in Table 16B-1(d) and Table 16B-1(e) for a 19mm and 12.5mm nominal maximum size aggregate.

Table 16B-1(d) Superpave aggregate grading control point

Nominal Maximum Size (mm) *(Note 1 below)*	Sieve size (mm)	Control point (%passing)	
		Minimum	Maximum
19.0	25	100	-
	19	90	100
	12.5	-	90
	2.36	23	49
	0.075	2	8
12.5	19	100	-
	12.5	90	100
	9.5	-	90
	2.36	28	58
	0.075	2	10

Table 16B-1(e) Superpave boundaries of aggregate restricted zone (Note 2 below)

Sieve size within restricted zone (mm)	Percent passing sieve size Nominal maximum size (mm) (Note 1 below)			
	19.0		12.5	
	Minimum	Maximum	Minimum	Maximum
2.36	34.6	34.6	39.1	39.1
1.18	22.3	28.3	25.6	31.6
0.6	16.7	20.7	19.1	23.1
0.3	13.7	13.7	15.5	15.5

Note (1) - The definition of Nominal Maximum Size of aggregate is one sieve larger than the first sieve to retain more than ten per cent of the aggregate. It is also recommended that where possible the largest particle size should not be more than 25 mm so that the requirements of the Marshall test can be complied with.

Note (2) – If gradations that violate the restricted zone perform similarly to or better than the mixes having gradations passing outside the restricted zone; then, the restricted zone requirement is redundant for mixes meeting all Marshall and/or Superpave volumetric parameters specified in section 1604B of this specification.

1604B REQUIREMENTS FOR ASPHALT CONCRETE

The mix design should be carried out using the Marshall and/or the Superpave test procedures. The Engineer should instruct in writing if either or both of these methods should be applied.

The mix design specifications for the two methods are as follows:

Marshall Method

The mixture shall comply with the requirements given in Table 16B-2(a).

TABLE 16B-2(a) Requirements for Asphalt Concrete

Asphalt concrete	No. of blows Marshall compaction	Minimum Stability (kN)	Flow (mm)	Air voids (VIM) (%)	Voids in Mineral Aggregate (VMA) (%)
19	75[1]	9	2 – 4	3 – 6	Minimum 13
12.5	75[1]	9	2 – 4	3 – 6	Minimum 14

Note 1: Satisfactory volumetric composition must be confirmed by refusal density testing

The nominal binder content shall be 5%. In addition to the requirements given in Table 16B-2, the maximum Marshall Stability for 2x75 blows shall be 18 KN, and at compaction to refusal shall retain a minimum of 3% VIM.

In order to determine the suitability of a coarse aggregate source, a Marshall Testprogramme shall be carried out. It will be advantageous to use a crushed rock which is known from past experience to give good results in this test procedure and should meet the requirements presented in Table 16B-1(b) and Table 16B-1(c). A grading conforming to requirements detailed in Table 16B-1(**d**) and Table 16B-1(**e**) of this Specification shall be used.

Having established the suitability of the aggregate source, several gradings satisfying the requirements of Table 16B-1(**d**) and Table 16B-1(**e**) shall be tested in the laboratory, including that used for the Marshall test, to establish relationships between bitumen content and VIM at refusal density. For each mix, samples will be made up to a range of bitumen contents and compacted to refusal using a vibratory hammer in accordance with BS 598 (Part 104:1989) with the following revision:

"It should first be confirmed that compaction on one face of the sample gives the same refusal density as when the compaction cycle is applied to both faces of the same sample. The procedure which gives the highest result shall be used."

From the bitumen content-VIM relationship a bitumen content which corresponds to VIM of 3% shall be identified. Compaction trials shall be undertaken, to confirm the workability of the mix. At least two or more gradings will be required for compaction trials. The compaction trials will identify a workable mix which can be made to a bitumen content which gives 3% Voids in Mix (VIM) at refusal density.

(a) Superpave method

The mix design, when compacted in accordance with AASHTO T 312 (Preparing and determining the density of Hot Mix Asphalt (HMA) specimens by means of the Superpave gyratory compactor) shall meet the relative density, voids in the mineral aggregate (VMA), Voids filled with Asphalt (VFA) and dust to binder ratio requirements specified in Table 16-B2(b).

The initial, design and maximum number of gyrations are specified in AASHTO R 35, Superpave volumetric design for Hot Mix Asphalt (HMA).

Cumulative Equivalent Standard Axles (CESA)[1] in Million	Required Relative Density, Percent of theoretical maximum specific gravity			Voids in the Mineral Aggregate (VMA), Percent Minimum		Voids Filled with Asphalt (VFA) Range, Percent	Dust-to-Binder Ration Range
	N initial	N design	N max	Nominal maximum size Aggregate (mm)			
				19.0	12.5		
3 to <10	≥89.0	96.0	≥98.0	13.0	14.0	65-75	0.6-1.2
10 to <30	≥89.0	96.0	≥98.0	13.0	14.0	65-75	0.6-1.2

[1]The anticipated project traffic level expected over a 20 year design period

Table 16B-1(c): Superpave aggregate grading control point

Nominal Maximum Size (mm), (Note 1 below)	Sieve size (mm)	Control point (%passing)	
37.5	0.075	0	6
	2.36	15	41
	25.0		90
	37.5	90	100
	50	100	-
25.0	0.075	1	7
	2.36	19	45
	19.0		90
	25.0	90	100
	37.5	100	-
19.0	0.075	2	8
	2.36	23	49
	12.5	-	90
	19.0	90	100
	25.0	100	-
12.5	0.075	2	10
	2.36	28	58
	9.5	-	90
	12.5	90	100
	19.0	100	-

Table 16B-1(d): Superpave boundaries of aggregate restricted zone

Sieve size within restricted zone	Minimum and maximum boundaries of Sieve size for nominal maximum aggregate size (minimum /maximum % passing)			
	37.5	25.0	19.0	12.5
4.75	34.7-34.7	39.5-39.5	-	-
2.35	23.3-27.3	26.8-30.8	34.6-34.6	39.1-39.1
1.18	15.5-21.5	18.1-24.1	22.3-29.3	25.6-31.6
0.6	11.7-15.7	13.6-17.6	16.7-20.7	19.1-23.1
0.3	10.0-10.0	11.4-114	13.7-13.7	15.5-15.5

Note (1): The definition of Nominal Maximum Size of aggregate is one sieve larger than the first sieve to retain more than ten per cent of the aggregate. It is also recommended that where possible that largest particle size should not be more than 25 mm so that the requirements of the marshal test can be complied with.

Mixes identified for compaction trials shall be manufactured to the laboratory design bitumen content and two other bitumen contents of + 0.5 % and 1.0% additional bitumen. Cores will be cut to determine the density of compacted material. The core will then be re-heated to 145±5°C in the appropriate mould and compacted to refusal in the vibrating hammer test. The cores cut from the compaction trial must have a destiny equivalent to 95% refusal density.

The compaction trials will identify a workable mix which can be made to bitumen content which gives 3% voids in mix (VIM) at refusal density.

1605B Mixing and laying asphalt concrete

Amend with the following:

The temperature of the bitumen and aggregates when mixed should be determined using both Penetration Index (PI) and softening point of the bitumen on the bitumen tests data chart (BTDC). The temperature of the bitumen and aggregates when mixed shall be 110+/-3°C above the softening point (Ring and Ball) of the bitumen.

Compaction shall commence as soon as the mix can support the roller without undue displacement of material and completed before the temperature of the mix falls below 90°C.

The mixing and placing of asphalt concrete must be carried out only under favourable weather conditions. Mixing and placing of asphalt concrete will not be allowed if the moisture content of aggregate affects the uniformity of temperature, or if free water is present on the working surface. Mixing shall not be allowed to take place more than two hours before placing begins unless provision had been made for storing. Storage of mixed materials will only be permitted in insulated hot mix bins. In any case, storage will not be permitted for a period longer than 12 hours after mixing, unless otherwise approved by the Engineer.

The minimum thickness of the compacted layer shall be 35mm when 12.5mm nominal maximum size aggregate is used (on the road shoulders).

1606B Compaction

Rolling shall be continued until compaction of the completed layer attains a minimum mean value of 95% of refusal density (no value less than 93%) and until the voids measured in the compacted layer are within the specified range as appropriate.

1700 CONCRETE WORKS

1703 Materials for Concrete

(b) Replace the first 3 lines with the following; -

Cement shall comply with the following Kenyan Standards:

- KS1725: 2001 CEM 1 42.5 N for ordinary Portland cement

1703, 1704, 1705 CONCRETE WORKS

LEVELLING CONCRETE (CLASS 15/20) FOR BOTTOM SLAB INCLUSIVE OF COST OF FORMWORKS

This work shall consist of placing and levelling lean Concrete Class 15/20 over the prepared bed of stone boulders in the foundation for bottom slab and wing walls in accordance with these specifications and which conformity with the lines, grades, thickness and typical cross-sections shown on the drawings unless otherwise directed by the Engineer.

a) Materials for Levelling Concrete

Requirement for the concrete Class 15/20 is specified as follows:-

Design compressive strength twenty eight (28) days : $15N/mm^2$

Maximum size of coarse aggregate : 20mm

Minimum cement content : 300 kg/m^3.

Maximum water/cement ration of 50% with slump of 80mm.

b) Construction Method

The bed of stone boulders or formation upon which the levelling concrete will be placed shall be free from water, smooth, compacted and true to the grades and cross-section shall be set to the required lines and grades.

c) Measurement and payment

Measurement for levelling concrete (Class 15/20) shall be made in cubic metres completed and accepted levelling concrete work measured in place which is done in accordance with the Drawings and the Specifications.

Payment for this work shall be the full compensation for furnishing and placing all materials, labour, equipment and tools, and other incidentals to Specifications and as directed by the Engineer.

Pay Item No. 17/02 Levelling Concrete Works (Class 15/20) for Box Culvert and wing walls inclusive of Cost of Form works.

(CLASS 25/20) OF CULVERT WALLS AND SLABS

This work shall consist of furnishing, mixing, delivering and placing of the concrete for the construction of culvert walls and slabs, in accordance with these Specifications and in conformity with the requirements shown on the Drawings.

Concrete Class 25/20, with UF2 finish on roof and floor slabs, shall be used for Culvert walls and slabs.

a) Concrete Materials

i) Cement

Cement shall be of Portland type and shall conform to the requirements of BS 12 or equivalent.

The Contractor shall select only one type or brand of cement or others. Changing of type or brand of cement will not be permitted without a new mix design approved by the Engineer. All cement is subject to the Engineer's approval; however, approval of cement by the Engineer shall not relieve the Contractor of the responsibility to furnish concrete of the specified compressive strength.

Conveyance of cement by jute bags shall not be permitted. Storage in the Contractor's silo or storehouse shall not exceed more than two (2) months, and age of cement after manufacture at mill shall not exceed more than four (4) months. The Contractor shall submit to the Engineer for his approval the result of quality certificate done prepared by the manufacturer.

Whenever it is found out that cement have been stored too long, moist, or caked, the cement shall be rejected and removed from the project.

b) Aggregates

(V) Fine and coarse aggregates must be clean, hard, strong and durable, not susceptible to ASR and free from absorbed chemicals, clay coating, or materials in amounts that could affect hydration, bonding, strength and durability of concrete.

Grading of aggregates shall conform to the following requirements:

i) Grading of Fine Aggregates

Sieve Size (mm)	Percentage by Weight Passing
10	100
5	89 -100
2.5	60 -100
1.2	30 -100
0.6	15 - 54
0.3	5 - 40
0.15	0 - 15

ii) Grading of Coarse Aggregates

Size of Coarse Aggregate	Amounts finer than each standard sieve percentage by weight							
	40	30	25	20	15	10	5	2.5
% by weight	100	-	-	90-100	-	30-69	0-10	-

Other requirements for aggregates are as follows:

iii) **Fine Aggregates**

Fitness Modulus, AASHTO M-6	: 2.3 – 3.1
Sodium Sulphate Soundness, AASHTO T104	: Max. 10% loss
Content of Friable Particles AASHTO 112	: Max 1% by weight
Sand Equivalent, AASHTO T176	: Min. 75

iv) **Coarse Aggregate**

Abrasion, AASGTO T96	: Max. 405 loss
Soft Fragment and shale, AASHTO M80	: Max. 5% by weight
Thin and elongated Pieces, AASHTO M80	: Max. 15%

v) **Water**

All sources of water to be used with cement shall be approved by the Engineer. Water shall be free from injurious quantities of oil, alkali, vegetation matter and salt as determined by the Engineer.

vi) **Admixture**

Only admixture, which have been tested and approved in the site laboratory through trial mixing for design proportion shall be used.

Before selection of admixture, the Contractor shall submit to the Engineer the specific information or guarantees prepared by the admixture supplier.
The Contractor shall not exclude the admixture from concrete proportions.

c) **Concrete Class 25/20**

The requirements of Concrete Class 25/20 are provided as follows unless otherwise the Engineer will designate any alteration.

Design compressive strength twenty eight (28) days	: 25N/mm^2
Minimum cement content	: 300kg/m3
Maximum cement content	: 540kg/m3
Maximum size of coarse aggregates	: 20mm
Maximum water/cement ratio of 50% with slump of 80mm	

d) **Proportioning Concrete**

The Contractor shall consult with the Engineer as to mix proportions at least sixty (60) days prior to beginning the concrete work. The actual mix proportions of cement, aggregates, water and admixture shall be determined by the Contractor under supervision of the Engineer in the site laboratory.

The Contractor shall prepare the design proportions which has 120% of the strength requirement specified for the designated class of concrete.

No class of concrete shall be prepared or placed until its job-mix proportions have been approved by the Engineer.

i. Concrete Works

1. Batching

Batching shall be done by weight with accuracy of:

Cement	: ½ percent
Aggregate	: ½ percent
Water and Admixture	: 1 percent.

Equipment should be capable of measuring quantities within these tolerances for the smartest batch regularly used, as well as for larger batches.

The accuracy of batching equipment should be checked every month in the presence of the Engineer and adjusted when necessary.

2. Mixing and delivery

Slump of mixed concrete shall be checked and approved at an accuracy of +25mm against designated slump in these Specifications.

3. Concrete in hot weather

No concrete shall be placed when the ambient air temperature is expected to exceed 33^{0}C during placement operations.

4. Concreting at night

No concrete shall be mixed, placed or finished when natural light is insufficient, unless an adequate approved artificial lighting system is operated; such night work is subject to approval by the engineer.

5. Placing

In preparation of the placing of concrete, the interior space of forms shall be cleaned and approved by the engineer prior to placing concrete. All temporary members except tie bars to support forms shall be removed entirely from the forms and not buried in the concrete. The use of open and vertical chute shall not be permitted unless otherwise directed by the engineer.

The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

ii. Measurement and Payment

Measurements for the Concrete Works Class 25/20 of culvert walls and slabs, shall be made in cubic metres for the walls and slabs actually constructed, measured from their dimensions shown on the Drawings. Payment for the Concrete Works (Class 25/20) of culvert walls and slabs shall be the full compensation for furnishing all materials of the concrete mixing, delivering, placing, finishing horizontal surfaces to class UF2 finish, and curing the concrete, equipment and tools, labour and other incidental necessary for the

completion of the work in accordance with the Drawings and these Specifications and as directed by the Engineer.

(CLASS 30/20)

Description

This work shall consist of furnishing, mixing, delivering and placing of the concrete for the construction of the insitu beams and deck slab, in accordance with Standard Specifications and in conformity with the requirements shown on the Drawings.

Concrete Class 30/20 shall be used for beams and slab.

Concrete Materials

a) Cement
Cement shall be of Portland type and shall conform to the requirements of BS or equivalent.
b) The Contractor shall select only one type or brand of cement or others. Changing of type or of cement will not be permitted without a new mix design approved by the Engineer. All cement is subject to the Engineers approval however, approval of cement by the Engineer shall not relieve the Contractor of the responsibility to furnish concrete of the specified compressive strength.
c) Conveyance of cement by jute bags shall not be permitted. Storage in the Contractors silo or store house shall not exceed more than two (2) months, and age of cement after submit to the Engineer for his approval the result of quality certificate done prepared by the manufacturer.
d) Whenever it is found out that cement have been stored too long, moist, or caked, the cement shall be rejected and removed from the project.

e) **Aggregates**
Fine and coarse aggregates must be clean, hard, strong and durable, not susceptible to ASR and free from absorbed chemicals, clay coating, or materials in amounts that could affect hydration, bonding, strength and durability of concrete. The aggregates should conform to BS 882.

f) Grading of aggregates shall conform to BS 812.

