COUNTY GOVERNMENT OF BOMET

DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING

BID DOCUMENT FOR UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD(Phase 1)

TENDER NO: **CGB/LHUP/KUSP/012/2019-2020**

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**
6. **CONDITIONS OF CONTRACT**
7. **STANDARD SPECIFICATIONS**
8. **SPECIAL SPECIFICATIONS**
9. **BILLS OF QUANTITIES**
10. **DRAWINGS**

JANUARY, 2020

BOMET MUNICIPAL BOARD COUNTY GOVERNMENT OF BOMET P. O. BOX 19-20400 BOMET	CHIEF OFFICER DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING COUNTY GOVERNMENT OF BOMET P. O. BOX 19-20400 BOMET

TABLE OF CONTENTS

SECTION 1: FORM OF BID 1

SECTION 2: APPENDIX TO FORM OF BID 4

SECTION 3: STANDARD FORMS AND SCHEDULES OF SUPPLEMENTARY INFORMATION 8

SECTION 4: INSTRUCTIONS TO BIDDERS 40

SECTION 5: QUALIFICATION CRITERIA 60

SECTION 6: CONDITIONS OF CONTRACT 74

SECTION 7: STANDARD SPECIFICATIONS 119

SECTION 8: SPECIAL SPECIFICATIONS 121

SECTION 9: BILLS OF QUANTITIES 229

SECTION 10: DRAWINGS 232

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 TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD
TENDER NO: CGB/LHUP/KUSP/012/2019-2020

TO:

COUNTY EXECUTIVE
DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING
COUNTY GOVERNMENT OF BOMET
P. O. BOX 19-20400
BOMET

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. 500,000.00
Employer	1.1 (a) (i)	County Executive Department Of Lands, Housing And Urban Planning County Government Of Bomet
Engineer	1.1 (a) (iv)	Chief Officer Department Of Lands, Housing And Urban Planning County Government Of Bomet
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 ten (10) percent of the Contract Price
Access to Data	11.1	Data made available by the Employer under Sub clause 11.1 is open for inspection at the offices of the Chief Officer Department Of Lands, Housing And Urban Planning County Government Of Bomet
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	1% of the Contract Sum
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	(10) Months
Amount of Liquidated Damages	47.1	0.05% of the Contract Price per day
Limit of Liquidated Damages	47.1	10% (Five percent) of the Contract Price.
Defects Liability Period	49.1	(08) Months
Advance Payment	60.1	There shall be NO advance Payment
Advance Payment Guarantee	60.1	N/A
Minimum Amount of Interim Payment Certificates	60.2	Kshs 1,000,000.00
Retention Money	60.5	10% (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	10 (Ten) 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: County Executive Department Of Lands, Housing And Urban Planning County Government Of Bomet P. O. BOX 19-20400 **BOMET** The Engineer's address is: Chief Officer Department Of Lands, Housing And Urban Planning County Government Of Bomet P. O. BOX 19-20400 **BOMET**

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 10

3.1 BANK GUARANTEE FOR ADVANCE PAYMENT 11

3.2 FORM OF BANK BID SECURITY 13

3.3 FORM OF INVITATION FOR BIDS 16

3.4 LETTER OF ACCEPTANCE 17

3.5 FORM OF AGREEMENT 18

3.6 PERFORMANCE BANK GUARANTEE (UNCONDITIONAL) 20

3.7 FORM OF LETTER OF NOTIFICATION OF AWARD 22

SCHEDULES OF SUPPLEMENTARY INFORMATION 23

3.8 BID QUESTIONNAIRE 24

3.9 CONFIDENTIAL BUSINESS QUESTIONNAIRE 25

3.10 SCHEDULE OF MATERIALS BASIC PRICES 27

3.11 MAJOR ITEMS OF CONSTRUCTION PLANT AND EQUIPMENT 28

3.12 SCHEDULE OF LABOUR BASIC RATES 29

3.13 DETAILS OF SUBCONTRACTORS 30

3.14 CERTIFICATE OF BIDDER'S VISIT TO SITE 31

3.15 FORM OF WRITTEN POWER OF ATTORNEY 32

3.16 SCHEDULE OF COMPLETED CIVIL WORKS CARRIED OUT BY THE BIDDER IN THE LAST FIVE YEARS 34

3.17 SCHEDULE OF PROJECTS CURRENTLY IN PROGRESS 35

3.18 FINANCIAL STANDING 36

3.19 OTHER SUPPLEMENTARY INFORMATION 37

3.20 DECLARATION FORM 38

3.21 ANTI CORRUPTION DECLARATION / COMMITMENT / PLEDGE FORM 39

STANDARD FORMS

3.1 BANK GUARANTEE FOR ADVANCE PAYMENT

To: CHIEF OFFICER
DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING
COUNTY GOVERNMENT OF BOMET
P. O. BOX 19-20400
BOMET

_____*(Date)*

Gentlemen,
UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD
TENDER NO: CGB/LHUP/KUSP/012/2019-2020

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 TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD**

TENDER NO: CGB/LHUP/KUSP/012/2019-2020

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 County Executive, Department Of Lands, Housing And Urban Planning
(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

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 TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD
TENDER NO: CGB/LHUP/KUSP/012/2019-2020
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 **Chief Officer, DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING** (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 TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD
TENDER NO: CGB/LHUP/KUSP/012/2019-2020
(hereinafter called "the Works") located in Bomet 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: ……..
(County Executive, Department Of Lands, Housing And Urban Planning)
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: CHIEF OFFICER
DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING
COUNTY GOVERNMENT OF BOMET
P. O. BOX 19-20400
BOMET

Dear Sir,

WHEREAS _____ (hereinafter called "the Contractor") has undertaken, in pursuance of Contract No. **……..** dated …… to execute **UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD**
TENDER NO: CGB/LHUP/KUSP/012/2019-2020

(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

CHIEF OFFICER
DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING
COUNTY GOVERNMENT OF BOMET
P. O. BOX 19-20400
BOMET

To: ……..
……..
……..

RE: Bid No. ……..

UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD
TENDER NO: CGB/LHUP/KUSP/012/2019-2020

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):

CHIEF OFFICER
DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING
COUNTY GOVERNMENT OF BOMET
P. O. BOX 19-20400
BOMET

……
SIGNED FOR CHIEF OFFICER

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 Chief Officer, Department Of Lands, Housing And Urban Planning***
County Government Of Bomet

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 **County Government of Bomet** 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 TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD TENDER NO: CGB/LHUP/KUSP/012/2019-2020**
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*]

……

……

Participated in the organised inspection visit of the site of the works for
UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD TENDER NO: CGB/LHUP/KUSP/012/2019-2020

……..day of……20……..

Signed……..
(Employer's Representative)

……..

…….. ……..
(Name of Employer's Representative) (Designation)

NOTE: This form is to be completed at the time of the organized site visit.

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 (2013)	Year (2014)	Year (2015)
	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 (2013)	Year (2014)	Year (2015)
	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

UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD TENDER NO: CGB/LHUP/KUSP/012/2019-2020

Date: ……

To: **CHIEF OFFICER**
DEPARTMENT OF LANDS, HOUSING AND URBAN PLANNING
COUNTY GOVERNMENT OF BOMET
P. O. BOX 19-20400
BOMET

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

UPGRADING TO BITUMEN STANDARDS OF B3-CHEBIRIR-BOMET UNIVERSITY ROAD
TENDER NO: CGB/LHUP/KUSP/012/2019-2020

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

A. GENERAL 42

1 Scope Of Bid 42
2 Source Of Funds 42
3 Corrupt Practices 42
4 Eligible Bidders 43
5 Qualification Of The Bidder 43
6 One Bid Per Bidder 44
7 Cost Of Bidding 44
8 Site Visit 44

B. BIDDING DOCUMENTS 45

9 Contents of Bidding Documents 45
10 Clarification of Bidding Documents 45
11 Amendment of Bidding Documents 46

C. PREPARATION OF BIDS 46

12 Language of Bid 46
13 Documents Comprising the Bid 46
14 Bid Prices 47
15 Currencies Of Bid And Payment 48
16 Bid Validity 48
17 Bid Security 48
18 No Alternative Offers 49
19 Pre-Bid Meeting 49
20 Format and Signing of Bids 50

D. SUBMISSION OF BIDS 50

21 Sealing and Marking of Bids 50
22 Deadline for Submission of Bids 51
23 Late Bids 51
24 Modification, Substitution and Withdrawal of Bids 51

E. BID OPENING AND EVALUATION 51

25 Bid Opening 52
26 Process to be confidential 52
27 Clarification of bids and contacting of the employer 52
28 Examination of bids and determination of responsiveness 53
29 Correction Of Errors 53
30 Evaluation And Comparison Of Bids 54

F. AWARD OF CONTRACT 57

31 Award 57
32 Employer's Right To Accept Any Bid And To Reject Any Or All Bids 57
33 Notification Of Award 58
34 Signing of agreement 59
35 Performance Security 59
36 Contract Effectiveness 59
37 Advance Payment 59
38 Corrupt And Fraudulent Practices 59

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 County Government Of Bomet, 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 5 and above 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 bid document may be accessed in our website at www.bomet.go.ke free of charge.

8 SITE VISIT

8.1 The bidder is informed that **site visit is mandatory** and he/she shall examine the Site of Works and its surroundings and obtain for himself all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. **The bidder's representative at this pre-bid site visit MUST be professionally qualified in the field of Civil Engineering**. The Employer will not recognise representation by such people as clerks, secretaries or drivers. The costs of visiting the site shall be at the bidder's own expense.

8.2 The bidder and any of his personnel or agents will be granted permission by the Employer to enter its premises and lands for the purpose of such inspection, but only on the express condition that the bidder, its personnel and agents, will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and

any other loss, damage, costs and expenses however caused, which but for the exercise of such permission would not have arisen.

8.3 The Employer will conduct a Site Visit concurrently with the pre-bid meeting referred to in Clause 19, attendance for which is **mandatory for all bidders. Failure to attend the site visit by any bidder will lead to disqualification of his /her bid. The date, time and venue of the pre-bid conference and site visit shall be the date, time and venue indicated in the Tender Notice, or any subsequent Addenda as the case may be**.

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 bidders designated representative and who must be one of the technical persons listed as a key staff in Schedule No. 5 is invited to attend a pre-bid meeting, which will take place at the **venue, date and time indicated in the Tender Notice, or any subsequent Addenda as the case may be.** The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

19.2 The bidder is requested as far as possible to submit any questions in writing or by cable, to reach the Employer not later than one week before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted in accordance with the Minutes of the meeting, including the text of the questions raised and the responses given together with any responses prepared after the meeting, will be transmitted without delay to all purchasers of the bidding documents. Any modification of the bidding documents listed in Sub-Clause 8.1, which may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to Clause 10 or through the minutes of the pre-bid meeting.

19.3 Non-attendance at the pre-bid meeting by a Bidder will be a cause for disqualification of his BID.

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. Errors will be corrected by the Employer as follows:

(a) Where there is a discrepancy between the amounts in figures and in words, the amount in words as indicated in the Form of Bid will govern;

(b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will prevail,

unless in the opinion of the Employer, there is an obvious typographical error, in which case adjustment will be made to the entry containing the error.

(c) In the event of a discrepancy between the bid amount as stated in the Form of Bid and the corrected bid figure in the main summary of the Bills of Quantities, the amount as stated in the form of bid shall prevail.

(d) The error correction factor shall be computed by expressing the difference between the bid amount and the corrected bid sum as a percentage of the corrected contractor's work (i.e. corrected tender sum less prime cost and Provisional sums)

(e) The error correction factor shall be applied to all the contractor's work (as a rebate or addition as the case may be) for the purposes of valuations for interim certificates and valuations of variations

(f) The bid will be adjusted in accordance with the above procedure for the correction of errors and, with concurrence of the bidder, and shall be considered as binding upon the bidder. If the bidder does not accept the corrections, the bid may be rejected and the Bid Security may be forfeited in accordance with clause 17.

29.2 Any error by the Bidder in pricing or extending the Bills of Quantities or carrying forward to the summary or BID Sum, shall be corrected in such a way that the BID Sum remains unaltered and the Bidder shall within seven (7) days after issuance of the written notice by the Employer, or such further time as the Employer may allow, correct his BID in such a manner as may be agreed or directed by the Employer failing which the BID may be absolutely rejected and the Bid Security forfeited in accordance with Sub-Clause 17.6.

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. 100,000,000/-.

(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 pass mark shall be **80%.**
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

5.1 ELIGIBILITY 62

5.2 HISTORICAL CONTRACT NON-PERFORMANCE 63

5.3 FINANCIAL SITUATION 64

5.4 EXPERIENCE 65

5.5 CURRENT COMMITMENTS 66

5.6 PERSONNEL CAPABILITY 66

5.7 SCHEDULE OF THE MAJOR ITEMS OF PLANT TO BE USED ON THE PROPOSED CONTRACT. 69

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 1, 2 , 3 , 4 & 5 (NCA 1, 2 , 3 , 4 and 5)) as a Paved Roads Contractor ▪ Tax Compliance Certificate (Valid)	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	
		▪ 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.	(a) Score • 0-6 Marks (b) Score • 0-4 Marks (c) Score • 0-5 Marks (d) Score • 0-5 Marks	(a) N / A (b) N / A (c) Score • 0-5 Marks (d) Score • 0-5 Marks	(a) Score • 0-6 Marks (b) Score • 0-6 Marks (c) N / A (d) N / A	(a) N / A (b) N / A (b) N / A	Section 3, Clause 31 (a) All pages must be initialized and stamped by both a practicing Auditor registered with ICPAC and one of the Directors. Auditor's practicing membership number from ICPAC must be indicated.
5.3.2	**Average Annual Construction Turnover**	Minimum average annual construction turnover calculated as total certified payments received for contracts in progress or completed, within the last Two (2) years: **KShs. 200 Million**	Score • 0-5 Marks	N/A	Score • 0-5 Marks	N/A	Section 3, 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 three (3) years** prior to the applications submission deadline and with activity in at least six (6) months in each year	Score • 0-5 Marks	N / A	Score • 0-5 Marks	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 **three (3) years** each with a value of at least **Kshs. 150 Million (One Hundred and fifty Million),** that have been successfully and substantially completed and that are similar to the proposed works. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Section 8, Special Specification	Score • 0-15 Marks	N / A	Score • 0-15 Marks	N / A	Section 3, Clause 31
5.4.3	**Work Methodogy**	Submission of a brief work methodology in accordance with sub-clause 5.3	Score • 0-6 Marks	Score • 0-6 Marks	N / A	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.	Score • 0-5 Marks	N/A	Score • 0-5 Marks	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	Score 4 marks 2 marks	N/A	Score 4 marks 2 marks	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	Score 4 marks 2 marks	N/A	Score 4 marks 2 marks	N/A	Section 3, Clause 31
(c)		Site Surveyor	Qualification: Diploma in Surveying General Experience: 7 years Specific Experience in similar works: 5 years	Score 3 marks 2 marks	N/A	Score 3 marks 2 marks	N/A	Section 3, Clause 31
(d)		Foremen	Qualification: Diploma in Civil Engineering. General Experience: 7 years Specific Experience in similar works: 5 years	Score 2 marks 1 marks	N/A	Score 2 marks 1 marks	N/A	Section 3, Clause 31
(e)		Materials Technologist	Qualification = Dip. Civil Eng General Experience = 6 yrs Specific Experience = 4 Yrs	Score 2 marks 1 marks	N/A	Score 2 marks 1 marks	N/A	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).

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	1			
	Asphalt concrete paver	1	1			
B	**Compactors**					
	Vibrating compaction plate 300 mm wide	1	1			
	Vibrating compaction plate 600 mm wide	1	1			
	Subtotal for B	**2**	**2**			
C	**Concrete Equipment**					
	Mobile concrete mixers	1	1			
	Concrete vibrators	1	1			
	Subtotal for C	**2**	**2**			
D	**Transport (Tippers, dumpers, water tankers)**					
	4X2 tippers payload 7 – 12 tonnes	1	(Each 1mark to a max. of 2marks)			
	6X4 tippers payload 16 – 20 tonnes	1				
	8X4 tippers payload 16 – 20 tonnes	1				
	Flat bed lorries	1				
	Subtotal for D – tippers & dumpers	**4**	**2**			
	Water tankers (18,000 – 20,000 litres capacity)	1	1			
	Subtotal for D					

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**	**1**	**1**			
	Wheeled loaders	1	1			
	Motor graders (93 - 205kW)	1	1			
	Trench excavator	1	1			
F	**Subtotal for E**	**3**	**3**			
	Excavators Hydraulic crawler mounted (7 – 10 tonnes) – 0.25 – 0.4 m3 SAE bucket. Hydraulic crawler mounted (10 – 16 tonnes) – 0.40 – 0.60 m3 SAE bucket. Hydraulic wheel mounted (7 – 10 tonnes) – 0.25 – 0.4 m3 SAE bucket. Hydraulic wheel mounted (10 – 16 tonnes) – 0.40 – 0.6 m3 SAE bucket. Hydraulic wheel mounted backloader (7 – 10 tonnes) – 0.25 – 0.4 m3 SAE bucket.		(Any gets 1 mark)			
	Subtotal for F					
G	**Rollers**	**2**	**2**			
	Self propelled single drum vibrating (various types) Pneumatic rubber tyre (1-2 tonnes/wheel)	1	1			
	Sheep's foot roller	1	1			
	Subtotal for G	1	1			
		3	**3**			

(Bidders must provide proof of ownership or lease arrangements for all plants and equipment. Proof of ownership must be provided also for leases other than 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 Responsiveness 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	- Category 1, 2 & 3 - 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	- Attend pre-bid meeting/visit - Bidders to sign attendance register - Certificate must be signed by the Employer's representative
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**	**Max 25**
	a	Audited Statements	0-6
	b	Cash flow statement (forecasts)	0-5
	c	Financial position/Ratios	0-4
	d	Bank statement	0-5
	e	Turnover	0-5
2		**EXPERIENCE**	**Max 20**
		General Experience	0-5
		Specific experience in related works	0-15
3		**CURRENT COMMITMENTS**	**Max 5**
		On-going works	0-5
4		**KEY PERSONNEL**	**Max 23**
		Site Agent	0-6
		Deputy Site Agent / Site Engineer	0-6
		Surveyor	0-5
		Foremen - 4 No. (General, Earthworks, Concrete, Bituminous Works)	0-3
		Materials Technologist	0-3
5		**PLANT AND EQUIPMENT**	**Max 16**
		Equipment capabilities	0-16
6		**WORK METHODOLOGY**	**0 - 6; Max 6**
7		**COUNTRY BASED**	**0 or 5; Max 5**
		TOTAL	**MAX 100**

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.

TABLE OF CONTENTS

Clause and Description **Page**

DEFINITIONS AND INTERPRETATION 83

1.1 Definitions 83

1.6 Gender Specific Words 83

ENGINEER AND ENGINEER'S REPRESENTATIVE 83

2.1 Engineer's Duties and Authority 83

ASSIGNMENT AND SUBCONTRACTING 84

4.1 Subcontracting 84

CONTRACT DOCUMENTS 85

5.1 Language and Law 85

5.2 Priority of Contract Documents 85

6.6 Metric Units 85

6.7 Intent of Drawings and Specifications 85

6.8 Design, Drawings and Specifications Prepared by the Contractor 85

6.9 Submissions of Designs and Drawings 86

6.10 As-Built Drawings 86

7.4 Drawings for Temporary Works 86

7.5 Size of Drawings 86

7.6 Submission to the Engineer 86

GENERAL OBLIGATIONS 87

8.1 Contractors General Responsibilities 87

8.3 General Requirements 87

10.1 Performance Security....88

10.2 Period of Validity of Performance Security....88

10.3 Claims under Performance Security....89

10.4 Cost of Performance Security....89

11.1 Inspection of Site....89

11.2 Access to Data....89

14.1 Programme to be Submitted....89

14.2 Revised Programme....91

14.3 Cash Flow Estimate to be Submitted....91

15.1 Contractor's Superintendence....92

15.2 Contractor's Agent or Representative....92

16.2 Engineer at Liberty to Object....92

16.3 Language Ability of Superintending Staff....92

16.4 Employment of Local Personnel....92

17.1 Setting Out....92

17.2 Notice to Engineer....92

19.1 Safety, Security and Protection of the Environment....93

20.4 Employer's Risks....94

21.1 Insurance of Works and Contractor's Equipment....95

21.2 Scope of Cover....95

21.4 Exclusions....95

21.5 Insurance of Goods....96

23.1 Third Party Insurance (Including Employer's Property)....96

23.2 Minimum Amount of Insurance....96

25.1 Evidence of Terms of Insurance....96

25.5 Source of Insurance....96

25.6 Insurance Notices....96

25.7 Insurance in Kenya....96

25.8 Notification to Insurers....96

26.2 Compliance with Statutes, Regulations 96

26.3 Inspection and Audit by the Funding Agency 97

28.2 Royalties 97

29.2 Passage and Control of Traffic 97

29.3 Reinstatement and Compensation for Damage to Persons or Property 97

29.4 Protection of Existing Works and Services 97

29.5 Protection of Survey Beacons 98

30.2 Transport of Contractor's Equipment or Temporary Works 98

30.5 Complying with State Laws and Regulations 98

30.6 Effects of other Concurrent Construction Projects 98

34.2 Labour Regulations 99

34.3 Engagement of Local Labour 99

34.4 Rates of Wages and Conditions of Labour 99

34.5 Repatriation of Labour 99

34.6 Housing for Labour 99

34.7 Accident Prevention Officer 99

34.8 Health and Safety 99

34.9 Life Saving Appliances and First Aid Equipment 100

34.10 Measures against Insect and Pest Nuisance 100

34.11 Epidemics 100

34.12 Burial of the Dead 100

34.13 Supply of Foodstuffs 100

34.14 Supply of Water 100

34.15 Alcoholic Liquor or Drugs 100

34.16 Arms and Ammunition 100

34.17 Festivals and Religious Customs 100

34.18 Disorderly Conduct 101

34.19 Records of Labour 101

34.20 Trade Unions 101

34.21 Default in payment of Wages....101

34.22 Breach and Removal from List....101

34.23 Observance by Subcontractors....101

35.2 Maintenance of Records....101

35.3 Reporting of Accidents....101

MATERIALS, PLANT AND WORKMANSHIP....101

36.1 Quality of Materials, Equipment, Supplies, Plant, and Workmanship....101

COMMENCEMENT AND DELAYS....102

41.1 Commencement of Works....102

41.2 Definition of Commencement....102

42.1 Possession of Site and Access Thereto....102

42.4 Possession of Site and Access thereto....102

45.1 Restriction on Working Hours....102

45.2 Overtime Hours....103

47.2 Reduction of Liquidated Damages....103

47.3 Currency of Liquidated Damages....103

DEFECTS LIABILITY....103

49.2 Completion of Outstanding Work and Remedying Defects....103

49.5 Defects Liability Period Replacements....103

ALTERATIONS, ADDITIONS AND OMISSIONS....103

52.1 Valuation of Variation....103

52.2 Power of Engineer to Fix rates....104

52.3 Daywork....104

PROCEDURE FOR CLAIMS....104

53.1 Notice of Claims....104

CONTRACTOR'S EQUIPMENT, TEMPORARY WORKS AND MATERIALS....104

54.1 Contractor's Equipment, Temporary Works and Materials....104

54.2 Employer not Liable for Damage....105

54.5 Conditions of Hire of Contractor's Equipment....105

54.9 Contractor's Responsibilities for Licenses 105

54.10 Equipment and Plant 105

MEASUREMENT 105

55.1 Quantities 105

55.2 Bill of Quantities with no Rates 105

56.1 Works to be Measured 106

57.1 Method of Measurement 106

PROVISIONAL SUMS 106

58.4 Prime Cost Sum 106

NOMINATED SUBCONTRACTORS 106

59.5 Certification of Payment to Nominated Subcontractors 106

CERTIFICATES AND PAYMENTS 107

60.1 Advance Payment 107

60.2 Interim Payment Certificate 107

60.3 Final Account and Final Payment Certificate 108

60.4 Payment of Certificates 109

60.5 Retention Money 109

60.6 Currency of Payment 109

60.7 Overdue Payments 109

60.8 Correcting and Withholding 109

60.9 Completion by Sections 110

60.10 Statement at Completion 110

60.11 Final Statement 110

60.12 Discharge 110

60.13 Final Payment Certificate 110

60.14 Cessation of Employer's Liability 111

62.1 Defects Liability Certificate 111

REMEDIES 111

63.1 Default of Contractor 111

63.2 Valuation of Date of Expulsion 111

63. Valuation of Date of Expulsion 111

63.4 Assignment of Benefit of Agreement 111

63.5 Corrupt or Fraudulent Practices 111

SPECIAL RISKS.....112

65.2 Special Risks 112

65.4 Projectile, Missile 112

65.9 Special Risks 112

SETTLEMENT OF DISPUTES.....112

67.1 Engineers Decision 112

67.2 Amicable Settlement.....113

67.3 Arbitration.....113

NOTICES.....113

68.1 Notices to Contractor.....113

68.2 Notices to Employer and Engineer 113

DEFAULT OF EMPLOYER.....113

69.1 Default of Employer 114

69.3 Payment on Termination 114

69.4 Contractor's Entitlement to Suspend Work 114

69.6 Suspension of Funding Agency Loan.....114

70 CHANGES IN COST AND LEGISLATION .....ERROR! BOOKMARK NOT DEFINED.

CURRENCY AND RATES OF EXCHANGE.....115

72 Currency Proportions.....115

ADDITIONAL CLAUSES.....115

74.1 Illegal Payments.....115

75.1 Termination of Contract for Employer's Convenience.....116

76.1 Restriction on Eligibility.....116

77.1 Joint and Several Liability.....116

78.1 Details to be Confidential.....116

78.2 Drawings and Photographs of the Works 116

79.1 Official Visitors.....116

80.1 Substantial Completion of the Works.....116

81.1 Monthly Site Meetings 117

81.2 Minutes of Site Meetings.....117

82.1 Legal Provisions.....117

83.1 Noise and Disturbance 117

83.2 Pollution 117

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 County Executive, Department Of Lands, Housing And Urban Planning
, County Government of Bomet

(iv) The "Engineer" shall be Chief Officer, Department Of Lands, Housing And Urban Planning County Government of Bomet 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)
- Madaraka Day (1st June)
- Idd-Ul-Fitr
- Mashujaa Day (20th October)
- Jamhuri Day (12th December)
- Christmas Day (25th December)
- Boxing 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

TABLE OF CONTENTS

Clause and Description **Page**

100 GENERAL 127
101 LOCATION AND EXTENT OF SITE 127
102 EXTENT OF CONTRACT 127
102.1 PROJECTS COMPONENTS ..... **ERROR! BOOKMARK NOT DEFINED.**
103 DRAWINGS 128
104 PROGRAMME FOR EXECUTION OF THE WORKS 128
105 ORDER OF EXECUTION OF THE WORKS 128
107 CERTIFICATE OF COMPLETION 128
108 METHOD OF CONSTRUCTION 128
109 NOTICE OF OPERATIONS 129
109.2 NOTIFICATION TERMS 129
117 HEALTH, SAFETY AND ACCIDENTS 129
119 USE OF EXPLOSIVES 129
120 PROTECTIONS OF EXISTING WORKS AND SERVICES 129
121 DIVERSION OF SERVICES 130
123 LIAISON WITH GOVERNMENT OFFICIALS AND POLICE 130
124 PROVISION OF LAND 130
125 WATER SUPPLY 132
127 INFORMATION FROM EXPLORATORY BORING AND TEST PITS 132
131 SIGNBOARDS 132
132.1 ENGINEER'S REPRESENTATIVE OFFICE 132
132.2 ENGINEER'S OFFICE AND LABORATORY FURNITURE 133
132.3 ENGINEER'S LABORATORY AND SURVEY EQUIPMENT 139
132.9 WIRELESS COMMUNICATION FOR THE ENGINEER 142
137 ATTENDANCE UPON THE ENGINEER AND HIS STAFF 145
137.1 STAFF EMPLOYED AND PAID BY THE CONTRACTOR FOR ATTENDANCE UPON THE ENGINEER 145
138 PROVISION OF VEHICLES 145
139 MISCELLANEOUS ACCOUNTS 146
140 PAYMENT OF OVERTIME FOR ENGINEER'S JUNIOR STAFF 146
141 MEASUREMENT AND PAYMENT 147
142 LIQUIDATED DAMAGES 147
143 PROTECTION OF THE ENVIRONMENT 147
144 OFF ROAD ENVIRONMENTAL MEASURES 148
145 STAFF TRAINING 148

200 MATERIALS AND TESTING OF MATERIALS 149
205 SOILS AND GRAVELS 149
211 BITUMINOUS BINDERS 149

300 SETTING OUT AND TOLERANCES 150
301 SETTING OUT 150

400 SITE CLEARANCE AND TOP SOIL STRIPPING 151
401 SITE CLEARANCE 151

500 EARTHWORKS 152
502 GENERAL 152
502.2 DEFINITIONS FOR EARTHWORKS 152
504 PREPARATION PRIOR TO FORMING EMBANKMENTS 152
504.2 BENCHING 152