Other requirements for aggregates are as follows:

Fine Aggregates

Fitness Modulus, AASHTO M-6	: 2.3 - 3.1
Sodium Sulphate Soundness, AASHTO T104	: Max. 10%loss
Content of Friable Particles AASHTO 112	: Max. 1% by weight
Sand Equivalent, AASHTO T176	: Min. 75

Coarse Aggregate

Abrasion, AASGTO T96	: Max. 405 loss
Soft Fragment and shale, AASHTO M80	: Max. 5% by weight
Thin and elongated pieces, AASHTO M80	: Max. 15%

Water

All sources of water to be used with cement shall be approved by the Engineer. Water shall be free from injurious quantities of oil, alkali, vegetation and salt as determined by the Engineer.

Admixture

Only admixture, which have been tested and approved in the site laboratory through trial mixing for design proportion shall be used.

Before selection of admixture, the Contractor shall submit to the Engineer the specific information or guarantees prepared by the admixture supplier.

The Contractor shall not exclude the admixture from concrete proportions.

Concrete Class 30/20

Concrete Class 30/20 shall be used for in situ beams and deck slab. The requirements of Concrete Class 30/20 are provided as follows unless otherwise the Engineer will designate any alteration:

Design compressive strength twenty eight (28) days	: 30N/mm^2
Maximum size of coarse aggregates	: 20mm
Minimum cement content	: 340kg/m^3
Maximum cement content	: 540kg/m^3
Maximum water/cement ratio of 45% with slump of 80mm	

Proportioning Concrete

The Contractor shall consult with the Engineer as to mix proportions at least sixty (60) days prior to beginning the concrete work. The actual mix proportions of cement, aggregates, water and admixture shall be determined by the Contractor under supervision of the Engineer in the site laboratory.

The Contractor shall prepare the design proportions which has 120% of the strength requirement specified for the designated class of concrete.

No Class of Concrete shall be prepared or placed until its job-mix proportions have been approved by the Engineer.

Concreting Work

a) Batching

Batching shall be done by weight with accuracy of;

Cement	: $^1/_2$ percent
Aggregate	: $^1/_2$ percent
Water and Admixture	: 1 percent

Equipment should be capable of measuring quantities within these tolerances for the smallest batch regularly used, as well as for larger batches.

The accuracy of batching equipment should be checked every month in the presence of the Engineer and adjusted when necessary.

b) Mixing and Delivery

Slump of mixed concrete shall be checked and approved against designated slump in these specifications. The time elapsing from when the water is added to the mix until the concrete is deposited in place at the site of the work shall not exceed thirty (30) minutes in case that the concrete is hauled in non agitative type trucks or carries, nor more than sixty (60) minutes in case that it is hauled in truck mixers or other carriers with agitators.

c) Concrete in Hot Weather

No concrete shall be placed when the ambient air temperature is expected to exceed 33°C during placement operations.

d) Concreting at Night

No concrete shall be mixed, placed or finished when natural light is insufficient, unless an adequate approved artificial lighting system is operated, and such night work is subject to approval by the Engineer.

e) Placing

In preparation of the placing of concrete, the interior space of forms shall be cleaned and approved by the Engineer prior to placing concrete. All temporary members except tie bars to support forms shall be removed entirely from the forms and not buried in the concrete. The use of open and vertical chute shall not be permitted unless otherwise directed by the Engineer. The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

f) Measurement and Payment

Measurements for the Concrete Works Class 30/20 of beams and deck slab shall be made in cubic metres for the walls and slabs actually constructed, measured from their dimensions shown on the Drawings.

Payment for the Concrete Works (Class 30/20) of beams and deck slab shall be the full compensation for furnishing all materials of the concrete mixing, delivering, placing, finishing horizontal surfaces to class UF2 finish, and curing the concrete, equipment and tools, labour and other incidentals necessary for the completion of the work in accordance with the Drawings and these Specifications and as directed by the Engineer.

1722 FORMWORK FOR CULVERT WALLS AND SLABS

This work shall consist of all temporary moulds for forming the concrete for culvert walls and slabs together with all temporary construction required for their support. Unless otherwise directed by the Engineer all formworks shall be removed on completion of the walls and slabs.

a) Materials

Forms shall be made of wood or metal and shall conform to the shape, lines and dimensions shown on the Drawings.

All timber shall be free from holes, loose material, knots, cracks, splits and warps or other defects affecting the strength or appearance of the finished structure.

Release Agents – Release agents shall be either neat oils containing a surface activating agent, cream emulsions, or chemical agents to be approved by the Engineer.

b) Construction Method

i) **Formworks**

Formworks shall be designed to carry the maximum loads which may be imposed, and so be rigidly constructed as to prevent deformation due to load, drying and wetting, vibration and other causes. After forms have been set in correct location, they shall be inspected and approved by the Engineer before the concrete is placed.

If requested, the Contractor shall submit to the Engineer working drawings of the forms and also, if requested, calculations to certify the rigidity of the forms.

Unless otherwise described in the Contract, all form joints for exposed surfaces of concrete shall form a regular pattern with horizontal and vertical lines continuous throughout each structure and all construction joints shall coincide with these horizontal and vertical lines.

Form joints shall be sealed against leakage of mortar. PVC pipes of 50mm diameter for weep holes shall be arranged as shown on the Drawings.

Unless otherwise specified, formwork shall be designed to form chamfers at all external corners whether or not such chamfers are shown on the Drawings to prevent cracks and other damage from arising.

The inside surface of forms shall be cleaned and coated with a releasing agent to prevent adhesion of the concrete. Release agents shall be applied strictly in accordance with the manufacturer's detailed instructions. The release agent shall be applied to the formwork prior to erection. Release agent must not come into contact with reinforcement. Immediately before concrete is placed, the forms shall thoroughly be thoroughly cleaned and freed from sawdust, shavings, dust, mud or other debris by hosing with water. Temporary openings shall be provided in the forms to drain away the water and rubbish.

ii) **Scaffolding**

All scaffolding required to support the forms shall be designed and constructed to provide necessary rigidity and support the loads without appreciable deflection or deformation.

Details, plans and structural and flexural calculations for scaffolding shall be submitted to the Engineer for approval, but in no case shall the Contractor be relieved of his responsibility for the results obtained by use of these plans, etc.

iii) **Removal of formwork**

The time at which the formwork is struck shall be the Contractor's responsibility and the forms shall not be removed until the concrete strength has reached 20N/mm^2.

c) **Measurement and Payment**

Formwork shall be measured as the net area, in square metres, in contact with the finished concrete surface of the walls and slabs. No measurement shall be allowed for formwork of temporary construction joints.

Payment for the Formworks shall be full compensation for furnishing, erecting, jointing all the forms for the concrete including furnishing and applying release agent, and

construction of the required scaffolding to support the forms, all conforming to the shape, lines, grade and dimensions of the structure as shown on the Drawings, all in accordance with the Drawings and as directed by the Engineer.

1728 REINFORCING BARS OF WALLS AND SLABS

This work shall consist of furnishing, fabricating and placing in the concrete of the bottom slab, top slab, beams, median wall, sidewalls, wing walls and aprons, reinforcing bars of the quality, type and size in accordance with these Specifications and in conformity with the requirements shown on the Drawings.

Reinforcing bars shall be high yield deformed bar and shall meet the requirements of British Standard BS 4449, unless otherwise called for the drawings or approved by the Engineer.

No reinforcing bar shall be delivered without a Certificate guaranteeing the yield stress.

All testing for compliance will be at the Contractor's expense.

1729 STORAGE OF REINFORCEMENT

Reinforcement shall be kept off the ground, free from dirt, oil, grease and rust and stored within a building or provided with suitable covers.

1730 BENDING REINFORCEMENT

The Contractor shall prepare bar bending schedules for the approval of the Engineer showing the location types, sizes, bending dimensions and cut lengths of the reinforcing bar required to be fixed in the works.

Qualified men shall be employed for the cutting and bending, and proper application shall be provided for such work.

Bars shall be cut and bent cold to the dimensions indicated and with equipment and methods approved by the Engineer.

Stirrups and tie bars shall be bent around a pin having a diameter not less than 15 times the minimum diameter of the bar. Bends of other bars, where full tension in the bar may occur, shall be made around a pin having a diameter not less than 7.5 times the bar diameter as shown on the Drawings.

Reinforcing bars shall be accurately formed to the shapes and dimensions indicated on the Drawings, and shall be fabricated in a manner that will not injure the materials.

1731 FIXING REINFORCEMENT

Reinforcing bars shall be accurately placed in proper position, and so that they be firmly held during placing of concrete. Bars shall be tied at all intersections by using annealed iron wire 0.9mm or larger diameter, or suitable clips.

Distances from the forms shall be maintained, corrected by means of metal hangers, metal blocks, metal supports or other supports approved by the Engineer.

The Engineer shall inspect reinforcing bars after placing. When a long time has elapsed after placing reinforcing bars, they shall be cleaned and inspected again by the Engineer before placing concrete.

When it is necessary to splice reinforcing bars at points, position and methods of splicing shall be determined based on strength calculations and approved by the Engineer.

In lapped splices, the bars shall be lapped by the required length, and wired together at several points by using annealed iron wire larger than 0.9mm. The minimum splice length shall be 40 times diameter of the bar unless otherwise shown on the drawings or instructed by the Engineer.

Exposed reinforcing bars intended for bonding with future extensions shall be effectively protected from injury and corrosion.

Oxyacetylene welding joint of reinforcing steel shall be done only if authorized by the Engineer in writing.

Measurement and Payment

Bending and installation of reinforcement bars shall be measured in terms of tons. In computing the weight to be measured, the theoretical weights of bars of the cross-section shown on the Drawings or authorized shall be used.

These weights are given in the following table: -

Bar type and Size	Weight (Kg/m)
Y8	0.395
Y10	0.617
Y12	0.888
Y16	1.58
Y20	2.47
Y25	3.85
R25	3.85

2000 ROAD FURNITURE

2001 Road Reserve Boundary Posts

Road reserve boundary posts shall be provided, with reference points, in compliance with Standard Specification Clause 2001.

2002 FENCING AND GATES

Add the following:

"Construction material for gates shall be steel. Fencing shall be constituted of wood permanent posts and six strand wire."

2003 EDGE MARKER POSTS

Edge marker posts shall be provided as directed by the Engineer and in compliance with Standard Specification Clause 2003.

2004 Permanent Road Signs

Permanent Road Signs shall be provided as directed by the Engineer and in compliance with the requirements of the "Manual for Traffic Signs in Kenya - Part II" and Standard Specification Clause 2004.

2004B Existing Road signs

Where directed by the Engineer, the Contractor shall take down road signs including all posts, nuts, bolts and fittings, and remove and dispose of the concrete foundation and backfill the post holes. The signs shall become the property of the Employer and the Contractor shall include in his rates for the loading, transport and unloading of the signs at the KENHA regional office at Mombasa.

Measurement and payment for taking down road signs shall be made by the number of signs of any type and size taken down, cleaned and delivered as directed.

2005 Road Marking

(a) General

Paint for road marking shall be hot-applied thermoplastic paint and shall comply with BS 3262 The paint shall be surface reflectorised complying with BS 6088.

The Contractor shall forward all paint intended for application to Materials Department, Ministry of Roads at least seven (7) months before the date of the application for testing and approval.

The rates inserted in the Bills of Quantities for road marking shall include for prior application of approved tack coat.

2005A RAISED PAVEMENT MARKERS – ROAD STUDS

MATERIAL

Road studs are molded of Acrylonitrile Butadiene Styrene (ABS) conforming to ASTM Specification D1788 – 68, Class 5-2-2 shell filled with inert, thermosetting compound and filler. The lens portion of the marker is of optical menthylmethacrylic.

CONSTRUCTION

The Road Stud shall be constructed of high impact ABS containing a multi-biconvex glass lens reflector system. It shall be of monolithic construction, and not less than 98.5mm^2. The height of the marker shall not exceed 17mm and the underside shall contain a non-honeycomb base (flat).

REQUIREMENTS

The markers shall conform to the following requirements:

a) **Colour**
Shall be white, yellow or red as specified and the Retro – reflectance values should conform to the testing procedures of ASTME 809.

b) **Impact Resistance**
The marker shall not crack or break when tested using a 1000gram weight from a height of 1 metre. (ASTM D 2444) or BS 3900 Part E3.

c) **Resistance to Water Penetration**
There shall be no water penetration behind the lens after submerged in a water bath at 70 + 50oF for 10 minutes. And it should still meet the reflectance Requirement as stipulated by BS 998.

d) **Heat Resistance**
Shall comply with the initial brightness as per BS 873 Part IV of 1978

e) **Night Visibility**
The marker shall be brightas per BS 873 Part IV of 1978

f) **Compression Resistance**
There shall be no cracking sound at a pressure lower than 25 tones as per BS 873 Part IV of 1978.

g) **CorrosionResistance**
After immersing a sample of Road stud in a solution containing 30g/1 of sodium chloride for thirty (30) days, there shall not be any signs of corrosion,(BS 998).

Note: These markers are intended for application directly to pavement surfaces and are compatible with raised pavement makers. These adhesives should be of high quality and tested for conformance to customer requirements.

ADHESIVES

i) They shall be of Resin Type - Epoxy of 2 different components Part 1 and 2 i.e. Adhesive and Reactor without any volatile solvents in both.

ii) Pot life: not less than 20 minutes at 20°C

iii) Rotational cure time: between 20 and 30 minutes at 20°C

iv) Hard cure: Between 40 and 60 minutes at 20°C

APPLICATION INSTRUCTION

Preparation of Pavements

Make sure that the road surface is absolutely dry and free of oil and grease.

Mixing of Adhesive

Pour component B into the container of component A. Stir mixture by hand with a wooden or metal stick until uniform Grey Tint without a striate is obtained.

Installation

Pour the mixture on to the underside of the road stud. Then place the road stud firmly on the road surface. Adhesive should stand out for about 5mm to 10mm over the edges of the stud.

Protection from the Traffic

Protect studs from traffic for 2 hours until the adhesive has properly hardened. Try by touching the adhesive.

NUMBER OF STUDS NEEDED FOR LABORATORY TESTS

In order to approve a particular type of road stud, 4 sample road studs of each colour shall be submitted.

2006 Guardrails

All materials for guardrails shall comply with the requirements of AASHTO M180-98. Guardrail posts and spacer blocks shall be galvanized UNP steel profiles 120 x 55x7mm or of the type and size shown on the drawings, with posts driven vertically at least 1.2m into the shoulder as directed by the Engineer.

Beams for guardrails shall be "Armco Flexbeam" or similar obtained from a manufacturer approved by the Engineer.

Reflective plates shall be galvanized V-type shape, manufactured from 1.5mm thick mild steel plate, with the outer surfaces coated with engineering grade retro-reflective material. Holes for fixing shall be drilled before the plates are galvanized.

2007 Kerbs

a) Vertical Joints
Vertical joints between adjacent Kerbs shall not be greater than 5 mm in width and shall be filled with a mortar consisting of 1:3 cement: sand by volume.

b) Transition between flush and raised kerbs
The transition between flush and raised kerbs (e.g. at bus bays) shall be termed as ramped kerbs. The transition between flush and raised kerbs shall occur within a length of 2.0m.

2008 KILOMETER MARKER POSTS

Kilometre marker posts shall be provided as directed by the Engineer and in compliance with Standard Specification Clause 2008.

2009 RUMBLE STRIPS

The Contractor shall provide, place, trim, shape and compact to line and level asphaltic concrete rumble strips on the finished shoulders as directed by the Engineer.

Asphaltic concrete rumble strip sets to the full width of the carriageway and shoulders shall also be placed as warning strips to speed humps at the preselected locations marked on the Drawings to the satisfaction of the Engineer.