504.3 GROUND COMPACTION 152
505 CONSTRUCTION OF EMBANKMENTS 152
507.2 ROCKFILL IN CARRIAGEWAY, EMBANKMENT AND BEHIND STRUCTURES 153
508 COMPACTION OF EARTHWORKS 154
509 MASS HAUL DIAGRAM 154
511 BORROW PITS 154
514 TOP SOILING AND GRASSING 154
514.2 HYDRO-SEEDING 155
514.3 APPLICATION OF CHEMICAL FERTILIZERS 155
515 SIDE DRAINS 155
517 MEASUREMENT AND PAYMENT 155

600 QUARRIES, BORROW PITS, STOCKPILE AND SPOIL AREAS 157

601 GENERAL 157
602 DEFINITIONS 157

700 EXCAVATION AND FILLING FOR STRUCTURES 158

703 EXCAVATION OF FOUNDATIONS FOR STRUCTURES 158
703.1 PREPARATION OF FOUNDATION AND APPROVAL 158
703A EROSION PROTECTION WORKS AT UPSTREAM AND DOWNSTREAM OF CULVERTS/BRIDGES 158
703A.1 SCOPE 158
703A.2 MATERIALS 158
703A.3 CONSTRUCTION OPERATIONS 158
707 BACKFILLING OF EXCAVATIONS AND FILLING FOR STRUCTURES 159
708 PROTECTION OF STRUCTURES 159
709 EXCAVATIONS FOR RIVER TRAINING AND NEW WATERCOURSES 159
710 STONE PITCHING 159

800 CULVERT AND DRAINAGE WORKS 160

804 EXCAVATION FOR CULVERTS AND DRAINAGE WORKS 160
805 EXCAVATION IN HARD MATERIAL 160
809 BEDDING AND LAYING OF PIPE CULVERTS 160
810 JOINTING CONCRETE PIPES 160
812 BACKFILL 160
816 MINOR DRAINAGE STRUCTURES 160
817 MITRE DRAINS, CUT-OFF DRAINS, CATCH WATER/DRAINS, OUTFALL DRAINS AND EARTH DAMS 161
817.2 CLEANING EXISTING DRAINS 161
817.3 CLEANING OF HYDRAULIC STRUCTURES 161
817.4 REMOVAL OF EXISTING PIPES, INLET AND OUTLET STRUCTURES 161
817.5 EXTENSION OF EXISTING PIPES 161
817.6 CHUTE DRAIN FOR HIGH EMBANKMENT SECTIONS 161
817.7 STONE MASONRY AND CONCRETE PAVING 162
819.1 REPAIR OF DRAINAGE SPOUTS 165
820 MEASUREMENT AND PAYMENTS FOR ADDITIONAL ITEMS 165
821 CEMENT MORTARED STONE MASONRY WALLS 167
822 SUBSOIL FILTER DRAINS 167
823 GULLEY POTS AND CHAMBERS 167
824 PEDESTRIAN CROSSINGS 167
825 MEASUREMENT AND PAYMENT FOR FURTHER ADDITIONAL ITEMS 167

900 PASSAGE OF TRAFFIC 169

903 MAINTENANCE OF EXISTING ROAD 169
903.1 MAINTENANCE OF RIGHT OF WAY 169
904 CONSTRUCTION OF DEVIATIONS 169
906 PASSAGE OF TRAFFIC THROUGH THE WORKS 169
912 MEASUREMENT AND PAYMENT 170

1100 SHOULDERS AND FOOTPATHS 171

1107 FOOTPATHS 171
1107.1 PRE-CAST CONCRETE PAVING BLOCKS 171

1107.2 FLEXIBLE SURFACING FOR FOOTPATHS AND OTHER PAVED AREAS 171
1108 MEASUREMENT AND PAVEMENT 171
1203 HANDPACKING 172
1204 MATERIAL REQUIREMENTS 173

1300 GRADED CRUSHED STONE SUBBBASE 174

1303 MATERIAL REQUIREMENTS 174
1306 LAYING AND COMPACTING GRADED CRUSHED STONE SUB-BASE 174
1311 IN SITU REPROCESSING OF GRADED CRUSHED STONE 174

1400 CEMENT TREATED MATERIALS 175

1403 CEMENT TREATMENT 175

14A LEAN CONCRETE 175

14A/04 MIX REQUIREMENTS 175
14A/05 METHOD OF CONSTRUCTION 175
14A/08 MEASUREMENTS AND PAYMENT 176

1500 BITUMINOUS SURFACE TREATMENTS AND SURFACE DRESSING 177

1502B MATERIALS FOR PRIME COAT AND TACK COAT 177
1504B SPRAYING OF PRIME COAT AND TACK COAT 177
1502C MATERIALS FOR SURFACE DRESSING 177
1503C RATE OF APPLICATION OF BINDER AND CHIPPINGS 177
1505C PRE-COATED CHIPPINGS 177
1508C APPLICATION OF SURFACE DRESSING 178
1509C AFTERCARE AND CONTROL OF TRAFFIC 178
1511C MEASUREMENT AND PAYMENT 178

1600 BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES 179

1600A GENERAL 179
1603A CONSTRUCTION PLANT 179
1606A SITE TRIALS 179
1607A MIXING OF AGGREGATES AND BITUMEN 179
1608A TRANSPORTING THE MIXTURE 180
1609A LAYING THE MIXTURE 180
1610A COMPACTION 180
1611A FINISHING JOINTS AND EDGES 180
1614A TOLERANCES 181
1600B ASPHALT CONCRETE FOR SURFACING 181
1602B MATERIALS FOR ASPHALT CONCRETE 181
1603B GRADING REQUIREMENTS 183
1604B REQUIREMENTS FOR ASPHALT CONCRETE 184
1605B MIXING AND LAYING ASPHALT CONCRETE 185
1606B COMPACTION 185
1608B SEALING BITUMINOUS SURFACE 185

1700 CONCRETE WORKS 186

1703 MATERIALS FOR CONCRETE 186
1703A LEVELLING OF CONCRETE FOR BOTTOM SLAB INCLUDING FORMWORK COST 187
1703B REINFORCEMENT BARS FOR WALLS AND SLABS 188
1703C FORMWORK FOR VERTICAL WALLS AND SLABS 190
1703D CONCRETE WORKS TO VERTICAL WALLS AND SLABS 191
1704 CONCRETE WORKS OF THE BEAMS AND DECK SLABS 194
1704.1 DESCRIPTION 194
1704.2 CONCRETE MATERIALS 194
1704.2.1 CONCRETE CLASS 30/20 195
1704.2.2 PROPORTIONING CONCRETE 196
1704.2.3 CONCRETING WORK 196
1704.3 CONCRETE CLASS 35/20 197

1704.4 MEASUREMENT AND PAYMENT 197
1705 MIXING CONCRETE 197
1740.2 INTERLOCKING CONCRETE PAVING BLOCK 197
1741 MEASUREMENT AND PAYMENT 198
1742 PLANT AND EQUIPMENT FOR AGGREGATES AND CONCRETE 199
1742.1 AGGREGATE PROCESSING PLANT 199
1742.2 CONCRETE PLANT 200

2000 ROAD FURNITURE 202

2001 ROAD RESERVE BOUNDARY POSTS 202
2004 PERMANENT ROAD SIGNS 202
2004.1 POSTS AND ROAD SIGNS 202
2004.2 COLOUR AND CONFIGURATION 202
2004.3 MATERIAL 202
2004.4 STRUCTURAL DETAILS 203
2004.5 RETRO-REFLECTIVE SHEETING 203
2004.6 MESSAGES AND BORDERS 204
2004.7 COLOUR 204
2004.8 ADHESIVES 204
2004.9 FABRICATION 205
2004.10 WARRANTY AND DURABILITY 205
2004.11 INSTALLATION 205
2004.12 FOUNDATION FOR SUPPORT 206
2004.13 MEASUREMENT FOR PAYMENT 206
2004.14 RATE 206
2005 ROAD MARKING 206
2006 GUARDRAILS 206
2006.1 REMOVING, RENOVATING AND RE-ERECTING GUARDRAILS 206
2006.2 PEDESTRIAN RAILING 207
2007 KERBS 207
2007.2 EXISTING KERBS 207
2007.3 REPAIR OF DAMAGED RAILING AND KERBS 207
2010 TREES 208
2010.1 PLANTATION OF TREES AND HEDGES 208
2012 SERVICE DUCTS BENEATH ROADS 210
2013 DUCT MARKERS 210
2014 ROAD BUMP AND RUMBLE STRIPS 210
2015 BOLLARDS 210
WHERE SHOWN ON THE DRAWINGS OR INSTRUCTED BY THE ENGINEER, THE CONTRACTOR SHALL CONSTRUCT PERMANENT BOLLARDS. THE BOLLARDS SHALL BE GAUGE 16 STEEL PIPE BOLLARDS OF DIAMETER MINIMUM 150MM AND 1.0 M ABOVE THE GROUND, EMBEDDED TO A DEPTH OF 0.5M AT PLACE. THE BOLLARDS SHALL BE FILLED USING A MINIMUM CLASS (15/20) CONCRETE AND AS SHOWN ON THE DRAWINGS. 210
2016 RETRO-REFLECTIVE ROAD STUDS 211
2017 MEASUREMENT AND PAYMENT 211

2200 DAY WORKS 213

2201 SCOPE 213
2202 STANDARDS 213
2203 MEASUREMENT AND PAYMENTS 213

2300 ENVIRONMENTAL MANAGEMENT PLAN 213

2400 TRAFFIC MANAGEMENT AND DIVERSION ..... ERROR! BOOKMARK NOT DEFINED.

2401 GENERAL ..... **ERROR! BOOKMARK NOT DEFINED.**
2402 TRAFFIC ROTARY ..... **ERROR! BOOKMARK NOT DEFINED.**
2403 ROAD DELINEATES ..... **ERROR! BOOKMARK NOT DEFINED.**
2404 SIGNS, LIGHTS, BARRIERS AND OTHER TRAFFIC CONTROL DEVICES 223
2405 BARRICADES 223
2406 PASSAGE THROUGH WORKS 223
2406.1 ONE-WAY TRAFFIC OPERATION 223

2406.2 TWO WAY TRAFFIC OPERATION 223
2406.3 TRAFFIC CONTROL DEVICES 224

2500 HIV/AIDS, GENDER, SOCIAL ISSUES AND LOCAL PARTICIPATION 225

2501 SCOPE 225
2502 INTERPRETATION AND DOCUMENTATION 225
2503 HIV/AIDS AWARENESS CAMPAIGN 225
2504 AIDS PREVENTION CAMPAIGN 225
2505 HIV/AIDS TRAINING 225
2505.1 OBJECTIVE 225
2505.2 SCOPE OF ACTIVITIES 226
2505.3 COLLABORATION 227
2505.4 CONTRACTOR'S RESPONSIBILITIES 227
2505.5 INPUTS 227
2505.6 REPORTING 227
2506 TIMING 228
2507 MEASUREMENT AND PAYMENT 228

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 Location and Extent of Site

The road is located within Bomet Municipality. The length of the road to be constructed under this contract(Phase 1) is approximately **1.0**Km out of 4.06Km.

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

102 Extent of Contract

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

i. Preliminary and General Items
ii. Site Clearance and Topsoil Stripping
iii. Culverts and Drainage Works
iv. Passage of Traffic
v. Natural Material for Sub-base and Base
vi. Bituminous Surface Treatments and Surface Dressing
vii. Bituminous Mix Bases, Binder Courses and Wearing Courses
viii. Road Furniture
ix. HIV/AIDS Awareness
x. Maintenance of the works during the construction period. The defects liability period shall be 12 Months.

103 Drawings

This clause shall be read as under:

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

104 Programme for Execution of the Works

The Contractor shall provide the works programme, required under Clause 14.1 of the Conditions of Contract, within 28 days of receipt of the Engineer's Order to commence work.

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 Works of 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 fulfil his obligations.

The Contractor shall allow in his programme for construction of trial sections and carrying out tests upon them as directed by the Engineer in accordance with the provisions of Clause 129 of the Standard Specification. The time for completion of the Contract shall not be extended because of the time taken to carry out tests and evaluate trial sections.

105 Order of Execution of the Works

In addition to Clause 105 of the Standard Specification, the Contractor shall carry out the Works such that a continuous and consecutive output of fully completed work is achieved.
Generally, the Contractor shall commence the works at the beginning of the road package and progress continuously towards the other end without leaving any isolated section or sections of road uncompleted.

107 Certificate of Completion

Wherever the "Certificate of completion" and "Period of Maintenance" are stated in the specification, these shall be read respectively as the "Taking Over Certificate" and "Defects Liability Period".

The Taking-Over Certificate for these works shall be issued upon application by the Contractor under Clause 48.2 of the Conditions of Contract on substantial completion of the construction works. The Defect Liability Certificate will be issued after the end of the Defects Liability Period.

Release of Retention Money will be on issuance of the said certificates.

108 Method of construction

Add the following to this clause:

The submissions of work programme, Order of Work and the General Description of works shall be consistent in presentation and content when handed over for the Engineer's approval and in accordance with programmes and schedules as stated in Clause 14.1 of Conditions of Contract.

Notwithstanding any contrary provision contained in the last paragraph of Clause 108 of the Standard Specification, the Engineer's normal working hours shall be defined as 8:00 a.m. to 5:00 p.m. on weekdays, including lunch break from 1.00 p.m. to 2.00 p.m. and 8:00 a.m. to 1:00 p.m. on Saturdays, with Sunday being set aside as a day of rest. If the contractor wishes to execute permanent works outside these hours, he shall request for and obtain written permission from the Engineer at least one full working day in advance to enable the Engineer to make necessary provision for the supervision of such work. The contractor shall meet any costs arising thereof.

109 Notice of Operations

Name the existing text as 109.1 and add the following:

109.2 Notification Terms

It shall be the Contractor's responsibility to notify the Engineer when any items of the Works scheduled are completed and ready for approval, and the contractor shall give a notice of one full working day to allow control tests to be performed.

117 Health, Safety and Accidents

Insert Sub-clause (i):

In accordance with the laws of Kenya, the Contractor shall make arrangement for awareness programme for public health education and particularly for HIV/AIDS as detailed under Section 26 of this specification.

119 Use of Explosives

Add the following to Clause 119:

The Contractor shall not use explosives without prior written consent of the Engineer. Where the use of explosives is so provided or ordered or authorised, the Contractor shall comply with the requirements of the following beside the law of the land as applicable:

(a) The Contractor shall at all times make full liaison with and inform well in advance and obtain such permission as is required from all Government Authorities, public bodies and private parties whatsoever concerned or affected or likely to be concerned or affected by blasting operations.

(b) The Contractor shall pay all license fees and charges, which may be, required for storage of explosives or in respect of any other matters whatsoever.

(c) The contractor shall be solely responsible for provision, supply, handling, storage and transportation of all explosive ancillary materials and stores and all other things of every kind whatsoever required for blasting operations and shall not delegate or subcontract these activities without the approval of Engineer.

(d) Before the beginning of the Defects Liability Period the Contractor shall remove all unused explosives from the site on completion of the Works or which are ordered by the Engineer, and submit to the Engineer written confirmation of compliance with the instruction.

(e) The Contractor shall submit to the Engineer monthly returns detailing the quantity of explosives brought to the site together with the quantities used during the month and the location and quantity of rock blasted.

120 Protections of Existing Works and Services

Add the following to this Clause:

The cost of determining the location of the existing services together with making good or repairing of any damage caused all to the satisfaction of the Engineer shall be included in the tender rates by the Contractor.

Any damage to, or interference with, existing utilities, caused by the Contractor's operations during the progress of the Works, shall be deemed to be the responsibility of the Contractor who shall undertake to make good at his own expense any damage so caused to the existing underground utilities or other features. The Contractor shall be liable in respect of all claims arising from such damages or interference that may occur.

The Contractor shall be responsible for arranging in liaison with the relevant authorities as soon as the requirements are known for the moving of or alterations to services including power lines, telephone lines, data cables, water mains, sewers and surface water drains which are affected by the works. The arrangements for such moving or alteration shall be subject to the agreement of the Engineer and the relevant authorities.

121 Diversion of services

Add the following to the existing text:

(a) The Contractor shall acquaint himself with the position of all existing services including sewers, water pipes, underground drains, cable for electricity and telephone lines, telephone and lighting poles before commencing any excavation or other work likely to affect these existing services.

(b) The Contractor shall pay any charges arising from the moving of such services for which Provisional Sums have been included in the Bill of Quantities. Subject to the agreement of the Engineer and upon production of receipts, the Contractor shall be reimbursed in Interim Certificates the net cost of such moving or alteration plus the percentage inserted in the Bill of Quantities for all costs and profits in making the payments.

(c) The Contractor shall be entirely responsible for and shall repair at his own cost, any services that may be damaged by his plant, equipment or personnel for not following the laid down procedure of locating and shifting services or damage that may occur subsequent to alteration of such services. The Contractor shall indemnify the Employer against claims arising from damages to existing services or works.

123 Liaison with Government Officials and Police

Add the following to the existing text:

In addition to the requirements of maintaining liaison with Government Officials and Police, the Contractor shall be responsible for acquainting himself with all current and valid ordinances or regulations which may affect the work.

The Contractor's attention is also drawn to his obligations with regard to inspection and examination of the site as stipulated under Clause 11 of the Conditions of Contract.

124 Provision of land

Notwithstanding the provisions of Clause 124 of the Standard Specification, all requirements of land for deviations, quarries, stockpiles, spoil areas and borrow pits when not in the road reserve but required for the construction purposes shall be approved by the Engineer, but the Contractor will make necessary arrangements with the property owners concerned and pay all charges arising thereof on or before completion of the Contract. However, the Employer shall not provide any land for the Quarries, stockpiles, spoil areas and borrow pits and access roads there to.

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 is reasonable and practicable. No separate payment shall be made to the Contractor on account of these items and the contractor shall make due allowances for them in his rates elsewhere.

Any encroachment of the road reserve, for example by kiosks, shall be brought to the Engineer's attention by the Contractor at the earliest opportunity.

125 Water Supply

Add the following to this clause:

The Contractor at his own cost shall obtain necessary permissions from both relevant Government authorities and private parties to draw water from natural sources and private sources respectively.

127 Information from Exploratory Boring and Test Pits

Delete the contents of Clause 127 and substitute with the following:

(a) The Materials Report prepared by the Employer does not form part of the bid documents. However, the report will be made available for the Contractor's verification only and any conclusions in regard to suitability of material, location of borrow pits and material quantities made by the Contractor based on this information, will be his own responsibility.

(b) The Contractor shall allow in his programme for construction of 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 change of method or equipment deems 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 test on them.

At least fourteen (14) days before the work of laying any pavement layer is commenced the Contractor shall construct a trial at least 100 m in length and to the full construction width and shall be laid to the specified depth for the material. For each trial the contractor shall use the materials m ix proportions, mixing laying, compaction plants 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.

131 Signboards

Add the following to this clause:

At the commencement of works, the Contractor shall provide and erect three signboards; one on each end of the proposed Project Roads and as instructed by the Engineer. The signboards shall comply with the requirements and detail shown in the Book of Drawings. Any amendments to the details in the Book of Drawings, prior to the signboards being erected, shall be with the approval of the Engineer.

132.1 Engineer's representative Office

The contractor shall for the duration of the Contract, furnish and equip Resident engineer's office located at the Bomet County HeadQuarters

A telephone shall also be provided for the Resident Engineer's office for his exclusive use. All the charges and fees related to the installation and maintenance of the telephone shall be deemed to have been included in the rates for providing and maintaining the Office. The Contractor will be reimbursed, separately, the cost of operating the phone under appropriate bill item in the BoQ.

The offices 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 offices.

The Contractor may be instructed by the Engineer under clause 58 of the General Conditions of Contract 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 appropriate bill items in the BoQ.

132.2 Engineer's Office and Laboratory Furniture

Furniture and equipment for the Engineer's Laboratory shall be as listed in the Special Specifications. It shall also be the Contractor's responsibility to replenish consumables when instructed by the Engineer. The Engineer's office and laboratory furniture will revert to the Employer on completion of the contract.

The following items shall be required in the Engineer's office. On completion of the contract all furniture and equipment specified below which will have been supplied shall revert to the Contractor.

1.	Executive Desk	2 No.
2.	Desk with lockable drawer	5No.
3.	Chairs executive (swivel type)	7No
4.	Lockable steel cabinets (with 4 drawers	1No.
5.	Bookshelf 2 door with drawers & shelves 2m long	1No.
6.	Bookshelf 3 door with drawers & shelves 2m long	1No.
7.	Stapling machine (Ofrex) and pins	2No.
8.	Paper punch	2No.
9.	3m tape measures	5No.
10.	Scientific calculator (Fx 951MS or above)	5No.
11.	Fully equipped first aid kit	2No.
12.	Waste paper basket	5No.
13.	Electric heater fans	2No.
14.	Padlock	2No.
15.	Wall clocks battery powered	1No.
16.	Filling trays	12No.
17.	Chairs (standard desk type)	10No.
18.	Triplicate book	24No.
19.	Diary	8No.
20.	Inventory Book	4No.
21.	Rulers	4No.
22.	Hard cover note books (4quire)	20No.
23.	Survey Books (Rise and Fall)	30No.
24.	Field note books	24No.
25.	Rims of Conqueror printing paper	24No.
26.	A4 Envelops 50No. per packet	50 Pkts
27.	B5 Envelops 50No. per packet	50 Pkts
28.	B6 Envelops 50No. per packet	50 Pkts
29.	Payment voucher books	10No.
30.	Pens (Bic Ball points) 25 in a Pkt	50 Pkts
31.	Cellotape	5No
32.	Office glue stick	5No
33.	Dictionary	2No.
34.	Photocopy / Printing papers (Reams)	60No.
35.	Masking tape	6No.
36.	Highlighters (Dozens)	3No.

37. Spring files 60No.

The contractor shall be responsible throughout the contract period for the maintenance of the office, it equipment and furniture and providing security all as specified in clauses 132 and 141 of the standard specification.

All payments for the office are subject to retention.

The contractor will be paid 50% of the cost on provision of the office complete with furniture and equipment and the remaining 50% of the cost to be spread evenly within the contract period. The cost of provision of all items under the Engineer's Office shall be deemed to have been included in the rate for provision for the Engineer's Office in the BoQ and not separate payment shall be made on the same.

The Contractor may be instructed by the Engineer under clause 58 of the General Conditions of Contract 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 and proof of having supplied, be paid under the same bill item as that of provision of the office. It is therefore assumed that the Contractor includes these items as listed below in his rate for provision of the Engineer's office as no separate payment shall be made.

The Contractor, when instructed, shall provide and install at the Engineer's office the Equipment specified below with a dealer's certificate and warranty:

a). <u>Multifunctional Printer / Scanner / Copier</u> 1No.

Type		Desktop Full Colour Printer / Copier / Scanner
Colour Support		Full colour
Copy Resolution	Scan	Main: 600 dpi × Sub: 600 dpi
	Print	1,800 dpi (equivalent) × 600 dpi
Gradation		256
Memory Capacity (Std./Max.)		2 GB/4 GB
HDD		250 GB
Original Type		Sheets, Books, Objects
Max. Original Size		A3 (11" × 17")
Output Size		Main unit: SRA3*[1], A3 to A5, 12-1/4" × 18" (A3 wide (311.1 mm × 457.2 mm)), 11" × 17" to 8-1/2" × 11", 5-1/2" × 8-1/2", 8" × 13"*[2], 16K, 8K Bypass Tray: SRA3, A3 to A5, B6*[3], A6*[3], 12" × 18" (A3 wide (311.1 mm × 457.2 mm)), 11" × 17" to 5-1/2" × 8-1/2", 8" × 13" *[4], 16K, 8K, Postcard (A6 (4" × 6" Card)), Envelope*[5], Label sheet, Tab paper, Banner paper (Width: 210 mm to 297 mm (8-1/4" to 11-

		11/16"), Length: 457 mm to 1,200 mm (18" to 47-1/4"))*6
Paper Capacity (80 g/m²)	Tray 1	500 sheets (up to B4)
	Tray 2	500 sheets (up to A3)
	Multiple Bypass Tray	150 sheets (up to SRA3)
Max. Paper Capacity (80 g/m²)*9		6,650 sheets
Paper Weight	Tray 1	52 to 256 g/m²
	Multiple Bypass Tray	60 to 300 g/m²
Multiple Copy		1 to 9,999 sheets
Auto Duplex	Paper Size	SRA3, A3 to A5, B6*3, A6*3, 12-1/4" × 18" (A3 wide (311.1 mm × 457.2 mm)), 11" × 17"*3 to 5-1/2" × 8-1/2"*3, 7-1/4" × 10-1/2", 8" × 13", 16K, 8K, Postcard (A6 (4" × 6" Card))
	Paper Weight	52 to 256 g/m²
Dimensions [W] × [D] × [H]		615 × 685 × 779 mm (24-3/16" × 27-15/16" × 30-11/16")
Weight		Approx. 85 kg (187-3/8 lb)
Space Requirements [W] × [D]*10		937 × 1,214 mm (36-7/8" × 47-13/16")

b). Personal Computer (PC) 2No.

Processor	Intel Core i7 Processor Speed: 3.0GHz
System Memory	6GB, DDR2 SDRAM expandable to 8GB.
Primary Storage	1TB (7200rpm) SATA II Hard drive
CD/DVD Drive	16x DVD+/- RW Drive2 Drive with double layer write capability
Display Navigation	17" TFT Monitor with SXGA 1400x1280 pixels resolution display 2 Button USB scroll mouse with mouse pad. Enhanced Quiet-key USB Space-saver
Audio	A525 Speakers for multimedia output
Communication Interface	Gigabit (UTP) network card with RJ45 port. The card must have the wake-on LAN feature enabled. Internal 11a/b/g WI-FI wireless card for wireless support.
I/O Interface	6 USB 2.0 (2 front and 4 Rear) 1 parallel port 1 VGA out Speakers line-out and headphone (front) 3 PCI expansion slots.
Operating System	Latest Windows with license
Pre-loaded Software	Latest Ms Office (Professional) installed with license
Anti-virus	Antivirus software with license
Warranty	1years
Preferred Brand	Dell
UPS	Make: APC Power Rating: 650VA Input Voltage: 220-270V MUST BE SUPPLIED WITH STANDARD POWER PLUG AND BACK TO BACK CABLES FOR CONNECTION TO CPU & MONITOR

UPS specifications

1. Rating	650 VAC (minimum)
2. Input Voltage	220-240V (minimum)
3. Output	220-240V (minimum)
4. Output frequency	50-60HZ
5. Battery module	minimum 25 minutes backup time on 50% rated a. Sealed Lead-acid b. Short recharge time (max. 5 hours for 100%)
6. Protection	Output overload Input output short-circuit

Software

1. XP Office Professional with licence
2. Antivirus Kaspersky (latest version)

c). Laptop 2No.

ITEM	MINIMUM SPECIFICATIONS
Processor	Intel i7, 3 GHz
System Memory	8GB DDR3 SDRAM 667MHz
Primary Storage	1 TB
Optical Drives	DVD+/ -RW
Display	15" screen 1024x800 resolution
AC adapter	Compliant 100-240V / 50-60Hz
Wireless LAN	Internal Wi-Fi Card & Bluetooth
Navigation	Keyboard with touchpad dual pointing device & external USB optical mouse
Audio	Std stereo speakers, built-in microphone & headphone jacks
Modem	In-built with SIM slot
LAN Network Interfaces	100 Kbps Ethernet port RJ45
Operating System	Latest Genuine Windows with license
Pre-loaded Applications	Latest MS Office Pro with license Kaspersky Antivirus with license
Carry Case	One
PC Card slots	Card reader
Battery type & life	6 cell Li-Ion battery up to 5 hrs
Salient features	2 Mega pixel Webcam 4 x 2.0 USB slots Security cable lock slot
Warranty	2years
Preferred Brand	HP

d). Laser jet Printer specifications 2No.

ITEM	MINIMUM SPECIFICATIONS
Print Speed	21ppm colour , 24ppm Coloured
Print Technology	Laser

Print quality, black	Up to 1200 X 1200 dpi
Memory	96MB
Processor speed	256MHz
Paper trays std	2
Paper Handling	150 sheet input tray, 250 sheet second paper tray
Duplex Printing (Printing on both sides)	Automatic
Paper sizes	Letter A3, A4, Legal, Executive, Index Cards, Envelops
Compatible Operating Systems	Windows 7, iOS, Linux, Macintosh
Connection interfaces	Hi-speed USB 2.0 Fast Ethernet 10/100/1000
Preferred brands	HP
Accessories supplied with printer	Connecting cables (Network + USB), Tonner, CD (Includes Software and user guides), Power cord
Warranty	1 year

e). Paper Shredder 1No.

Continuous run time	continuous
Cut style	cross-cut
Depth	17.7 in.
Dimensions	33"H x 18"W x 17"D
Features	SafeSense; 100% Jam-Proof System; Silent Shred; Caster; Energy Saving System; Continuous Duty Motor; Electronic Auto Start/Stop
Full-wastebasket indicator	yes
Height	30.9 in.
Input voltage	120 V AC
Manual reverse	yes
Maximum shred speed	16
Model	225Ci
Number of sheets per pass	20
Number of users	3-5
Overload protection	yes

Product line	Powershred
Shred size	0.16" x 1.5"
Shredder use	CDs/DVDs; credit cards; paper clips; staples
Throat width	9.5
Warranty length	2-year limited; limited lifetime
width	17.1 in.

f). Camera Specifications 1 No.

ITEM	MINIMUM SPECIFICATIONS
Pixels	20.1 mega pixel
Optical zoom	20x
Compatible recording media	Memory stick duo / Memory stick PRO duo / SD Memory Card
LCD	>= 2.5" (230K Pixels)
Stamina (Battery Life)	>= 110 minutes
Battery system	Lithium ION Battery
USB	2.0 High Speed
Still image record mode	JPEG
Supplied Accessories Battery Charger Multi cable Power Cord Application Software	Battery – Lithium ION Battery
Salient features Recording media remaining indicator Wrist strap Carry case	Battery remaining indicator

The Personal Computers, Laptop, camera and Photocopying Machine shall revert to the Contractor at the end of the Contract. The cost of provision of all items under the Engineer's Office shall be deemed to have been included in the rate for provision for the Engineer's Office in the BoQ and therefore no additional payment shall be made for the same.

132.3 Engineer's Laboratory and Survey Equipment

a) General

The Contractor shall provide install and maintain in a good state of repair for the duration of the Contract, such laboratory, survey and other equipment as listed in the Special

Specifications. Such equipment shall be of approved manufacturer and shall be made available to the Engineer within the following time periods:

- Survey equipment, not more than 30 days after the Engineer's Order to Supply
- Laboratory equipment, not more than 60 days after the Engineer's order to Supply

Any delays to the Contractor or the Contractor's activities caused by the Engineer being unable to perform survey work, field or laboratory test due to the Contractor's failure to supply and/or maintain the said equipment shall be deemed to have been caused by the Contractor's own actions and any consequences of such delays shall be interpreted as such.

The laboratory and survey equipment shall revert to the Employer on completion of the Contract.

b) survey equipment

1. 2 No. Levelling staff 5m. with levelling bubble Wild GNLE or similar
2. 2No. 50m. steel band measuring tape
3. 2No. 30m. linen measuring tape
4. 1No. 3m. aluminium straight edge
5. 1No. 1m. stainless steel straight edge
6. 1No. 100m. steel band tape
7. 3No. Programmable scientific calculators FX 570 or equivalent
8. 2No. Survey umbrella
9. 1No. Roll of tracing paper
10. 3No. Protractor 360
11. 2No. Triangular scales (Conventional scales)
12. 4No. 3m. ranging rods
13. Marker pens
14. Geodetic GNSS Receivers with downloading software as specified below;

Specification	**Minimum Requirements**	**Detailed Requirements**
GNSS Performance	GNSS technology	Smart Track technology: • Advanced measurement engine • Jamming resistant measurements • High precision pulse aperture multipath correlator for pseudorange measurements • Excellent low elevation tracking • Very low noise GNSS carrier phase measurements with <0.5 mm precision • Minimum acquisition time
	Smart Track technology:	Smart Track technology:
	Max. simultaneous tracked satellites	Up to 60 Satellites simultaneously on two frequencies
	Satellite signals tracking	• GPS: L1, L2, L2C • GLONASS: L1, L2 • Galileo, QZSS2 • BeiDou B1, B2 • SBAS: WAAS, EGNOS, GAGAN, MSAS
	Reacquisition time	< 1.2 sec
	Position latency	< 20m/ sec

Measurement Performance & Accuracy	DGPS / RTCM	Typically 25 cm
	Single Baseline (<30 km)	Horizontal: 8 mm + 1 ppm Vertical: 15 mm + 1 ppm
	Network RTK	Horizontal: 8 mm + 0.5 ppm Vertical: 15 mm + 0.5 ppm
	RTK technology	Smart Check technology
	Reliability	Better than 99.99%3
	Time for initialization	< 45 sec
	OTF range	Up to 70 km2
	Supported RTK network solutions	VRS, FKP, iMAX
	Supported RTK network standards	MAC (Master Auxiliary Concept) approved by RTCM SC 104
Hardware	Weight	1.4 kg
	Weight	2.90 kg standard RTK rover including controller, batteries, pole and bracket
	Dimension (diameter x height)	198.5 mm x 197.5 mm x H 99 mm
	Supply voltage	Nominal 12 V DC Range 10.5 – 28 V DC
	Power consumption	Internal power supply Recharge & removable LI-Ion battery,
	Internal power supply, operation time	• 10.00 h static observations • 7.00 h receiving RTK data with internal UHF radio • 5.00 h transmitting RTK data with internal UHF radio • 6.00 h receiving / transmitting RTK data with internal modem
	External power supply	Rechargeable external NiMh battery 9 Ah / 12 V
Memory & Data Recording	Memory medium	Removable microSD Card: 1 GB
	Data capacity	1 GB
	Type of data	Onboard recording of: • GNSS raw data • RINEX data
	Recording rate	Up to 20 Hz
User Interface	Buttons	• ON / OFF button • Function button
	Button functionality	Function button: • Easy switch between Rover / Base mode • Easy “Here” positioning functionality
	Led status indicator	*Bluetooth*®, position, RTK Rover status, RTK Base status, data logging, internal power status, external power status
	Additional user interface	Additional web interface functionality provides full status indicator and configuration options
Communications	Communication ports	1 x USB / RS232 Lemo 1 x *Bluetooth*® port, *Bluetooth*® v2.00+ EDR, class 2
	Radio modem	• Fully integrated, fully sealed receive and transmit radios • SATEL, Pacific Crest and TrimTalk support • 403 – 473 MHz bandwidth • Output power 1W max.
	UHF antenna options	• External UHF antenna connector (Type QN)

	GSM / UMTS phone modem	• Fully integrated, fully sealed 3.75G phone modem • Quad-Band GSM / GPRS: 850 / 900 / 1800 / 1900 MHz • Penta-Band UMTS: 800 / 850 / 900 / 1900 / 2100 MHz • DynDNS service support – Base station supports up to 10 rovers via TCP/IP
	GSM / UMTS antenna	• Integrated GSM / UMTS antenna
	Radio modems	Support of any suitable UHF / VHF radio
	Real-time data formats for data transmission and reception	CMR, CMR+
	Real-time data formats according RTCM standard for data transmission and reception	RTCM 2.2, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 MSM Full support of RTCM 3 Transformation Message

c) Importation, possession and use of irradiating devices

Where required, the Contractor shall provide a nuclear gauge for the Engineer's laboratory. He shall follow the procedures for the procurement and deployment of the equipment in accordance with the Ministry of Health Regulatory Process for Setting up a Radiation Facility and arrange to obtain the necessary licences and permits, as required by the Radiation Protection Board in compliance with the Radiation Act, Cap 243 of the Laws of Kenya. The Approval for importation must be sought before the device is brought into the country. The storage facility shall be approved by the Radiation Protection Board and the Ministry of Roads Materials and Research Department.

Before handling the equipment, all staff to be deployed on the use of the gauge shall be trained, assessed and approved by the Radiation Protection Board and the Ministry of Roads Materials and Research Department. Exemptions shall be granted only to persons with proof of previous training by the said institutions. They shall also undergo medical examinations at a medical facility approved by the Board before deployment. The Contractor shall arrange for purchase of radiation badges and monitoring radiation levels every month by the Ministry of Health or an Agent approved by the Radiation Protection Board.

The cost of the medical examinations and monitoring radiation for the Engineer's laboratory staff shall be paid by the Contractor and reimbursed under the BOQ upon production of the receipts. However, the Contractor shall include the cost of obtaining the licences, permits and annual renewal thereof, construction of the storage facility and the transportation cage in his rate for provision of the equipment and no additional payment shall be made in the Contract.

The gauge shall revert to the Contractor on completion of the Contract

132.9 Wireless Communication for the Engineer

(a) Radio communication equipment

The Contractor shall, if so instructed by the Engineer, provide, install, maintain and license as necessary a radio Communication network for the duration of the Contract and for the exclusive use of the Engineer. The Communication network shall be complete and shall consist of one fixed base radio station complete with all accessories and complete trans-receiver stations for each of the Engineer's staff cars, mobile office and laboratories. The equipment provided shall have a range adequate for mobile units and extreme ends of the site

to communicate with each other and/or with the Central control. The model and make of the radio communication system shall be approved by the Engineer.

The Contractor shall be responsible for obtaining all necessary permits and licenses needed for the operation of the radio call services. The Contractor shall maintain the equipment in good working condition, including charging of batteries for the mobile units.

Failure by the contractor to provide or maintain the equipment shall make him responsible for all costs that may be incurred as a result of the Engineer's staff using alternative means of communication, including delays in supervision and approval of the works.

Ownership of the radio equipment shall be the Employer's on completion of the Contract.

Payment for complying with this requirement is included in the Bill of Quantities.

(b) Mobile phones

The Contractor shall, if so instructed by the Engineer, provide, connect and maintain mobile phones for the exclusive use by the Engineer and for the duration of the Contract. The Contractor shall provide airtime for these mobile phones as directed by the Engineer. The minimum specifications for the phone are shown below:

NETWORK	**Technology**	GSM / HSPA / LTE
BODY	**Dimensions**	150.9 x 72.6 x 7.7 mm (5.94 x 2.86 x 0.30 in)
	Weight	157 g (5.54 oz)
	Build	Corning Gorilla Glass 4 back panel
	SIM	Single SIM (Nano-SIM) or Dual SIM (Nano-SIM, dual stand-by)
		- Samsung Pay (Visa, MasterCard certified) - IP68 certified - dust proof and water resistant over 1.5 meter and 30 minutes
DISPLAY	**Type**	Super AMOLED capacitive touchscreen, 16M colors
	Size	5.5 inches (~76.1% screen-to-body ratio)
	Resolution	1440 x 2560 pixels (~534 ppi pixel density)
	Multitouch	Yes
	Protection	Corning Gorilla Glass 4
		- Always-on display - TouchWiz UI - Curved edge screen
PLATFORM	**OS**	Android OS, v6.0 (Marshmallow)
	Chipset	Qualcomm MSM8996 Snapdragon 820 Exynos 8890 Octa
	CPU	Quad-core (2x2.15 GHz Kryo & 2x1.6 GHz Kryo) Octa-core (4x2.3 GHz Mongoose & 4x1.6 GHz Cortex-A53)
	GPU	Adreno 530 Mali-T880 MP12
MEMORY	**Card slot**	microSD, up to 256 GB (dedicated slot) - single-SIM model microSD, up to 256 GB (uses SIM 2 slot) - dual-SIM model
	Internal	32/64 GB, 4 GB RAM
CAMERA	**Primary**	12 MP, f/1.7, 26mm, phase detection autofocus, OIS, LED flash, check quality
	Features	1/2.5" sensor size, 1.4 µm pixel size, geo-tagging, simultaneous 4K video and 9MP image recording, touch focus, face/smile detection, Auto HDR, panorama

	Video	2160p@30fps, 1080p@60fps, 720p@240fps, HDR, dual-video rec., check quality
	Secondary	5 MP, 1/4.1" sensor size, 1.34 µm pixel size, f/1.7, 22mm, dual video call, Auto HDR
SOUND	**Alert types**	Vibration; MP3, WAV ringtones
	Loudspeaker	Yes
	3.5mm jack	Yes
		- 24-bit/192kHz audio - Active noise cancellation with dedicated mic
COMMS	**WLAN**	Wi-Fi 802.11 a/b/g/n/ac, dual-band, Wi-Fi Direct, hotspot
	Bluetooth	v4.2, A2DP, LE, aptX
	GPS	Yes, with A-GPS, GLONASS, BDS
	NFC	Yes
	Radio	No
	USB	microUSB v2.0, USB Host
FEATURES	**Sensors**	Fingerprint, accelerometer, gyro, proximity, compass, barometer, heart rate, SpO2
	Messaging	SMS(threaded view), MMS, Email, Push Mail, IM
	Browser	HTML5
	Java	No
		- Fast battery charging: 60% in 30 min (Quick Charge 2.0) - Qi/PMA wireless charging (market dependent) - ANT+ support - S-Voice natural language commands and dictation - OneDrive (115 GB cloud storage) - MP4/DivX/XviD/WMV/H.264 player - MP3/WAV/WMA/eAAC+/FLAC player - Photo/video editor - Document editor
BATTERY		Non-removable Li-Ion 3600 mAh battery
	Talk time	Up to 27 h (3G)
	Music play	Up to 74 h
MISC	**Colors**	Black, White, Gold, Silver, Pink Gold
	SAR US	1.17 W/kg (head) 1.59 W/kg (body)
	SAR EU	0.26 W/kg (head) 0.51 W/kg (body)
	Price group	9/10
TESTS	**Performance**	Basemark OS II: 2107 / Basemark OS II 2.0: 2050 Basemark X: 28480
	Display	Contrast ratio: Infinite (nominal), 4.439 (sunlight)
	Camera	Photo / Video
	Loudspeaker	Voice 70dB / Noise 69dB / Ring 71dB
	Audio quality	Noise -92.5dB / Crosstalk -92.2dB
	Battery life	Endurance rating 98h

137 Attendance upon the Engineer and His staff

Further to the provisions of Clause 137 of the Standard Specification, the Engineer may instruct the Contractor to provide the staff for attendance to the Resident Engineer in accordance with the following Sub-Clauses:

137.1 Staff employed and paid by the Contractor for attendance upon the Engineer

The Engineer may instruct employment of staff listed below by the Contractor for attendance upon the Resident Engineer. The Contractor shall provide housing as described under Clause 132 of this Specification and pay the salaries, allowances and benefits as determined by the Engineer and claim reimbursement under the BOQ. These shall be subject to the statutory deductions, namely PAYE, NSSF and NHIF which the Contractor shall remit to the relevant authorities every month with copy of each remittance being submitted to the Engineer for his records. The minimum monthly gross salary in Kenya Shillings for the respective staff shall be as shown below:

(a) Assistant Engineer	100,000.00
(b) Inspector of Works	75,000.00
(c) Laboratory Technologist	60,000.00
(d) Administrator	40,000.00
(e) General Clerk	30,000.00
(f) Survey Assistant / Leveler	60,000.00
(g) Secretary	35,000.00
(h) Chainmen	30,000.00
(i) General Attendants	30,000.00

The Engineer shall interview, select and recommend for employment all the positions listed above. Upon employment, the Contractor shall provide each with an Employment Contract in accordance with the Employment Act, 2007 or the latest amendment of the Act, stating therein the conditions of employment. At the end of the Contract Period or termination of services, whichever comes earlier, each employee shall be issued with a Certificate of Service as provided for in the foregoing Act. Use of documents drafted by the Engineer shall not relieve the Contractor of his duties and obligations under this Clause.

138 Provision of vehicles

In addition to provisions of the Clause 138 of the Standard Specification, the Contractor shall when instructed, provide brand new vehicles and maintain in good working condition for the exclusive use of the Engineer and his staff throughout the Contract period. The Engineer shall have the sole right of selecting the type and brand of the vehicles, and confirm the number of each type and brand to be provided. The Engineer shall also have the right to propose modifications and additions to the vehicles as he may deem necessary for security, beauty or other usage needs. The Contractor shall insure the vehicles comprehensively for any licensed drivers and shall provide competent drivers during normal working hours and whenever required by the Engineer. The cost of provision of the vehicle shall be inclusive of the first 4,000 kilometres travelled in any month.

Should any vehicle supplied not be in roadworthy condition, the Contractor shall provide an acceptable equivalent replacement vehicle until such a time as the original vehicle is repaired to the satisfaction of the Engineer and returned for use.

Double Cabin and single cabin pick up Vehicles should be four Wheel Drive (4WD), with power assisted steering, Double wishbone independent suspension at front axle and rigid axle with leaf springs at rear and diesel propelled engine minimum capacity 2,800 cc. The vehicles should be fitted with other accessories below:

i) Spare tyre and wheel jack;
ii) FM radio and CD player;
iii) Power Windows;
iv) Full Air-conditioning;
v) Immobilizer and antitheft security system;
vi) Driver and passenger SRS Airbags;
vii) Canvas cover over the carrying deck at the back.

All vehicles to be supplied will be brand new or odometer reading 0 – 1,000km, right hand drive, air-conditioner and power steering as described below.

(a) Two (2) Type 2: Minimum 2.8-litre turbo charged diesel 4-wheel drive, or similar approved twin-cab pick-up.

Ownership of the vehicles supplied to the Engineer shall revert to the Contractor upon completion of construction.

139 Miscellaneous Accounts

The Contractor maybe instructed by the Engineer to make payments of general miscellaneous accounts for such items as stationary, stores and equipment and miscellaneous supervision personnel and claims or the Engineer may direct the Contractor to purchase or pay for the above. The Contractor will be paid on a prime cost basis plus a percentage for overheads and profits under appropriate items in the Bills of Quantities.

140 Payment of Overtime for Engineer's Junior Staff

In addition to the support staff provided by the contractor, the following shall also constitute part of the Engineer's junior staff:

(a) Assistant Engineer
(b) Inspector of Works
(c) Laboratory Technologist
(d) Administrator
(e) General Clerk
(f) Survey Assistant / Leveler
(g) Secretary
(h) Chainmen
(i) General Attendants

If the Contractor wishes to execute the works on regular basis outside the Engineer's normal working hours as given in Clause 108, over a prolonged period, the Engineer may if he deems it

necessary, employ additional supervisory staff for which the required salaries shall be in full by the contractor through the Engineer's office. In addition, the Contractor shall provide the required accommodation for such staff at his own cost. The Contractor shall not be reimbursed any of this cost.

141 Measurement and Payment

Item: Mobile Telephones

The provision of mobile phones units for the Engineer shall be measured and paid for by the number. The rate entered in the Bill of Quantities shall include for the costs of providing the mobile units complete with charger unit, a "hands free" headset, connection to the network and all service charges applicable.

Add the Following clauses:

142 Liquidated Damages

Liquidated Damages at the rate indicated in the Appendix to Form of Bid shall apply in the event of the work not being completed within the time for completion plus any extension of time which may be determined by the Engineer. The limit of liquidated damages shall be as indicated in the Appendix to Form of Bid.

143 Protection of the Environment

Further to the requirements of Sub-clause 19.1 of the Conditions of Contract, the Contractor shall be responsible for the following measures to protect the environment.

(a) Compliance with national and local statutes and regulations relating to protection of the environment. The Contractor will be responsible for familiarizing himself with all existing national and local legislation in this regard.

(b) All construction activities shall be carried out using the best possible means to reduce environmental pollution such as noise, dust and smoke. All vehicles and plant shall be regularly serviced in accordance with the manufacturer's recommendations to ensure that they operate efficiently and without excessive noxious emissions. The Engineer will have the authority to instruct the Contractor to temporally cease operations and/or remove from the site vehicles or plant which do not comply with this requirements, until such time that he is satisfied that the best practicable means to reduce environmental pollution to a minimum are being used.

(c) The Contractor shall at all times maintain all sites under his control in a clean and tidy condition and shall provide appropriate and adequate facilities for the temporary storage of all waste prior to disposal.

(d) The Contractor shall be responsible for the safe transportation and disposal of all waste generated as a result of his activities in such a manner as will not give rise to environmental pollution in any form or hazard to human or animal health. In the event of any third party being employed to dispose of waste, the Contractor shall be considered to have discharged his responsibilities under this Clause from the time at which waste leaves sites under his control, providing that he has satisfied himself that the proposed transportation and disposal arrangements are such as will not give rise to pollution or health hazard.

(e) The Contractor shall be responsible for the provision of adequate sanitary facilities for his workforce, and that of his subcontractors at all construction and ancillary sites. The Contractor shall not allow the discharge of any untreated sanitary waste to ground water or any water of ground surface watercourse.

(f) All concrete and asphalt plants shall be operated and maintained in accordance with the original manufacturers specifications and manuals, and in such a manner as to minimize emissions of hydro-carbons and particulate if in the opinion of the Engineer the operation of such plant is causing or is likely to cause nuisance or health problems to the site staff or the general public. The Contractor shall carry out such work as is necessary to reduce emissions to an acceptable level within a time-scale agreed with the Engineer.

(g) The Contractor shall regularly spray with water all exposed dirt surfaces to reduce dust levels.

(h) The Contractor shall take all responsible measures, at all sites under his control to prevent spillage and leakage of material likely to cause pollution of water resources. Such measures shall include but not be limited to the provisions of bunds around fuel, oil and bitumen storage facilities and provision of oil and grease traps for servicing and fuelling areas. Prior to construction of such facilities the Contractor shall submit details of pollution prevention measures to the Engineer for his approval.

(i) The Contractor shall be responsible for ensuring that exposed surfaces are re-vegetated as construction progresses all to the satisfaction of the Engineer.

(j) The removal of trees shall be kept to the minimum necessary to accommodate the permanent works. Prior to the removal of any trees the contractor shall inform the Engineer of the intended operation and obtain the permission of the Engineer for the removal of the trees. If any tree is removed without permission the Contractor shall replace it with an approved tree at no additional cost to the Employer.

(k) The Contractor shall ensure that fires, except for controlled fires for burning rubbish, do not start within the Site or in the environs thereto as a result of the works or from the actions of his employees. The burning of waste, such as vehicle tyres causing noxious emissions is prohibited. The contractor shall have available at all times trained fire-fighting personnel provided with adequate fire-fighting equipment to deal with all fires. The contractor shall additionally at all times provide sufficient fire protection and fighting equipment locally to parts of the works which constitutes particular fire hazards.

No separate payment shall be made in respect of this Clause 142 and the Contractor shall be deemed to have allowed in his general rates and prices for the costs of complying with the requirements of this clause.

144 Off Road Environmental Measures

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.

145 Staff Training

The Contractor shall allow for training of engineers, technicians and other support staff as may be instructed by the Engineer.

The payment of the allowances of such staff shall be made as instructed by the Engineer under the relevant item of the Bills of Quantities.

200 MATERIALS AND TESTING OF MATERIALS

205 Soils and Gravels

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.

(i) After four days soaking in the case of virgin materials, and
(ii) After seven days curing plus seven days soaking in the case of cement improved materials.

211 Bituminous Binders

(a) Requirements

(ii) Straight run bitumen

The ash content of penetration grade bitumen shall not exceed 0.5% by weight.

300 SETTING OUT AND TOLERANCES

301 Setting Out

(a) General

If traverse points to be used for setting out are close to the existing carriageway and interfere with the construction works, the Contractor shall relocate them to a location where they will not be disturbed. The coordinates and heights of all transverse points so relocated shall be listed and provided to the Engineer for checking and/or approval. The Contractor shall also reference with monuments the new road centrelines every 200 m long straight sections and at all salient points along curves, consisting of a pin in a concrete beacon, before commencement of any works.

The roads reserve boundary posts shall have 12 mm diameter steel pins, 200 mm long embedded in concrete with 25 mm exposed and sticking from the top surface. This pin shall be coordinated and heightened and details of the same shall be provided to the Engineer for approval.

(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.

400 SITE CLEARANCE AND TOP SOIL STRIPPING

401 Site Clearance

Add the following as the last paragraph of Sub-clause (a).

Site clearance is not required over the paved width of the existing road and shoulders. No measurements and payment for site clearance will be made for this width. The remaining area within the road reserve including the sides of the existing embankments and cutting should be cleared as instructed by the Engineer. This operation shall also include the removal of selected trees as directed by the Engineer. The Contractor shall provide paint and all the assistance the Engineer may require to mark the trees which should not be removed during site clearance.

The Contractor shall take care not to uproot or damage trees which are within the road reserve but outside the construction width. After the contractor has staked out the extent of the road, the Engineer with assistance of the Contractor shall mark out the trees to be removed. After removal the trunk and branches of these trees shall be cut into pieces not more than 2.0 m in length, transported and neatly stored at the nearest Ministry of Roads camp at a position to be indicated by the Engineer. Payment for this work shall be as detailed in the Bill of Quantities. The rate inserted by the Contractor for this work shall include the cost of complying with all the requirements of this clause.

500 EARTHWORKS

502 General

Renumber the existing text as 502.1 and add the following Sub-clause 502.2 to this clause:

502.2 Definitions for Earthworks

Formation level is defined as the lower (bottom) level of sub-base. Sub-grade is the material within 300 mm or such other thickness as may be shown on the drawings, below the formation level. Earthworks are defined as the works below the sub-grade level.

504 Preparation Prior to Forming Embankments

Renumber the existing text as 504.1 and add Sub-clauses 504.2 and 504.3 as follows;

504.2 Benching

Where shown on the drawings or instructed by the Engineer, the Contractor shall, where fill is required, excavate benches where the ground to receive the fill has a slope greater than 1 (vertical): 5 (horizontal).

Where benching is required, the existing ground, after removal of top soil in accordance with the requirements of Section 4 of the Specification, shall be benched by cutting steps such that the horizontal width between the cut face of the bench and the instructed final embankment slope is not less than 1.5 m .Each slope shall be graded to a slope of 1 in 40 from the centreline of the road so as to avoid the pounding of water. The minimum width of 1.5 m shall generally be required for each bench and the Contractor shall allow working in narrow widths.

All earthworks in widening shall be compacted to 100% MDD (AASHTO T99).

The volume of material cut from benches and its re-utilization shall not be measured for payment but is deemed to be included in the Contractor's rates for earthworks.

504.3 Ground Compaction

After top soil stripping in accordance with Section 4 of the Specification and benching in accordance with Clause 504 of the Specification, the existing ground, including benches, under embankments shall be compacted to a dry density of at least 95% MDD (AASHTO T99) to a depth of 150 mm below ground level unless otherwise directed by the Engineer. Compaction of benches other than the first bench will not be separately measured and is deemed to be included in the Contractor's rates for earthworks.

505 Construction of Embankments

Only material approved by the Engineer shall be used in embankments. Material with high swelling characteristics or high organic matter content and other undesirable material shall not be used, unless specifically authorized by the Engineer. Unsuitable material shall include:

- Material containing more than 5% by weight of organic matter, such as topsoil , humus, material from swamps, mud ,log stumps and perishable material
- Material with a swell of more than 3%
- Clay with a liquid limit exceeding 50%
- Material having moisture content greater than 105% of optimum moisture content (standard compaction) in its naturally occurring state.

Material for sub-grade shall meet 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% MDD(T99)

- Swell less than 1% on the laboratory mix sample
- Maximum dry Density (MDD) not less than 1500 kg/m^2.

Add the following:

In case the Contractor has in his possession heavy compaction equipment, he may opt to construct the sub-grade in a single layer of 300 mm thickness, following compaction trials and upon the Engineer's approval.

Rename the existing text of the Standard Specification as 507.1 and add the following to this clause:

507.2 Rockfill in Carriageway, Embankment and Behind Structures

(a) Scope of Application

With the approval of the Engineer, the rock fill Material can be used only in the following circumstances:

(i) Where the height of embankment is more than 3 m, including formation level, the lowest 1.0 m thickness can be constructed using rockfill.

(ii) For all heights, the sloped portion beyond shoulder can be constructed using with provision that, under all circumstances, a minimum of 500 mm thick earthen cushion shall be available between formation level and top level of rockfill.

(iii) Behind the structures irrespective of the height of embankment up to the bottom of sub-grade.

(b) Material

The maximum size of stones shall not exceed 300 mm in any direction. The voids between rocks shall be filled by smaller rock fragments.

(c) Spreading and Compaction

The method of compaction as specified under Clause 507.1 of the Standard Specification and/or as directed by the Engineer, should ensure that no boulders are loosely packed and can move or rock after compaction. The top layer as well as the sides of the retaining normal earth fill on one side shall be fully blinded with filter media comprising crushed aggregate and sand. The grading and layering of filter media shall be such as to form effective filter layer through which particles of inner soil fill of embankment are not able to migrate into the rock fill layer in the process of settlement/consolidation or due to movement of water. The layer work shall combine with the layers of the adjacent rockfill so as to facilitate simultaneous compaction.

(d) Rates

The rates are applicable to completed construction as measured by taking levels before and after compaction up to the top of blinding/filter media 300 mm thick and are inclusive of all materials, void filling materials, blinding materials and filter media.

The preload material shall be removed from any stage of the construction when, in the opinion of the Engineer, based on settlement monitoring records, the required primary consolidation of the soft silts has been achieved.

Based on consolidation properties of soil, expected preload time shall be estimated for each stage. However, this time can be influenced, not only by settlement, but also by the

rains. The Contractor will not be entitled to extra payment should these times be varied due to the site conditions or the rains.

(e) Settlement Monitoring

Continuous monitoring of settlement will be necessary to check the efficiency of the system. The instruments for monitoring settlement and stability shall include settlement platforms, Piezometers to determine if pore pressures are exceeding limits that might endanger stability, and Inclinometers to determine if lateral movement occurs.

Settlement monitoring devices shall be installed at the Contractor's cost to monitor the settlement behaviour of ground under fill, to establish the effectiveness of the drainage system. The Contractor shall carry out the settlement monitoring works, including the installation of all the required equipment, in accordance with Standard Specification.

508 Compaction of Earthworks

Fill above ground level adjacent to pipe culverts shall be compacted in layers not exceeding 150 mm in thickness to a field density of 100% MDD (AASHTO T99) up to the level of the top of the pipes or top of surround. The compaction shall extend for a width equal to the internal diameter of the pipe on either side of the pipe (s) or surround (s).