2010 Trees

Add the following to Clause 2010 of the Standard Specification:

2012 Service Ducts

Service ducts shall be provided in locations as directed by the Engineer. Ducts shall be heavy duty PVC spigot and socket pipe of 3mm minimum wall thickness. Minimum cover to the top of the pipe from formation level shall be 0.6m. Pipes shall be bedded and surrounded by a 100mm minimum thickness of compacted fine granular material of 10mm maximum size. The remainder of the trench shall be backfilled with selected backfill material of subbase quality up to the top of formation level.

Measurement and payment shall be by the metre of pipe installed, and shall include all excavation, spoil, bedding and surround, backfill, transport, supply, bed, lay of PVC pipe complete with 2mm galvanized draw wire, and end sealing caps and end markers.

2013 Road Humps

Where shown on the drawings or directed by the Engineer, the Contractor shall provide, place, trim, shape and compact to line and level road humps.

Road humps shall be constructed in asphaltic concrete or concrete class 20/10 to the dimensions shown on the drawings or as directed by the Engineer.

Road humps should be painted with white thermoplastic paint of 45 ° diagonal strips as shown on the drawings.

2014 RAISED ZEBRA CROSSING

Where shown on the drawings or as directed by the Engineer, the Contractor shall provide, place, trim, shape and compact to line and level flat-topped zebra crossing as detailed on the drawings.

2015 DUCT MARKER POSTS

Duct markers shall be installed by the Contractor at each end of the services ducts provided under clause 2015. The duct marker shall be located immediately beyond the outer edge of the shoulder or footpath and as close to the line of the duct as physical constraints permit. Where several ducts are laid side by side, only one duct marker post will be necessary. The duct marker posts shall be constructed as shown on the Drawings and shall be clearly and durably

marked on the side facing away from the road. The marker post shall be inscribed "X ducts" where X is the number of ducts laid in the group marked by the marker post.

2016 CULVERT MARKER POSTS

Culvert markers shall be installed by the Contractor at each end of culverts constructed along the project road. The culvert marker shall be located immediately beyond the outer edge of the shoulder or footpath and as close to the line of the culvert as physical constraints permit. Where several culverts are laid side by side, only one culvert marker post will be necessary at each end of the culverts. The culvert marker posts shall be constructed as shown on the Drawings and shall be clearly and durably marked on the side facing away from the road. The marker post shall be inscribed "X culverts" where X is the number of culverts laid in the group marked by the marker post.

2017 BOLLARDS

Where shown on the Drawings or instructed by the Engineer, the Contractor shall construct permanent bollards. The bollards shall be precast using a class of concrete as shown on the drawings.

2018 PLOT BOUNDARY BEACONS

Where shown on the Drawings or instructed by the Engineer, the Contractor shall construct plot boundary beacons. The plot boundary beacons shall be 1.2m long reinforced concrete post with 150x150mm cross-section founded on 450x450x350 mass concrete as shown on the drawings.

2019 CHANNEL BLOCKS

The Contractor shall provide, lay and joint 125mm x125 and 125mm x 250mm channel blocks to roads, footpaths and shoulders as shown on the Drawings or as instructed by the Engineer.

2021 MEASUREMENT AND PAYMENT

Item: Reflective road studs

Unit: No.
Road studs shall be measured by the number instructed and installed. The rate shall include for the cost of provision and transport of all materials, preparation of the road surface, application of adhesives and full compliance with the manufacturer's instructions.

Item: Road humps

Unit: m
Road humps shall be measured by the length installed. The rate shall include for provision, installation and compaction to the satisfaction of the Engineer and removal of surplus material.

Item: Flat topped zebra crossing

Unit: No.

Flat topped zebra crossings shall be measured by the number instructed and installed. The rate shall include for all materials, labour and equipment, and all measures required in the construction of the crossing, in accordance with the drawings.

Item: Service ducts

Unit: m
Service ducts shall be measured by the metre as the length of duct installed as per the Engineer's instructions. The rate shall include for providing all materials, excavation, installation of PVC ducts, backfilling to the formation level, compaction, all in accordance with clause 2015.

Item: Duct Marker Post

Unit: No
Duct marker posts shall be measured by the number instructed and installed. The rate shall include for provision and installation of posts, all excavation and backfill, compaction to the satisfaction of the Engineer.

Item: Culvert marker post

Unit: No
Culvert marker posts shall be measured by the number instructed and installed. The rate shall include for provision and installation of posts, all excavation and backfill, compaction to the satisfaction of the Engineer.

Item: Bollards:

Unit: No
Bollards shall be measured by the number instructed and installed. The rate shall include for provision and installation of bollards, all excavation and backfill, compaction to the satisfaction of the Engineer.

Item: Plot boundary beacons

Unit: No
Plot boundary beacons shall be measured by the number instructed and installed. The rate shall include provision, transport of materials, excavation, erection of beacons and backfill, compaction to the satisfaction of the Engineer.

Item: Channel blocks

Unit: m
Channel blocks shall be measured by the length installed, in accordance with the drawings, or as instructed by the Engineer. The unit rate shall include for all excavation (including in hard materials) provision and placing of backing and bedding concrete, cutting of blocks as necessary, and placing of channel blocks to the line and level shown on the drawings or as instructed by the Engineer.

2100 MISCELLANEOUS BRIDGE WORKS

2105 GUARDRAILS

Notwithstanding provisions to the contrary in the Standard Specifications, guardrails or safety parapet shall be erected on the bridge as detailed in the drawings and approved by the Engineer.

Guardrails and safety parapet shall be measured and paid for per linear metre.

2200 DAY WORKS

2202 MEASUREMENTS AND PAYMENT

Add after the first paragraph of Clause (a) Plant:

Where items of major equipment listed in the schedule of Daywork are specified by type (e.g. concrete mixer etc.) the power rating of such items of equipment to be provided by the Contractor shall not be lower than the power ratings of such equipment, manufactured within the last two years prior to the date of Tender. Any item of major plant employed upon Daywork which has a power rating lower than specified shall be paid for at rates lower than those in the schedule of Daywork. The reduction in the rate payable shall be in proportion to the reduction in power rating below that specified.

This specification covers instructions that may be issued by the Engineer as additional or substituted work to be executed on a day work basis by the Contractor or by his sub-contractors.

2202 Standards

All codes and standards mean the latest. Where not specified otherwise the installation shall generally follow the Kenyan Standard Specification for Road and Bridge Construction

2203 Measurement and Payments

Measurement and payment for all day works items shall be in accordance with the items listed in the Bill of Quantities, the preamble to Bill of quantities and the specifications above and cover the payment of plant, labour and materials for work executed in accordance with the Engineer's instructions.

2400 STREET LIGHTING

2401 SCOPE

This specification is for street lighting accessories to be used along the pole on the power lines
This specification covers the following items:

i. Street lighting columns
ii. Street lighting bracket
iii. Lanterns as follows
   a) 100W, 150W,250W,400W, High Pressure Sodium Lamps or LED Lights complete with control gear (i.e. chokes, igniters, capacitors, etc as applicable)
   b) 100W,150W, 250W High Pressure Sodium Flood or LED lights
iv. Pole mounted street lighting control pillar (separate specs attached)
v. Photo-cell
vi. Control timers
vii. High intensity discharge ballasts
viii. Igniters
ix. Contactors
x. capacitors
xi. Consumer units
xii. Earth leakage circuit breakers

The specification stipulates the minimum requirements for street lighting accessories for use under the Contract and it shall be the responsibility of the supplier to ensure adequacy of the design, good engineering practice, adherence to specification and the applicable standards and regulations as well as ensuring good workmanship in the manufacture of the items for the Client.

2402 STANDARDS

The following standards contain provisions which, through reference in this text constitute provisions of this specification. Unless otherwise stated, the latest editions (including amendments) shall apply:

- BS EN 40-3-1:2013; Lighting columns, design and verification for characteristic loads
- lEC 62031: LED modules for general lighting (solid state lighting) -Safety specifications
- lEC 61547-2009: Equipment for general lighting purposes - EMC immunity
- lES LM-80-08 : Method for Measuring Lumen Maintenance of LED Light sources
- lEC 62471: Photo biological safety of lamps and lamp systems
- lEC 62262: Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
- IEC60598-2-3: Particular requirements - Luminaries for road and street lighting
- IEC60662: High Pressure Sodium Vapour Lamps specifications
- IEC60192: Low Pressure Sodium Lamps Performance Specifications
- lEC 61439-3: low-voltage switchgear and control gear assemblies
- EN 60235: Discharge Lamps safety specifications
- ISO 9001: Quality Management systems- Requirement
- ISO 1460: Metallic coatings-Hot DIG Galvanized coatings on ferrous material
- lEC 60923:2001 Ballasts for discharge lamps (excluding tubular fluorescent lamps) Performance requirements
- lEC 926:1995 Auxiliaries for lamps-Starting devices: General and safety requirements
- lEC 60927:2005 Starting devices (other than glow starters) – Performance requirements
- lEC 61048:2006 Capacitors for use in tubular fluorescent and other discharge lamp circuits: General and safety requirements
- lEC 61049:1991 Capacitors for use in tubular fluorescent and other discharge lamp
- Circuits : Performance requirements
- lEC 60947-4-1: Low voltage switchgear and control gear—Contactors and motor Starters
- lEC 60439: Low Voltage switchgear and Control gear assemblies
- lEC 61008: Residual current operated circuit breaker without integral over current

2403 REQUIREMENTS

(a) Service Conditions

The street lighting accessories shall be suitable for continuous use outdoors in tropical areas of altitude up to 2200m above sea level, humidity of up to 90%, average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C and heavy saline conditions along the coast.

(b) Street lighting columns

The size of the columns shall be 8m or 10m and shall be specified in the tender The columns shall be manufactured in accordance with the requirements of BSEN40 and latest versions
The columns shall be manufactured from galvanized tubular/sheet steel. The columns shall be designed to be capable of accepting lanterns with the following windage of lanterns

Mounting height (m)	Lantern (kg)	Windage are (m^2)
8m post top/ side entry	10	0.19
10m post top/side entry	15	0.19

The columns shall have a root for planting to a depth of 1200mm and 1500mm for 8 and 10 metre columns respectively. The columns shall have a cable entry slot of 65mm*150mm with the top slot 350mm below the ground level
The base section of the columns shall have a minimum wall thickness of 3.2mm and have a base compartment openings of a minimum 60x115mm. The shaft sections shall have minimum diameters of 114mm for all the columns
The height above the ground of the base sections shall be 1250mm marked A.
The fixing of the bracket to the column shall be over a reduced diameter spigot to maintain the smooth parallel line between the column and the bracket arm. The bracket arm shall be held in position by stainless steel screws allowing fixing in any one of the four 90 degrees positions

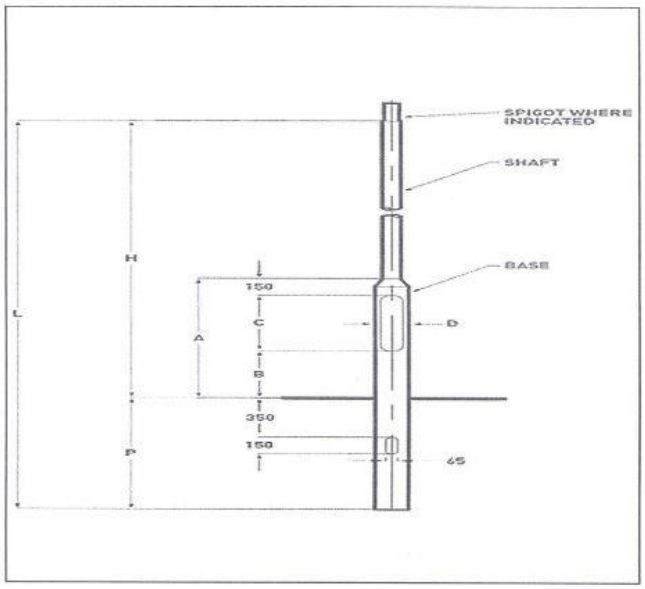


Fig1: Column details

H	P	L	A	B	C	D	Base diameter	Shaft diameter	Spigot detail
8	1200	9200	500	500	600	115	168	114	Ø101*250
10	1500	11500	1250	500	600	115	168	114	Ø101*250

The column shall have a means of preventing undesired rotational movement of the bracket, once fixed in position, to the column shaft shall be incorporated in the columns design
The method of joining the base section and the shaft of the columns shall be by swage joint with an internal centralizing washer
The columns shall have the same pattern of door lock. Keys shall be supplied for 5% of all columns supplied. The door fixing bolt shall have tapered end to facilitate self centring when closed
The columns shall have an internal full length base board, equivalent to the door size, substantially non-hygroscopic, fitted in each compartment for mounting control gear. Base board fixing studs or

bolts shall not protrude beyond the front face of the base board. The base board shall be firmly bolted into position. On delivery, the columns door shall come assembled on the column.
The column shall be fitted with a M12 x 30mm brass earth studs threaded the whole length, with two plain washers and two nuts within the base compartment and shall be made easily accessible.
Column doors shall be provided with an external lug to enable earthing of the column door with an M8 brass stud.
The columns shall have no sharp edges that can damage electrical cables during installation or service. An anti-chafe ring shall be fitted where cable routes change direction from horizontal to vertical within the bracket.
The columns and bracket arms shall not be hot dip galvanized to a minimum of 100 pm in accordance with ISO 1461 unpainted. The galvanized surface shall then be degreased and left with a smooth finish to prepare for painting.
The minimum dry film thickness of paint shall be 100pm throughout the column
The columns shall have line on the circumference of the base section to denote ground level.

(c) Street lighting bracket

The brackets shall be manufactured from galvanized tubular steel, or aluminum. The aluminum/zinc coating shall be tested to ISO 1460 standards.
The brackets shall be manufactured, supplied and installed in accordance with the requirements of BS EN 40-3 or revision of such. Sharp edges shall not be permitted.
The brackets shall be designed to be capable of accepting lanterns with the following weights and windage as per table 1 below:

Mounting height	Lantern weight (kg)	Windage area (m2)
10m / side entry	Max 15	0.19
12m / side entry	Max 15	0.27

The method of securing the bracket arm must be positive such that the arm cannot rotate. The arm and lantern shall be set at right angles to the highway to be illuminated
The outreach of the bracket shall be 1.0m, 1.5m and 2.0m. This shall be stated in the tender.
The bracket arms shall provide an incline of lantern 50, or 00in Environmental zone E1 when fitted to spigots of 42mm OD* 127mm long for 8 and 10 metre columns
The brackets shall be of single of double projection, as shown

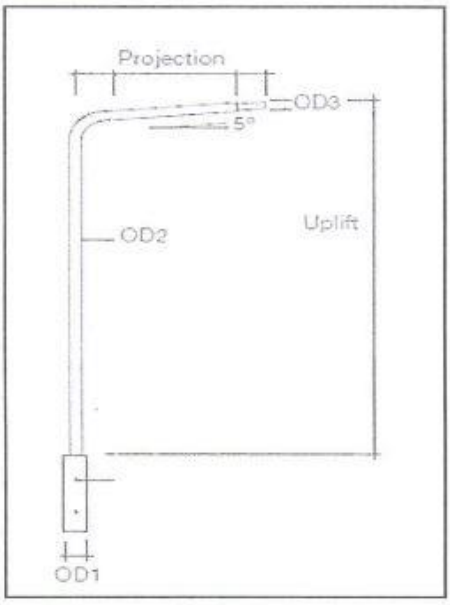


Fig 2(a): single bracket

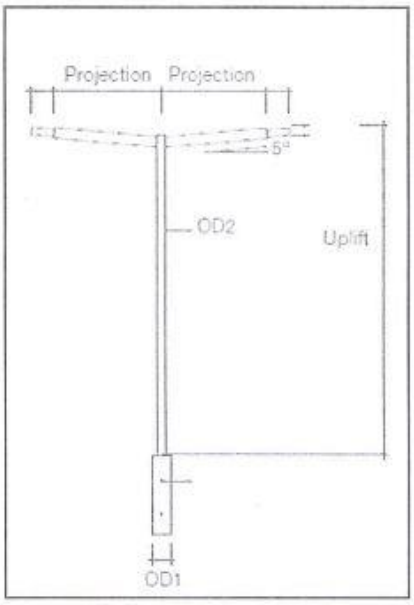


Fig2 (b): Double bracket

Projection (mm)	Spigot diam. (mm)	OD1 (mm)	OD2 (mm)	OD3 (mm)	Uplift (mm)
1000	76	89	48	42	2000
1500	76	89	48	42	2000
2000	76	89	48	42	2000

(d) Lanterns

The lanterns used for road lighting shall be integral and fitted with electronic control equipment and Centrally Managed Control Systems.

The lanterns should be manufactured to IEC 60598-1 and incorporate an efficient optical system to direct the light into the highway. To ensure minimum environmental pollution of the night sky the upward light emitted shall be kept to a minimum
The Lanterns shall allow for side entry and post mounting and shall, when post mounted, be capable of adjustable inclination between zero (0°) and five (5°) degrees without the need for special and additional adaptors
Lanterns shall be environmentally friendly and all component parts shall be easily recyclable.
The lanterns body shall be UV stabilized polycarbonate, with installation hardware and instructions. All component parts shall be corrosion resistant.
The body/frame and canopy of lanterns shall be made of high-quality die-cast aluminum, painted grey, silver or black. An alternative to an aluminum canopy shall be allowed if manufactured from high quality, recyclable materials
Lanterns shall be available with polycarbonate bowls, low profile bowls, and flat glass or curved tempered glass protectors.
The impact rating for glass protectors shall be IK08 minimum in accordance with I EC 62262:2002
All lanterns shall be fitted with bowls of sound and robust construction capable of being easily dismantled for maintenance or repair purposes. All lanterns shall be fitted with bowls manufactured from vandal resistant material and stabilized to minimize toss of transparency due to weathering and exposure to ultra violet light
All hinges, toggle catches, captive screws and nuts shall be made of non-corrosive material.
Lanterns shall be reasonably weather and dust-proof and shall be fitted with a suitable gasket between the body of the lantern and the bowl. The IP Rating of the lantern shall not be less than IP 65. They shall have tiltable mounting base and easy to access ballast compartment to make installation easy.
The means of supporting the lamp shall be so designed that the position of the lamp in the lantern relative to any optical equipment remains substantially the same under all conditions of service and throughout the life of the lantern.
The optical equipment controlling distribution should include high purity aluminum reflectors and/or prismatic refractors and these shall have a smooth exterior surface or be protected by hermetically sealed cover plates to prevent an accumulation of dirt and to facilitate cleaning. Refractors wholly within a totally enclosed lantern need not be sealed.
All lanterns shall be fitted with a porcelain terminal block, earth terminal, cable clamp and lamp holder ready wired to connector block with heat resisting type cable.
All lanterns shall be fitted with integral control gear and have a heat barrier between the lamp enclosure and gear compartment. The control gear shall be fitted to a tool-less, quick release gear tray, equipped with a plug and socket connector for ease of maintenance or replacement purposes.
Electrical equipment shall be installed so that levels of radio interference given in I EC 61547 are not exceeded.
The downward light output ratio shall be a minimum of 70%
Lanterns shall be securely fitted to bracket arms or columns and the lamp and all parts affecting the photometric performance shall be in a clean condition and correctly orientated
Lanterns shall have electronic, dimmable ballasts enabled for connection to the central management system (CMS) components but able to be connected to standard electronic photocell controls

(e) High Pressure Sodium Lamps

High pressure sodium lamps shall comply with EN 60235 & lEC 60662
EC Declaration of conformity certificate shall be provided.
High pressure sodium lamps shall be the "Plus" type with higher xenon pressure for increased Im/W
High pressure sodium lamps shall incorporate a solid state getter with clear lamp bases (getter-blackened lamp bases shall not be accepted)
High Pressure Sodium Lamps shall be of the single arc-tube type to ensure the light source is always at the centre of the luminaire optic for consistent photometric performance. Elements within the lamp construction shall not give rise to shadows cast.
The construction shall be sturdy and robust with as few as welds as possible in order to reduce the risk of early failures due to external shock and vibration during transportation and installation
Minimum Performance Criteria

High pressure sodium lights	Rated luminous efficacy lm/W (100hrs)	LSF @ 16,000 hrs	LLMF @ 16,000 hrs	Correlated colour Temp T_C (K)	Max colour rendering (Ra)
100W	107	0.96	0.94	2000	25
150W	110	0.96	0.94	2000	25
250W	128	0.96	0.94	2000	25

400W	140	0.96	0.94	2000	25

(f) High pressure sodium flood lights with integral ballast

The High Pressure Sodium Flood lights units shall be of rated voltage/frequency of 240V, 50HZ ±6%
The unit shall be compact in size, attractively styled contemporary design, rugged and dependable, easy to install and service.
The unit shall be Integral ballast, one-piece housing, and one-piece lens cover
The unit shall be secured by four 1/4" Dia. Captive stainless steel slotted hex-head bolts.
The unit shall have thermal shock and impact resistant glass lens sealed with heavy duty, high temperature silicone rubber gasket, firmly seated.
The unit shall have a heavy duty mogul-base porcelain socket with heavy gauge brass, nickel-plated, double lamp-grip screw shell and spring loaded center contact.
The unit shall have a compound parabolic, double segment, finished aluminum reflector for optimum efficiency.
The unit shall be for pole mounting, built-in slip-fitter, for internal wiring, adjustable laterally and vertically, with bronze polyester finish.

(g) Photoelectric Controller for Streetlights

Photoelectric control shall fit an EEI/NEMA standard 3-terminal polarized twist lock type receptacle and shall be furnished complete with a neoprene receptacle gasket.
Photo-electric controllers must be manufactured using non-hazardous materials

(h) Electrical Ratings

S/NO	Parameter	Specification
1	Operating voltage	230-250 V, 50Hz
2	Contacts	Single pole/ single throw; normally closed at night
3	Contact load rating	1000 Watts incandescent; 1800 VA H.I.D
4	Surge protection	Expulsion or Metal Oxide –Varistor type arrestor
5	Turn on level	1.0-1.5 lumens
6	Turn to turn off ratio	1:2-1:5
7	Temperature range	-40^0 C to +70^0 C

(i) Light Emitting Diodes (LEDS) fittings and Luminaire

The LEDs fittings and lunninaire shall be manufactured and tested as per the requirements of lEC 62031, lEC 61547 and 60598-1 and the requirements of this specification
The LEDs shall be of different lumen output and power ranges as alternative solution for existing 150w~400W classical system sodium lights
The housings shall be die cast and extruded aluminum housing with universal two-bolt slip fitter mounts to 1-1/4" to 2" (1-5/8" to 2-3/8" O.D.) diameter mast arm. The Levelling adjustment shall be ±5°.
The LEDs housing shall receive a fade and abrasion resistant, epoxy polyester powder coat, light gray finish standard. Aluminum extruded components shall be anodized.
The housing shall meet the 3000 hours salt spray test to lEC 60598-1

(j) Light Emitting Diodes

The LEDs shall be of Hi-flux/Hi-power white LEDs producing a minimum of 95% of initial intensity at 100,000 hours of life.
The LEDs shall be tested in accordance with lES LM-80 testing procedures.
The LEDs shall have a mean correlated colour temperature of 4000K (standard) and 70 minimum CRI.
The LEDs shall be 100% mercury and lead free
The LEDs shall comply with the following minimum system performance criteria

- The Tc life shall be + 65°C
- LEDs shall have a system lifetime @Tc life (min 90%) of at least 50,000 hrs
- The Tc min shall be at least -20°C (startup at -40°C)
- The Tc max shall be 75°C
- The Tc thermal cutoff module shall be + 75°C (starts dimming)
- The To thermal cutoff driver shall be + 85°C (maximum dimming)
- The input voltage shall be 220-250 V
- shall be suitable for at least class II

(k) Led Optical Systems

The LEDs micro-lens systems shall produce lESNA Type 2 or Type 3 distributions. The Luminaire shall produces 0% total lumens above 90° (BUG Rating, U=0).
Optional house side shield cuts light off at 1/2 mounting height behind luminaire shall be provided.
For flood lights the available beam angles shall be either 15°, 60° or asymmetrical
10-year limited warranty shall be provided for the luminaire and components.
Note: both driver and LED module shall be able to be replaced independently

(l) Performance for LEDs

			TYPE 2			TYPE 3		
	Current (mA)	Watts (W)	Lumen (Lm)	Efficacy (lm/W)	BUG Rating	Lumen (Lm)	Efficacy (lm/W)	BUG Rating
1	700	163	15000	92	B2 UO G2	14800	91	B2 UO G2
2	700	215	20000	93	B3 UO G3	19700	92	B3 UO G3
3	700	260	24000	92	B3 UO G3	23700	91	B3 UO G3

(m) Timers

The timers shall be Single Phase (230V AC) version in single frame size capable of carrying a load of 6 kW to 12 kW manufactured to IEC60439-3
The timers shall allow one to set the ON and OFF time. The switching of street lights shall be repeated every day as per the set time through Programmable 24 hours' Time Switch / Programmable Astronomical Time Switch. The program shall consist of a closing time and an opening time for a circuit.
The timers shall have a Programmable Time Switch that shall automatically adjust the set time along with seasonal variation to control ON /OFF for lighting on purpose of realizing that light is turned ON when sun sets & turned OFF when sun rises. This time switch is programmed on latitude base for whole year for sun rise and sun set timing.
The timer selection mode shall be by Auto or Manual Selector switch
The timers shall be for wall mounting on cubicles and shall be pre-wired ready for use

(n) High Intensity Discharge Ballasts

Ballasts shall comply with lEC 922 and lEC 60923 and shall bear the IEC. Mark and wiring connection type on the casing.
Ballasts shall be vacuum-pressure impregnated with a silica-filled polyester varnish to re-enforce the electrical insulation, preclude moisture, inhibit noise, and dissipate heat. The process of vacuum impregnation shall be such that the interstices of the windings are completely filled with the impregnating material. Connections shall be brought out to a suitable brass screw terminal block mounted on the ballast housing. Terminal blocks with steel screws will not be acceptable.
The HID ballasts shall be Vacuum impregnated constructed in such a manner that the lamination is engaged within a galvanized steel standard and the insulation system shall be rated class H (180°C maximum coil hot spot temp.)
The ballasts shall conform to the following electrical characteristics

Wattage (W)	Current (A)	Power factor (λ)	Temp rise (^{0}C)	Connection type
100	1.2	0.42	70	CWA
150	1.8	0.40	70	CWA
250	3.0	0.40	70	CWA
400	4.45	0.43	70	CWA

*CWA-constant wattage autotransformer
The bidders shall provide the HID ballasts characteristic curves to support their offers
The HID ballasts shall date stamped on either the top surface or the side surface of the ballast core
The HID ballasts shall be component recognized by the UL (underwriters Laboratory) and shall meet the E 88% efficiency requirements of EISA (ACT, 2007)

(o) Capacitors

Capacitors shall comply with lEC 61048 and lEC 61049 and shall bear the IEC mark
Capacitors shall only be connected to the primary (line) side of transformer ballasts. After connection of the power factor correction capacitor, the power factor shall not be less than 0.88 (lagging).
All capacitors shall be fully encapsulated and filled with self-extinguishing resin.
The capacitors shall be of the ratings shown in the table below for the High Pressure Sodium lamps

LAMP		CAPACITOR
Wattage (W)	Current	μF±5%

100	1.2	13
150	1.8	20
250	3.0	33
400	4.4	45

(p) Ignition devices

Igniters shall comply with lEC 60927 and shall bear the lEC mark. Igniters shall be of the superimposed-pulse solid-state electronic trigger type.
The igniters shall be capable of operating lamps of the following wattage range 150W, 250Wand 400W
Igniters shall be of the standard type to allow striking of the lamp without switching the power off after replacement of a faulty igniter.
Igniters shall be suitable for operating any make of lamp in conjunction with any make of ballast at temperatures up to 90° C. The igniter shall be connected in series with the ballast and installed between the ballast and lamp holder. Systems that operate with the igniter in parallel with the lamp, or with special tapped ballasts, will not be acceptable.
All igniters shall be suitable for connection in the circuit so that the ignition pulse is confined between the igniter and lamp holder.
The igniters shall conform to the following electrical characteristics.

1	Lamp wattage (w)	11,150,250,400
2	Switch on voltage (v)	≤ 200
3	Switching off voltage	›168
4	KV peak	3.4
5	Load capacitance pF	155
6	Losses at peak current of 4.5 a in watts	2.7

(q) Consumer Unit

The consumer unit shall be manufactured in accordance with lEC 60439-1
The unit shall be complete with blanking plates, busbars, busbar cover, terminal blocks, and hinged door complete with installation instructions.
The unit shall be supplied complete with a suitably rated double pole isolator. Switch mounted on DIN metal plates (mild steel or phosphor bronze) rails with spare space on DIN rail (35mmx 7.5mmx1.0mm) for mounting the circuit breakers and contactors.
The consumer unit shall be for surface mounting type and outdoor installation inside a street lighting control pillar.
The consumer unit shall comply with the following technical requirements

	DESCRIPTION	REQUIREMENT
1	Standard	IEC 439 AND BS 60439
2	Max load/no of ways	80A, 4Way SPN
3	Degree ofn protection	IP 46
4	Enclosure of material	Cold rolled sheet steel
5	Finish	Gray Ral 7015

(r) Earth Leakage circuit Breaker

The Earth Leakage Circuit Breaker (ELCB) shall conform to lEC 61008 and BS4293
The ELCB shall incorporate a residual current operated electromagnetic release which operates without any auxiliary source of supply to open a circuit automatically in the case of an earth leakage fault between phase and earth greater than or equal to lAn
The ELCB shall be suitable for the circuit of 50Hz, rated voltage 230/400V, and rated current at least 40Amps
The ELCB shall have overload, short circuit and over voltage protect functions.
The ELCB shall be used in electrical distribution system to prevent electric shock. The ELCB shall conform to the electrical characteristics shown below.

Number of poles	1P+N
Rated current I_n (A)	40
Rated residual operating current (I_n)(mA)	30
Rated insulation (V)	600
Trip time	1*1 n<300ms
Rated voltage (V)/ Frequency	230/400; 50Hz
Residual current off-time	0.1 S
Short circuit capacity (Isc)	10KA
Mechanical/ electrical endurance	3000/2000
Tripping curve	C,D

Vibration resistance (g)	5
Degree of protection	IP20
Terminals capacity (mm^2)	≥25

(s) Contactor

The contactor shall be manufactured to lEC 60947-4-1 and Kenyan standards.
The contactor shall be an ac current operated type rated 40A double pole.
The contactor shall be suitably rated for operating lighting circuits of High Pressure Sodium of ratings 150W, 200W and 400W respectively
The contactors shall be manufactured to IEC 60947-4-1 and Kenyan standards
The bidder shall provide the relevant electrical durability curves to support the offer

	Description	Requirements
1	Type	AC operated double pole
2	Rated operational voltage Umax	690V
3	Rate insulational voltage	1000V
4	Rated operational current	40A
5	Impulse withstand voltage	8KV
6	Maximum breaking capacity	250A
7	Maximum electrical switching frequency for AC-1	600 Cycles/hr
8	Heat dissipation per pole	1.8W
9	Mechanical durability	3 million operating cycles
10	Degree of enclosure	IP 56

(t) Quality management systems

The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that tests and documentations will fulfil the requirements stated in the contract documents, standards, specifications and regulations.
The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications shall be submitted with the tender for evaluation.
The bidder shall indicate the delivery time of the items, manufacturer's monthly & annual production capacity and experience in the production of the type and size of items being offered. A detailed list & contact addresses (including e-mail) of the manufacturer's previous customers for similar type of the goods sold in the last five years as well as reference letters from customers shall be submitted with the tender for evaluation.

2404 TESTS AND INSPECTION

The accessories shall be inspected and tested in accordance with the requirements of the reference standards and this specification. It shall be the responsibility of the supplier to perform or to have performed all the tests specified.
Copies of previous Test Reports for the accessories issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. The accreditation certificate for the third party testing laboratory shall also be submitted with the tender (all in English Language).
Copies of type test reports to be submitted with the tender (by bidder) for evaluation shall be specified by the tender for each accessory on offer
Routine and sample test reports for each accessory to be supplied shall be submitted to KPLC for approval before shipment/delivery of the goods.
The Engineer will witness tests at the factory before shipment where necessary.
Tests to be witnessed by The Engineer at the factory before shipment shall be in accordance with relevant standards and this specification.
On receipt of the goods The Engineer may perform any of the tests specified in order to verify compliance with this specification.
The supplier shall replace without charge to Client any accessory, which upon examination, test or use; fail to meet any of the requirements in the specification.