Adjacent to the structures, all fill above ground level up to the underside of the sub-grade shall be compacted in layers not exceeding 150 mm in thickness to a field density of 100% MDD (AASHTO T99). In case of fill around box culverts, this shall be carried out for the full width of the fill and for a length bounded by the vertical plane passing through the ends of wing walls.

Where the formation in cut areas is formed of hard material, the Contractor shall remove the hard material to a depth of 200 mm or such other depth as may be directed by the Engineer. The void so formed shall be backfilled with sub-grade quality material and compacted to the same standard and tolerances as for sub-grade in fill.

Improved sub-grade, where required as part of the embankment construction shall be compacted and finished to the same standards and tolerances as those required for normal sub-grade.

509 Mass Haul Diagram

No mass haul diagram has been provided with the Contract documents. The Contractor shall locate suitable materials for constructing earthworks along the alignment and elsewhere.

511 Borrow Pits

Delete the first paragraph and substitute with 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 but to the approval of the Engineer.

514 Top Soiling and Grassing

Consider the existing text to be Sub-clause 514.1

The embankments and cut faces referred to in Clause 514.1 of the Standard Specification are synonymous with fill slopes and cut slopes defined in Clause 110 (c) of the same specification.

The guiding dams referred to in Clause 514.1 of the Standard Specification are synonymous with the guiding dams referred to in Clause 817 of the same specification.

Add the following Sub-clause 514.2

514.2 Hydro-seeding

Where it is specified that hydro-seeding should be carried out on topsoil, the thickness of the topsoil shall be 100 mm unless, where suitable soil is present, the Engineer orders the topsoil to be omitted or applied in reduced thickness.

The Engineer and the Contractor shall agree the types and mixtures of seeds to be used on before the Contractor orders any seed he may wish to use. The variety of resulting grass or plants should not be attractive to livestock or grass eating animals.

The Contractor shall be solely responsible for establishing an acceptable grass cover and any approval by the Engineer of seed or seed mixtures intended for use by the Contractor shall not relieve him of this responsibility. All areas to be hydro-seeded or hand seeded shall be scarified forming horizontal drills running parallel to the contours. The drills are to be spaced at intervals of 150 to 250 mm apart. Seeding to Mulch shall be added to the hydro-seeding mix at an approved rate.

Hydro-seeding shall be carried out with an approved hydro-seeding machine at a rate of application of not less than 20 gm/m^2 for fill and cut slopes and 10 gm/m^2 for other areas. When the use of anti-erosion compounds is required and such compound is to be applied simultaneously with the hydro-seeding, it shall be mixed with the hydro-seeding mixture before application.

514.3 Application of Chemical Fertilizers

For all areas to be grassed the Contractor shall have the top 150 mm of the prepared surface analyzed to determine the quantity and type of fertilizer that may be required for establishing proper growth conditions for the grass. The locations of soil samples taken shall be indicated on plans by the Contractor. The Contractor shall furnish the Engineer with the soil analysis and subsequent fertilizer recommendations. Only after approval by the Engineer of the nature and quantity of fertilizer may the application proceed.

Soil improvement chemicals and fertilizers shall be made available for application of chemical fertilizer. As such no separate reimbursement to the Contractor shall be made. The Contractor shall be deemed to have included his costs in the rates for top soiling and grassing.

515 Side drains

Whenever excavation works inside drains constitutes a separate operation from the bulk earthworks such excavations shall be classified as catch water drains under Section 8 of the Specification.

517 Measurement and payment

(a) Fill in soft material

Add the following at the end of this item:

Quantities for embankment widening shall be measured using the final compacted volume of filled material over the existing embankment after removal of top soil. No separate payment shall be made to the Contractor for any additional earthworks resulting from his construction methods or for working space for his construction plant and equipment or for complying with the requirements of Clause 504.2 of this specification with respect to benching where necessary. The Contractor shall take this into consideration when preparing his rates.

(c) Spoil in soft material

Add the following at the end of this Item:

The rate for spoil in soft material shall also allow for removal and disposal of material in waterlogged areas. No separate payment shall be made for overhaul.

Add the following:

(n) Item: Providing an approved seed mixture for hydro-seeding

Unit: Kilogramme (kg)

The Unit of measurement shall be the kilogramme of seed of the specified or approved seed mixture provided. The rate shall include the full compensation for procuring and furnishing certified seeds and compliance with Clause 514.2 of this specification.

(o) Item: Hydro-seeding

Unit: Hectare (ha)

The unit of measurement for hydro-seeding shall be the area, measured in hectares of grass established by hydro-seeding which has an acceptable cover. The rate shall include full rate for furnishing cellulose pulp, mixing it with seed, water and with any anti-erosion compound, if required, applying the mixture, watering weeding, reseeding bare patches, and for any other work which may be necessary for establishing an acceptable cover and maintaining the grass.

Add the following to this section. The details apply to both the activities for the quarries and road works.

600 QUARRIES, BORROW PITS, STOCKPILE AND SPOIL AREAS

601 General

The Employer will not make available to the Contractor any land for quarries, borrow pits, stockpile and spoil areas, except for those in the road reserves and specifically approved by the Engineer.

The Contractor will be entirely responsible for locating and providing suitable sources of materials complying with the specifications and for procurement, winning, haulage to site of these materials, rehabilitating the borrow pits, quarries, stockpile and spoil areas, and all costs involved therein. Similarly, the Contractor will be responsible for provision of areas for stock piling materials and disposal of spoil dumps or stockpiling within the road reserve. The Contractor may utilize them subject to the approval of the Engineer.

No additional payment will be made to the Contractor to cover costs arising from the requirement of this clause. The Contractor shall include the costs of complying with this clause in the rates and prices inserted elsewhere in the Bill Of Quantities.

602 Definitions

Add the following to Clause 602:

(d) Materials Report

The information on possible material sites is given for the general guidance of bidders. However, bidders are advised to conduct their own investigation as the information contained therein is neither guaranteed nor warranted.

700 EXCAVATION AND FILLING FOR STRUCTURES

703 Excavation of foundations for structures

Make amendments to this clause as follows

Read the second paragraph as "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 T.99) immediately before structures are constructed.

Paragraph 4, last line: - Replace "95%" with "100%".

Add the following to this clause:

703.1 Preparation of Foundation and Approval

(a) Preparation of Foundation

The bottom of foundations shall be levelled both longitudinally and transversely or stepped as directed by the Engineer. Where the material met with is other than rock, the same shall be compacted to at least 95% MDD. Where rock and soil are met with in part widths, the area in the soil portion shall be sub-excavated to a depth of 100 mm and backfilled with Class 15/20 concrete. All rock faces shall be freed of soft and loose material, cleared and cut to a firm surface, level, stepped or serrated as directed by the Engineer. All seams shall be cleared out and filled with cement mortar, to the satisfaction of the Engineer.

(b) Approval of Foundation

After excavation in each location is completed, the Contractor shall notify the Engineer, and no foundation concrete shall be placed until the Engineer has approved the depth of the excavation and the character of the foundation material.

703a Erosion Protection Works at Upstream and Downstream of Culverts/Bridges

703a.1 Scope

The work shall consist of provision of erosion protection works in the form of bed flooring and curtain or cut-off walls at the upstream and downstream ends of the new as well as the existing box/pipe culverts. The work shall be carried out to such designs and at such locations as indicated on the Drawings or as directed by the Engineer.

The erosion protection works shall consist of dry rubble stone bed flooring and random rubble masonry curtain (cut-off) wall at the upstream and downstream ends of box/pipe culverts.

703a.2 Materials

The material for bed flooring shall be dry rubble stone, each stone weighing not less than 40 kg.

The curtain wall shall be constructed of random rubble masonry in cement mortar of 1:3.

703a.3 Construction Operations

(a) Curtain Wall

The trench for the curtain wall shall be excavated as per Clause 703 of the Standard Specification at such locations and to such depths shown on the Drawings or as directed by the Engineer. After preparing the foundation bed, the curtain wall shall be constructed to the thickness shown on the Drawings and to levels up to top of the bed flooring.

(b) Floor Paving

The bed for the flooring shall be prepared by excavation in accordance with Clause 703 of the Standard Specification or filling in accordance with Clause 707 of the same specification, levelled and compacted to at least 98% MDD. The top of bed shall be prepared to such levels that after construction of the bed flooring, it is in line with the invert of the culvert barrel and sloping away. The bed flooring shall end before the curtain wall.

707 Backfilling of Excavations and Filling for structures

Make amendments to this clause as follows

Delete "95% where ever it appears and insert "100%".

708 Protection of Structures

Add the following to Clause 708.

Unless specific provisions for any structure in respect of cofferdams has been made in the Bill of Quantities, no payment will be made for the erection, maintenance and removal of cofferdams and the Contractor's rates shall be deemed to be all inclusive.

709 Excavations for River Training and New Watercourses

Add the following to Clause 709:

For culvert widening the Contractor shall inspect the structures to be widened and allow for any river training works he deems necessary in his rates for excavation.

710 Stone Pitching

Add the following to Clause 710:

Stone pitching to drains, inlets and outlets of culverts to embankments and around structures shall consist of sound un-weathered rock approved by the Engineer.

All stone for pitching shall be capable of withstanding a crushing stress of 20 N/mm² when soaked. The source of stone shall be free from overburden, mudstone, cracks, sand holes, veins, laminations or other imperfections as may be identified by the Engineer during the approval process.

The surface to receive the pitching shall be compacted and trimmed to slope and the stone laid, interlocked and rammed into the material to give an even finished surface.

In areas where stone pitching has been damaged, the Contractor shall identify such areas and notify the Engineer for his agreement of the extent of the Works required and his approval and instructions to proceed with the Works. Stone pitching repair and reconstruction shall be carried out in accordance with Clause 710 of the Standard Specification. The Works shall involve removal of the damaged stone pitching and reconstruction of the said areas in accordance with Clause 710 of the Standard Specification by the use of the sound salvaged material together with any necessary additional material where all such materials shall comply with Section 7 of the Standard Specification

800 CULVERT AND DRAINAGE WORKS

804 Excavation for Culverts and Drainage Works

In the Standard Specification make the following amendments on this clause:

In paragraph 6, line 3, in paragraph 7, line 5 and in paragraph 11, line 6, delete reference to "95%" and insert "100%".

805 Excavation in Hard Material

In the Standard Specification, sub-clause 805 (a) and (b) delete reference to "95%" and insert "100%".

809 Bedding and Laying of Pipe Culverts

In the Standard Specification, sub-clause 809 (a), delete reference to "95%" and insert "100%".

Add the following to Clause 809:

(d) Laying, Bedding and Surround for Culverts Cast In-situ

In addition to the requirements of the Standard Specification, where inflatable balloon method of casting culverts in-situ is used, it is essential that thorough pre-construction trials are carried out and necessary adjustments made to ensure that:

(i) All concrete used for surround and the top 50 mm or 80 mm of bedding for culverts shall be Class 30/20 while the rest of the concrete shall be class 20/20.

(ii) The inner concrete barrel surface immediately in contact with the inflated balloon form during placing shall achieve Class F3 finish.

(iii) Cement to be used shall be cement 42.5

810 Jointing Concrete Pipes

In addition to the requirement of Clause 810 of the Standard Specification, all precast concrete pipes shall be ogee jointed pipes laid with a 1:2 (cement: sand) mortar and provided with fillets on the outside and as described in the Standard Specification.

812 Backfill

In the Standard Specification make the following amendments to this clause:

(a) Wherever the expression "dry density of 95% (AASHTO T99)" occurs, this expression shall be deleted and replaced with "dry density of 100% (AASHTO T99)".

(b) Delete paragraph 6: "For pipes culverts…depth of 150 mm", entirely.

816 Minor Drainage Structures

Add the following to this clause:

(a) Concrete Lined Drains

The exposed surfaces of concrete lined drains shall be a class UF2 finish. Concrete lined drains shall be constructed to the same standard as the minor drainage structures.

(b) Cast in situ chutes on side slopes

Where pre cast chutes are provided, refer to Section 1 of this the specifications.

817 Mitre Drains, Cut-off Drains, Catch Water/Drains, Outfall Drains and Earth Dams

Rename the existing text as 817.1 and add the following sub-clauses:

817.2 Cleaning Existing Drains

Where instructed by the Engineer, the Contractor shall clear blocked side drains and/or outfall drains to a free flowing condition. The work shall consist of but not be limited to:

- Stripping and removal of extraneous material including vegetation and roots to spoil
- Carting away and spreading any spoil to the satisfaction of the Engineer, and
- Reshaping the drains to a free flowing profile.

817.3 Cleaning of Hydraulic Structures

Where instructed by the Engineer, the Contractor shall clean the existing hydraulic structures by removing all undesirable material in the structures to ensure they are clean and free flowing. The Contractor shall dispose of all the silt and other undesirable material to spoil. After the cleaning out of structures, the Contractor shall be responsible for maintaining the hydraulic structures in a clean condition for the duration of the Contract.

817.4 Removal of Existing Pipes, Inlet and Outlet Structures

The Contractor shall remove existing concrete pipes where instructed by the Engineer including bedding, surround, inlet and outlet structures. Concrete shall be disposed of as directed by the Engineer. Masonry structures where in a good condition shall be preserved to reuse as may be directed by the Engineer. Additional material shall be added to the void left after removal of these pipes and structures and shall be carefully compacted to 100% MDD (T99). The void shall then be preserved for placement of any new pipes or construction of new structures.

The existing inlet and outlets structures, where in good condition, and reusable as beds to pipe extensions, shall not be removed. Any such structures removed without the Engineer's approval shall be restored to the original condition at the Contractor's expense.

817.5 Extension of Existing Pipes

Where shown on the drawings or instructed by the Engineer, the Contractor shall extend the existing concrete pipes. Part of the existing pipe surround shall be broken and concrete collar constructed as shown on the drawings. The extension shall be backfilled to the same standards as for new pipes.

817.6 Chute drain for High Embankment Sections

(a) Scope

This work shall consist of construction of chute drain on the slope of the road embankment including erosion protection works at the locations and to dimensions shown on the Drawings or as directed by Engineer. The schedule of works shall be so arranged that the drains are completed in proper sequence with roadway to ensure that no damage is caused due to lack of drainage.

(b) Materials

The drains shall be of half round pipe of 600 mm dia. formed by joining pre-cast semicircular RCC sections at site as shown in the drawings. The RCC work shall conform to the relevant clauses of these specifications.

The toe wall below ground level shall be of brick masonry in cement mortar 1:4 or plain cement concrete of class 15/20, as shown on the Drawings.

Dumped riprap for erosion protection at ground level shall be hard, unweathered and durable rubble stone of size 150 mm to 250 mm.

(c) Construction Operations

Excavation for fixing drain sections at the locations where the chute drains are to be installed, a semi-circular cut on the side slope of the embankment along the line of the chute drain shall be made in such a way that the RCC drain sections could be fixed snugly with their edges flush with the adjoining embankment slope. The sloping bed of the drain shall be to a regular line and suitably compacted to provide a firm bed.

817.7 Stone Masonry and Concrete Paving

(a) Description

The work shall consist of construction of lined ditches, stone paved shoulders, hard strips, chutes, toe walls, retaining walls, slab culvert walls, head walls, wing walls, aprons and slope protection works using natural stones for stone related masonry and precast concrete blocks for concrete block masonry set in cement mortar.

(b) Materials

(i) Stones

Stones used shall be hard and durable without weak seams or cracks and of rectangular shape. The Los Angeles Abrasion Value shall not exceed 50. The apparent specific gravity shall not be less than 2.2 and water absorption when tested in accordance with AASHTO T85 shall not exceed 5 percent.

(ii) Concrete Blocks

Concrete blocks for concrete block masonry shall be precast from Class 20/20 concrete while those used for paving shall be in Class 25/20 concrete. The blocks shall, in general, have the length, width and height in the proportion of 3:1.5:1 or as ordered by the Engineer. The blocks shall be moist cured for at least 7 days, and kept under cover for another 21 days in the casting bed before being lifted for use in the works. The blocks when tested flat after 28 days of casting shall have a compressive strength not less than 125 percent of the cylindrical compressive strength specified for the class of concrete used.

(iii) Mortar

The mortar shall be made of a mixture of cement and sand in the proportion of one cement to three sand. Cement shall be Portland cement conforming to AASHTO M85, Type I or II. The sand shall be crushed stone or natural sand or a combination thereof conforming to AASHTO M45. Water added shall be just adequate for making a workable mix and shall be subject to the approval of the Engineer.

(c) Construction Requirements

(i) Stone Masonry

The stone masonry shall be used for walls of different types above the ground level. The stones shall be of regular shape with length of any stone not exceeding 3 times its height, with the breadth on the bed not less than 150 mm nor greater than three quarters of the thickness of the wall. Unless otherwise directed, the stone shall have thickness not less than 150 mm.

All stone possessing bedding planes shall be laid with its natural bed as nearly as possible at right angles to the direction of the load, and in case of arch rings, the natural bed shall be radial.

Each course shall present a uniform horizontal line of more or less equal height. Vertical joints shall be broken by the adjoining courses. All joints shall be sufficiently thick to prevent stone to stone contact and shall be completely filled with mortar. On the exposed face no part of the masonry shall deviate from the general line of the wall by more than 20 mm.

Walls of stone masonry shall be provided with weep holes as shown on the Drawings or directed by the Engineer. In continuous long structures, expansion joints shall be formed as shown on the Drawings subject to a minimum spacing of 10 m.

All face joints shall be finished almost flush with the surface of the work without covering the stones. The top surface of all walls shall be provided with 20 mm thick cement mortar coping with a crossfall for shedding rainwater.

Newly laid masonry shall be protected against the harmful effects of weather and cured for a minimum period of 4 days. All visible surfaces of the masonry shall be clean and free from mortar stains and other blemishes.

Backfill behind the stone masonry walls shall be placed only after the masonry work has been in place for at least 14 days or as directed by the Engineer.

(ii) Grouted Stone Riprap

This type of masonry that is constructed in a single layer over a bed of mortar shall be used for shoulder paving, hard strips, aprons, drainage chutes, lined ditches and slope protection. The stone shall be of regular shape and uniform thickness. Prior to laying of the stone, the base shall be brought to regular shape and levels, watered and well compacted. Where this type of masonry is to be used for paving shoulders or for carriageway widening of the existing roads, the base shall be slightly loosened, watered and compacted to 95% MDD prior to application of the riprap. The stone shall be placed over a bed of mortar about 20 mm thick. After placement of the stones by hand, all the joints shall be completely filled with cement mortar. The finished work shall present a uniform surface with no point deviating from the general line by more than 10 mm in the case of shoulder paving, and hard strips, and not more than 25 mm in other cases. The finished work shall be protected against the adverse effects of weather and cured for at least 4 days.

(iii) Dry Stone Riprap

This work shall consist of placing 150 mm to 300 mm size rubble stone on the front side of cut-off walls of culverts and Irish Crossings as erosion protection measure. The dimensions of the riprap construction shall be as shown on the drawings or as

directed by the Engineer. The stone used shall be of hard and durable type as are used for stone/boulder masonry. The stone shall be so placed that major hollow spaces are avoided.

(d) Measurement and Payment

(i) Stone Masonry

The quantity to be paid will be measured by volume in m³ of stone masonry complete in place and accepted. In computing the volume for payment, the dimensions used will be limited to those shown on the Drawings or ordered in writing by the Engineer.

No deductions will be made for weep holes, drainpipe or other openings of less than 0.2 m² in the area. The cement mortar coping on top of the wall shall be included in the measurement for stone masonry.

If the masonry is for heightening or lengthening an existing wall, the work of removing the plaster, if any, on the old wall including roughening of the surface to effect good bonding shall be considered incidental to the work and shall not be paid for separately.

The quantities of excavation below ground level and backfilling will be measured as structural excavation.

(ii) Grouted Stone and Dry Stone Riprap

Grouted Stone Riprap shall be measured by m² of completed and accepted work placed to the specific thickness. Measurement shall be limited to the dimensions shown on the Drawings or as otherwise authorised by the Engineer. No measurement shall be made of unauthorised areas or for extra thickness. Toe walls and cut-off walls below ground level shall be measured in m³ and paid for as Boulder Masonry.

Where the rip-rap is used for shoulder paving or for widening carriageway of existing road, the bed preparation shall be measured as sub-grade preparation in accordance with Clause 508 of the Standard Specification. In all the other cases, slope and bed preparation shall not be measured for payment but will be considered subsidiary to the pay item.

Dry Stone Riprap shall be measured as placed in position in m³. Any excavation for making space for placing the riprap shall be measured as common excavation in accordance to Clauses 504 and 505 of the Standard Specification.

(iii) Payment

The amount of completed and accepted work as measured will be paid for at the bid unit prices per m³ for "Stone Masonry", "Dry Stone Riprap" and "Grouted stone riprap", used for shoulder paving, hard strips, ditch lining, aprons, drainage chutes and slope paving. These prices shall be in full compensation for furnishing and placing all materials, and for all labour, equipment, tools and incidentals necessary for completion of the work complying with the specifications.

Add the following to Clause 819 of the Standard Specification:

819.1 Repair of Drainage Spouts

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.

(a) Materials

(i) Ordinary Portland cement KS 1825
(ii) Aggregates conforming to BS 5328
(iii) GI Pipes
(iv) Paint.

(b) Equipment

(i) Welding equipment
(ii) Painting brushes
(iii) Miscellaneous construction equipment

(c) Procedure

The existing drainage spouts shall be cleaned of all muck. The new GI drainage spouts shall then be replaced for the damaged spouts as per the detailed drawings.

In case where drainage spouts have not been provided, the RCC kerb shall be cast after fixing new pipes as per the detailed drawings. The casting of concrete and fixing of pipes shall be made as per the standard practice.

The GI drainage spouts shall be painted with black anticorrosive paint of approved brand and manufacture to give an even shade.

The existing reinforcement shall be realigned and additional reinforcement shall be provided as per the drawings or as directed by the Engineer.

Concrete shall be mixed and laid as per the standard practice and as per the drawings. For bonding old concrete with the new concrete, the old concrete surface shall be painted with epoxy bonding agent or polymer cement slurry before the concreting is cast.

820 Measurement and Payments for Additional Items

(a) Item: Concrete for top 50 mm or 80 mm bedding and surround for culverts cast in situ.

Unit: m^3

The rate for concrete for each size of culverts instructed shall include for the cubic metre of the top 50 mm or 80 mm of concrete for bedding and surrounds, as instructed, calculated from the dimensions on the drawings or as directed by the Engineer.

The rate for concrete for bedding and surrounds for culverts cast in situ shall include for the cost of providing and placing the concrete and complying with Clauses 809, 810, 814, 819 and 1713 of the Standard Specification.

No extra payment shall be made for provision of inflatable forms and other requirements for casting culverts in-situ and the Contractor shall be deemed to have provided for these in his rates.

(b) Item: Cleaning and grading the existing outfall and metre drains

Unit: m^3

Cleaning the existing drains shall be measured by the volume instructed. The volume shall be the product of the cross sectional area of the material to be removed from the drain and the length instructed.

(c) Item: Removal of material from existing side drains

Unit: m^3

Cleaning of the existing drains shall be measured by the volume instructed. The volume shall be the product of the cross sectional area of the drain to be cleaned and the length instructed. Payment will not be made under this item where the material can be removed in conjunction with bulk earthworks.

(d) Item: Removal of the existing pipes

Unit: m^3

Removal of the existing pipes shall be measured by the length of culvert removed. It shall include for breaking out where necessary and carting of the removed culvert and surrounds to spoil or stockpile as shall be directed by the Engineer. It shall also include all the costs of complying with the requirements of Clause 817.3.

(v) Item: Demolition of inlet and outlet structures

Unit: m^3 of concrete or masonry

Demolition of inlet and outlet structures shall be measured by the volume of concrete or of masonry structures demolished. There will be no distinction between reinforced and un-reinforced concrete structures. The rate shall include for disposal of concrete and reuse of masonry as directed by the Engineer. Stone pitching shall not be measured separately and where it is to be removed shall be treated as normal site clearance.

(w) Item: Cleaning the existing hydraulic structures

Unit: m^3

Cleaning of the existing hydraulic structures shall be measured by the volume of material removed. The rate shall include for the cost of removing all undesirable material, transporting and disposing off as well as the additional costs of gaining access to the structures as specified and maintaining the structures in a clean condition.

(x) Item: Concrete collar

Unit m^3

Reinforced concrete collars shall be measured by the volume of concrete placed as shown on the drawings or instructed by the Engineer.

Where the existing culvert which is to be extended has a concrete surround, the rate shall also include for removal of this surround for the length of the collar to be placed around the existing culvert.

In all cases the rate shall also include for excavation below the culvert and the preparation and compaction of the in situ material to form a bed for the collar.

821 Cement Mortared Stone Masonry Walls

Masonry walling shall be constructed with sound clean stone with a minimum width of 200 mm. The stone shall have a fair finish. The stone shall be individually placed to break joint and to provide a minimum of voids. The stone shall be wetted and jointed in a 3:1 (sand: cement) mortar. Exposed stone on the wall faces shall be cleaned of mortar by washing or wire brushing. The mortar shall be flush pointed to the approval of the engineer.

Weep holes shall be provided as instructed and shall be cleaned of mortar and any other clogging material that may have entered during construction.

The walling shall be protected from the weather and kept moist for a minimum of seven (7) days after completion.

822 Subsoil Filter Drains

The Contractor shall lay subsoil filter drains where shown on the drawings or instructed by the Engineer. The drain shall extend to the underside of the sub-grade or sub-base and shall consist of a perforated pipe wrapped in geotextile fabric as specified in the Standard Specifications and shown on the drawings. The pipe and fabric shall be laid on and backfilled with granular filter materials. The granular material shall comply with the requirements given in the table below.

BS Sieve Size (mm)	**Percentage by mass Passing Sieve**	
	Minimum	**Maximum**
37.5	100	100
20	85	100
10	50	100
5	35	90
1.18	15	50
0.600	5	35
0.150	0	5

823 Gulley Pots and Chambers

Where shown on the drawings or instructed by the Engineer, the existing roadside gulleys and gulley pots shall be adjusted before laying final wearing course such that there are no depressions around man holes, gulleys or chambers. The beds, frames and haunches shall be adjusted with concrete Class 20/20 true to line and level and to the satisfaction of Engineer.

824 Pedestrian Crossings

Where shown on the drawings or instructed by the Engineer, the Contractor shall construct pedestrian crossings across open drains. The crossing will be 2 m wide, with culverts located as directed by the Engineer. The pedestrian crossing shall be finished to the same standards as the adjacent footpath. Where there is no footpath, the crossing shall be finished with approach path comprising 150 mm gravel base with surface dressing similar to the adjacent shoulder as directed by the Engineer.

825 Measurement and Payment for Further Additional Items

(a) Item: Preparation of bed for concrete lined open drains

Unit: m^2

The unit of measurements shall be the square metre of excavation trimmed to receive concrete lining. The rate shall include for all the excavation below the finished line of the drain, providing and laying of gravel bed, and compacting and shaping to the line and level required to receive the concrete lining.

(b) Item: Cast in situ concrete chutes

Unit: m^3

Cast in situ shall be read as "Pre-cast". Pre Cast concrete chutes shall be measured by the volume of concrete cast. The rate shall include for preparation of sides, laying, fixing and for complying with the requirements of Sections 8 and 17 of the Standard Specification.

826 Concrete and Cement Strength

Concrete class shall be as specified. Cement to be used in all construction works shall be 42.5 KN.

900 PASSAGE OF TRAFFIC

903 Maintenance of Existing Road

Amend as follows:

The Engineer shall hand over the existing road to the contractor, in sections, at the commencement of the Contract for construction purpose. However, the Contractor shall be responsible for all repairs and maintenance of the entire road package for the duration of the Contract. The existing road is bituminous and the Contractor shall maintain it with asphalt materials or other materials similar to those of the existing pavement layers. The Contractor shall regularly inspect the road and carry out such repairs and maintenance to the satisfaction of the Engineer. If at any time the Engineer draws the Contractor's attention to a road section which requires maintenance the Contractor shall promptly repair the section. The Contractor shall be legally responsible for any accident or damage attributable to his failure to maintain the road.

Add the following to this clause:

903.1 Maintenance of Right of Way

Throughout the period of the Contract the Contractor shall at all times maintain public vehicular access to the right of way, within the right of way and from the right of way to all public and private land, as it was immediately prior to his commencement of the Works.

The Contractor may, on submission of written request to the Engineer, including a drawing, programme and specification, be given approval to operate:

(a) A road diversion suitable for the road traffic and suitable width or

(b) Traffic on a one way system using manual coordinated direction control or automatic traffic lights having a secure source of power.

Applications for approval shall show every detail of the proposals including road construction cross section including pavement, surfacing, profile and drainage, road signing, communication between the ends of the controlled section lighting and the proposed period of operation.

One way systems shall be provided with adequate sign posting and the Contractor shall limit delays to any traffic to the minimum and with the approval of the Engineer. The travelling public shall be notified by signs, of exceptional delay well in advance of the site of delay, as required by the Engineer.

Payment for temporary diversions, traffic provisions and maintenance of roadways shall be as provided in the Contract and as instructed by the Engineer.

904 Construction of Deviations

Add the following paragraph between the second and the third paragraphs of Item (a):

The Contractor shall programme his works in such a way that traffic shall not be required to pass over more than 1.5 km at any one time unless otherwise approved by the Engineer.