2405 MARKING AND PACKING

(u) Marking

The accessories shall be indelibly and permanently marked with the following information:

- The manufacturer or supplier identity,

- The designation of lighting accessory
- The order number or equivalent;
- The product dimensions in millimetres;
- The words "Property of Client".

(v) Packing

The package shall be clearly marked with the following information;

- The manufacturer's and/or supplier's identification;
- Name of country of manufacture;
- Dimensions in millimetres;
- Quantity per box;
- The words "Property of Client ".

2406 DOCUMENTATION

The Contractor shall submit its tender complete with Guaranteed Technical Particulars for tender evaluation. The technical documents to be submitted (all in English Language) for tender evaluation shall include the following:
Fully filled clause by clause description of the item on offer as per Guaranteed Technical Particulars and signed by the manufacturer;

- Copies of the Manufacturer's catalogues, brochures, drawings and technical data;
- Details of manufacturing capacity and the manufacturer's experience;
- Copies of required type test reports by a third party testing laboratory accredited to ISO/I EC 17025;
- Copy of accreditation certificate to ISO/lEC 17025 for the third party testing laboratory;
- Manufacturers letter of authorization, quality certificate and other technical documents required in the tender.
- The successful bidder (supplier) shall submit the following documents/details to The Engineer for approval before manufacture:
- Guaranteed Technical Particulars signed by the manufacturer;
- Design Drawings with details of accessories to be manufactured for Client.
- Quality Assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations.
- Detailed test program to be used during factory testing
- Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the accessories for The Kenya Power & Lighting Company:
- Packaging details and quantity per package.

The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the accessories to Client.

2407 MEASUREMENT AND PAYMENT

The payment for items in this clause shall include full compensation for all work associated with the provision of Street Lighting as specified.
Item: Lanterns with integral control gear and 250 SON-T/XL-T lamps as Thorn Alpha 8 or equivalent
Unit: No
Item: Provide new street lighting columns 10 m long with 1.8m single arm out-reacg complete with 500mm x 500mm x mm thick plate base plate and 600 x 600 x 600 mm concrete foundation with drawing
Unit: No
Item: Provide new 5A double pole mcbs
Unit: No
Item: Provide new 10mm2x2 core PVC SWA/PVC copper cable
Unit: m
Item: Provide new 100mm dia PVC duct to be laid at every road crossing cable in accordance with specifications
Unit: m

Item: Tiles marked "HATARI" for cable protection covers 100x300x25mm
Unit: No
Item: 500mm wide by 1000mm deep trenching and backfilling etc
Unit: m
Item: Provide 1.5mm 2 PVC/PVC X 2 core and earth conductor
Unit: m
Item: Concrete cable route marker
Unit: m
Item: Control pillar in accordance with drawing and incorporating 1 KP and L Meter, 2 KP and L cutout, 3 isolator, 4,60 ATP and N Contractor, 5.60 a el cb, 0.5 current trip and 6.4 way T.P and distribution board complete with sp mcbs
Unit: No
Item: Earthing at each control pillar
Unit: No
Item: Earthing at every second street lighting column
Unit: No
Item: Photocell mounted on a 5M high powder coated octagonal galvanized steel column complete with wiring and all accessories to control contractor mounted in the control pillar
Unit: No
Item: Reinforced concrete guard blocks as per the drawing
Unit: No
Item: Cable glands
Unit: No
Item: Allow a prime cost as contribution to KP & L CO.
Unit: Provisional Sum
Any amount required under this item will be approved by the Engineer, prior to expenditure. Handling costs and profit in respect of this sub-item will be paid as a percentage (%) of the Provisional Sum expended.
Item: Test the completed works in accordance with I.E.E. regulations and as specified
Unit: Provisional Sum
Any amount required under this item will be approved by the Engineer, prior to expenditure. Handling costs and profit in respect of this sub-item will be paid as a percentage (%) of the Provisional Sum expended

2500 _HIV/AIDS, GENDER ISSUES, SOCIAL ISSUES AND LOCAL PARTICIPATION

2501 SCOPE

This specification sets out the Contractor's obligations with regard to on-site HIV/AIDS awareness campaign and preventive measures which are to be instituted.

2502 INTERPRETATION AND DOCUMENTATION

The following documents shall inter-alia be read in conjunction with this Specification;

- The Instructions to Bidders
- The Conditions of Contract
- The Drawings

2503 GENERAL REQUIREMENTS

a) HIV/AIDS Awareness Campaign

The Contractor shall institute an HIV/AIDS awareness campaign amongst his workers for the duration of the contract. As part of the campaign the Contractor will be required to display AIDS awareness posters in all buildings frequented by workers employed on the contract, where such buildings fall under the control of the Contractor. In addition, the Contractor will put at least ten HIV/AIDS awareness posters in the vehicles that are regularly used on site. The posters shall be printed on gloss paper and shall be at least A1 size on buildings and A3 size, or other approved size, on vehicles. The message on the posters shall be supplied by the Employer through the Engineer before the posters are printed.

AIDS awareness shall also be included in the orientation process of all workers employed on the contract.

b) AIDS Prevention Campaign

The Contractor shall institute an HIV/AIDS prevention campaign amongst his workers for the duration of the contract. As part of the campaign the Contractor will be required to make condoms available to workers. The condoms shall be from an approved manufacturer. The Contractor shall make available at least 4,000 condoms every month through dispensing machines or other approved method of distribution. The Contractor shall at all times keep the site adequately supplied with condoms.

c) HIV/AIDS Training

Introduction

HIV/AIDS is having a significant and increasing impact in Kenya. Statistics show a prevalence of 10-15% along some of the major roads in the country. Interventions that stimulate the movement of people increase both the exposure to the HIV virus and the spread of the virus. Road construction has been identified as one such intervention.

MOR policy is to integrate HIV/AIDS awareness and prevention into all road construction and rehabilitation programmes. This is in accordance with the Third National Strategic Plan (2000-5) for HIV/AIDS prevention and control as approved by the Government of Kenya, International Bank for Reconstruction and Development (IBRD) and many other organizations.

It is a contractual requirement to carry out HIV/AIDS awareness and prevention activities during the construction period as provided in this specification.

Objective

The objective is to reduce the risk of exposure to and spread of the HIV virus in the area of the construction. The target group will be local labourers and their supervisors employed by the works Contractors. The wider community will benefit indirectly through their normal day-to-day interaction with the target group.

Scope of activities

Activities for HIV/AIDS awareness and prevention will be broad-based targeting both individuals and groups. They may consist of:

(i) Information posters in public places both on and offsite (eating houses, bars, guest houses, vehicles etc.)

(ii) Availability of socially marketed condoms.

(iii) Peer educators (reference people) drawn from the local labour and educated in HIV/AIDS issues for discussions with colleagues (estimate 1 per 100 employees).

(iv) Small focus group discussions and information covering key issues

(v) Theatre groups and video presentations

(vi) Promotional events (such as sports to encourage openness and discussion of HIV/AIDS issues

(vii) Promotional billboards to raise awareness of the integration of construction and HIV/AIDS activities

(viii) Inclusion of HIV/AIDS activities at site meetings with the Provincial/District committees and other representatives

(ix) Availability of promotional material such as t-shirts, caps bumper stickers, key rings etc.

The scope of activities may be tailored as required to meet the perceived needs and priorities of the labourers, determined by participatory approaches to ensure they are appropriate desired and have a public health impact. The scale and frequency of activities may also be adjusted to suit requirements of the target group. Education will cover:

- preventive behaviours including partner reduction, condom use, awareness and importance of treatment of Sexually Transmitted Infections (STIs);
- skills including negotiating safer sex, correct condom use, purchase without embarrassment; and
- referral to local health centres and available services.

Tasks to support the above activities will be to:

1. Establish the status and focus of all current and planned HIV/AIDS activities in the area to ensure complementarity and determine potential involvement in project activities.
2. Carry out a brief review of regional activities combining road construction with HIV/AIDS campaigns to determine options, best practice key issues, constraints, etc.
3. Review of Information, Education and Communication (IEC) materials available and their relevance to road construction, making recommendations for future development of IEC materials.
4. Provide education and training for site personnel, supervisors and peer educators for the scope of activities as above.
5. Provide supervision for peer educators to ensure sustained quality of education. Incentives for their continual work may be small promotional items such as t-shirts, caps, etc.
6. Provide mechanisms for the social marketing of condoms and distribution of materials.
7. Monitor activities regularly to assess effectiveness and impact. This should an include an initial, interim and final assessment of basic Knowledge, Attitude and Practices (KAP) taking account of existing data sources and recognising the limitations due to the short time frame to show

behaviour change. The KAP will be supported by qualitative information from focus group discussions.

Collaboration

HIV/AIDS activities are co-ordinated nationally by the National Aids Control Council (NACC). MoR, in consultation with NACC and the Ministry of Health (MoH), will co-ordinate with the provincial, district and local representatives. Representatives of local health authorities will be invited to attend training and communication activities.

Activities on the construction site will be linked as far as possible with on-going HIV/AIDS awareness and prevention in the area. This will ensure complementarity of approaches, reinforcing education and minimising duplication. In addition, these links will ensure that the target group will have access to continued information after the end of the construction period.

Contractor Responsibilities

The Contractor will employ and designate a qualified HIV/AIDS expert to be approved by the Engineer, who will works closely with the Client, MoR and other implementing agencies to support the HIV/AIDS awareness and prevention activities. This will ensure maximum effectiveness and integration with construction activities. Specific, but not exclusive, issues to be addressed by the Contractor are:

a) Scheduling of appropriate timing and duration for the implementation of HIV/AIDS activities as part of work plan for labourers and supervisors. Designated rest times such as lunch breaks and pay days should be excluded.

b) Identification of suitable individuals for education from recruitment records for education with the implementing organisation.

c) Provision of suitable sites for communication activities and for condom distribution.

d) Monitoring the implementation of peer educational activities.

e) Provision of necessary support to the implementing organisation.

The Contractor shall be actively involved in the liaison and coordination associated with the provision and implementation of the HIV/AIDS awareness and education program.

Inputs

An organisation experienced in the provision of HIV/AIDS awareness and prevention activities will be selected as a Sub-Contractor to provide the above scope of activities on behalf of the main Contractor.

Reporting

The implementing organisation will produce the following reports to be submitted to the Contractor, Consultants, MOR and NACC:

- Monthly progress briefs for inclusion in site meetings.
- Quarterly reports detailing activities carried out, issues, follow up, etc.
- Review report of activities in the road construction sector,
- Review report of existing IEC materials with recommendations for development of materials specifically for the road sector.
- Final report detailing the methodology and activities carried out under this project including lessons learnt, impact, liaison with the Contractor and other parties, etc.

In addition, a report with the recommended approach for integration of HIV/AIDS awareness and prevention activities in the road construction sector will be produced. This will be a synthesis of project activities including contractual approaches, communication activities, availability of materials, liaison with existing organisations, etc. It will be developed with all parties involved in the construction activities to ensure the wide range of views and experiences is gained.

The final report and recommended approach will be presented to MOR, NACC and other interested organisations including private sector, funding agencies and NGO's.

Timing

Activities shall commence at the start of the construction period and continue throughout the thirty (30) months to ensure a sustained impact. Reporting and dissemination activities shall continue for three months after the project is completed to ensure integration into current practice.

2504 MEASUREMENT AND PAYMENT

Section I of the Bill of Quantities contains a prime cost sum for the provision of a HIV/AIDS awareness campaign, plus a percentage for the Contractor's liaison and coordination, overheads and profit associated with the provision and implementation of this campaign.

2600 ROAD SAFETY CAMPAIGN

2601 SCOPE

This specification sets out the Contractor's obligations with regard to on-site road safety campaign which is to be conducted during the construction period. The aim of this road safety campaign is to achieve safe road use in the project area.

Indeed, an improved roadway complete with paved surface will undoubtedly encourage more vehicular traffic and will allow vehicles to travel at higher average speeds. This will increase the possibility for accidents between vehicles, and with non-motorized traffic such as cyclists, pedestrians and both domestic and wild animals.

Although the improved road will be wider in certain areas and dangerous curves will be straightened, thus making it safer to travel at higher speeds, there is still likelihood of collisions between vehicles and with vehicles and bicycles, pedestrians, and livestock (and wildlife).

Due to poor road conditions over the years, people, animals, NMTs, and particularly children are unaware of the danger of a fast approaching vehicle and may cross the road in front of it. This impact is likely to be serious during daytime hours when traffic is heavier and when drivers are able to move faster.

Thus the Contractor shall conduct a road safety campaign in order to increase the awareness of the dangers of the road among the communities living alongside the project road, and the Consultant's workers.

2602 GENERAL REQUIREMENTS

(a) Road safety prevention campaign

The Contractor shall institute a road safety campaign amongst his workers, and the communities living alongside the road, for the duration of the contract. . As part of the campaign the Contractor will be required to display road safety posters in all buildings frequented by workers employed on the contract, where such buildings fall under the control of the Contractor, and in all schools and public buildings within the road project area. In addition, at least three (3) of the Contractor's vehicles, regularly used on site shall display road safety posters. The posters shall be printed on gross paper and shall be at least A1 size on buildings and A3 size, or other approved size on vehicles. The message on the posters shall be supplied by the Employer through the Engineer before the posters are printed.

(b) Road safety training

- Objective

  The objective of the road safety campaign is to reduce the risk of exposure to road accidents in the area of the road. The target groups will be the public alongside the road, especially the children in schools and the chiefs of the village, but also local labourers and their supervisors employed by the works contractors. The wider community will benefit indirectly through their normal day-to-day interaction with the target groups.

- Scope of activities

  Activities for road safety awareness will be broad-based targeting both individuals and groups. They may consist of:

  (i) Information posters in public places both on and offsite (eating houses, bars, guest houses, etc.) and on contractor's vehicles,

(ii) Peer educators (reference people) drawn from the local labour, and from the local communities, and educated in road safety issues for discussions with colleagues or the local community members,

(iii) Small focus group discussions and information covering key issues,

(iv) Theatre groups and video presentations,

(v) Promotional events (such as football matches) to encourage openness and discussion of road safety issues,

(vi) Promotional bill boards to raise awareness of the integration of construction and road safety activities,

(vii) Availability of promotional materials such as T-shirts, caps, bumper stickers, key rings, etc.

The scope of activities may be tailored as required to meet the perceived needs and priorities of the local communities and the workers, determined by participatory approaches to ensure they are appropriate, desired and have a public impact. The scale and frequency of activities may also be adjusted to suit requirements of the target groups. Education will cover:

- preventive behaviours including safe road crossing, walking on shoulders and not on the road;
- referral to local information centres and services available.

Tasks to support the above activities will be to:

1. Establish the status and focus of all current and planned road safety campaign activities in the area to ensure complementarity and determine potential involvement in project activities.
2. Carry out a brief review of regional activities combining road construction with road safety campaigns to determine options, best practice key issues, constraints, etc.
3. Review of Information, Education and Communication (IEC) materials available and their relevance to road construction, making recommendations for future development of IEC materials.
4. Provide education and training for site personnel, supervisors, local community members, and peer educators for the scope of activities as above.
5. Provide supervision for peer educators to ensure sustained quality of education. Incentives for their continual work may be small promotional items such as T -shirts, caps, etc.
6. Monitor activities regularly to assess their effectiveness and impact. This should include an initial, interim and final assessment of basic knowledge, attitude and practices (KAP) taking account of existing data sources and recognizing the limitations due to the short time frame to show behaviour change. The KAP will be supported by qualitative information from focus group discussions.

- **Contractor's Responsibilities**

The Contractor will designate a qualified road safety expert, to be approved by the Engineer, who will work closely with the Client, MOR and other implementing agencies to support the road safety campaign activities. This will ensure maximum effectiveness and integration with construction activities. Specific but not exclusive issues to be addressed by the Contractor are:

- Scheduling of appropriate timing and duration for the implementation of the road safety campaign as part the work plan.
- Identification of suitable individuals for education from recruitment records with the implementing organization and from within the local communities.
- Provision of suitable sites for communication activities.
- Monitoring of the implementation of peer educator activities.

- Provision of support as necessary to the implementing organization and local communities.

Inputs
An organization experienced in the provision of road safety campaigns will be selected as a subcontractor to provide the above scope of activities on behalf of the main Contractor.

Reporting
The implementing organization will produce the following reports to be submitted to the Contractor, the Engineer, and the Employer:

- monthly progress briefs for inclusion in site meetings.
- quarterly reports detailing activities carried out, issues, follow up, etc.
- a review report of activities in the road construction sector,
- a review report of existing IEC materials with recommendations for development of materials specifically for the road sector.
- a final report detailing the methodology and activities carried out under this project including lessons learnt, impact, liaison with the Contractor and other parties, etc.

Timing
Activities shall commence at the start of the construction period and continue throughout the Contract duration to ensure a sustained impact. Reporting and dissemination activities shall continue for three months after the project is completed to ensure integration into current practice.

2603 MEASUREMENT AND PAYMENT

The payment for items in this clause shall include full compensation for all work associated with the provision of road safety campaign related services as specified.

Item: Instituting a Road Safety Awareness Campaign

Unit: months

The unit of measurement shall be the calendar month or part thereof, measured over the duration of the campaign. The tendered rate shall include full compensation for equipment, labour and material required for the provision of the service.

Item: Instituting an Accident Prevention Campaign

Unit: months

The unit of measurement shall be the calendar month or part thereof, measured over the duration of the campaign. The tendered rate shall include full compensation for equipment, labour and material required for the provision of the service.

Item: Road Safety Training

Unit: Provisional Sum

Compensation for road safety specialists for the implementation of the Training element of Clause 26 03 (b)
Any amount required under this item will be approved by the Engineer, prior to expenditure. Handling costs and profit in respect of this sub-item will be paid as a percentage (%) of the Provisional Sum expended.

SECTION 9: BILLS OF QUANTITIES

Bill of Quantities

The Bill of Quantities shall be divided into the following sections:

- Preamble
- Grand summary
- Work items
- Appendices to the Works Items

PREAMBLE TO BILL OF QUANTITIES

1. The Bills of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional and are given to provide a common basis for bidding.
3. There is no guarantee to the Contractor that he will be required to carry out all the quantities of work indicated under any one particular item or group of items in the Bill of Quantities.
4. The rates and prices bid in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the contract, include all Contractor's equipment, labor, supervision, materials, erection, maintenance, insurance, profit, taxes and duties, together with all general risks, liabilities and obligations set out or implied in the contract.
5. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the in the Bill of Quantities.
6. The whole cost of complying with the provisions of the Contract, shall be include in the items provided in the priced Bill of Quantities, and where no items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related items of work.
7. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bills of Quantities. References to the relevant sections of the Contract documentation shall be made of before entering prices against each item in the priced Bill of Quantities.
8. The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.
9. The Bills of Quantities have been drawn up in accordance with the Standard Specification for Road and Bridge Construction issued in 1986 by the Ministry of Roads and Public Works
10. All items are measured net in accordance with the drawings, and provisions of the Standard Specification for Road and Bridge Construction issued in 1986 by the Ministry of Roads and Public Works. No allowances has been made for waste and the principle of net measurements shall apply to all works executed under this contract.
11. All quantities measured for payment will be determined by the Engineer on the basis of the actual net quantities used in the accepted permanent works.
12. No alteration shall be made to the Bill of Quantities and no extra item shall be inserted. The Bidder shall satisfy himself that the Contract Sum arrived at by pricing the quantities and items given sufficient compensation for constructing and maintaining the whole of the works in accordance with the Contract Documents.
13. The Bidder is deemed to have spread over and included in the prices and sums inserted in the Bills of Quantities the following items, unless inserted as Method Related charges:
    a) For concrete works the cost of in-situ workability tests
    b) For Equipment/Plant, inspection and testing to the Engineer's satisfaction and inspection to satisfy Kenyan Government import procedures at the place of manufacture, necessary packing or crating and shipping to site, all insurances for the importation of the plant, all handling, transportation, on and off loading and storage of the plant/equipment storage areas, all handling, transportation, on and off loading and stacking of the plant at the site, and supply to the engineer of all necessary test certificates and Technical Documents.
14. Provisional Sums
    a) The contractor shall not carry out any work in respect of any item for which a Provisional Sum is included in the Bills of Quantities until he has received written instructions from the Engineer in regarding such item.
    b) In respect of Provisional sums including for the supply of goods, materials or services, by a nominated sub-contractor, it shall be the duty of the Contractor to make an application to the Engineer sufficiently in advance of the progress of the work for instructions regarding such

items. The contractor shall then, when required by the Engineer, obtain competitive quotations under specifications to be provided by the Engineer and, if instructed, samples, for the supply of such goods, materials or services shall be provided. It shall be the responsibility of the contractor to place and process the order for such upon the instructions of the Engineer.

c) The contractor shall produce to the Engineer the receipted accounts for all goods, materials or services obtained under Provisional Sum items and the amounts paid to the contractor shall be in accordance with relevant Clauses of the Conditions of contract. No payments shall be made to the contractor until the said receipts have been presented to the Engineer.
d) Provisional Sums inserted in the Bills of Quantities in respect of materials to be specially imported for the contract by the contractor shall be deemed to include insurance, freight, clearing and forwarding; and all other charges. In the case of imported materials obtained through a manufacturer's agent in South Sudan, the Provisional sum shall include the agent's fees and charges.
e) The Bills of Quantities include items in respect of the provisional sums for materials and sub-contractor's given in the form of percentage of the sums to be expended to cover the contractor's profits and overheads, including but not limited to the costs of obtaining quotations for, and placing of orders or awarding sub-contracts, and all expenses in connection with administering such orders or sub-contracts, as described in relevant clauses of the conditions of contract.

15. Day works, payment for works executed on a day work basis will be made as follows:-
    a) The whole of the day work bill is provisional.
    b) Labor: the cost for each class of labor as entered in the schedule of Day works which shall be the actual cost of wages plus a percentage to cover transport to site, insurance, small tools, supervision, overheads and profit.
    c) Materials: the actual quantity invoiced as delivered to site at the rate given in the schedule of Day works which shall include delivery, storage, handling, overheads and profits. All materials are to comply with the specifications.
    d) Plant: at the rate given in the schedule of day works which shall include delivery and removal from site, fuel and lubricants.
    e) The contractor will generally only be required to execute day works, for which in the opinion of the Engineer, he has suitable plant, employs suitable labor and for which he can obtain the necessary materials.
    f) In the event that the contractor is required to execute day works for which he does not possess suitable plant, or employ suitable labor, he shall be reimbursed such reasonable expenses as he incurs in the provision of such plant or labor, together with the amount determined above.
    g) The chargeable time shall be the actual time for which the labor or plant is used on the works, calculated as a multiple of the periods quoted below, and subject to the minimum of that period.
    h) The rates for plant shall be inclusive of all fuels, greases and other consumable stores, and of spare parts etc but exclusive of operators, drivers, attendants etc, who will be paid under the item for labor on the instructions of the Engineer's representative. Idle time shall not be paid for and rates shall include for delivery of plant to the site.
16. Earthworks
    a) Quantities for site clearance, stripping and spreading shall be based on the horizontal projection of the area cleared or stripped.
    b) The rates for excavated items shall be deemed to include inter alia for setting aside spoil for reuse in the works or disposing to approved tips, except where otherwise provided for in the Bill of Quantities.
    c) Disposal of excavated material shall be deemed to be disposed off the site unless otherwise stated in item descriptions.
    d) The rates shall include as appropriate for:
        i. Breaking through surfaces, handling different classes of material separately; excavation beyond the net plan area of the foundations for working space and for battering or timbering etc.
        ii. Timbering.
        iii. Dealing with water from any source whatsoever.
        iv. Backfilling as specified.
        v. Disposal of surplus spoil.
        vi. Trimming of exposed excavated surfaces.
    e) Measurement of volume of excavation for structures shall be calculated from the plan dimensions of the structure without allowances for working space.
    f) The depth of excavation in pipe trenches will be measured from ground level to the invert of the pipe. Measurement for other excavations will be to the size which is required to accommodate the permanent works. A bidder shall accordingly allow in his prices for any amount of extra

excavation which may be necessary for working space to complete the work to the satisfaction of the Engineer.

g) Items are included for 'Extra for Rock' on a volume basis. The rates shall include for breaking out and any other additional costs and the items shall apply to work encountered within measured excavation. Rock shall be measured as a volume calculated from the thickness encountered within the plan area of a mass excavation, within the plan dimensions of a structure, or within the nominal width of a trench. The decision of the Engineer on the classification of rock encountered in excavation shall be final and binding.

h) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledge hammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 300 kilowatt power (Caterpillar D9 or equivalent) with a single, rear-mounted, hydraulic ripper. Boulders of more than 1.0m3 occurring in soft material shall be classified as hard material.

i) Soft material shall be all material other than hard material.

j) When the site of any particular item of the works has been sufficiently cleared of trees, undergrowth etc. and before any excavation or filling has been carried out, the contractor shall carry out a survey under the supervision of the Engineer's representative to take, record and agree upon an adequate number of original ground levels. The data so obtained shall be used as a basis for the computation of excavation and filling.

k) The volume of fill will be measured net to finished levels as shown on the drawings or as amended by the Engineer.

17. Reinstatement: items have been shown for re-instatement only where the existing surfaces before commencing work shows easy identifiable signs of being used for some purpose. Elsewhere, reinstatement shall be to match existing ground conditions.
18. Erosion control: the cost of erosion control measures during construction, as referred to in specifications are to be borne by the contractor.
19. Reinforcement
    a) All reinforcement will be paid for on the basis of its computed weight except for fabric reinforcement which will be paid for on the basis of the net area placed. The units rates inserted in the Bill of Quantities shall include for all necessary cutting, bending and fixing, and shall include for all necessary cutting, bending and fixing all additional bars which may be required as spacer supports and lacings and also for all soft iron tying wires, fixing dips of approved pattern and manufacture, and chairs. The cost of all temporary works including clips, chairs etc. shall be included in the rates for reinforcement or other reinforcement shall be included in the rates for reinforcing steel.
    b) The weights for reinforcing bars shall include for all hooked or bent ends as per the bending schedule to be prepared by the contractor during construction. Rates for fabric reinforcement or other reinforcement shall include for all laps, cutting to size, bending and waste.
20. Concrete
    a) The rates for concrete shall include for making and testing preliminary test cubes, for making work test cubes and forwarding them to the Engineer, forming the concrete to the slopes and falls as shown on the drawings and any additional concrete used in excess net requirements. The rates shall also include for forming construction joints, for protection, for curing, for rubbing down of exposed surfaces of concrete after removal of form work and for floating or brushing of other exposed surfaces where this is required.
    b) The rates for precast concrete paving shall include for all cutting, bending, joining and laying to fails.
    c) The rates for precast concrete paving shall include for form work, concrete bed and backing, all cutting, bedding, jointing and laying to fails.
    d) The rates for form work shall include for fillets and chamfers up to 50mm wide on the splay, coating to prevent adherence of concrete and the provision of temporary openings to facilitate inspection and cleaning. Rates shall also be inclusive of all necessary box outs and cut outs for holes up to 1 square meter.
    e) Deductions from form work quantities will be made for openings more than $1m^2$ in area.
    f) Form work for upper surfaces inclined at 300 or less to the horizontal is not measured and the cost of any such form work used will be deemed to be included in the relevant concrete item rate.
    g) Wrought formwork where specified will be measured to 150mm below ground levels.
    h) Items required for structural joints and construction joints shown on drawings shall be paid for as per the rates in the Bill of Quantities; the rate for providing and fixing PVC water bar being inclusive of all joints, overlaps, junctions, welding, formwork not shown on drawings shall be deemed to be included in the unit rates for concrete work.
21. Definition of terms used

a) 'Provide'- shall mean all costs to cover purchase of materials in good condition, services for transaction with the supplier, supervision, transport to site of works all charges for rental, consumptions, overheads, and profits throughout the contract. It shall also include for all maintenance, insurance and handling and storage whenever applicable.
b) 'Excavate for'- shall mean handling of any material from its incumbent position intended for specified work shown in the drawing or directed by the Engineer and backfilling and compacting part of material after laying pipes, and cart away remaining to tips to be provided by the contractor. The cost for this work shall include all survey, supervision, labor, tools, machinery, protection of work, pumping, insurances and overheads and profits.
c) 'Laying'- shall cover all work necessary for placing an object or material to true line and level specified in a drawing or as directed by the Engineer.

22. "Authorized" "Directed" or "Approved" shall mean the authority, direction or approval of the Engineer.
23. The units of measurement and abbreviations tabulated below are used herein

Unit	Abbreviation	Unit	Abbreviation
cubic meter	m^3 *or* cu m	litre	l
hectare	ha	millimetre	mm
hour	hr	month	mth
kilogram	kg	number	No.
kilometre	Km	provisional sum	Prov. Sum
lump sum	LSum.	square meter	m^2 *or* sq m
meter	m	square millimetre	mm^2 *or* sq mm
metric ton (1,000kg)	t	vehicle	Veh
		week	wk

BILL No.1 : PRELIMINARY AND SUPERVISORY SERVICES					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE**	**AMOUNT**
1.01	Construct, furnish and maintain accommodation for Engineer's staff as detailed in drawings and specifications. Ownership to revert to the Contractor				
	(i)Type I	No x Month	24		
	(ii)Type II	No x Month	72		
	Accommodation for Engineer's junior staff				
	(iii)Type III	No x Month	48		
	(iv)Type IV	No x Month	72		
	(v) Type V	No x Month	120		
1.02	Provide P C sum for Maintenance Engineer's Representative's office.	No	1		
1.03a	Provide P C sum for Maintenance Engineer's Representative's laboratory in accordance with specifications	No	1	2,000,000.00	2,000,000.00
1.03b	E.O. item 1.03a for the Contractor's overheads, profits && expenses	%	2,000,000		
1.04a	Provide P C sum for Purchase and maintenance Engineer's survey equipment for the duration of the Contract as listed	PC	1	2,000,000.	2,000,000.00
1.04b	E.O. item 1.04a for the Contractor's overheads, profits && expenses	%	2,000,000		
1.05a	Provide PC Sum for Maintenance of Engineers laboratory for the duration of the Contract.	PC Sum	1	3,000,000.00	3,000,000.00
1.05b	E.O. item 1.05a for the Contractor's overheads, profits && expenses	%	3,000,000		
1.06	Provide with driver, fuel and maintain One (1) new four wheel drive station wagon Type I vehicles of minimum 3000 cc diesel engine capacityfor the exclusive use of the Engineer inclusive of the first 4000 km per vehicle per month. Include for vehicles to revert to Contractor at the end of the Contract.	Veh.Mth	24		
1.07	Extra over Item 1.06 for mileage over 4000km per month per vehicle.	Km	10,000		
1.08	Provide with driver, fuel and maintain Two (2) new 4WD double cabin pick-ups Type II of minimum 3000 cc capacity engines or equivalent for the exclusive use of the Engineer, inclusive of the first 4000km per vehicle per month. Ownership to revert to Contractor at the end of the Contract.	Veh.Mth	48		
1.09	Extra over Item 1.08 for mileage over 4000km per month per per vehicle.	Km	10,000		

1.1	Allow a Prime Cost sum of Kshs 500,000 for the Engineer's staff airtime charges	PC SUM	1	1,000,000.00	1,000,000.00
1.11	E.O. item 1.12 for the Contractor's overheads, profits && expenses	%	1,000,000		
1.12	Provide ,erect and maintain publicity signs as directed by the Engineer	No	8		
1.15	Allow Prime Cost sum of Kshs 1,000,000 for temporary hotel accommodation for the employer	PC	1	1,000,000	1,000,000
1.16	Allow for Contractor's profits, expenses and overheads on item 1.15	%	1,000,000		
1.17	Provide a Prime Cost sum of Kshs 3,000,000 for the engineer's miscellaneous account to be spent in whole or part as instructed by the engineer and to be reimbursed against receipt	PC SUM	1	3,000,000	3,000,000
1.18	Allow for Contractor's profits, expenses and overheads on item 1.17	%	3,000,000		
1.21	Allow for Prime Cost of Kshs 1,000,000 for the provision and operation of the Contractor's Environmental Management Plan	PC Sum	1	1,000,000	1,000,000
1.22	Contractor's profit, expenses and overheads over item 1.21	%	1,000,000		
1.23	Allow for Prime Cost of Kshs 8,000,000 for Attendance upon the engineers junior staff allowance and remuneration	PC Sum	1	8,000,000.00	8,000,000.00
1.24	Contractor's profit, expenses and overheads over item 1.23	%	8,000,000.00		
	Total Bill 1 Taken To Summary				