906 Passage of Traffic through the Works

Add the following to this Clause.

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 payments will be made for any expenditure on traffic control. Should the Contractor propose any other method of passage of traffic including construction of traffic deviations and use of the existing roads the Contractor shall investigate the

alternatives, construct and maintain them to the satisfaction of the Engineer. The Employer shall not be liable for investigations or costs arising from the alternatives methods of traffic control proposed by the Contractor. Deviations or other measures for traffic control where proposed by the Contractor shall meet the requirements of the specifications and drawings and be approved 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. The Contractor shall ensure that the supervisor or person in charge of the work force is readily recognized from the rest of the workforce. In addition, the Contractor shall provide a full time traffic safety officer to coordinate aspects of road safety for the whole site.

The Contractor shall be deemed to have included all costs related to employing the traffic safety officer and for all the duties performed by him in his rate for passage of traffic.

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:

1107 Footpaths

Where shown on the drawings or directed by the Engineer, footpaths shall be constructed. The Footpaths shall be constructed using the precast concrete paving blocks as the finish or asphalt or gravel wearing course. The line of the footpaths shall be as shown on the drawings or as directed by the Engineer.

1107.1 Pre-cast Concrete Paving Blocks

Precast concrete blocks shall be hydraulically pressed, complying with BS 7263: Part 1. Blocks shall be laid in accordance with BS 7263: Part 2 to the required cross fall.

1107.2 Flexible Surfacing for Footpaths and other Paved Areas

Flexible surfacing for footpaths and paved areas shall be laid in compliance with section 16 of the Standard Specification.

Surfacing shall be laid true to level and cross fall as shown on the drawing or instructed by the Engineer. Payments for flexible surfacing on footpaths will be measured and paid in accordance with the provisions of section 16 of Standard Specification.

1108 Measurement and Pavement

(a) Item: Precast Concrete Paving Blocks

Unit: m^2

Precast concrete blocks shall be paid by the area measured on plan. The rate shall include for supplying, laying the bedding, jointing, compacting, laying at kerbs and radii and all the Contractor's obligations with respect to this clause.

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.

1202 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.

Measurement and payment of natural materials for subbase shall be in conformity with Method A of the Standard Specification with the following amendment

Delete "Free haul of 1.5km" whenever it is referred to under this Clause. No separate payment shall be made for overhaul in this contract.

1203 HANDPACKING

a) Sources of Material

The Contractor may obtain suitable material from existing commercial quarries. Before being delivered to the site of the Works, the material will be tested for compliance with the requirements stipulated in the following sub clauses.

b) General Requirements

Where the use of hand packed stone is specified, the rock from which the stones and screenings are produced shall comply with the following.

A.C.V. – Max. 40%
L.A.A. – Max. 30%
S.S.S. – Max. 12%

c) Stones

The stones shall be free from an excess of flat or elongated particles, soft and less durable rock, clays, loam, topsoil and other deleterious matter. The stones shall be of such grading and size that they pack firmly when laid by hand. The larger stones shall have a maximum dimension slightly greater than the thickness for the required compacted layer and be of a shape acceptable to the Engineer. The smaller stones shall have a reasonably uniform grading and be of a nominal size suitable, in the opinion of the Engineer, for filling the surface voids of the as placed larger stones in place. The nominal size of the smaller stones will be of the order of 50mm.

d) Screening

The screenings shall consist of tough durable crushed rock, free from an access of flat, elongated, soft or disintegrated pieces and harmful material, such as loam, clay, organic matter, or other deleterious substances and shall be to the Engineer's approval.

The grading of the screenings shall form a smooth curve and shall be within and approximately parallel to the following limits: -

B.S. Sieve Size	Percentage by Weight Passing B.S. Sieves
10mm	100
5mm	85-100
0.425mm	30-50
0.150mm	10-30
0.075mm	0-20

Sandy soil which may, with the approval of the Engineer, be added to the screenings or used in lieu of the screenings, shall comply with the following requirements: -

i) It shall consist mainly of sand sizes and have a reasonable smooth grading.
ii) The fraction passing 0.075mm sieve shall be less than the weight passing 5mm sieve.
iii) P.I. shall not be greater than 5.

e) Construction

On the prepared area, individual stones shall be positioned by hand with the greatest dimension vertical, and the largest and flattest end downwards. The greater number of stones shall be slightly higher than the thickness of the layer when laid. After placement of the stones in the specified manner, the material shall be initially compacted, preferably with a grid roller and a vibratory roller, which shall continue until the layer is thoroughly keyed, and until the compacted layer contains not more than 10% air voids. The irregularities that may show up during compaction shall be corrected by loosening the surface and removing or adding material as may be required and recompacting. Where necessary quarry fines of the same material shall be spread and broomed into the interstices and rolling shall continue until no more fines will go in to give a homogenous compacted layer of sub base.

f) Measurement and Payment

The stone will be paid for as the volume in cubic metres of material measured in place upon the road. The volume of material shall be calculated as the product of the compacted thickness specified or ordered by the Engineer and the net area required to be laid. The rate shall be the full inclusive price for providing, laying, packing and compacting the material and shall include for complying with Clauses 1311a), b). The rate shall also include for all haulage.

1204 MATERIAL REQUIREMENTS

The Contractor shall allow for winning, hauling to site, laying, watering and compacting to 100% MDD (AASHTO T.180). The material shall also comply with the following requirements:-

P.I. - Max 15

CBR @ 100% MDD (modified AASHTO T180) at 4 days soak: Min 30

P.M. - Max 250

1300 GRADED CRUSHED STONE SUBBBASE

1303 Material requirements

The material for graded crushed stone Sub-base shall comply with requirements for Sub-base stone Class B 0/40. After compaction and compliance with the requirements of Clause 1403 of this specification below, the Sub-base/Base graded crushed stone material shall have a maximum of 8% of particles smaller than 0.075 mm and the resultant layer shall comply with all requirements of Section 13 of the Standard Specification.

The crushing ratio for all graded crushed stone pavement materials shall be minimum 100%.

1306 Laying and Compacting Graded Crushed Stone Sub-base

Graded crushed stone shall be laid by a paving machine.

Add the following to this section:

1311 In Situ Reprocessing of Graded Crushed Stone

In pavement reconstruction sections with an existing graded crushed stone base, the existing graded crushed stone shall be used in pavement and shoulder construction. The bituminous layer shall be removed to spoil or for recycling as instructed by the Engineer, leaving in place the existing graded crushed stone base in situ. After removal of surfacing, the graded crushed stone shall be jointly inspected by the Engineer and Contractor and any contaminated material re-used in earthworks, deviations or disposed off in manner approved by the Engineer. Where the contaminated layer extends into a lower pavement layer, the Existing sub-base or sub-grade layer shall be reworked and re-compacted before reprocessing the graded crushed stone layer. Before addition of any stone material the existing surface shall be lightly compacted to remove undulations and levels taken. The Contractor shall confirm the grading of the stone material and shall add imported material, mixed in such a manner that the reprocessed material shall comply with the requirements of Clause 1303 of the Standard Specification. The material shall be scarified, mixed, watered, spread and compacted as sub-base or base in the carriageway and/or shoulders as shown on the drawings or directed by the Engineer.

1400 CEMENT TREATED MATERIALS

1403 Cement Treatment

Cement for improvement shall be Ordinary Portland Cement complying with Clause 207 of the Standard Specification. The cement content of the improved graded crushed stone material will be in the range of 1% to 2% by weight. The actual cement content requirement will be determined on site as directed by the Engineer after laboratory and site trials.

14A LEAN CONCRETE

14A/04 Mix Requirements

(i) Proportions

The ratio of cement to aggregate shall be 3% by weight (including any absorbed moisture but excluding free water in the aggregate).

14A/05 Method of Construction

(i) Curing

Add the following to this Clause:

The lean concrete shall be protected from injuries action by sun, rain, flowing water, frost, or mechanical injury. At completion of finishing and at the time the concrete surface has hardened enough to prevent the surface being marred by the curing material it shall be cured by one or more of the following methods:

Moist Curing: Wet the concrete surface with a fine spray of water and cover with water proof paper, polythene-coated burlap, or polythene sheeting. Thoroughly saturate polythene-coated burlap with water before placing. Select size of sheets that are at least 300 mm longer than necessary to cover the entire width and edges of base. Place sheets with light coloured side up. Overlap adjacent sheets not less than 300 mm with the lapped edges securely weighed down or the sheets lapped 150 mm and cemented or tampered to form a continuous cover and closed joint. Place the weight on the cover down to prevent displacement or billowing from winds. Fold coverings down over the exposed edges and secure with a continuous bank of earth or other approved means. Use covers in good condition when placed and immediately repair tears and holes they occur during the 7-day curing period.

Liquid Membrane-forming Compound Curing: Apply compound immediately after surface loses its water sheen and has a dull appearance. The curing membrane method should conform to AASHTO M 148. Mechanically agitate curing compound during use. Apply at maximum rate of 5.0 square meters per litre of compound. If compound lacks uniform continuous coherent films or exhibits checks, cracks, peels, or pinholes, apply an additional coat of compound to areas where films is defective. Have readily available impervious sheet curing for use to protect freshly placed concrete in the event that conditions occur to prevent correct application of compound at the proper time. Re-spray surfaces with curing compound after rainfall. Apply at the same rate required above.

The concrete surfaces shall be protected from foot and vehicular traffic and other sources of abrasion for a minimum of 72 hours. The curing method adopted shall be maintained for the entire curing period.

14A/08 Measurements and payment

(a) Item: Curing lean concrete

Unit: m^2

The unit of measurement shall be the area of surface cured satisfactorily. The rate shall allow for complying with Section 14A of the Standard Specification.

1500 BITUMINOUS SURFACE TREATMENTS AND SURFACE DRESSING

1502B Materials for Prime Coat and Tack Coat

(i) The binder for prime coat shall be MC 70 cutback bitumen. This shall be applied over granular surface to receive any bituminous layer.

(ii) The binder for tack coat shall be K1-60 bitumen emulsion. This shall be applied over bituminous surface to receive further bituminous layer. A tack coat shall also be applied on prime coat, which has lost its adhesive properties due to contamination, long exposure or weathering before receiving bituminous layer. Such an application shall be made without additional expenditure by the Employer, unless it is required due to reasons outside the Contractor's control.

1504B Spraying of Prime Coat and Tack Coat

(i) The rate of application of prime coat shall be from 1.0 to 1.2 litres/m². 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.

(ii) The rate of application of the tack coat on bituminous surface shall be 0.3 to 0.8 litres/m². 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.

1502C Materials for Surface Dressing

(a) Binder

The binder shall be 80/100 penetration bitumen.

(b) Chippings

(i) Hardness, soundness, shape and cleanliness

Stone for surface dressing on the carriageway and shoulders shall be class 1. Should it be necessary and in the Engineers opinion to clean chippings before laying, the Contractor will wash the chippings to the satisfaction of the Engineer and no extra payment will be made for this operation.

1503C Rate of Application of Binder and Chippings

Rates of spray of bituminous binder and spread rates for chippings shall be as stated in the relevant items in the Bill of Quantities or as instructed by the Engineer. The exact rate to be applied may be varied to suit field conditions and will be proposed by the Contractor for the agreement of the Engineer.

Should any change occur in the nature of source of chippings or binder, the Contractor shall advice 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.

Payments 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 pre-coated. The bituminous binder used for pre-coating shall be A3 anionic bitumen emulsion.

The chippings shall be completely coated with the binder at a nominal rate of 0.4% - 0.8% by dry weight of chippings. The actual rate of application should be as instructed by the Engineer following the Contractor's field trials.

The mixing plant shall comply with the requirements of Clause 1603A, Parts (a) and (b), of the Standard Specification.

The binder shall be heated so that it can be distributed uniformly and care shall be taken not to over heat it. The temperature shall at no time exceed 35ºC.

The chippings shall be washed (if necessary) dried and heated so that they are mixed at a temperature of between 20ºC and 35ºC 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 chipping 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.

1508C Application of Surface Dressing

At the joint between the shoulder and carriageway, each layer of surface dressing on the carriageway shall be extended 100 mm into the shoulder. In like manner each layer of surface dressing on the shoulder shall also be extended 100 mm into the carriageway. The Contractor shall allow in his rates for this overlap. No additional payment will be made for either the binder or the chippings when complying with this requirement.

1509C Aftercare and Control of Traffic

Surface dressing shall not be trafficked for at least seven (7) days. Where the surface dressing is to be applied to new asphalt concrete, a minimum period of 72 days must elapse before commencing the surface dressing.

1511C Measurement and Payment

(c) Item: Pre-coated chippings

Unit: m^3 of each nominal size of each class

Pre-coated 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 m^2 per M^3 or the actual rate of application in m^2 per m^3 whichever calculation gives the lower volume.

The rate for chipping shall include for the cost of providing and hauling the chippings and bitumen pre-coating the chippings with bitumen at the instructed rates, spreading and rolling the chippings at the instructed application rate, all hauls as necessary and complying with parts A and C of Section 15.

1600 BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES

1600A GENERAL

1603A Construction Plant

(a) Compaction Plant

To achieve specified densities it is expected that vibrating rollers will be required to achieve satisfactory results. It is essential that thorough pre-construction trials be carried out to ensure that the vibrating rollers are set up at the optimum amplitude and frequency for the material being laid that they do not break down aggregate particles and that the optimum compaction temperatures are established to allow compaction without creating ripple effects or other distortions of the surfacing.

1606A Site trials

Delete the second paragraph and insert the following:

The trials shall be carried out to:

(a) Test materials designed in the laboratory so that a workable mix, which satisfies the specified requirements can be selected.

(b) 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.

Renumber paragraph 5 from "(v)-(vi)" to read "(v)-(viii)".

1607A Mixing of Aggregates and Bitumen

Delete the second and third paragraphs and then add the following:

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 homogenous mixture but for no longer.

The Aggregates and bitumen shall each be heated to enter the mixing chamber at temperatures selected within the range 150 ºC to 170 °C. The temperature of the stone at entry to the mixing chamber shall not be more than 15 ºC 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 of 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 not less than 135°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 aggregates 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 form 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

Delete the entire clause and replace it with the following

The mix shall be transported from the mixing plant to the spreader in truck 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 solvent 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 specified limits. Any loads wetted excessively by rain will be rejected. Hauling over freshly laid material will not be permitted.

1609A Laying the Mixture

Add the following paragraphs:

Mixtures that have a temperature of less than 135°C when dumped into the paver will be rejected. The paver shall be adjusted and the speed regulated so that the surface of the course will be smooth and the course of such depth shall be such that, when compacted, it will conform to the cross-section shown on the drawings. Lanes shall be parallel to the road centreline.

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 a manner as to ensure a continuous bond between the old and new pavement. All contact surfaces at cold joints, and joints with structures including manholes and pits shall be coated with a thin and uniform coat of MC 70 or other medium curing bitumen.

1610A Compaction

Add the following paragraphs:

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 materials as necessary before continuing the rolling. The speed of the rollers shall not exceed 5 km/h and shall at all times be slow enough to avoid displacement of the hot mixture. Any displacement of the mixture, occurring as results of reversing the direction of the rollers, 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 24 hours.

1611A Finishing Joints and Edges

Add the following to this clause:

Construction joints in the various pavement layers shall be staggered by at least the following distances

(a) Joints in Binder Course relative to joints in Wearing Course: 500 mm
(b) Joints in Dense Bitumen Macadam base relative to joints in Wearing Course: 400 mm

The contractor shall produce a plan showing all pavement construction joints for approval by the Engineer before pavement construction commences.

Transverse joints in Dense Bitumen Macadam Base Binder and Wearing Course shall be staggered by at least 500 mm. 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 500 mm at the end of the lane shall be left uncompacted.

Cold transverse joints shall be cut back to expose an even, vertical service 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 Wearing Course.

1614A Tolerances

Add the following at the end of the second paragraph:

Passing sieves between 1.0 mm and 0.075 mm sizes, +3% by total weight of dry aggregate including mineral filler

Passing 0.075 mm sieve, +2% by total weight of dry aggregate including mineral filler

1600B ASPHALT CONCRETE FOR SURFACING

1602B Materials for Asphalt Concrete

(a) Penetration grade bitumen

Delete sub-section (a) and replace with the following:

Bitumen shall be penetration grade, and shall meet the requirements of Table 4.3 in ORN 19 as summarized below:

Table 4.3 (ORN 19) Minimum requirements for penetration grade bitumen

Test, based on Original Bitumen	Test Method (ASTM)	Penetration Grade		
Penetration at 25°C	D5	40/50	60/70	80/100
Softening point (°C)	D36	49-59	46-56	42-51
Flash point (°C) (Min)	D92	232	232	219
Solubility in trichloroethylene (%) (min)	2042	99	99	99
TFOT heating for 5h at 163°C:				
(a) Loss by mass (%, (Max)	D1754	0.5	0.5	0.8
(b Penetration (% of original),(Min)	D5	58	54	50
(c) Ductility at 25°C, (Min)	D113	-	50	75

The bitumen for asphalt concrete works shall 80/100 grade.

(c) Mineral Filler

(i) Under this sub-clause in the Standard Specification, rename Table 16B-1 as 16B-1 (a)

(ii) Add the following

The coarse aggregate shall entirely be crushed rock from a source known to give high values of stability (>9 kN) in the Marshall Test. Crushed river gravel shall not be used. Aggregate shall be Class "a" meeting the requirements given in Table 16B-1(b) below.

Table 16B-1(b) Requirements for coarse aggregate (retained on 6.3-mm sieve)

Property	Test	Property
Cleanliness	Sand equivalent for <4.75 mm fraction (Material passing 0.425 sieve) Plasticity index[2] Linear shrinkage	>40 <4 <2
Particle shape	Flakiness index (FI)[3]	<25
Strength	Aggregate Crushing value (ACV)[4] Aggregate impact value (AIV)[4] 10% FACT (dry) KN[4] Los Angeles Abrasion (LAA)[5]	<25 <25 >160 <30
Abrasion	Aggregate Abrasion Value[4]	<12

Property	Test	Property
Soundness[7]	Sodium Sulphate Soundness (SSS): Coarse aggregate Fine aggregate Magnesium Sulphate Soundness (MSS): Coarse aggregate Fine aggregate	 <10 <16 <15 <20
Polishing	Polished Stone Value	>60
Water absorption	Water Absorption[6]	<2
Bitumen affinity	Immersion Mechanical test: index of retained Marshall stability [8] Static immersion test[9] Retained indirect Tensile strength[10]	>75 >95% coating retained >79% (at 75% VIM)

Key

1. AASHTO 1176
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 &283

The aggregates for bituminous mixes shall be stored in single sizes in separate bins or in areas covered with tightly laid wood planks, sheet metal, hard compact gravel, concrete or other hard and clean surfaces. The surfaces shall be self-draining, and in such a manner that will preclude the inclusion of foreign material. Aggregates of different grades and sizes and from different sources shall be stored in separate piles and if these piles are close together they shall be separated by bulkheads.

1603B Grading Requirements

The grading mixture of a coarse and fine aggregate shall be within and approximately parallel to the grading envelopes as given in table 16B-1(a) for 0/20 binder coarse. In addition, the material shall comply with the requirements below.

The Contractor shall investigate a number of gradings so that a worktable mix, which also retains a minimum of 3% voids in mix (VIM) at refusal density, is identified. As guidance towards identifying a suitable grading, recommendations are provided in Tables 16B-1(c) and (d)

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.

1604B Requirements for Asphalt Concrete

The nominal binder content shall be 5.0% - 5.5% in addition to the requirements given in Table 16B-2 0f the Standard Specification. The maximum Marshall stability of the mix for 2x75 blows shall be 9 kN and, at compaction to refusal, it shall have 3% voids in mix (VIM).

In order to determine the suitability of a coarse aggregate source, a Marshall Test programme shall be carried out. It will be advantageous to use a crushed rock which is known from past experience to give good results in the test procedure. A grading conforming to the type I binder course detailed in Table 16B-1(a), 0/20, of the Standard Specification should be tested (but with 100% passing the 25 mm sieve) and it shall meet the requirements of Table 16B-2 of this specification.

Having established the suitability of the aggregate source several gradings 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 gyratory compactor and 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 results shall be used"

From the bitumen content –VIM relationship, bitumen content which corresponds to VIM of 3% shall be identified. Compaction trial shall be undertaken to confirm the workability of the mix. At least two or more grading will be required for compaction trials. The compaction trials will identify a workable mix which can be to a bitumen content which gives 3% voids mix (VIM) at refusal density.

1605B Mixing and laying asphalt concrete

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 minimum thickness of individual layers shall be as follows:

(a)	For 37.5 mm mix	65 mm
(b)	For 25.0 mm mix	60 mm
(c)	For 19.0 mm mix	50 mm
(d)	For the 12.5 mm mix	40 mm

1606B Compaction

Rolling shall be continued until the voids measured in the completed layer are in accordance with the requirement for a minimum compacted density of 98% of Marshall Test Maximum Density or a minimum mean value of 95% of refusal density (with no value less than 93%) as appropriate.

1608B Sealing bituminous surface

After the Wearing Course has been trafficked and bitumen has hardened, the Wearing Course shall be sealed with 10/14 mm pre-coated chippings in accordance with Clause 1505C. The period of hardening will depend on the traffic level and should be such that the chippings will not become embedded in the wearing surface. The Contractor will propose and the Engineer will approve a section to be ready for sealing.

1700 CONCRETE WORKS

1703 Materials for Concrete

This work shall consist of placing selected approved material of 250 mm minimum diameter on the foundation put after excavation to receive levelling concrete in accordance with these specifications and in conformity with the lines, grades and cross sections shown on the Drawings as directed by the Engineer.

(a) **Materials**

Selected rock: The selected rock boulders to be placed for this work shall be hard, sound and durable quarry stones as approved by the Engineer. Samples of the stone to be used shall be submitted to and approved by the Engineer before any stone is placed.

The maximum size of the stone boulders shall be 300 mm.

(b) **Construction Method**

After completion of the structural excavation the surface of the loose soil shall be levelled and compacted. Then the stone of the above sizes shall be placed in one layer of 250 mm over the compacted bed where the bottom slab will rest. Coarse sand shall spread to fill up the voids in the stone boulders, and compaction with vibratory compactors should be performed to make this layer dense whereon a concrete of levelling course shall be placed.

(c) **Measurement and Payment**

Measurement for the bedding materials shall be made in cubic metres for the completed and accepted work, measured from the dimension shown on the Drawings, unless otherwise directed by the Engineer.

Payment for the bedding Materials for Levelling Concrete Works shall be full compensation for furnishing and placing all materials, all labour equipment, tools and all other items necessary for proper completion of the work in accordance with the Drawings and specifications and as directed by the Engineer.

Add the following for fine aggregate

It shall also meet the following requirements.

Test	**Test Method**	**Requirement**
Fineness Modulus	AASHTO M6	2.0-3.5
Sodium Sulphate Soundness loss on 5 cycles	AASHTO T104	10% Max.
Friable particles content	AASHTO T112	1% Max.
Test for organic impurities	AASHTO T21	Lighter than standard
Sand equivalent	AASHTO T17	75% Min.
Fraction passing 75 micron sieve	AASHTO T27	5% by weight max. (10% max. for crusher dust)

Add the following for course aggregate

The coarse aggregate shall conform to the following quality requirements:

Test	**Test Method**	**Requirement**
Sodium Sulphate Soundness loss on 5 cycles	AASHTO 104	12% max.
Los Angeles Abrasion	AASHTO T96	40% Max.
Content of Friable Particles	AASHTO T112	1% by weight Max.
Soft Fragments and Shale	AASHTO M80	Max. 5% by weight
Flaky Pieces	BS 812	20% Max.
Elongated pieces	BS 812	20% Max.
Combined quantity of chlorides calculated as sodium chloride and sulphates as sodium sulphate	ASTM D1411	1000 ppm, Max.

Add the following to Clause 1703(g):

The water for mixing and curing concrete shall not contain solids and impurities more than the following permissible limits:

Impurities	**Permissible Limits**
Organic, mg/l	200
Inorganic, mg/l	3000
Sulphates (as SO_4), mg/l	500
Chlorides (as Cl), for plain cement concrete work and 1000 mg/l for reinforced concrete work mg/l	2000

The pH value of work shall generally be between 6 and 8.

Add the following to Clause 1703:

(iii) Limits for Total Chemical Impurities in concrete

For reinforced concrete work the total chemical impurities collected from aggregates, cement, admixtures and water shall not exceed the following limits:

Impurities	**Permissible limits of undesirable chemicals in concrete in percentage by weight of cement**
Chlorides (as Cl ion), (%)	0.06
Sulphates (as SO_3), (%)	4.0

1703a Levelling of Concrete for Bottom Slab Including Formwork Cost

This work shall consist of placing and levelling lean or blinding 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 in 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, 28 days : 15 N/mm^2

Maximum size of coarse aggregate : 20 mm

Maximum cement content : 300 kg/m^3
Maximum water/cement ratio of 50% with slump of 80 mm

(b) Construction Method

The bed of stone boulders upon which the levelling concrete will be placed shall be 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 and which has been executed in accordance with the drawings and the Specifications.

Payment for this work shall include furnishing and placing all materials, labour, equipment and tools, and other incidentals to specifications and as directed by the Engineer.

1703b Reinforcement Bars for Walls and Slabs

This work shall consist of furnishing, fabricating and placing in the concrete of the bottom slab, top slab, 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.

(a) Material

Reinforcement bars shall be deformed and shall meet the requirements of British Standard BS 4461, unless otherwise called for on the drawings or approved by the Engineer.

No reinforcement bar shall be delivered without a certificate guaranteeing the yield stress. The reinforcement bars shall be kept off the ground, free from dirt, oil, grease, or avoidable rust and stored within a building or provided with suitable covers.

If it is necessary for the Engineer to ascertain the quality of the reinforcement bars, the Contractor shall test the reinforcement bars, at his own expense, by the means as directed by the Engineer.

(b) Construction Method

(i) Bar Bending Schedule

The Engineer shall provide the Contractor with bending schedules showing the location types, sizes, bending dimensions and cut lengths of the reinforcement bars required to be fixed in the works.

(ii) Cutting and bending

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 bars. 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 drawing.

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 be injurious to the materials.

(c) Placing

Reinforcing bars shall be accurately placed in proper position so that they be firmly held during placing of concrete.

Bars shall be tied at all intersections by using annealed iron wire 0.9 m or larger diameter or suitable clips.

Distances from the formwork shall be maintained, corrected by means of metal hangers, metal blocks, metal supports or other supports approved by the Engineer.

The Engineer shall inspect the formwork and reinforcement bars after placing. When a long time has elapsed after placing reinforcement bars, they shall be cleaned and inspected again by the Engineer before casting concrete.

(d) Splicing and Joint

When it is necessary to splice reinforcement 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 0.9 mm.

When a long time has elapsed after placing reinforcement bars, they shall be cleaned and inspected again by the Engineer before placing concrete.

(e) Joint

Exposed reinforcement bars intended for bonding with future extensions shall be effectively protected from injury and corrosion.

Oxyacetylene welding joint of reinforcing steel shall be carried out only if authorized by the Engineer in writing.

(f) Measurement and Payment

Bending and installation of reinforcement bars of piers and abutments shall be measured in terms of tonnes. The length of steel bar of each size will be shown on the drawings in which the bar length for splicing is excluded. 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 table below.

Bar Type and the Nominal Diameter in Millimetres	Weight of Bar in Kilograms per 12 m length of bar
Y10	7.40
Y12	10.66
Y16	18.95
Y20	29.60
Y25	46.30
Y32	75.80

1703c Formwork for Vertical 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 formwork shall be removed on completion of the walls and slabs.

(a) Materials

Formwork 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 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

Formwork 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 formwork has been set in correct location it shall be inspected and approved by the Engineer before the concrete is cast.

If requested, the Contractor shall submit to the Engineer working drawings of the formwork and also calculations to certify the rigidity of the formwork.

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. PVC pipes of 50 mm 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 cast, the formwork shall be thoroughly cleaned and freed from sawdust, shavings, dust, mud or other debris by

hosing with water. Temporary openings shall be provided in the formwork to drain away the water and rubbish.

(ii) Scaffolding

All scaffolding required to support the formwork 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 details.

(iii) Removal of formwork

The time at which the formwork is removed shall be the Contractor's responsibility and the formwork shall not be removed until the concrete strength has reached the strength to the approval of the Engineer

(c) Measurement and Payment

No measurement shall be allowed for formwork of temporary construction joints.

Payment for the formwork shall be incidental to the pay items of particular grade of concrete for furnishing, erecting, jointing all the formwork for the concrete including furnishings and applying release agent, and construction of the required scaffolding to support the formwork 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.

1703d Concrete Works to Vertical 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 shall be used for Culvert walls and slabs.

(a) **Concrete Materials**

(i) Cement:

Cement shall be of Portland type (Strength 42.5) and shall conform to the requirements of BS 12 or equivalent.

The Contractor shall select only one type or brand of cement. Changing of the 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 his responsibility to furnish concrete of the specified compressive strength requirements.

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 prepared by the manufacturer.

Whenever it is found out that cement has been stored too long, moist or caked, the cement shall be rejected and removed from the project.