BILL No.4 SITE CLEARANCE AND TOP SOIL STRIPPING					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
4.01	Clear site on road reserve including removal of trees, hedges, bushes and other vegetation of trees, hedges, bushes and other vegetation or deterious organic material, grub up roots and back fill to 100% MDD (AASHTO T99) with approved material in accordance with the specification.	Ha	26		
4.02	Remove top soil not exceeding 200mm depth and stockpile for reuse as directed by the engineer.	m3	51,589		
4.03	(a) Excavate, remove and dispose existing 600mm and 900mm dia. Pipe culverts.	M	190		
	(b) Excavate, remove and stockpile for reuse, existing pipe culverts of any size, as directed by the Engineer	M	115		
4.04	Demolish and dispose pipe culvert inlet and outlet structures.	No.	68		
4.05	Allow for Provisional Sum of Sh.2,750,000 for removal of Structures and Obstructions, Payment to be on day works basis	Prov. sum	1.00	2,750,000	2,750,000
4.06	Allow for contractor's overheads and profits on item 4.05	%	2,750,000.00		
4.07	Allow a Provisional Sum of Kshs 20,000,000 for removal, alteration and reinstatement of existing services, all in accordance with the Contract and	Prov. Sum	1	20,000,000.00	20,000,000
4.08	Remove and dispose of existing stone or concrete drains	m	110		
4.09	Remove existing road signs and stockpile as directed by the Engineer	No.	40		0
Total Bill 4 Taken To Summary					

BILL No.5 EARTHWORKS					
ITEM	**DESCRIPTION**	**Unit**	**Quantity**	**Rate**	**Amount**
5.01	Fill in soft material and compact to at least 95% MDD	M3	41,275		
5.02	As item 5.01 but in hard material	M3	5,600		
5.03	Spoil in soft material or re use as directed by the engineer	M3	89,085		
5.04	Spoil in hard material	M3	3,107		
5.05	Compaction to 150mm depth of existing ground below fills and cuts to 95% MDD (AASHTO T99)	m3	16,300		
5.06	Compaction of the 300mm below formation level in cutting to 100% MDD (AASTO T180)	M3	19,450		
5.07	E.O. item 5.06 for compaction of top 300mm in fills to 100% MDD (AASHTO T99)	m3	13,930		
5.08	Provide, lay and compact 300mm improved sub grade material to 100% MDD (AASHTO T99)(Provisional)	M3	47,192		
5.09	Topsoiling prior to grassing minimum compacted thickness of topsoil shall be 50mm all in accordance with specifications	M2	23,000		
5.1	Grassing - planting of spring of approved indigenous grass types; to embankments, cuttings or where directed by the Engineer	M2	23,000		
Total Bill 5 Taken To Summary					

BILL No.7 EXCAVATION AND FILLING FOR STRUCTURES					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
7.01	Excavate for structures in soft material	M3	2,340		
7.02	Extra over item 7.01 for excavation in hard material	M3	123		
7.03	Excavate for gabions in soft material	M3	2000		
7.04	Extra over item 7.03 for excavation in hard material	M3	5		
7.05	Provide and place gabion mesh-boxes size 2mxlmxlm. The rate shall include for the cost of providing and fixing the mesh, and the cost of providing, hauling and placing the rock	M2	14,640		
7.06	Provide and place grouted stone pitching including removal of spoil, to drains, slopes, inlet, as directed by the Engineer	M2	3,800		
7.07	Provide and back fill approved materials around structures, compacted to 100% MDD (AASTHO T99) in layers not exceeding 150mm	M3	202		
7.08	Provide, place and compact rock fill below structures and in swampy areas	M3	8,000		
7.09	Provide and compact porous fill materials behind behind the wing walls	M3	30		
7.1	Carry out river training works as directed	M3	40		
7.11	Rock fill to Gabions	M3	7,340		
7.12	Filter Fabric	M2	4,800		
7.13	Dumped Rip Rap	M3	1,650		
Total Bill 7 Taken To Summary					

BILL No.8 CULVERT AND DRAINAGE WORKS					

Item	Description	Unit	Quantity	Rate (Kshs)	Amount
8.01	Excavate in soft material for pipe culverts and subsoil drains in soft material including support of trench sides	M3	3,410		
8.02	Excavate for inlet, outfall, mitre and catch water drains in soft material	M3	7,407		
8.03	Provide, lay and joint 600mm dia. Precast concrete pipes including access roads	M	900		
8.04	Provide, lay and joint 900mm dia. Precast concrete pipes including access roads	M	255		
8.05	As item 8.13 but 1200mm dia	M	45		
8.06	Provide, place and compact concrete class 15/20 to beds, surrounds and haunches to concrete pipes including form work	M3	1,025		
8.07	Provide and place Class 20/20 concrete to beds, headwalls, wing walls, apron slabs, haunches, toe walls, inlets and outlets to culverts, minor drainage structures including all form work, reinforcement and finishing	m3	425		
8.08	Provide BRC A142 fabric mesh reinforcement or equivalent in 8.07	m3	1,770		
8.09	Excavate in soft material, Precast Rectangular Concrete Side Drains(50mm thick) Using Class 20/20 Concrete with Reinforcement	M	3,600		
8.1	Excavate in soft material, provide and place 600mm invert block drains with two course side slab	M	7,500		
8.11	Concrete scour checks as shown in the drawings	M3	275		
8.12	Provide and Place 600mmx225x75mm thick precast concrete slab	M2	995		
Total Bill 8 Taken To Summary					

BILL No.9 PASSAGE OF TRAFFIC					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**

9.01	Provide and maintain the signs and barriers for safe passage of traffic				
	(i) signage	No.	150		
	(ii) Barricades- drum type	No.	80		
	(iii) barricades- steel portable	No.	40		
9.02	Allow for the passage of traffic through the works	Lump Sum	1		
9.03	Improve existing road	Lump Sum	1		
9.03	Construct and maintain 6.5m wide deviations in accordance with Clauses 904 and 905 of the Specifications	Km	12		
9.04	Provide, spread and Compact gravel wearing course of thickness 150mm and CBR greater than 20 on Deviations	m^3	8,007		
Total Bill 9 Taken To Summary					

BILL No.12 NATURAL MATERIALS FOR BASE AND SUBBASE					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
	NOTE: No overhaul will be paid for these items as they shall be deemed to have been included in the Contractor's rates				
12.01	Excavate gravel for 175- 225mm thick subbase material as specified, haul, spread, compact to 95% M.D.D. (AASHTO T.180) and shape to level and tolerance to Cycle lanes, Foot paths, Access Roads and Markets	m^3	26,248		
12.02	Excavate gravel for 150mm thick base material as specified, haul, spread, compact to 95% M.D.D. (AASHTO T.180) and shape to level and tolerance to Cycle lanes, Foot paths, Access Roads and Markets	m^3	18,575		
Total Bill 12 Taken To Summary					

BILL No.14 CEMENT AND LIME MATERIALS					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**

14.01	Provide and spread cement stabalizer at 40 - 80kg/cum as directed by the Engineer, to Natural Material.	Tonne	2,300		
14.02	Mix in cement (mix - in - place method)	M3	44,820		
14.04	Protection and curing of Cement and lime treated material	M2	247,542		
Total Bill 14 Taken To Summary					

BILL No.15 : BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
15.0	NOTE: No overhaul will be paid for bitumen/chippings as these shall be deemed to have been included in the rates				
15.01	Provide and spray bituminous binder type MC30 (prime coat) at a rate of 1.2l/m2	Litres	156,098		
15.02	Provide and spray bituminous binder type K1-70 tack coat at a rate of 0.5l/m2	Litres	104,585		
Total Bill 15 Taken To Summary					

BILL No.16 : BITUMINOUS MIXES					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
	NOTE: No haulage will be paid for aggregates, bitumen or the premix. The cost for haulage shall be included in the rates. Rates to be inclusive of fines				
16.01	On prepared surface of base layer, provide, lay and compact modified AC with 4.9% nominal bitumen content and 0/20 mm aggregates	M^3	68,420		
Total Bill 16 Taken To Summary					
BILL No.17 : CONCRETE WORKS					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**

17.01	Provide all materials, mix, place and compact concrete class 30/20	m^3	500		
17.02	Provide all materials, mix, place and compact concrete class 25/20	m^3	300		
17.03	Blinding Concrete class 15/20	m^3	180		
17.04	Unformed vertical surface finish-class UF1	m^2	1,000		
17.05	As item 17.05 but class UF3	m^2	800		
17.06	As 17.04 but horizontal-class F1	m^2	1,000		
17.07	As 17.04 but horizontal-class F3	m^2	800		
17.08	High Tensile Steel Reinforcement bars-dia less or equal to 16mm	Tonne	50		
17.09	As item 17.14 but diameter greater than 16mm	Tonne	100		
17.10	Fabric Reinforcement A252	Tonne	1		
17.11	Supply and fix heavy duty PVC pipes 75mm Dia by 300mm long for weep holes for culverts	m^2	30		
Total Bill 17 Taken To Summary					

BILL 19: SRUCTURAL STEEL WORKS					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**

19.01	914 X 419 X 388kg/m main girders	Ton	70		
19.02	127x64x14.9kg/m unequal angle shear connectors at 300mm welded to top flange with 7mm fillet weld all round and bolted as shown in drawings	Ton	3		
19.03	432x102x66kg/m channel stiffeners bolted to girder at web stiffeners	Ton	5		
19.04	12mm thick web stiffener plate welded all round with 6mm fillet weld and 4 no. 21mm dia holes for 19mm dia bolts as shown in drawings	Ton	0.5		
19.05	4No. 900x350x25mm thick plates at top and bottom of web splices with 24mm diameter bolt holes to detail as shown in drawings	Ton	0.37		
19.06	2No. 25mm thick plates on sides of web plices with 24mm diameter bolt holes to detail as shown in the drawings	Ton	0.3		
Total Bill 19 Taken To Summary					

BILL No.20 : ROAD FURNITURE

Item	Description	Unit	Quantity	Rate (Kshs)	Amount
20.01	Provide and erect priority signs				

	a) 1000mm size	No.	24		
	b) 750mm size	No.	61		
20.02	Provide and erect warning signs	No.	52		
20.03	Provide and erect standard informatory signs 400 x 300 mm	No.	41		
20.04	Provide standard mandatory signs 600mm	No.	38		
20.05	Provide and erect Non-Standard informatory signs:				
	(a) Less than 1 m2	No.	50		
	(b) 1 - 2 m2 area	No.	13		
	(c) 2 - 5 m2 area	No.	7		
	(d) > 5 m2	No.	7		
20.06	Paint with thermoplastic paint 0.1 m wide yellow centreline on the road	m2	1,000		
20.07	Paint with thermoplastic paint 0.1 m wide white lines on centreline and the road edge	m2	1,000		
20.08	As item 20.07 but 0.2 m wide (Bus-bay Separation marking)	m2	181		
20.09	As item 20.08 but 0.4 m wide give way line	m2	125		
20.1	As item 20.08 but 0.5 m wide but pedestrian crossing	m2	188		
20.11	Paint with thermoplastic paint 0.25 m thick wide yellow lines on edge marking as directed by the Engineer	m2	57		
20.12	Provide, lay and joint 125mm x 250mm half-battered kerbs				
	(a) straight and radius 20 m and above	m	1,375		
	(b) radius < 20 m	m	316		
20.13	As Item 20.12 but 125mm x 100mm channels				
	(a) straight and radius 20 m and above	m	2,750		
	(b) radius < 20 m	m	625		
20.14	Provide and erect edge marker posts as directed by the Engineer	No.	75		
20.15	Paint single headed road arrows as directed by the Engineer	No.	13		
20.16	Provide and install galvanised flexbeam guard rails complete with reinfored concrete posts, spacers, nuts, bolts and fittings as directed by the Engineer	m	1,050		
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
20.17	Provide and erect road reserve boundary posts	No.	58		
20.18	Provide and install retroreflective delineators (Cat's eyes) as directed by the Engineer	No.	2,250		

20.19	Provide and erect Kilometre marker posts as directed by the Engineer	No.	40		
20.2	Provide and erect asphalt concrete speed humps as shown on the drawings, where directed by the Engineer.	m3	30		
20.22	Provide and erect environmental awareness billboards of size > 5m2 at urban centers	No.	8		
20.23	Provide and construct asphalt concrete rumble strips to carriageway or shoulders as shown on the drawings, where instructed by the Engineer.	m	750		
20.24	Provide and erect 200mm diameter concrete bollards	No.	110		
20.25	Provide, lay and compact 105mm x 210mm x 80mm precast concrete paving blocks laid on 50mm sand laying course (provisional)	m^2	1,530		
Total Bill 20 Taken To Summary					

BILL No.21 : MISCELLANEOUS BRIDGE WORKS					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
21.01	Provide and apply bituminous waterproof to abutments and wingwalls in two layers at a rate of 0.55L/m2 as shown in the drawings or	m^2	2,000		

	as directed by the Engineer.				
21.03	Provide and place steel flexi-beam guard-rails to bridge approaches including steel post, anchors and welding as directed by the Engineer.	m	16,000		
21.04	Provide and place approved elastomeric bridge bearings of dimension shown in the drawings.	No.	80,000		
21.07	As item 21.06 but handrail posts 75 x 75 x 4mm RHS	no	20		
21.13	75mm diameter to abutments and wing walls drain pipes	M	80		
Total Bill 21 Taken To Summary					

BILL No.22 : DAYWORKS					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**

	Items of Major Plant Employed on Dayworks				
	Note: THE WHOLE OF THIS BILL IS PROVISIONAL				
	Where items of Major Plant listed in the Schedule of Dayworks are specified by type (e.g Cat D7, Cat. 120H) the power rating of such plant is that manufactured within the two years prior to the date of tender.				
	Any plant employed upon Dayworks which have power rating lower than that stated above, shall be paid for at rates lower than those in the Schedule of Dayworks. The reduction in the payable rate shall be in proportion to the power rating below that specified above.				
	PLANT				
22.01	Crawler Dozer with Hydraulic Ripper				
	(a) 100-135 Kw rated flywheel power	hr	5		
	(b) 136-185 Kw rated flywheel power	hr	12.5		
	(c) 186-250 Kw rated flywheel power	hr	12.5		
22.02	Motorized rubber tyred single engine scrapers		-		
	(a) Up to 16m3 heaped capacity	hr	12.5		
	(b) 17-26 m3 heaped capacity	hr	12.5		
22.03	Motorized rubber tyred twin engine scrapers		-		
	(a) Up to 16 m3 heaped capacity	hr	12.5		
22.04	Motor Graders with Hydraulic Ripper or Scarifier		-		
	(a) 80-110 Kw rated flywheel power	hr	12.5		
	(b) 111-120 Kw rated flywheel power	hr	12.5		
	(c) 121-160 Kw rated flywheel power	hr	12.5		
22.05	Tracked Excavator Cranes		-		
	(a) 20-28t max working load	hr	12.5		
	(b) 2 8.1 -3 6.1t max working load	hr	12.5		
	(c) 36.1-56t max working load	hr	12.5		
22.06	Excavators hydraulic wheeled dual purpose		-		
	(a)0.6-0.8m3 rated bucket capacity	hr	12.5		
	(b)0.81-1.0m3 rated bucket capacity	hr	12.5		
22.07	Wheeled loaders 4X4 articulated		-		
	(a) 1.5-2.0 m3 SAE rated capacity	hr	12.5		
	(b) 2.01-3m3 SAE rated capacity	hr	12.5		
	(c) 3-5 m3 SAE rated capacity	hr	12.5		
22.08	Crawler Loaders with Hydraulic Ripper		-		
	(a) 0.8-1.3m3 SAE rated capacity	hr	12.5		
	(b) 1.31-1.99 m3 SAE rated capacity	hr	12.5		
	(c) 2-2.5 m3 SAE rated capacity	hr	12.5		
22.09	Rollers Towed vibratory including tractor		-		
	(a) 6.5-8.8t un-ballasted weight	hr	12.5		
	(b) 8.6-11.7t un-ballasted weight	hr	12.5		
22.1	Road Roller deadweight (Steel Three Wheel)		-		