(b) **Aggregates**

Fine and coarse aggregates must be clean, hard, strong and durable, 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 requirements in the tables below.

(i) **Grading of Fine Aggregate**

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 Coarse Aggregate	**Amounts finer than each standard sieve percentage by weight**							
	40	30	25	20	15	10	5	2.5
	100	-	-	90 - 100	-	30 - 69	0 - 10	-

Other requirements for aggregates are as detailed below.

(iii) **Fine Aggregates**

Fitness Modulus, AASHTO	M – 6
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, AASHTO T96	Max 405 loss
Soft Fragment and shale, AASHTO M80:	Max. 5% by weight
This 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.

Chemical admixtures where permitted shall conform to the requirements of AASHTO M194. Unless otherwise specified, only Type A (Water reducing), Type B (Retarding), Type D (Water reducing and retarding), Type F (Water reducing, high range) or Type G (Water reducing, high range and retarding) shall be used.

Admixtures containing Chloride ion (Cl) in excess of one percent by weight of the admixture shall not be used in reinforced concrete.

A Certificate of Compliance signed by the manufacturer of the admixture shall be furnished to the Engineer for each shipment of the material used in the works.

(c) Concrete class 25/20

Concrete Class 25/20 shall be used for culvert walls and slabs. The requirements of concrete Class 25/20 are provided as follows unless otherwise the Engineer will designate any alteration.

Design compressive strength, 28 days: $25N/mm^2$
Maximum size of coarse aggregates: 20 mm
Maximum water/cement ratio of 45% with slump of 80 mm

(d) Proportioning Concrete

The Contractor shall consult with the Engineer as to mix proportions at least thirty (30) 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.

(e) Concrete Work

(i) Batching

Batching shall be conducted by weight with accuracy of:

Cement	:	0.5 %
Aggregate	:	0.5 %
Water and Admixture	:	1 %

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.

(ii) Mixing and delivery

Slump of mixed concrete shall be checked and approved at an accuracy of +25 mm against designated slump in these specifications.

(iii) Concrete in hot weather

No concrete shall be placed when the ambient air temperature is expected to exceed thirty three degrees Celsius (33°C) during casting operations.

(iv) 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.

(v) Placing

In preparation of the placing of concrete, the interior space of formwork shall be cleaned and approved by the Engineer prior to casting concrete. All temporary members except tie bars to support formwork shall be removed entirely from the formwork 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 cast in the formwork.

(f) Measurement and Payment

Measurement 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 furnishings all materials of the concrete mixing, delivering, placing 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.

1704 Concrete Works of the Beams and Deck Slabs

1704.1 Description

This work shall consist of furnishing, mixing, delivering and placing of the concrete for the construction of the in situ beams and deck slab, including form F3 type finish, 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 slabs.

1704.2 Concrete materials

(a) Cement

Cement shall be of Ordinary Portland (Strength 42.5) type and shall conform to the requirements of BS or equivalent.

The Contractor shall select only one type or brand of cement or others. Changing of the type 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 the cement by the Engineer shall not relieve the Contractor of the responsibility of furnishing concrete of the specified compressive strength requirements.

Conveyance of cement by chute bags shall not be permitted. Storage in the Contractor's silo or store house shall not exceed more than two (2) months, and the age of cement after submitting to the Engineer the result of quality certificate prepared by the manufacturer for his approval.

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

Fine and coarse aggregates must be clean, hard, strong and durable, 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.

Grading of aggregates shall conform to BS 812.

Other requirements for aggregates are as given below.

(i) Fine Aggregates

Fitness Modules	AASHTO M-6	2.3 to 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

(ii) Coarse Aggregate

Abrasion	AASHTO T96	Max. 405 loss
Soft Fragment and Shale	AASHTO M80	Max. 5% by weight
Thin and elongated pieces	AASHTO M80	Max. 15%

(c) 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, and vegetable matter and salt as determined by the Engineer.

(d) 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.

1704.2.1 Concrete class 30/20

Concrete Class 30/20 shall be used for in situ beams and deck slabs. The requirements of concrete Class 30/20 are as detailed below unless otherwise the Engineer will designate any alteration.
Design compressive strength, 28 days:30N/mm^2
Maximum size of coarse aggregates: 20 mm
Minimum cement content: 300 kg/m^3, and

Maximum water/cement ratio of 45% with slump of 80 mm

1704.2.2 Proportioning Concrete

The Contractor shall consult with the Engineer as to the mix proportions at least thirty (30) 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 requirements 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.

1704.2.3 Concreting Work

(a) Batching

Batching shall be conducted by weight with accuracy of

Cement: ½ %
Aggregate: ½ %
Water and Admixture: 1%

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 carriers, or 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 thirty three degrees Celsius (33^0C) during casting 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 subjected to approval by the Engineer.

(e) Placing

In preparation of the casting of concrete, the interior space of formwork shall be cleaned and approved by the Engineer prior to casting concrete. All temporary members except tie bars to support formwork shall be removed entirely from the formwork and not buried in 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 concrete batch immediately after it is cast in the formwork.

1704.3 Concrete class 35/20

Concrete Class 35/20 shall be used for in situ beams and deck slabs. The requirements of concrete Class 35/20 are as detailed below unless otherwise the Engineer will designate any alteration.

Design compressive strength, 28 days: $35N/mm^2$
Maximum size of coarse aggregates: 20 mm
Minimum cement content: 300 kg/m^3, and
Maximum water/cement ratio of 45% with slump of 80 mm

1704.4 Measurement and Payment

Measurement for the Concrete Works for beams and deck 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 of beams and deck slabs shall be full compensation for furnishing all materials of the concrete mixing, delivering, placing and curing the concrete, equipment and tools, labour and other incidentals including form F3 type, necessary for the completion of the work in accordance with the Drawings and these specifications and as directed by the Engineer.

1705 Mixing Concrete

Add the following to Clause 1705 of the Standard Specification.

Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or other approved containers. The time elapsing from the time water is added to the mix until the concrete is deposited in place at the site of the work shall not exceed 30 minutes when the concrete is hauled in non-agitating trucks, or more than 90 minutes when hauled in truck mixers or truck agitators.

Where concrete is supplied from a central plant, there shall be sufficient transporting equipment to ensure continuous delivery at the rate required. The rate of delivery shall be such as to provide for the proper handling, casting, and finishing of the concrete. The method of delivery and handling the concrete shall be in a way which will facilitate casting with a minimum of re-handling and without damage to the structure or the concrete. The methods of delivery and handling for each site shall be approved by the Engineer. The Engineer may suspend the mixing and casting of concrete at any site for which he considers the Contractor's delivery equipment inadequate until such a time as the Contractor provides additional approved delivery equipment.

Concrete shall be allowed to be placed only when the Engineer or his representative is present at the site and has previously checked and approved in writing the positioning, fixing and condition of the reinforcement, and the alignment and suitability of the formwork.
Concrete shall be placed so as to avoid segregation of the materials and displacement of the reinforcement. When casting involves dropping the concrete by more than 1.5 metres, it shall be conveyed through sheet metal troughs, chutes or other approved pipes. The chutes, troughs and pipes shall be kept clean and free from coating of hardened concrete by thoroughly washing with water after each operation.

Rename Clause 1740 as 1740.1 and add the following to this clause:

1740.2 Interlocking Concrete Paving Block

(a) Quality

The block for the paving works shall be as shown on the drawings and as directed by Engineer. The blocks shall be 60 mm thick of quality concrete class of such that yields the

strength of 50 N/mm2, having specified the size and type with grey or red or combination of them.

Grading of sand for bedding			**Grading of sand for the joint filling**	
Sieve Size (mm)	**Percentage Passing**		**Sieve Size (mm)**	**Percentage Passing**
9.52	100		2.36	100
4.75	95 – 100		1.18	90 – 100

Grading of sand for bedding			**Grading of sand for the joint filling**	
Sieve Size (mm)	**Percentage Passing**		**Sieve Size (mm)**	**Percentage Passing**
2.36	90 – 100		0.6	60 – 90
1.18	50 – 95		0.3	30 – 60
0.6	25 – 60		0.15	10 – 30
0.3	10 – 30		0.075	0 – 10
0.15	0 – 15			
0.075	0 – 10			

(b) Foundation of Paving Blocks

Over the prepared and consolidated sub-grade a layer of Sub-base using crushed aggregate shall be laid to falls and slopes to a compacted thickness of 100 mm and compacted with C-10 tonne roller. Over the prepared sub-base, a layer of 3 mm and down fine sand shall be laid and compacted to 25 mm in thickness and to required falls and slope to the satisfaction of the Engineer.

(c) Paving Blocks Laying

The blocks shall be laid on top of the prepared base in required pattern as directed by the Engineer. On completion of the laying work, approved fine screened sand shall be spread over the paving and the joints filled with fine sand compacted as directed by the Engineer. Extra sand on the surface shall be removed by brushing. When required, the edge blocks shall be cut clean and sharp with approved tools and as per the manufacturer's instructions. The cut edges shall be rubbed smooth before laying. Compaction with a power vibrating plate (Wacker model VPH 70) shall be used suitably as recommended by the approved proprietary manufacturer. Any blocks damaged during laying shall be replaced. The entire work of the installation and materials shall meet the approval of the Engineer.

1741 Measurement and Payment

Delete Clause 1741(c).

Add the following to Clauses 1741 (d), (e) and (f):

Read Clause 1741(l) as follows:

The precast unit of measurement shall be m^3 of particular grade of concrete.

Add the following to this section:

1742 Plant and Equipment for Aggregates and Concrete

1742.1 Aggregate Processing Plant

Aggregate processing plant to be provided by the Contractor shall conform to the following:

(a) Type of Plant

Except where aggregates are supplied from commercial sources, a modern and dependable aggregate plant capable of producing satisfactory concrete aggregates in sufficient quantities and the rate necessary to meet the requirements of the construction schedule shall be provided at a location acceptable to the Engineer. Complete facilities shall be provided for proper crushing, washing, classifying, storing, reclaiming and delivering the aggregates to the mixing plant.

(b) Samples and Test

The aggregate plant shall be operated for a sufficient time in advance of the dates set for first placement of concrete to permit the development of procedures which result in high capacity production of aggregates proven by tests to meet all the requirements of this specification.

(c) Fines in Sand

The facilitation for fine aggregate production shall be so designed and operated as to retain the necessary quantity of finer fractions. An excess of fines will not be permitted. If natural sand is from marine source, the sand shall be cleaned of clayey material and washed with potable water before use. All crushing, washing, screening, classifying, blending, batching, or other properties of fine aggregate necessary to meet these specifications shall be performed so as to produce acceptable gradation complying with this specification.

(d) Drainage of Sand

Aggregates shall not be removed directly from the washing or classifying operations to the aggregate bins in the concrete mixing plant, but shall be stored as required, to permit drainage of excess water and in such a manner as to avoid contamination by foreign materials. Sand shall remain free-draining storage for at least 48 hours prior to use.

(e) Segregation

The stockpiles for aggregates shall be formed so as to prevent segregation, and as approved by the Engineer. The deposition and removal thereof shall be conducted in a manner to maintain the uniformity of grading. The side slopes of stockpiled aggregates shall be kept flatter than the angle of repose to prevent accumulation of coarser material at the bottom of the slope.

(f) Volume of Storage

Sufficient live storage of all size fractions of processed aggregates shall be maintained at all times, to permit continuous placing of concrete at the rates so as to meet the scheduled requirements. If aggregates are stockpiled on the ground, the bottom portion of the stockpile within 300 mm of ground shall not be used. The Contractor may also plan to store sufficient quantity of coarse and fine aggregate so that concreting during the rains can proceed without hindrance as the collection of the same during the rains may be difficult.

(g) Approval of Aggregate Plant Layout

Plans and written specifications for the aggregate processing plant including description and capacity data on the processing equipment, and flow charts of the whole processing

operation which shall show rates of flow of material at the various crushing and separation points in the processing, as well as the volumes of the stockpiles and the number and types of equipment to be used in transporting the aggregates from aggregate plant to the mixing plant, shall be submitted to the Engineer in advance of plant erection for his approval.

1742.2 Concrete Plant

A modern dependable batch type mixing plant capable of producing concrete of specified quality and at the rate of output required to meet the specified requirements, and a balanced complement of transporting, handling and placing equipment shall be provided at locations and in a manner approved by the Engineer. The concrete mixing plant shall be completely installed for a sufficient length of time prior to scheduled date for placement of first concrete, to enable the Engineer to make the necessary physical tests, prior to use of the plant for the production of concrete.

(a) Standby Arrangement

As a standby arrangement to the batching and mixing plant, the stationary mixer/mixers of capacity 700 litres of mixed concrete and other appropriate equipment shall be provided.

(b) Type of Plant

The type of plant to be furnished shall be fully automatic. The term "automatic" is used to define a plant in which:

(i) Batch weights are set manually on a mix selector
(ii) Mixes are charged automatically by mix selector
(iii) Materials are batched automatically

Ice flaking machine of sufficient capacity shall be installed as a part of batching plant.

(c) Batchers

Individual weigh batchers shall be provided for all works, requiring the use of more than two separate size groups of coarse aggregates. Cumulative weight batchers may be used for work requiring the use of not more than two separate size groups of coarse aggregates provided that the cement is weighed and batched separately from the aggregates. The batchers shall be arranged to permit the convenient addition or removal of material. Batching equipment shall be so constructed and arranged that the sequence and time of discharge can be controlled to produce a re-blending and mixing of the aggregates and, wherever possible, mixing of the cement with the aggregates as the materials pass through the charging hopper in to the mixer. This control shall be effected by the controls of the batcher discharge gates. Batcher controls shall be so interlocked that a new batching cycle cannot be started until all batchers are completely empty.

(i) Weighing Units

Every delivering point of aggregates and cement into the mixer, charging hopper shall have a weighing unit and each weighing unit shall include a visible, springless direct reading dial which shall indicate the scale load at all stages of the weighing operation from zero to full capacity.

The scale dials and the weighing equipment shall be in full view of the operator, so that he may conveniently observe the operation of the batcher gates and the discharge of the materials. Provision shall be made for adjustment and change in weights of materials being charged in the hopper.

(ii) Measuring Water

Water shall be measured by weight except in situations for which written approval is given by the Engineer to measure by volume. The mechanism for measuring and delivering water to the mixers shall not permit leakage when the valves are closed.

The filling and discharge shall be measured by weight. The filling shall be capable of ready adjustment to permit varying the quantity of the admixtures to be batched. The equipment shall be kept in a clean and fully operating condition.

(iii) Tolerance in Batching

Weighing devices shall be capable of measuring the various ingredients of the following accuracy.

Materials	Percent (by weight)
Cement	1
Water	1
Aggregate smaller than 40mm size	2
Admixture	1 (or volume)

(iv) Records & Charts

An accurate record shall be maintained at the batching plant by the Contractor for the following:

(a) The weight of the cement, water and admixture
(b) The weight of the aggregate for each size shall be recorded separately.
(c) Temperature of the concrete immediately after mixing
(d) Mixing time of each batch when all the materials are loaded into the mixer
(e) Time when the concrete is delivered from the mixer
(f) Ambient temperature

(v) Recorders

A recorder shall be provided for each set of units measuring each of the materials delivered to the mixer. The recorder shall produce a continuous visible record, on a single ruled chart, of the weight of the cement, water and each size of aggregates, of the mixing time of each batch after all materials are in the mixer, of the temperature of the concrete and of the time of day at intervals of not more than fifteen (15) minutes. The recorder shall be completely housed and shall be capable of being locked and shall be placed in a position convenient for observation by the plant operator and the Engineer. Each chart shall be so ruled and printed that it may be readily and permanently identified, so that the quantities and time may be read directly without scaling or calculation. A portion of the recorder chart equivalent to at least thirty (30) minutes of plant operation shall be visible after recording. This portion of the chart shall be supported over its entire width on a smooth, firm backing so that notes can be made without puncturing the paper. The recorders and scale dials shall be housed in a room, box or compartment visible at all times and sufficiently tight to exclude objectionable dust coming from the plant operation.

2000 ROAD FURNITURE

2001 Road Reserve Boundary Posts

The Contractor shall establish a reference point on top of each boundary post.

2004 Permanent Road Signs

Rename the existing text with the heading "2004.1 Posts and Road Signs"

2004.1 Posts and Road Signs

Posts for road signs shall be vandal-proofed by the drilling of 3 mm diameter holes at 100 m centres on alternative sides.

Add the following to this clause:

2004.2 Colour and configuration

The colour, size and location of all traffic signs for the project road shall be as specified on the drawings and in the absence of any details or any missing details, the signs shall be provided as directed by the Engineer.

The sign shall be reflectorised as shown on the drawings or as directed by the Engineer. The signs shall be of retro-reflective type and made of prismatic reflected sheeting fixed over aluminium sheeting as per these specifications.

The cautionary and mandatory signs shall be fabricated through the process of screen-printing. With regard to informatory signs with inscriptions, the message shall be of cut out letters made in the transparent overlay film pasted over the base sheeting with pressure sensitive adhesive or as the base sheeting with pressure sensitive adhesive or as instructed by the manufacturers or as directed by the Engineer.

2004.3 Material

The various materials and fabrication of the traffic signs shall conform to the following requirements:

(a) Concrete

Concrete shall be of the grade shown on the Contract drawings or otherwise as directed by the Engineer.

(b) Reinforcing Steel

Reinforcing steel shall conform to the requirement of the relevant codes as directed by Engineer unless otherwise shown on drawing.

(c) Bolts, nuts, washers

High strength bolts, precision bolts and nuts shall conform to the relevant specifications. The bolts and nuts shall be galvanised (zinc coated, 0.55 kg/m^2 minimum single spot) and galvanising shall conform to the relevant specifications.

(d) Plates and supports

Plates and support sections for the signposts shall conform to the relevant specifications. The plates and supports shall be galvanised (zinc coated, 0.55 Kg/m^2. minimum single spot.) and galvanising shall conform to the relevant specifications.

(e) Aluminium

Aluminium sheets used for sign boards shall be of smooth, hard and corrosion resistant aluminium alloy conforming to the relevant specification. The back of the sheet shall be painted with two coats of Epoxy paint.

The thickness of the sheet shall be 3 mm for all types of signs.

2004.4 Structural Details

The structural details for supports shall be as per the Contract drawings and/or as directed by the Engineer.

2004.5 Retro-reflective Sheeting

(a) General Requirements

The retro-reflective sheeting used on the sign shall consist of the white or coloured sheeting having a smooth outer surface, which has the property of retro-reflective over its entire surface. It shall be unused and shall show no evidence of cracking, scaling, pitting, blistering, edge lifting or curling and shall have negligible shrinkage or expansion. A certificate of having tested the sheeting for these properties in an unprotected outdoor exposure facing the sun for two years and its having passed these tests shell be obtained from a reputed laboratory of the manufacturer of the sheeting, for each lot separately.

The reflective sheeting shall be of prismatic lens type OF ASTM - Type-IX.

(b) Lens Type

The retro-reflective sheeting shall be of Prismatic lens type, consisting of cube corner lenses and pressure sensitive adhesive and should be applied to the sign substrate at room temperature of 18 ºC, transparent, waterproof plastic having smooth surface. The coefficient of retro-reflective as determined in accordance with ASTM Standard E- 810 shall give the minimum values as indicated in table given below.

Minimum Coefficient of Retro-reflection for Retro-reflective sheeting Prismatic Lens Type (candelas/lux/m^2)

Obtuse Angle (°)	Entrance Angle (°)	White	Yellow	Green	Red	Blue
0.1	-4	660	500	66	130	30
0.1	+30	370	280	37	74	17
0.2	-4	380	285	38	76	17
0.2	+30	215	162	22	43	10
0.5	-4	240	180	24	48	11
0.5	+30	135	100	14	27	6
1.0	-4	60	60	8	16	3.6
1.0	+30	45	34	4.5	9	2

When totally wet, the sheeting shall not show less than 90% of the values of retro-reflectance indicated in table above. At the end of 7 years, the sheeting shall retain at least 75% of its original retro-reflectance.

2004.6 Messages and Borders

The messages (legends, letters and numerals) and borders of Cautionary/Regulatory sign boards shall be screen printed. Screen printing shall be processed and finished with materials in a manner specified by the sheeting manufacturer and shall be bonded with the sheeting in the manner specified by the manufacturer.

The messages (legends, letters and numerals) and borders of information signs shall be of cut letters made in transparent overlay film pasted over the base sheeting with pressure sensitive adhesive or as instructed by the manufacturers or as directed by the Engineer.

For screen printed transparent coloured areas on white sheeting, the co-efficient of retro-reflection shall not be less than the values of corresponding colour in the table above.

Cut-out messages and borders, wherever used, shall be made in transparent film applied on base sheeting with pressure sensitive adhesive with the coefficient of retro-reflection which shall not be less than the values of corresponding colour in the table above. For the background colour of the sign the coefficient of retro-reflection shall not be less than that specified in the table above for the respective colours.

2004.7 Colour

The colour shall be as specified and shall conform to the requirements of the table below. Conformance to colour requirements shall be determined spectrophotometrically in accordance with ASTM E 1164, with instruments utilizing either 45/0, or 0/45 illumination/viewing conditions and tolerances as described in ASTM E 1164 for retro-reflective materials.

Conformance to Colour Requirements

								Reflectance Limit (y)		
Colour	x	y	x	y	x	y	x	y	Min	Max.
White	.30	.3	.35	.35	.33	.37	.28	.32	40.0	
Yellow	.48	.42	.54	.45	.46	.53	.42	.48	24.0	45.0
Red	.69	.31	.59	.31	.56	.34	.65	.34	3	15
Blue	.07	.17	.15	.22	.21	.16	.13	.03	1.0	10.0
Green	.03	.39	.16	.36	.28	.44	.20	.79	3.0	9.0

The four pairs of chromaticity coordinates determine the acceptable colour in terms of CIE 1931 standard colorimetric system measured with standard illumination source D65. These colours are equivalent to those listed in ASTM D4956 using source C.

The colour shall be durable and uniform in acceptable hue when viewed in daylight or under normal headlights at night.

2004.8 Adhesives

The sheeting/film shall have a pressure sensitive adhesive of the aggressive tack type requiring no heat, solvent or other preparation for adhesion to a smooth clean surface. The adhesive shall be protected by an easily removable liner (removable by peeling without soaking in water or other solvent) and shall be suitable for the type material of the base plate such that it shall not be possible to remove the sheeting from the sign base in one piece by use of sharp instrument. The adhesive shall form a durable bond to smooth, corrosion and weather resistant surface of the base plate. In case of pressure sensitive adhesive sheeting, the sheeting shall be applied in accordance with the manufacturer's specifications.

2004.9 Fabrication

The surface to be reflectorised shall be effectively prepared to receive the retro-reflective sheeting. The aluminium shall be de-greased either by acid or hot alkaline etching and all scale/dust removed to obtain a smooth plain surface before the application of retro-reflective sheeting. If the surface is rough, approved surface primer may be used. After cleaning, the metal shall not be handled, except by suitable device or clean canvas gloves, between all cleaning and preparation operation and application of reflective sheeting/primer. There shall be no opportunity for the metal to come in contact with any contaminants prior to the application of retro-reflective sheeting.

Complete sheets of the material shall be used on the signs except where it is unavoidable. At splices, sheeting with pressure sensitive adhesives shall be overlapped not less than 5 mm. Where screen printing with transparent colours is proposed, only butt jointing shall be used. The material shall cover the sign surface evenly and shall be free from twists, cracks and folds. The transparent overlay film in which cut-out messages have been made shall be bonded with sheeting in the matter specified by the manufacturer.

2004.10 Warranty and Durability

The Contractor shall obtain from the manufacturer a seven year warranty for satisfactory field performance including stipulated retro-reflectance of the retro-reflective sheeting of Prismatic lens type and that of transparent film and submit the same to the Engineer. In addition, a seven year warranty for field satisfactory performance of the finished signs with retro-reflective sheeting of Prismatic lens type, inclusive of the screen printed or cut out letters/legends, transparent film and their bonding to the retro-reflective sheeting shall be obtained from the contractor/Supplier and submitted to the Engineer. The Contractor/Supplier shall also furnish a certification that the signs and materials supplied against the assigned work meets all the stipulated requirements and carry the stipulated warranty.

Warranties shall be given in original and shall have legal jurisdiction in Kenya. Warranties given by power of attorney holders will not be acceptable.

Processed and applied in accordance with recommended procedures, the reflective material shall be weather resistant and, following cleaning, shall show no appreciable discoloration, cracking, blistering or dimensional change and shall not have less than 50 % of the specified minimum reflective intensity values, given in the table under Clause 2004.4 (b) above, when subjected to accelerated weathering for 1000 hours, using type E or EH weatherometer (AASHTO Designation M-268).

2004.11 Installation

Sign posts, their foundation and sign mountings shall be so constructed as to hold these in a proper and permanent position. Sign supports shall be of galvanised structural steel and shall be firmly fixed to the ground by means of properly designed foundation or as shown on the Contract Drawings. The work of the foundation shall conform to the relevant clauses of the Standard Specification.

All components of the signs and supports, excluding the back side of aluminium sheet and the reflective portion, shall be thoroughly scaled, cleaned and galvanised (zinc coated, 0.55 Kg/m^2. minimum single spot.) and shall conform to the relevant specifications.

The signs shall be fixed to the posts by welding and/or bolts and washers as shown on the drawing. After the nuts have been tightened, the tails of the bolts shall be furred over with a hammer to prevent removal.

2004.12 Foundation for Support

The foundation for the supports of the sign boards with single support shall be by making excavation in all type of strata to the sizes and level as shown on the relevant drawings and fixed with class 20/20 cement concrete during installation.

The foundation for the supports of the sign boards with two or more supports shall be made by boring holes in all types of strata to the sizes levels as shown on the relevant drawings and fixed with class 20/20 cement concrete during installation. All concrete works shall be carried out as per the relevant specifications.

2004.13 Measurement for Payment

The measurement of standard cautionary and mandatory sign boards shall be in numbers of sign boards supplied and fixed and this shall constitute full payment for the supply of all materials for the sign board and its supports and foundations, fabrication and installation in the ground or embankment as per the specifications. Informatory sign boards with board area exceeding 1.0 m^2. shall be measured by area of the reflectorised sheet in square meters.

2004.14 Rate

The Contract unit rate shall be payment in full for the cost of making the road sign including supports and foundations, including all materials, installing it at the site and incidentals to complete the work in accordance with the specifications. In case of overhead sign boards supported on overhead gantry the rate shall not include the support gantry, its foundation and erection which shall be paid separately.

2005 Road Marking

Road marking paints shall be hot applied thermoplastic materials as specified under Clause 219 of the Standard Specification.

2006 Guardrails

Add the following to this clause:

2006.1 Removing, Renovating and Re-erecting Guardrails

Where the existing guardrails have to be removed, or removed and re-erected, or removed, renovated and re-erected, the three processes of removal, renovation and re-erection shall be carried out as follows:

(a) Removing the Guardrails

All guardrails and end units shall be loosened. Posts shall be carefully dug out and the holes shall be filled and compacted in 150 mm layers. Items used for fixing, including bolts, nuts, washers, shall be placed in bags, after which all materials shall be transported to a store approved by the Engineer and all stored in-groups by type.

Where material is intended for re-use, it shall first be unpacked for inspection by the Engineer. The Engineer will decide which material that shall be disposed off if, on inspection it is found unsuitable for re-use.

(b) Renovating the Guardrails

Guardrails and end pieces suitable for re-use shall be taken to the workshop for cleaning and painting. Rust and the existing paint shall be completely removed and minor

indentations hammered out. The guardrails shall receive surface treatment in accordance with Clause 2006 of the Standard Specification.

Timber posts suitable for re-use shall be cleaned and treated with an approved timber preservative. Bolts nuts and washers to be re-used shall be cleaned and all dust removed, and shall then be oiled.

(c) Re-erection

The guardrails shall be erected in positions as shown and all the removed materials suitable for re-use and as much supplementary new materials as may be necessary shall be used. Re-erection shall be as specified for new guardrails.

2006.2 Pedestrian Railing

Pedestrian safety barriers shall comply with the requirement of BS 3049. The steel tubing and wire mesh shall be primed with zinc chromate or equal suitable for galvanizing, undercoat and finished with not less than two coats of permanent outdoor enamel of white paint.

2007 Kerbs

Name the existing text with the head as "2007.1 Installation".

Add the following to this clause:

2007.2 Existing Kerbs

Where shown on the drawing or directed by the Engineer, the Contractor shall remove the existing road kerbs and channel, including bed and haunches. Care shall be taken to minimize over break into the existing pavement. The Contractor shall reinstate any over break with a lean concrete or such other materials as may be approved by the Engineer.

2007.3 Repair of Damaged Railing and Kerbs

The repair of damaged railing shall be done by replacement of damaged pipes and posts.
The damaged kerbs shall be repaired by cement mortar.

(a) Materials as per Relevant Codes

Ordinary Portland cement
Coarse aggregate and fine aggregate
Tor steel
Water suitable for concreting
MS steel sections and pipes
Zinc rich epoxy primer like Nitrozinc primer or any approved equivalent and epoxy coal tar.

(b) Equipment

(i) Welding equipment
(ii) Painting/white washing brushes
(iii) Other miscellaneous equipment

(c) Procedure

The damaged portion of steel/RCC rating shall be removed up to the unaffected portion of the railing and the parent remaining parts which have to be connected with new components shall be thoroughly cleaned.

In case of RCC railing, the casting of new units shall be carried out by adopting standard practice of construction using all necessary care. The newly constructed RCC components shall be cured as per standard practice of curing by water. The dried up and cured concrete shall be white/colour-washed with proper care to match with the existing colours.

In case of MS pipe railing, the new components or repaired components shall be fixed with necessary care keeping in consideration the alignment and level. The railing components shall then be painted with zinc rich epoxy based primer and finishing with two coats tar epoxy or paint to match the existing colour including cleaning and surface preparations as directed by the Engineer.

The damaged kerbs shall be repaired with cement mortar and the cement mortar shall be cured as per the standard practice. The kerbs shall then be painted black and yellow in alternative bands with reflecting paint of specification and quality approved by the Engineer to give an even shade on work as per the Standard Specification.

2010 Trees

Add the following to Clause 2010 of the Standard Specification:

2010.1 Plantation of Trees and Hedges

(a) Scope

The work shall consist of:

- Planting of tree saplings in median or other designated locations, and
- Planting of hedges within median area.

(b) Materials

(i) Dump Manure

Dump manure shall be of well decayed (at least six months) organic or vegetable matter, obtained in the dry state from the municipal dump or other similar sources approved by the Engineer. The manure shall be free from earth, stone, brickbats or other extraneous matter.

(ii) Farmyard Manure

Farmyard Manure shall be well decayed (should be at least 6 months covered in dump), free from grits and any other unwanted materials.

(iii) Good Earth

The soil shall be agricultural soil of sandy-loam texture, free from grit, marrum, shingle, stone, brickbats, building rubbish and any other foreign matter. The earth shall be free from clods or lumps of sizes bigger than 75 mm in any direction. It shall have PH value ranging between 6 and 8.5.

(iv) Oil Cake (Neem/Castor/Groundnut)
The cake shall be free form bush, dust, grit and any other foreign matter.

(v) Sapling of Trees

The sapling of trees shall be of medium height, leafy type and draught resistant variety native to the area and be of good quality of minimum of 2 m height or calliper diameter of 25 mm as directed by the Engineer.

(vi) Sapling of Hedges
The saplings shall be of draught resistant variety normally grown for hedges in the area, approved by the Engineer.

(c) Construction Operations

(i) Tree Planting and Refilling Earth after Mixing with Oil Cake, Manure and Watering
Holes of circular shape of 900 mm diameter and 1000 mm in depth in ordinary soil shall be excavated and the excavated soil, broken to clods of sizes not exceeding 75 mm in any direction, shall be stacked outside the hole. Stones, brickbats, unsuitable earth and other rubbish, all roots, weeds and other undesirable growth encountered during excavation shall be separated out and unserviceable material removed from the site as directed by the Engineer.

Useful material, if any, shall be stacked properly and separately. Good earth in quantities required to replace such discarded stuff shall be brought and stacked at site by the Contractor, with a depth not more than 500 mm from ground level. The pit shall be treated for termite by raking the soil up to 50 mm and treated with 5% Aldrin or Chloradang dust in soil.

The tree hole shall be manured with powdered neem/castor oil cake along with farm yard manure/dump manure screened through 16 mm sieve and these shall be uniformly mixed with the excavated top soil after the manure has been broken down to powder (size of particles not to exceed 6 mm in any direction) in equal proportion. A 2 m high sapling of trees shall be placed at the centre of the hole and then the mixture shall be filled into the hole up to the level of adjoining ground and then profusely watered to enable the soil to subside. The refilled soil shall then be dressed evenly with its surface about 50 mm to 75 mm below the adjoining ground level or as directed by the Engineer.

The planting shall be completed soon after completion of the median.

(ii) Circular Mild Steel Tree Guard with Bars

The tree guard shall be 900 mm in diameter.

The tree guards shall be formed of:

- 3 № 25 mm x 25 mm x 3 mm angle iron verticals 1.95 m long excluding splayed outward at lower end up to an extent of 50 mm
- 3 № 25 mm x 5 mm MS flat rings fixed as per the design
- 5 № 1.55 m long 6 mm diameter bars. Each ring shall be in two parts in the ratio of 1:2 and their ends shall be turned in radically for a length of 40 mm at which they are bolted together with 8 mm diameter and 30 mm long MS bolts and nuts.

The vertical iron shall be welded to rings along the circumference with electric plant. 15 № bars shall be welded to rings at equal spacing along the circumferences of ring. The lower end of the angle iron verticals shall be splayed outwards up to an extent of 50 mm. The lower end of the flat of lower ring shall be at the height of 1.95 m. The middle ring shall be in the centre of top and lower ring. The bars shall be welded to the rings as directed by the Engineer. The entire tree guard shall be given two coats of paint of approved brand and of required shade over a priming coat of ready mixed primer of approved brand. The design of the tree guard shall be approved by the Engineer.

(iii) Planting of Hedges

The hedges saplings shall be planted in two rows, one each along each edge of the median. Bed for the saplings shall be prepared with necessary manuring, and the live saplings shall be planted in lines parallel to the median edge to the directions of the Engineer. Spacing between saplings in a row shall be such that a thick hedge can be grown, and this shall generally be not farther away than 300 mm.

The planting shall be completed soon after completion of the medians.

(iv) Grassing of Median Area

The area of the median between the hedges shall be seeded and mulched to develop grass cover as directed by Engineer.

(d) Maintenance

The saplings of trees and hedges planted shall be watered and maintained by the Contractor till issuance of the final certificate at the end of the Defects Liability Period. This shall also include watering, weeding out of undesirable plants and replacement of dead plant, manuring and trimming of the hedges.

Add the following clauses to this section:

2012 Service Ducts beneath Roads

Where instructed by the Engineer, the Contractor shall construct service ducts beneath the carriageway and shoulders/footpaths. The ducts shall consist of 100 mm to 300 mm diameter ogee precast concrete pipes surrounded by a minimum of 100 mm thickness of Class 15/20 concrete. The minimum clearance between the road formation and the top of the concrete surround shall be 100 mm.

The ducts shall be provided with draw cords fabricated from strong man-made fibre such as nylon and each duct shall be sealed at each end with a tight fitting plastic plug. In the existing pavement, the duct shall be at least 250 mm below the road surface measured from the top of the concrete pipes and all back filling shall be in Class 15/20 concrete. The concrete pipes shall conform to the requirements of Clause 215 of the Standard Specification.

2013 Duct Markers

Duct markers shall be installed by the Contractor at each end of the services ducts provided under Clause 2012 above. 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 shall be inscribed 'X DUCTS' where X is the number of ducts stated in the group marked by the marker posts.

2014 Road Bump and Rumble Strips

Where shown on the Drawings or instructed by the Engineer, the Contractor shall provide, place trim to line and level bumps and/or rumble strips on the carriage way, connecting roads or shoulders. Where instructed, the road bumps shall extend the full width of carriageway and shoulders. The bumps shall be constructed in asphalt concrete to the dimensions shown on the Drawings and to the same standard as the wearing course on the main carriageway.

2015 Bollards

Where shown on the Drawings or instructed by the Engineer, the Contractor shall construct permanent bollards. The bollards shall be gauge 16 steel pipe Bollards of diameter minimum

150mm and 1.0 m above the ground, embedded to a depth of 0.5m at place. The bollards shall be filled using a minimum class (15/20) concrete and as shown on the Drawings.

2016 Retro-Reflective Road Studs

All retro-reflective road studs shall comply with BS 873: Part 4. The Contractor shall submit details of the reflective road studs he proposes to use in the works to the Engineer for approval. The Contractor shall submit also a Certificate of approval from an approving authority. The reflective road studs shall be installed in the locations shown on the drawings or instructed by the Engineer.

2017 Measurement and Payment

(a) Item: Remove existing guardrail

Unit: m

Removal of guardrail shall be measured by the metre as the length of guardrail instructed to be removed, measured between terminal points of the sections removed. The rate shall include for loading, transporting to any point on the site, off-loading and stacking the material and disposing off material unsuitable for re-use.

(b) Item: Renovate and re-erect guardrails

Unit: m

The unit of measurement shall be the length of single guardrail, whether straight or bent, or end pieces renovated as specified. The rate shall include for all works as specified and storage as required. The rate shall also include for erecting the guardrails in accordance with Clause 2006 and any new poles, nuts, bolts and accessories that may be required.

(c) Item: Pedestrian railing

Unit: m

Pedestrian railing shall be paid by the length instructed by the Engineer. The rate shall include for supplying and erection in accordance with the drawings. It shall also include for any bending of end pieces as may be required, disposal of excess materials and tidying up the site after completion of installation.

(d) Item: Service ducts

Unit: m

Service ducts stall 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, and installation of concrete pipes with concrete surround, backfilling to formation level, compaction, draw-cords and plugs, all in accordance with Clause 2012 above.

(e) Item: Duct markers

Unit: №

Duct markers posts shall be measured by the number installed. The rate shall include for provision and installation of posts, all excavation and backfill, compaction to the satisfaction of the Engineer and removal of surplus materials.

(f) Item: Bollards

Unit: №

Bollards shall be measured by the number installed. The rate shall include for provision and installation of bollards, all excavation and backfill, compaction to the satisfaction of the Engineer and removal of surplus material.

(g) Item: Reflective road studs

Unit: №

Retro-reflective road studs shall be measured by the number installed. The rate shall include for provision and installation of studs to the manufacturer's recommendations and satisfaction of the Engineer.

(h) Item: Road Bumps

Unit: m^3 of each type

2200 DAY WORKS

2201 Scope

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.

2300 ENVIRONMENTAL MANAGEMENT PLAN

The Contractor shall implement the Environmental Management Plan (EMP) measures (Matrix Tables given below both for construction and maintenance and use phases), enhancement measures as directed by the Engineer. He shall submit the report on compliance with the Environmental Mitigation measures periodically to the Engineer. The Engineer will review the compliance submitted by the Contractor.

Environment and Social Management Plan Matrix

(a) Construction Phase

Table 1: Actions Matrix

Item №	Anticipated Impacts and Sources	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitoring Parameters
1	**Degradation of water sources:** • Over-abstraction of water, • Water quality degradation, • Effects on downstream dependants, • Stream bed siltation, **Sources:** • Silt from earth moving, • Oil and grease, • Raw asphalt concrete, • Workshops and machinery maintenance areas, • Construction camp sites, • Material preparation sites.	• Observe regulations on water abstraction permits, slope excavations, etc.), • Monitor standards of sanitation at the construction camps, • Establish a mechanism for solid waste collection, storage, transfer and disposal, • Liaise with water authorities for installation of RGSs at all crossings.	The Contractor, The Resident Engineer. DEO Immediate action and maintained throughout the project period.	• Minimal silt discharging into water bodies, • NO effects on physical status of water quality, • Centralized effective collection of solid wastes	• Status of streams and wetlands and water quality along reserve, • General social Concerns. **Specific attention at all crossings and other water bodies.**
2.	**Air quality:** • Dust and particulate matter, • Visual disruption, • Particulate matter, • Surface depositions, • Bronchial and eye problems. **Sources:** Construction activities (earth moving and machinery operations).	• Ensure earth surface roads, deviations and dry materials are kept damp at alls times, • Establish information flow process to the communities on dusty conditions, • Keep inevitable dusty conditions and/or emissions as short as possible,	The Contractor and the Resident Engineer. Surveillance by the, NEMA Officials, DEO and Public Health Officials. Project period	Low visible particulate matter in the air. Requirements of Clause 19 of the General Conditions of Contract	• Dust level within the project, • Exhaust fumes from construction machineries. **Project wide situation.**

Item №	**Anticipated Impacts and Sources**	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitoring Parameters
3	**Vegetation Cover Degradation:** • Removal of vegetation from road reserve and deviation routes, • Loss of vegetation from material sites and access routes, **Sources:** • Construction of deviations, • Material borrow pits and quarries,	• Collaborate with the Local authorities in their beatification programmes, • Implement top-soiling and grassing programme for the road reserve and material sites, • Introduce soft shrubs in the median of the dual carriage, • Introduce trees on canopies on reserves near built-up areas, • Ensure vegetation does not compromise road safety.	The Contractor and Resident Engineer County Engineers & DEO to keep surveillance	Vegetation trend that is also safe to the road users. Requirements of Clause 19 of the standard Bid Docs	Greenery along the route of the road. **Special attention at sloppy sections and river crossings will be necessary.**
4	**Environmental Pollution:** • Siltation of water bodies, • Pollution of water (turbidity and hydrocarbons residuals), • Visual pollution (from dust and emissions), **Sources:** • Oil/grease storage, • Solid waste disposal (filters, greases, asphalt wastes, etc.), • Construction machinery and vehicles, • Excavated earth,	• Develop Standard Operating Procedures (SOPs), schedules and supervision guidelines for the project works, • Focus on sensitive features (e.g. stream crossings and slopes) for necessary precautions, • Establish dust control programme and machinery performance and waste disposal controls,	The Contractor Resident Engineer NEMA offices, water offices and County Engineers to keep surveillance.	Minimal disruption to physical and biological environmental quality throughout the route.	• Water quality, • Environmental features, • Risks to health and safety, • Wastes characteristics. **Pollutants from camp sites, service yards and material preparation yards.**

	• Water abstraction points,				
Item №	**Anticipated Impacts and Sources**	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitoring Parameters
5	**Land degradation:** • Soil loss, • Soil quality degradation, • Land use changes, • Material sites, **Source:** • Surface runoff channels from camps and working areas, • Temporary road diversion routes, • Material extraction and transportation.	• Monitor land use trends along the route in liaison with Lands department, • Initiate a planned vegetation programme on road reserve, • Rehabilitation plans of materials sites with landowners (lease agreements to reflect this aspect).	The Contractor and the Resident Engineer Surveillance by the County Engineers and DEO	Conservation of soils on each side of the road.	Land use trends. **A project wide concern, specific locations of camp sites, sloppy zones and crossings.** **The Contractor to carry out full ESIA for all material sites**
6	**Health and Safety** • Personal injuries (construction employees), • Communicable diseases including HIV/AIDS), • Potential accidents at material quarries, • Environmental diseases (bronchial and eye problems), **Sources:** • Construction dust and emissions, • Interaction of construction workers with communities, • Pollution of water from construction activities,	• Provide safety programmes for material sites and working areas, • Provide safety provisions (signage and lighting) for deviations, • Awareness, prevention and training on HIV/AIDS and other social diseases, • Provide service roads and bus at settlement areas to reduce road accidents. • Provide medical, insurance cover and PPEs for all the	The Contractor and Resident Engineer. The PPRO, Surveillance by the Respective DWO, DPHO, and the DEO Entire project period.	Information flow and dissemination on health and safety. Specific response to HIV/AIDS issues Requirements of Clause 19 of the standard Bid Docs Requirements of Clause 34 and 35 of the General Condition Of Contract	Complaints on health safety aspects related to the road construction activities. Trends in HIV/AIDS cases along the corridor, Special focus on material sites and road diversions routes. **Focus on major towns and settlement areas I the project corridor.**

	• Material sites, • Traffic deviations, • Construction camp sites.	construction workers.			

Item №	**Anticipated Impacts and Sources**	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitoring Parameters
7	**Social and Economic:** • Temporary disruption of business activities, • Insensitivity to public concerns during construction, • Access into and out of highway by special social groups, • Benefits to riparian communities • Safety issues (deviations and materials sites, etc.), • Noise to residents living along the route, **Sources:** Materials sites, Deviation routes, Construction machineries, Crossings, Construction camps.	• Enhance consultations with communities on activities affecting them and collaborate on the impacts reduction, • Establish modalities of recruiting manual labour from within the project areas, • Provide service roads and slips accesses, • Relevant Locals Authorities to consider physical planning along the highway / road (s) for maximum benefits, • Integrate construction works with other projects ongoing in the project route, • The contractor to establish and manage environmental and social committee to oversee mitigation measures,	The Resident Engineer in conjunction with the Contractor, Liaison with local authorities and the Provincial Administration, Entire construction period	An acceptable, sustainable and economically viable road with long term benefits to the people without adverse implications on the physical and social environment.	Trends in socio-economic dynamics along the project road and its catchments , **Special attention on realigned and expanded sections of the road. Encroached sections will also require attention.**

Item №	**Anticipated Impacts and Sources**	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitoring Parameters
8	**Provision of Road Reserve**	• County Government/KENHA to undertake availability of the road reserve, • Serve adequate quit notices to the encroaching developments	KENHA/COUNTY Upon commencement of the project	Clear project route and get back the road reserve.	**The design of the road is confined within the 60m.** **Completed survey will provide actual encroachments and necessary acquisitions.**
9	**Material Sites (hard stone, gravel and water)** • Land degradation, • Loss of land vegetation cover, • Surface hydrology changes, • Access roads' damages, • Water sources' degradation, • Water quality.	Full ESIA studies should be undertaken on all materials sites upon final identification, Rehabilitate the material sites after construction. Lease responsibilities with landowners necessary, Obtain appropriate permits for construction water abstractions	Contractor and Resident Engineer. DEO and County Engineers to supervise Throughout the construction phase.	Sustainable abstraction of materials.	It is likely that all material sites will be on private land. Sources of construction water have other uses by the communities.
10	**Decommissioning** • Removal of construction camps, • Materials sites and preparation yards, • Equipment removals.	• Carry out decommissioning audits for the camp sites, • Rehabilitate all material sites and preparation yards, • Remove all construction equipments and excess materials from the site.	The Contractor under supervision of the Resident Engineer, PPRO and the DEOs	Rehabilitated material sites and cleared material preparation yards.	Usability of the affected camps' and material sites.

(b) Road Maintenance and Use

Table 2: Action Plan Matrix (Maintenance and Use)

Item №	Anticipated Impacts and Sources	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitorable Indicators
1	**Environmental Pollution:** • Water quality degradation, • Air pollution, • Solid waste dumping (road litter), • Material spills (pollutants), • Vehicular scraps, • Residuals from material sites and preparation yards, **Sources:** • Surface runoff drains from the road, • Oils spills on road surface, • Road litter (from road users and roadside clearing), • Poorly maintained vehicles – higher related emissions, • Spills from accident sits, • Emerging social and economic centres, • Road repairs and maintenance activities.	• Establish a policy and implementation guidelines in close collaboration with experts and NEMA, • Develop monitoring compliance with vehicular emission standards along the road, • Introduce clean-up responsibilities for the road users (e.g. spills from accident vehicle owners), • Provide public waste receptacles at strategic locations along the route (bus stops and crossing areas), • Drainage channels be kept clear at all times to prevent overloading with polluting materials, • Collaboration with the traffic police on enforcement of road regulations.	COUNTY Consultation with the DEO and Water Offices for surveillance, Administration, Traffic Police Department and the Local Authorities.	A road that is compatible with the social conditions and features.	Complaints on the utilization of the roads, Environmental quality trends (status of water sources, water quality and aquatic vegetation), Compliance with road transport regulations.

Item №	**Anticipated Impacts and Sources**	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitorable Indicators
2	**Health, Safety and Security** • Contamination of water and water sources, • Noise and vibrations, • Increased road accidents, • Security aspects, • Spread of infectious diseases (HIV/AIDS and other social diseases) **Sources:** • Contaminated runoff from the road surface, • Roadside litter and solid wastes, • Increased traffic and driving style variances along the route, • Social interactions, • Inadequate road safety signage and facilities.	• Draw strategies for road safety measures and sensitize residents within risk areas, , • Integrate safety measures in the overall maintenance of the road, • Develop liaison with health provision arms for emergence response on the road, • Liaise with appropriate department to ensure compliance with road regulations and traffic rules along the stretch, • Ensure maintenance of signage and other facilities at all times.	COUNTY Traffic Police department,. Administration Leadership, Health department and rescue groups. Continuous	Enhanced safety throughout the road and construction of the road to enforce security.	Complaints from the riparian residents, Recorded cases and categories of road accidents, HIV/AIDS trends within towns along the route.

3	**Social and Economic Aspects** • Land use changes due to efficient transport, • Increased settlements and population, • Higher traffic volumes, • Mixed economic activities (general trading, industrial, institutional, etc.), • Road safety issues, • Road ownership by all.	• Collaboration with physical planning Depts. to enhance roadside planning. • Collaborations for sustainable social and economic development, • Include environmental aspects in scheduled road audits.	COUNTY Continuous process	Compatibility of the road with social and economic interests of the local residents and road users.	Land use trends in time and along the route, Population trends Complaints received from the local communities and the road users in general.

Item №	**Anticipated Impacts and Sources**	Proposed Actions	Responsibility and Timeframe	Targets to Achieve	Monitorable Indicators
4	**Maintenance** • Drainage clearance for free storm water flow, • Vegetation clearing for enhance visibility, • Roadside litter collection, • Road safety facilities and signage maintenance, • Re-encroachment into the road reserve, • Roadside land development practices,	• Establish modalities for the involvement of the riparian landowners in the maintenance of the road, • Install and maintain appropriate road signs. Liaise with other authorities in the control of roadside advertisement billboards that masks the safety signs, • Maintain trash bins at strategic locations along the route (bus stops and major crossing points), • Prepare a maintenance procedure in line with existing guidelines.	COUNTY DEO, water authorities the Administration for surveillance Continuous process	Maintained high level quality of road surface, installations and components.	
5	**Decommissioning phase:**	Undertake a decommissioning audit of part, sections or entire road reconstruction and establish appropriate measures to prevention environmental pollution and public safety.	COUNTY After the design road life span (15 – 25 years) Any major repairs along the route.	None or minimum impacts to the environment and social well being	–

2400 TRAFFIC MANAGEMENT AND DIVERSION

2401 General

The Contractor shall prepare and submit to Engineer within one month of the date of commencement of the works a detail traffic diversion plan as per the requirement of traffic authorities. The Contractor shall have to carry out the modifications in the traffic diversion plan at various stages of work as required. The Contractor shall maintain liaison with the traffic/highway police/authorities so as to ensure smooth flow of traffic at all stages of the work without causing inconveniences to the traffic.

2402 Traffic Rotary

The Contractor shall provide traffic rotary showing traffic direction made up of four blinders mounted on M.S. Frame of 5-x50 mm x 6 mm size 250 Hz frequency electrically operated at both ends of the cordoned area for help and guidance of road users. Necessary arrangements for supply of electricity shall be made by the Contractor.

2403 Road Delineates

Road delineates as per the relevant codes and as per the relevant drawings and as directed by Engineer shall be fixed at suitable intervals to have a suitable guidance to the road users at the night time for smooth flow of traffic. Delineators shall be fixed firmly in the ground. Also, red flags and cat eye reflectors shall be fixed on the barricades. Alternative arrangements shall also be kept ready in case of failure of electricity.

2404 Signs, Lights, Barriers and other Traffic Control Devices

Signs, lights, barriers and other traffic control devices shall be provided and maintained in a satisfactory condition till such time that they are not required as directed by the Engineer, so as to ensure smooth and safe traffic on the road throughout the length of the project road.

2405 Barricades

The barricades erected on either side of the carriageway/portion of the carriageway closed to traffic, shall be of strong design to resist violation, and painted with alternate black and white stripes. Red lanterns or warning lights of similar type shall be mounted on the barricades at night and kept lit throughout from sunset to sunrise.

At the points where traffic is to deviate from its normal path, whether on temporary diversion or part width of the carriageway, the channel for traffic shall be clearly marked with the aid of pavement markings, painted drums or similar devices to the directions of the Engineer. At night, the passage shall be delineated with lanterns of other suitable light source.

2406 Passage through Works

2406.1 One-Way Traffic Operation

One-way traffic operation shall be established whenever the traffic is to be passed over part of the carriageway inadequate for two-lane traffic. This shall be done with the help of temporary traffic signals or flagmen kept positioned on opposite sides during all hours. For regulation of traffic, the flagmen shall be equipped with red and green flags and lanterns/lights.

2406.2 Two Way Traffic Operation

On both sides, suitable regulatory/warning signs as approved by the Engineer shall be installed for the guidance of road users. On each approach, at least two signs shall be put up, one close to the

point where transition of carriageway begins and the other 120 m away. The signs shall be of approved design and of refectory type, if so directed by the Engineer.

2406.3 Traffic Control Devices

Signs, lights, barriers and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time that they are not required as directed by the Engineer. The temporary travelled way shall be kept free of dust by frequent applications of water as necessary.

The details of work which is to be carried out by the Contractor as part of the traffic management during the construction period are given under Bill № 9 of the Bill of Quantities

2500 HIV/AIDS, GENDER, 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 red in conjunction with this specification.

- The instruction to bidders
- The Conditions of Contract
- The drawings

2503 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, at least ten (10) of the Contractor's vehicles, regularly used on site shall display HIV/AIDS awareness posters. The posters shall be printed on gloss paper and shall be at least A1 size on building 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.

In the awareness campaign, the Contractor shall employ and designate a safety officer who will undertake and coordinate all aspects of the HIV/AIDS awareness campaign.

2504 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 and comply with the current ISO Standards or WHO/UNAIDS Specifications and Guidelines for condoms, 1998, or any more recent equivalent publication. 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.

As part of the campaign the Contractor shall operate at least one STD and HIV/AIDS clinic on site or make alternative arrangements with an existing suitably qualified and equipped Local clinic. The clinic shall have a minimum of two rooms each at least 10 m^2 with ablution and washroom. The clinic shall be suitably staffed and equipped for screening, diagnosis and counselling of STD and HIV/AIDS of the project staff and labour. The Contractor shall cover the costs of the clinic to provide free treatment for general STD cases, whereas workers with HIV/AIDS shall be referred to the national HIV/AIDS programme coordinated by the Ministry of Health.

2505 HIV/AIDS Training

2505.1 Objective

The objective of the AIDS/HIV training programme is to reduce the risk of exposure to and spread of the HIV virus in the Area influenced by the construction project. The target group will be local

labourers and their superintendents employed by the works Contractor. The wider community will benefit indirectly through their normal day-to-day interaction with the target group.

2505.2 Scope of activities

Activities for HIV/AIDS awareness and prevention will be broad-based, targeting both individuals and groups. They may consist of:

- Information posters in public places, both on and offsite (eating houses, bars and guest houses) and on the Contractor's vehicles
- Availability of socially marketed condoms
- Peer educators (reference people) drawn from the local labour and educated in HIV/AIDS issues for discussion with colleagues (estimate 1 per 100 employees).
- Small focus group discussions to disseminate information covering key issues
- Theatre groups and video presentations
- Promotional events (such as football matches) to encourage openness and discussion of HIV/AIDS issues.
- Promotional bill boards to raise awareness of the integration of construction and HIV/AIDS activities
- Inclusion of HIV/AIDS activities at site meetings with the Local Aids Committees and other approved representatives.
- Availability of promotional materials including T-shirts, caps, bumper stickers and key rings.

The scope of activities may be tailored as required to meet the perceived needs and priorities of the labourers and should involve participatory approaches to ensure that they are appropriate and have a public health impact. The scale and frequency of activities may also be adjusted to suit the requirements of the target group. The education will cover:

- Preventive behaviour including partner reduction, condom use, awareness and appreciation of the importance of treatment of sexually transmitted incidences (STIs)
- Skills including negotiating safer sex, correct condom use, purchase of condoms without embarrassment, and
- Referral to local health centres and available services.

Tasks to be undertaken to support the above activities services shall include:

- Establishing the status and focus of all current and planned HIV/AIDS activities in the area to ensure complementarities and determining potential involvement in project activities
- Carrying out s brief review of regional activities combining road construction with HIV/AIDS campaigns to determine options, best practice key issues and constrains
- Reviewing of Information, Education and Communication (IEC) materials available and their relevance to road construction, making recommendations for future development of IEC materials
- Providing education and training for the site personnel, superintendents and peer educators for the scope of activities as above.
- Providing supervision for peer educators to ensure sustained quality of education and provision of incentives for the scope of activities as above.
- Providing Mechanism for the social marketing of condoms and distribution of materials

- Monitoring activities regularly to assess effectiveness and impact. This should include an initial, interim and final assessment of basis knowledge, attitude and practices (KAP) taking account of the existing data sources and recognizing the limitations due to the short time frame to show behaviour change. The KAP shall be supported by qualitative information from focus group discussion.

2505.3 Collaboration

HIV/AIDS activities are coordinated nationally by the National Aids Control Council (NACC). The Department of Lands, Housing and Urban Planning in consultation with NACC and the County Department of Health (MOH) shall coordinate with the local representatives. Representatives of Local Health Authorities shall be invited to attend training and communication activities.

Activities on the construction site shall be linked as far as possible with the on-going HIV/AIDS awareness and prevention in the area. This will ensure complementary of approaches, reinforcing education and minimizing duplication, in addition, these links will ensure that the target group will have access to continued information after the end of the construction period.

2505.4 Contractor's Responsibilities

The Contractor will employ and designate a qualified HIV/AIDS expert, to be approved by the Engineer, who will work closely with the Employer, Ministry of Health 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 shall include:

- Scheduling appropriate timing and durations of the implementation of HIV/AIDS activities as part of work plan for labourers and superintendents.
- Designated rest times such as lunch breaks and paydays shall be excluded.
- Identification of suitable individuals from recruitment records for education with the implementing organization
- Provision of suitable sites for communication activities and for condom distribution
- Monitoring of the implementation of peer educator activities, and
- Provision of support as necessary to the implementing organization.