	(a) 6.5 -8.8 t un-ballasted weight	hr	12.5		
	(b) 8.6-11.7 t un-ballasted weight	hr	12.5		
22.11	Roller rubber tyredself propelled		-		
	(a) up to 1 t per wheel	hr	12.5		
	(b) 1.1 t-2.0 t per wheel	hr	12.5		
22.12	Roller Vibratory single roll Rubber tyred, 8.3-10.5 t un-ballasted weight	hr	12.5		
22.13	Vibrating plate compactor 114-200 kg operating weight	hr	12.5		
22.14	Compressor rated by normal delivery of free air per minute complete with all tools		-		
	(a) 6.0-7.4 m3/mm	hr	12.5		
	(b)7.5-9.7m3/min	hr	12.5		
	(c) 9.8-25.5m3/min	hr	12.5		
22.15	Mobile rubber tyred rough terrain crane 23-40 t max working load	hr	25		
22.16	Small dumpers 751kg-1.2t max rated pay load	hr	12.5		
22.17	Pumps(Inclusive of all hoses		-		
	(a) 50-76mm delivery	hr	12.5		
	(b) 77-101 mm delivery	hr	12.5		
22.18	Rubber tyred tractors including trailer. 50-70kw rated flywheel power	hr	12.5		
22.19	Concrete mixers (wet capacity)		-		
	(a) up to 100 litres	hr	12.5		
	(b) 101-200 litres	hr	12.5		
	(c) 201-300 litres	hr	12.5		
22.2	Transit Mixer 4.5 m3/hour	hr	37.5		
22.21	Concrete pump of 45 and 30 m3 capacity	hr	25		
22.22	Concrete poker vibrator	hr	25		
22.23	Concrete pump of 45 and 30 m3 capacity	hr	25		
22.24	Lorries - Flatbed		-		
	(a) up to 7.5t gross vehicle weight	hr	25		
	(b) 7.6-12.0t gross vehicle weight	hr	25		
22.25	Lorries - Tippers		-		
	(a) up to 11t gross vehicle weight	hr	25		
	(b) 11-17t gross vehicle weight	hr	12.5		
	(c) 17.1-25t gross vehicle weight	hr	12.5		
22.26	Van, Pickup or similar utility vehicle		-		
	(a) up to 1t carrying capacity	hr	25		
	(b) 1.1-2.6 t carrying capacity	hr	12.5		
22.27	Self propelled water or fuel tanker		-		
	(a) 3500-4550 litre capacity	hr	12.5		
	(b) 4551-7000 litre capacity	hr	12.5		
	(c) 7001-12000 litre capacity	hr	12.5		
22.28	Bitumen pressure distributor		-		
	(a) 3500-4550 litre capacity	hr	12.5		
	(b) 4551-9000 litre capacity	hr	12.5		
22.29	Hot mix plant - 60 tonnes per hour	hr	12.5		
22.3	Wet mix plant - 60 tonnes per hour	hr	12.5		
22.31	Hydrostatic paver & finisher with sensor control	hr	12.5		
22.32	Batching and mixing plant 15-20 m3 capacity	hr	10.5		
22.33	Concrete paver finisher with 40 HP motor	hr	12.5		

22.34	Chip spreader	hr	12.5		
22.35	Mechanical broom	hr	12.5		
22.36	Kerb making machine	hr	12.5		
22.37	Road marking machine	hr	12.5		
22.38	Electric generator		-		
	(a) 100 KVA	hr	12.5		
	(b) 125 KVA	hr	12.5		
22.39	Crusher Plant	hr	12.5		
22.4	Pulvimixer	hr	17.5		
	(a) Unskilled Labour	hr	125		
	(b) Skilled Labour		125		
	(c) Artisan	hr	25		
	(d) Plant Operator	hr	25		
	(e) Driver	hr	50		
	(!) Foreman	hr	25		
	(g) Office attendants and chainmen	hr	125		
	(h) Blaster (Certified)	hr	25		
	All items of materials must be priced to comply with the Specifications.		-		
22.42	Ordinary Portland Cement	tonne	2.5		
22.43	Hydrated Lime	tonne	2.5		
22.44	Mild Steel		-		
	(a) Up to and including 16 mm diameter	tonne	1.25		
	(b) Over 16 mm diameter	tonne	1.25		
22.45	High Yield Steel		-		
	(a) Up to and including 16mm diameter	tonne	1.25		
	(b) Over 16mm diameter	tonne	1.25		
22.46	Aggregates for Concrete		-		
	(a) Fine	m3	25		
	(b) coarse	m3	25		
22.47	Shuttering Timber		-		
	(a) Fl finish	m2	25		
	(b) F2 finish	m2	25		
	(c) F3 finish	m2	25		
22.48	Aggregates for Concrete		-		
	(a) Class 3 any size	m3	25		
	(b) fine aggregate	m3	25		
22.49	Cutback Bitumen and emulsion		-		
	(a) 80/100 penetration grade bitumen	litre	250		
	(b) MC 3000 cut-back bitumen	litre	250		
	(c) MC 70 cut-back bitumen	litre	250		
22.5	Gabion mesh, size l.0 m x l.0 m x l.0 m	m2	25		
22.51	Stone for gabions	m3	25		
22.52	Dynamite stick explosives	kg	12.5		
22.53	Explosive fuse	m	25		
22.54	Detonators	No	25		
Total Bill 22 Taken To Summary					

BILL No.24 :STREET LIGHTING					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**

24.01	Allow a provisional sum of kshs.10,000,000 for provision and installation of street lighting as instructed by the Engineer	Prov. Sum	1	10,000,000.00	
Total Bill 24 Taken To Summary					

BILL No.25 : HIV/AIDS AWARENESS CAMPAIGN					
Item	**Description**	**Unit**	**Quantity**	**Rate (Kshs)**	**Amount**
25.01	Implement HIV/AIDS awareness campaign amongst the workers for the duration of the Contract	month	15		
25.02	Allow for the availability of condoms to workers and staff for the duration of Contract	month	15		
25.03	Allow for the participation of representative of local health authorities, provincial director of health and National AIDS council to train and communicate with workers. Allowance to include transport, meals, accommodation and any other reasonable allowances associated expenses and equipment expenses	month	15		
25.04	Allow for the engagement of specialist HIV sub-contractor to deal with prevention and awareness activities as per programme to be approved by the Engineer	month	15		
25.05	Allow for the preparation and submission of monthly report for HIV/AIDS awareness and prevention activities report to be tabled at site meetings	month	15		
Total Bill 25 Taken To Summary					

BILL No.26 : ROAD SAFETY AWARENESS CAMPAIGN					
Item	**Description**	**Unit**	**Qty**	**Rate (Kshs)**	**Amount (Kshs)**
26.01	Instituting a Road Safety Awareness Campaign	month	15		
26.02	Instituting an Accident Prevention Campaign	month	15		
Total Bill 26 Taken To Summary					

GRAND SUMMARY
SUMMARY OF BILL OF QUANTITIES

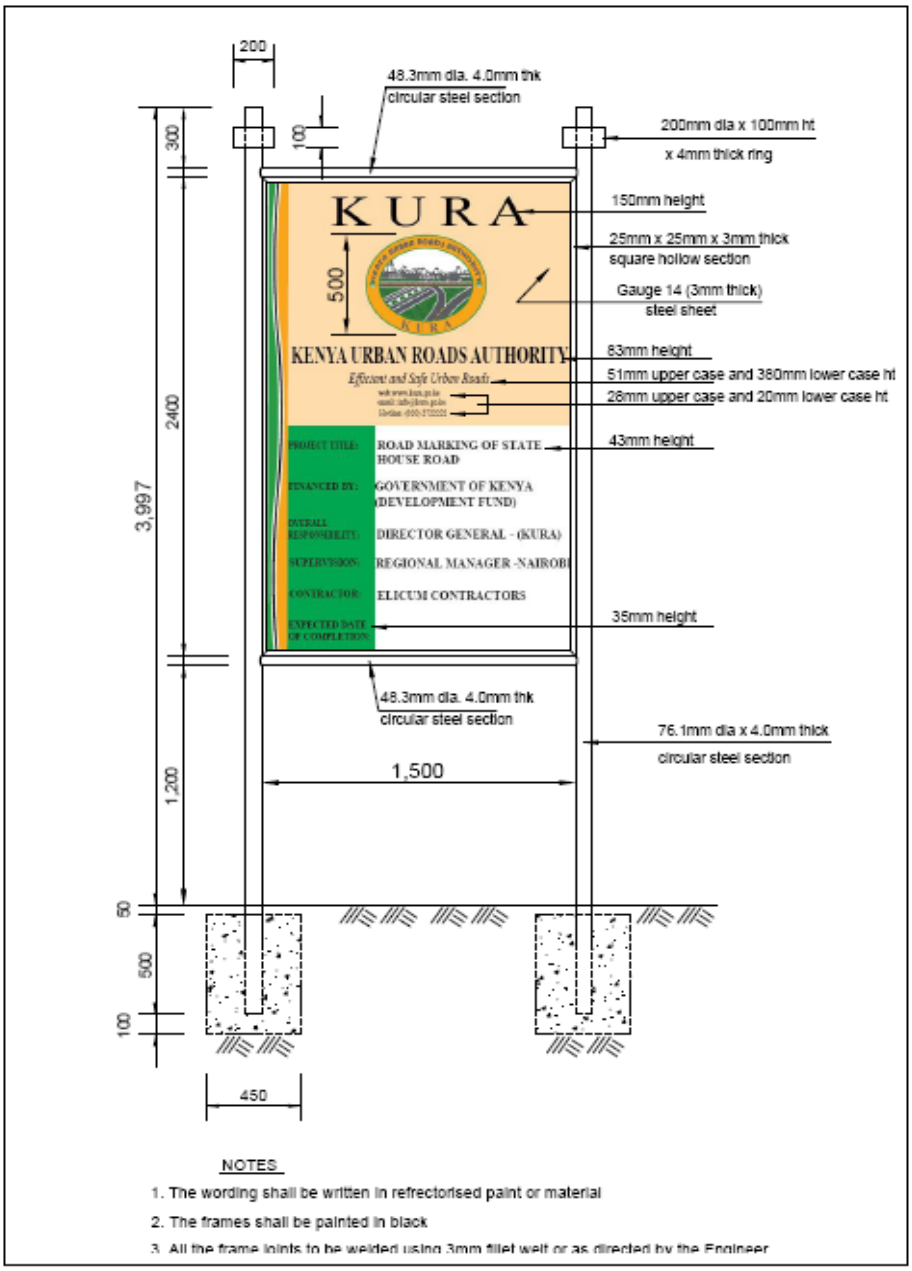
ITEM	DESCRIPTION	AMOUNT
1	Preliminary and General Items	
4	Site Clearance and Topsoil Stripping	
5	Earthworks	
7	Excavation & Filling for Structures	
8	Culverts and Drainage Works	
9	Passage of Traffic	
12	Natural Material for Sub-base and Base	
14	Cement and Lime Treated Material	
15	Bituminous Surface Treatments and Surface Dressing	
16	Bituminous Mix Bases, Binder Courses and Wearing Courses	
17	Concrete Works	
20	Road Furniture	
21	Miscellaneous Bridge Works	
22	Dayworks	
24	Street Lighting	
25	HIV/AIDS Awareness and Education	
26	Road Safety Education	
A	**Sub-total of Bills**	
B	Total for Daywork (Provisional Sum)	
C	Specified Provisional Sums Included in Subtotal of Bills	
D	Total of Bills Less Provisional Sums (A-(B+C))	
E	Add 7.5% of (D) for Physical Contingencies to be Expended in Part or Deleted Entirely in Accordance with Clause 13 of the Conditions of Contract	
F	Add 16% of (A+E+F) for Value Added Tax (VAT)	
G	**Bid Price (A+E+F) Carried Forward to Letter of Bid**	

SECTION 10: DRAWINGS

LOCATION MAP

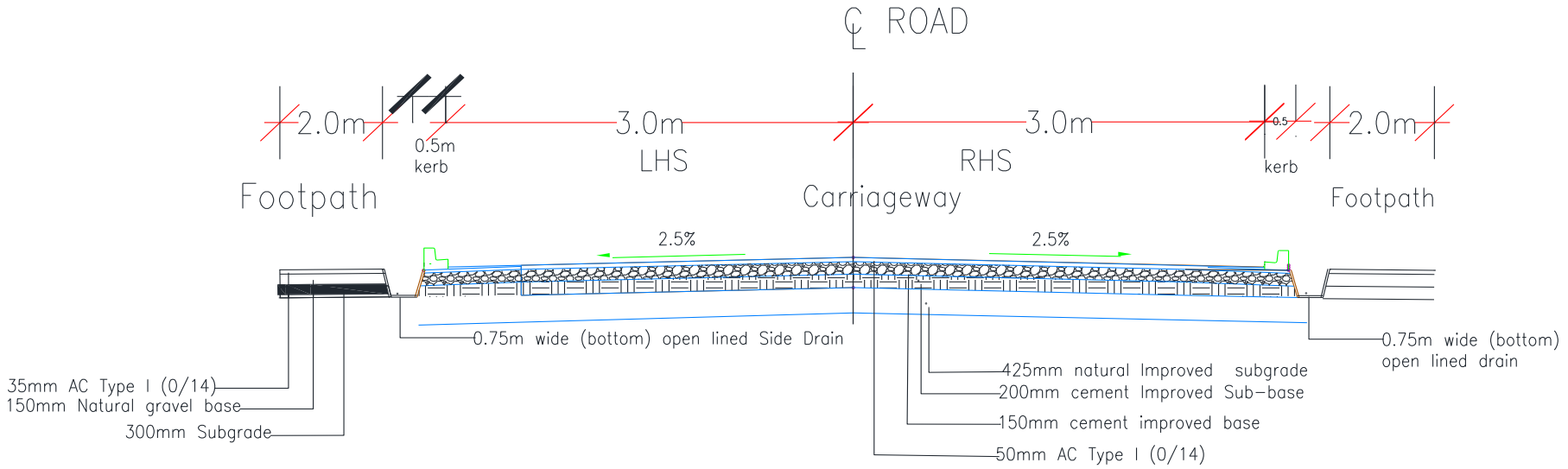

Untitled Map
Write a description for your map.
Legend
Feature 1
Feature 2
Hotel
Meru
Nakumatt Meru
School
Sweet Beans Kenya
kinoru kenya power
Meru
meru library
marvins manyatta
meru museum
gakorome market
gakorome
PCEA meru town
down town filling station
Google Earth
©2020 Google
Image © 2020 CNES / Airbus
N
1 km

PUBLICITY SIGN


200
48.3mm dia. 4.0mm thk
circular steel section
100
300
200mm dia x 100mm ht
x 4mm thick ring
KURA
150mm height
500
25mm x 25mm x 3mm thick
square hollow section
Gauge 14 (3mm thick)
steel sheet
KENYA URBAN ROADS AUTHORITY
63mm height
Efficient and Safe Urban Roads
51mm upper case and 38Omm lower case ht
28mm upper case and 20mm lower case ht
2400
3,997
PROJECT TITLE:
ROAD MARKING OF STATE HOUSE ROAD
43mm height
FINANCED BY:
GOVERNMENT OF KENYA (DEVELOPMENT FUND)
OVERALL RESPONSIBILITY:
DIRECTOR GENERAL - (KURA)
SUPERVISION:
REGIONAL MANAGER -NAIROBI
CONTRACTOR:
ELICUM CONTRACTORS
EXPECTED DATE OF COMPLETION:
35mm height
48.3mm dia. 4.0mm thk
circular steel section
76.1mm dia x 4.0mm thick
circular steel section
1,500
1,200
50
500
100
450
NOTES
1. The wording shall be written in refrectorised paint or material
2. The frames shall be painted in black
3. All the frame joints to be welded using 3mm fillet welt or as directed by the Engineer

TYPICAL CROSS- SECTION

UPGRADING OF ROADS IN MERU COUNTY HEADQUATERS



TYPICAL CROSS- SECTION