2505.5 Inputs

An organization experienced in the provision of HIV/AIDS awareness and prevention activities shall be selected as a subcontractor to provide the above scope of activities on behalf of the main Contractor.

2505.6 Reporting

The implementing organization shall produce the following reports to be submitted to the Contractor, Consultants, CGB and NACC:

- Monthly progress briefs for inclusion in site meetings discussions
- Quarterly reports detailing activities carried out, issues and follow ups
- A review report of activities in the road construction sector
- A review report of the 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.

In addition, a report with the recommended approach for integration of HIV/AIDS awareness and prevention activities in the road construction sector shall be produced. This shall be a synthesis of project activities including contractual approaches, communication activities, availability of materials and liaison with the existing organizations. It shall be developed with all parties involved in the construction activities to ensure that the wide range of views and experiences are gained.

The final report and recommended approach will be presented to the CGB, NACC and other interested organizations including private sector, funding agencies and Non-Governmental Organisations.

2506 Timing

Activities shall commence at the start of the construction period and continue throughout the Contract period to ensure that a sustained impact reporting and dissemination activities shall continue for three months after the project is completed to ensure integration into the current practice.

2507 Measurement and Payment

The payment items in this Clause shall include full compensation for all work associated with the provision of HIV/AIDS related services as specified.

Item: Instituting an HIV/AIDS awareness campaign

Unit: Months

The unit of measurement shall be the calendar month or part thereof, measured over the duration of the campaign. The rate shall include for providing a Safety Officer to deal with HIV/AIDS together with his/her transport requirements. The payment shall be made monthly, pro-rata for parts of a month, from the date of appointment of the officer until the completion of the works or substantial demobilization of the local workforce whichever comes first.

Item: Instituting an HIV/AIDS prevention campaign

Unit: Months

The unit of measurements shall be the month. The rate shall include the cost of providing a clinic or make alternative suitable arrangements, running the clinic, providing condoms as per the specifications and meeting all the costs of time related costs.

The payment shall be made monthly, pro-rata for parts of a month, from the date of establishing the clinic until the completion of the works or substantial demobilization of the local workforce whichever comes first.

Payment shall only be made for periods during which the Contractor has effectively provided the services.

Item: HIV/AIDS training

Unit: Provisional Sum

Payment shall be made for the actual expenditure incurred by the Contractor for which receipted vouchers shall be produced. The rate shall include full compensation for equipment, labour and material required for the provision of the services.

In addition, the Contractor will be paid for handling, overheads and profit at a percentage (%) rate of the receipted expenses incurred.

SECTION 9: BILLS OF QUANTITIES

PREAMBLE TO BILL OF QUANTITIES

1. The Bill of Quantities shall form part of the Contract documents and is to be read in conjunction with Instructions to Bid, Conditions of Contract, Specifications and Drawings.

2. The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed description given in the Conditions of Contract and specification for the full direction and description of work and materials.

3. The Quantities set forth in the Bill of Quantities are estimated and provisional representing substantially the work to be carried out and given to provide a common basic for bidding and comparing the bids. 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. The basic of payment shall be the Contractor's rates and the quantities of work actually done in fulfilment of his obligation under the Contract.

4. The prices and rates inserted in the Bill of Quantities will be used for valuation of the work executed and the Engineer will measure the whole of the works executed in accordance with this Contract. A price or rate shall be entered in link against every item in the Bill of Quantities with the exception of items which already have 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 discount if any. Bidders who fail to comply with this will be disqualified.

5. Provisional Sums (including Dayworks) in the Bill of Quantities shall be expended in whole or part at the discretion of the Engineer in accordance with Subclause 52.4 and Clause 58 of the Conditions of Contract.

6. The price and rates entered in the Bill of Quantities shall, except insofar as it is otherwise provided in the Contract , include all constructional plants to be used, labour, insurance, supervision, compliance, testing, materials, erection, maintenance of works overhead and profit, taxes and duties together with the general risks, liabilities and obligations set out or implied in the Contract , transport, electricity and telephone, water, use and replenishment of all consumables, including those required under the Contract by the Engineer and his staff.

7. Errors will be corrected by the Employer for any arithmetic error in computation or summation as stipulated under Clause 28 of the Instructions to Bidders.

8. The Bill of Quantities, unless otherwise expressly stated therein, shall be deemed to have been prepared in accordance with the principle of the latest edition of the Civil Engineering Standard Method of Measurement (CESMM)

9. "Authorised" "Directed "or "Approved" shall mean the authority, direction or approval of the Engineer.

10. Unless otherwise stated, all measurement shall be net on the finished work carried out in accordance with the details shown on the drawings or instructed, with no allowance for extra cuts or fills, waste or additional thickness necessary to obtain the minimum finished thickness or dimensions required in this Contract. Any work performed in excess of the requirements of the plans and specifications will not be paid for, unless ordered in writing by the Engineer.

11. Hard/rock materials 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 150 brake horse power (112 kilowatt) with a single rear–mounted hydraulic ripper Boulders of more than 0.2 m^3 occurring in soft materials shall be classified as hard material

(m) Soft materials shall be all material other than hard material as defined under Item (l) above.
(n) The units of measurement and abbreviations tabulated below are used herein

Unit	**Abbreviation**
Number	№
Millimetre	mm
Square millimetre	mm² / sq mm
Metre	m
Square metre	m² / sq m
Cubic metre	m³ / cu m
Hectare	ha
Kilogramme	kg
Lump sum	LS
Prime Cost	PC
Tonne	Tonne
Metric ton (100 kg)	t / tonne
Degrees centigrade	ºC
Hour	h / hr
Week	wk
Month	mth
Horsepower	HP
Kilowatt	KW

UPGRADING CHEBIRIR-BOMET UNIVERSITY ROAD IN BOMET COUNTY					
BILL № 1: Preliminary and General Items					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
1.01	Provide and maintain Engineer's main office (including furniture, equipment machines and stationary) as detailed in section 132.4 of the Special Specifications or as instructed by the Engineer for use during the duration of the Contract.	Lump sum	1	550,000.00	550,000.00
1.02	Allow a provisional sum of KShs. 400,000 for offsite Material Testing as directed by the Engineer	Prov. Sum	1	400,000.00	400,000.00
1.03	Extra Over on Item 1.02 for the Contractor's Overheads and Profit.	%			
1.04	Provide with driver and maintain 1(1) Brand New Type 2 vehicle, with 2.5 - 2.8 litre turbocharged 4-wheel drive vehicle or similar as per the Engineer's instructions and approval, fitted with air bags, mobile telephone hand free headset and a two way radio for the exclusive use of the Engineer inclusive of the first 4,000 km per vehicle month.	V. Months	12		
1.05	Extra Over on Item 1.04 inclusive of fuels, maintenance, lubricants and servicing for kilometrage over 4,000 km per vehicle month.	KM	4000		
1.06	Allow a Provisional Sum of KShs 500,000 for the Engineer's miscellaneous account to be spent in whole or part as instructed by the Engineer and to be reimbursed against receipts.	Prov. Sum	1	500,000.00	500,000.00
1.07	Extra Over on Item 1.06 for the Contractors Overheads and Profit.	%			
1.08	Provide, erect and maintain publicity signs as instructed by the Engineer.	№	2		

1.09	Allow a Provisional sum of KShs. 3,650,000 for attendance upon the Engineer supervisory staff in accordance with Clause 137 of the Special Specification	Prov. Sum			
i	Supervising Engineer	M. Months	10	150,000.00	1,500,000.00
ii	Inspector of works	M. Months	10	50,000.00	500,000.00
iii	Laboratory Technician	M. Months	10	50,000.00	500,000.00
iv	Surveyor	M. Months	10	50,000.00	500,000.00
v	Levellers	M. Months	10	35,000.00	350,000.00
vii	Secretary	M. Months	10	30,000.00	300,000.00
1.10	Include a percentage on Item 1.09 for the Contractor's Overheads and Profit.	%			
BILL 1 TOTAL CARRIED TO SUMMARY PAGE					**9,115,000.00**

BILL № 4: Site Clearance and Topsoil Stripping					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
4.01	Clear site on road reserve including removal of trees, hedges, bushes, and other vegetation or deleterious organic material , grub up roots in accordance with the specifications	Ha	1.0		
4.02	Remove up to 0.2m top soil including removal of all grass, transport to spoil and spread or stockpile for re-use as directed by the Engineer	m3	1,950		
4.03	Excavate, remove and dispose existing 900mm, 600mm and 300mm dia pipe culverts including the inlet and outlet structures as directed by the Engineer	m	25		
4.04	Dismantling of structures on roadway including sorting out the dismantled material, disposal of unserviceable material complete with leads and lifts as instructed by the Engineer and utilizing the serviceable material free of cost in permanent works.				
	(a) Stone masonry	m^3	30		
	(b) Dismantling of pavement				
	(i) Paving Blocks Pavement and stock pile for re - use in construction	m^2	25		
	(c) Dismantling of fences				
	(i) Live Fencing	m	10		
4.05	Provide a provisional sum of KShs 600,000 for relocation of services.	Prov. Sum	1		
4.06	Include a percentage on Item 4.05 for the Contractor's Overheads and Profit.	%			
BILL 4 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 5: Earthworks					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
	No separate payments shall be made for the overhaul of the material and the cost of such haulage shall be included in the rates and or prices.				
5.01	Cut to spoil in soft material as directed by the Engineer.	m3	5,400		
5.02	As Item 5.01 but in hard material	m3	480		
5.03	Provide and Fill in soft material from borrow pits	m3	3,200		
5.04	Provide, spread, water, process and compact 300 mm improved subgrade to 100% MDD (AASHTO T99) in two layers of 150 mm thickness.	m3	2,800		
5.05	Rock fill as directed by the Engineer	m3	2,800		
5.06	Provide filter fabric over or around rock fill	m2	100		
BILL 5 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 7: Excavations and Filling for Structures					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
	No separate payments shall be made for the overhaul of the material and the cost of such haulage shall be included in the rates and or prices.				
7.01	Excavate in soft material to any depth for structures such as box culverts, abutments, wing walls, gabions and pier foundations	m^3	1,500		
7.02	Excavate in hard material to any depth for structures such as box culverts, abutments, wing walls, gabions and pier foundations	m^3	600		
7.03	Providing, placing selected granular backfill material behind abutment, wing walls and retaining walls to any depth and complete compaction	m^3	300		
7.04	Provide and lay stone pitching 200mm thick and grout with mortar as specified or as directed by the engineer.	m^3	1,000		
7.05	Fill in Porous fill material	m^3	350		
7.06	Provide and place gabion mesh and mattresses	m^2	350		
7.07	Provide rock fill below structures and to gabions	m^3	350		
7.1	Provide filter fabric under and/or behind gabions	m^2	100		
BILL 7 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 8: Culvert and Drainage Works					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
	No separate payment shall be made for the haulage of surplus or unsuitable excavated material and the cost of such haulage shall be included in the rates and/or prices				
8.01	Excavate in soft material to the range of depths stated below for pipe culverts, subsoil drains, headwalls, wing walls, aprons, toe walls, drop inlets, mitre drains, cut off drains, outfall to free flowing, catch water drains and median drains including support of trench sides, backfilling and compacting as specified or as instructed by the Engineer.	m3	2,200		
8.02	As Item 8.01 but in hard material	m3	250		
8.03	Provide, lay and joint 300mm or 450 mm I.D. Reinforced Cement Concrete pipes for Service ducts as per the drawings or as instructed by the Engineer	m	100		
8.04	Provide, lay and joint 600 mm I.D. Reinforced Cement Concrete pipes	m	80		
8.05	Provide, lay and joint 900 mm Internal Diameter (I.D.) Reinforced Cement Concrete pipes	m	18		
8.06	Provide, lay and joint 1200 mm I.D. Reinforced Cement Concrete pipes	m	9		
8.07	Provide and place A142 fabric mesh reinforcement or equivalent for item 8.07	m2	100		
8.08	Provide, place and compact class 15/20 for blinding	m3	100		
8.09	Provide, place and compact class 20/20 concrete	m3	120		

8.1	Provide and joint 600x360mm precast concrete invert block drain (IBD) channels with two double side precast side slabs of 600x225x75mm as lining for side drain including bedding and backfilling with selected material as directed by the Engineer.	m	2,100		
BILL 8 SUB-TOTAL CARRIED TO SUMMARY PAGE					

BILL № 9: Passage of Traffic	

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
9.01	Provide and maintain the signs and barriers for safe passage of traffic				
	(i) Signage	№	10		
	(ii) Barricades - drum type	№	5		
	(iii) Barricades - steel portable	№	5		
9.02	Allow for the passage of traffic through the works	Lump Sum	1	200,000.00	200,000.00
BILL 9 TOTAL CARRIED TO SUMMARY PAGE					
BILL № 12: Natural Material for Sub base and Base					

12.01	Provide, lay, and compact hand packed stone material including filling of voids with stone dust and watering as directed by the Engineer.	M3	2,500		
12.02	Provide , place, water and compact natural gravel of CBR greater 15% for walkway as directed by the Engineer	M3	500		
BILL 12 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 15: Bituminous Surface Treatments and Surface Dressing	

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	Note: No haulage will be paid for bitumen, chippings or sand this should be included in the rates billed rates.				
15.01	Clean and prepare surfaces of main carriageway, slip roads, shoulders, bus bays, accesses and junctions, provide, heat and spray on the same MC 70 cutback bitumen prime coat at a rate of spray in the range of 1.0 litre/m² to 1.2 litres/m² or as instructed by the Engineer	litre	6,830		
15.02	Clean and prepare surfaces of main carriageway, slip roads, shoulders, bus bays, accesses and junctions, provide, heat and spray two coats of K1-60 bitumen emulsion as tack coat on the bituminous layer in Item 15.01 at a spray rate in the range of 0.3 litre/m² to 0.8 litre/m² or as instructed by the Engineer	litre	6,830		
BILL 15 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 16: Bituminous Mix Bases, Binder Courses and Wearing Courses	

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSH)	AMOUNT (KSH)
	Note: No haulage will be paid for bituminous mix bases and Asphalt Concrete (AC) binder course and the rate shall be all inclusive.				
16.01	Prepare surfaces, provide, mix, lay and compact 50mm Asphaltic Concrete (AC) (Type 1) as binder course on sub base with bitumen and 0/20 mm aggregates on prepared surface of Hand Packed Base Layer	m3	400		
16.02	Prepare surfaces, provide, mix, lay and compact 35mm Asphaltic Concrete (AC) (Type 1) as wearing course on base with bitumen and 0/14 mm aggregates on prepared surface of Asphalt Binder Course	m3	280		
BILL 16 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 17: Concrete Works					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
17	CONCRETE				
17.01	Provide, place and compact class 15/20 for blinding	m3	15		
17.02	Provide, place and compact concrete Class 20/20 for base, abutments and piers	m3	40		
17.03	Provide, place and compact concrete Class 25/20 for girders and slab	m3	50		
	FORMWORK				
	Provide, erect and afterwards dismantle and remove				
17.03	Vertical formwork to achieve class F3 finish	m2	90		
17.04	Vertical formwork to achieve class F2 finish	m2	90		
17.05	Vertical formwork to achieve class F1 finish	m2	90		
17.06	As item 17.04 but horizontal	m2	90		
17.07	As item 17.05 but horizontal	m2	90		
	REINFORCEMENT				
	Provide, bend and fix into position				
17.08	High yield steel bars to BS 4461 of sizes 16mm and above	Tonne	5		
17.09	As item 17A.07 but of size 12mm and below	Tonne	5		
BILL 17 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 20: Road Furniture					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
20	**Road Marking and Road Signs**				
	Road Marking				
20.01	Provide and lay hot applied thermoplastic road marking compound in approved colour and shade (ASTM 9) for road marking on bituminous surface on center line, 100 mm, edge line 150 mm wide 3.0 mm thick, using fully automatic extrusion machine and using pre-melter for melting thermoplastic material including cleaning the surface of all dirt, dust, and other foreign matter, complete with demarcation at site/pre-marking, finishing and managing the traffic movements. Marking to be done as per the specifications, detailed drawings and as instructed by the Engineer.				
	(i) For lane marking (broken lines) with yellow paint, 100 mm wide	m2	100		
	(ii) For edge lines (continuous line) with white paint, 100 mm wide	m2	200		
20.02	Providing and applying two coats of synthetic enamel paint including primer to kerbs as per the Technical Specifications and as instructed by the Engineer.	m	1,000		

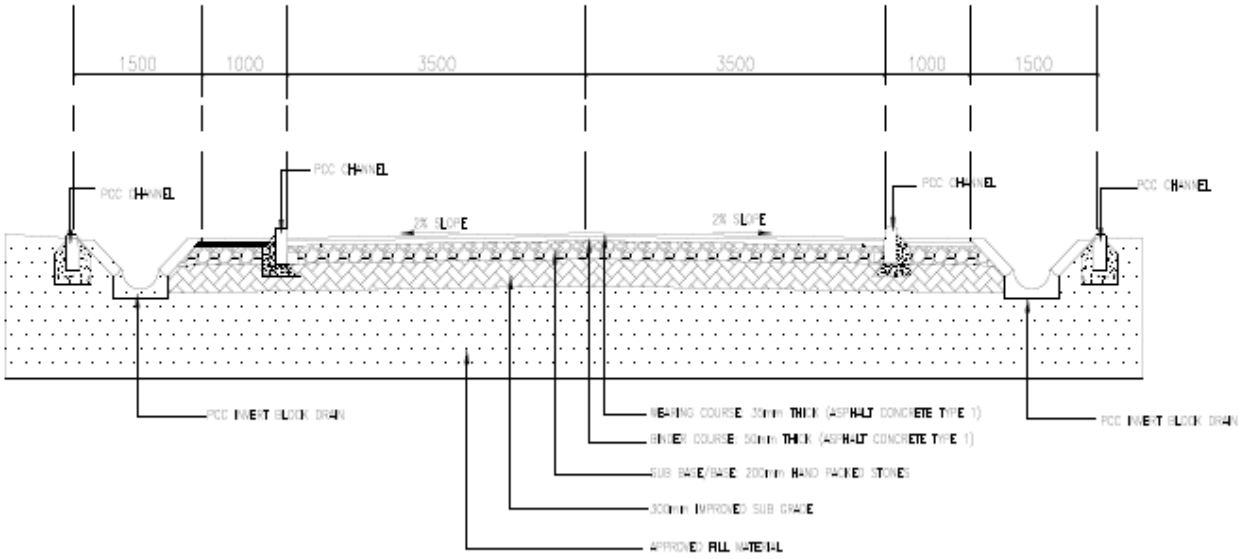
20.03	Provide and lay hot applied thermoplastic road marking compound in approved colour and shade (ASTM 9) for road marking on bituminous road surface on pedestrian crossings, chevrons, directional arrows, give way and stop lines 200mm thick using fully automatic extrusion machine and using pre-melter for melting thermoplastic. Material, including dispensing drop on glass beads of approved make and as per BS 6088 at the rate of 250g/m² including cleaning the surface of all dirt, dust, and other foreign matter, complete with demarcation at site/ pre-marking, finishing and managing the traffic control. Marking to be done as per the specifications, drawings and as instructed by the Engineer.	m2	100		
	Permanent Road Signs				
20.04	Supply and fix regulatory/mandatory road sign boards made up with high intensity grade retro-reflective type sheeting (ASTM 9) complete as per the drawings and Technical specifications.	№	2		
20.05	Supply and fix cautionary/warning road sign boards made up with high intensity grade retro-reflective type sheeting (ASTM 9) complete as per the drawings and Technical Specifications	№	2		
20.06	Supply and fix informatory road sign boards made up with high intensity grade retro-reflective type sheeting complete as per drawing and Technical specifications.				
	(i) Area less than 1.0 m2	№	2		
	(ii) Area more than 1.0 m2 but less than 2 m2	№	2		

BILL 20 SUB-TOTAL CARRIED TO NEXT PAGE					
	Sub - total brought forward from previous page				
20	**Other Road Furniture**				
20.08	Provide and lay cement concrete kerb/divider for central reserve, footpaths and traffic islands in concrete Class 25/20 as per the drawings and as instructed by the Engineer complete with all leads and lifts. Pre-cast/cast-in-situ kerb / divider				
	(i) Barrier type	m	500		
	(ii) Flush	m	500		
20.09	Excavate for, provide, lay and joint 100mm x 125mm wide precast concrete channels to radius greater than 12m and laid on 100mm thick concrete class 15/20 bed and haunch as specified	m	1,000		
20.1	Construct AC speed humps and rumble strips on carriageway in locations directed by the Engineer	m3	20		
20.11	Excavate in any material for, provide all materials, supply and install bollards 150mm diameter class A black pipes circular hollow sections 6mm thick, 200mm diameter with brackets welded at base and filled with compacted concrete class 10/15 and 1:3 cement mortar conical coping on top to the Engineer's satisfaction. The pipes shall be 1000mm long with 550mm protruding above the ground and the part above ground painted black with a 300mm white reflective strip.	№	10		
BILL 20 TOTAL CARRIED TO SUMMARY PAGE					

BILL № 26: HIV/AIDS Awareness					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**RATE (KSH)**	**AMOUNT (KSH)**
26.01	Implement HIV/AIDS awareness campaign (Through IEC materials, training, posters and banners) amongst the workers for the duration of the Contract	month	10		
26.02	Allow for the availability of condoms to workers and staff for the duration of Contract	month	10		
26.03	Allow for the participation of representative of local health authorities, provincial director of health and National AIDS council to train and communicate with workers.	month	10		
26.04	Allow for the engagement of specialist HIV sub-contractor to deal with prevention and awareness activities including Voluntary Testing and Counselling for workers and staff as per programme to be approved by the Engineer	month	10		
26.05	Allow for monthly reporting for all the HIV/AIDS awareness activities including Voluntary testing of construction workers and counselling, support and care	month	10		
BILL 26 TOTAL CARRIED TO SUMMARY PAGE					

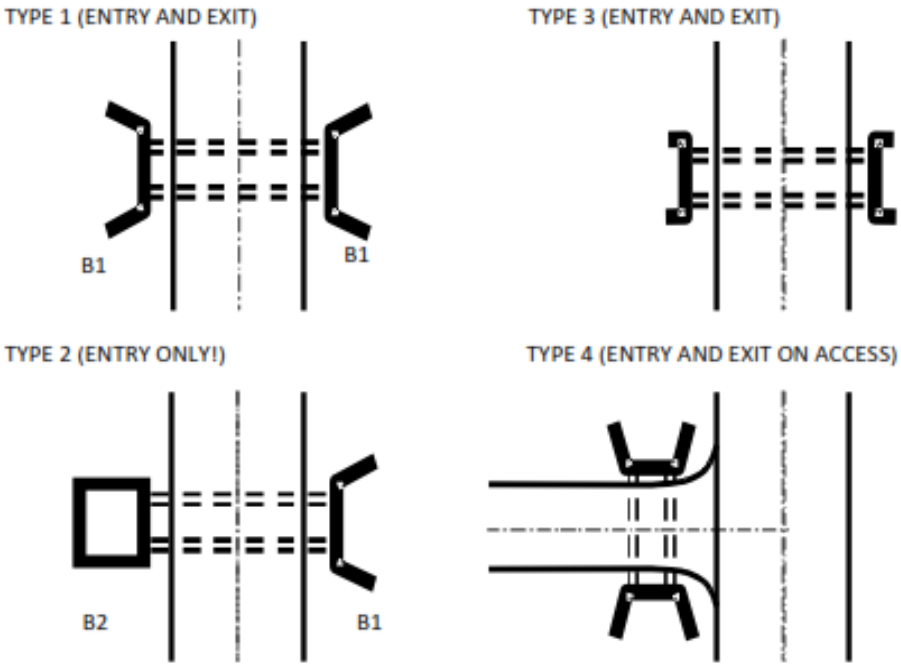
UPGRADING CHEBIRIR-BOMET UNIVERSITY ROAD IN BOMET COUNTY		
SUMMARY OF BILLS OF QUANTITIES		
BILL No.	DESCRIPTION	AMOUNT (KES)
1	GENERAL	
4	SITE CLEARANCE AND TOPSOIL STRIPPING	
5	EARTHWORKS	
7	EXCAVATION AND FILLING FOR STRUCTURES	
8	CULVERTS AND DRAINAGE WORKS	
9	PASSAGE OF TRAFFIC	
12	NATURAL MATERIAL FOR SUB BASE AND BASE	
15	BITUMINOUS SURFACE TREATMENT AND SURFACE DRESSING	
16	BITUMINOUS MIX BASES BINDER COURSES AND WEARING COURSES	
17	CONCRETE WORKS	
20	ROAD FURNITURE	
26	HIV AWARENESS	
	SUB TOTAL A	
	Add of 2.5% of Subtotal for physical contingencies.	
	SUB TOTAL B	
	Add 16% VAT of SUB TOTAL B	
	GRAND TOTAL CARRIED TO FORM OF TENDER/BID	

SECTION 10: DRAWINGS



CHEBIBIR-BOMET UNIVERSITY RD. TYPICAL CROSS-SECTION

FIGURE C.1 - CULVERT ENTRY / EXIT STRUCTURE TYPES



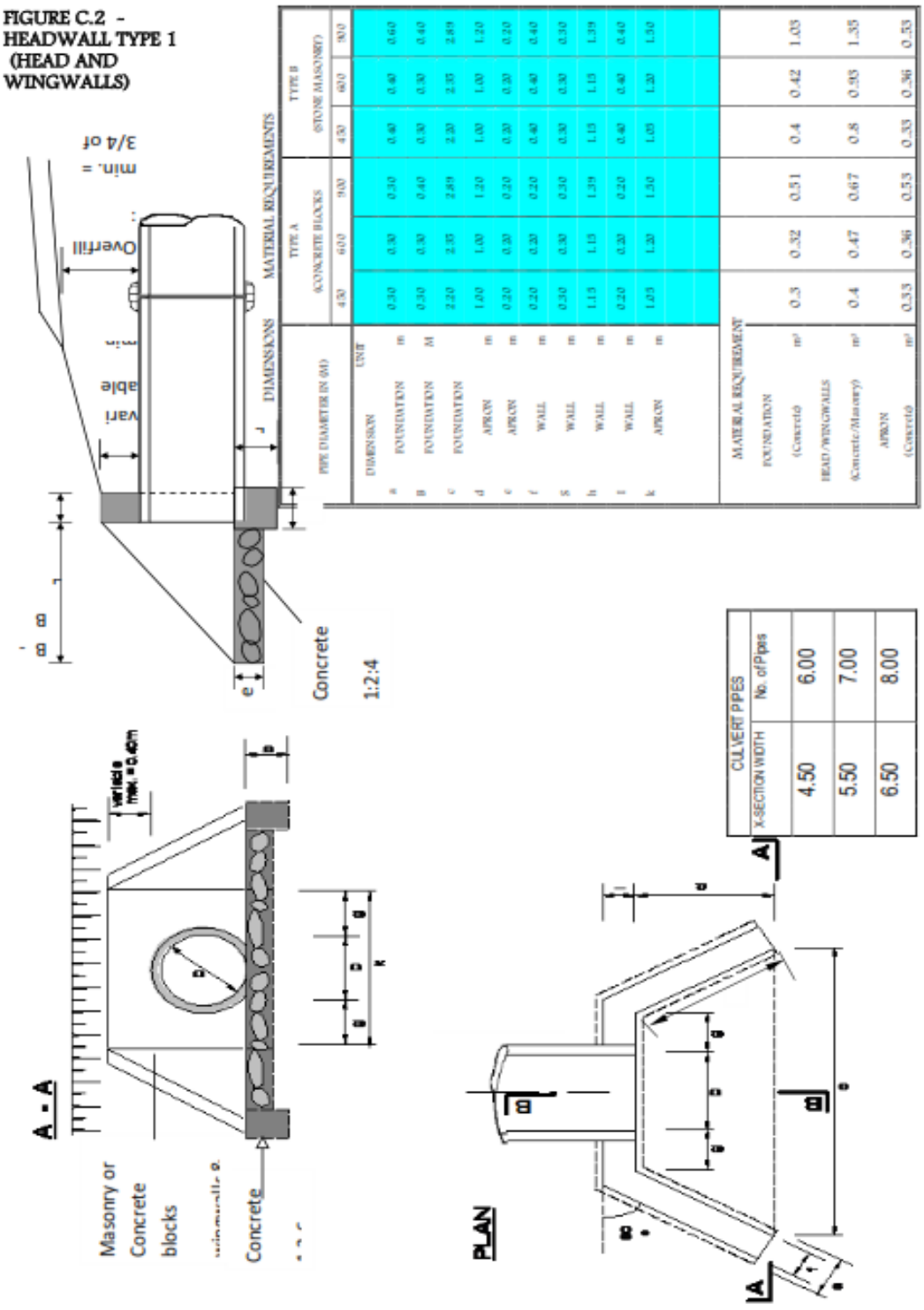
NOTE:

Coding system has been used in describing the standardised designs of the various culvert entry and exit structures. The code names consist of a number
to specify shape and function as elaborated in above while the used construction materials are identified through an alphabetic symbol as follows:

A = Concrete block
B = Stone masonry
C = Dressed stones

An example code of "B2" would therefore stand for a drop inlet type structure to be built in stone masonry.

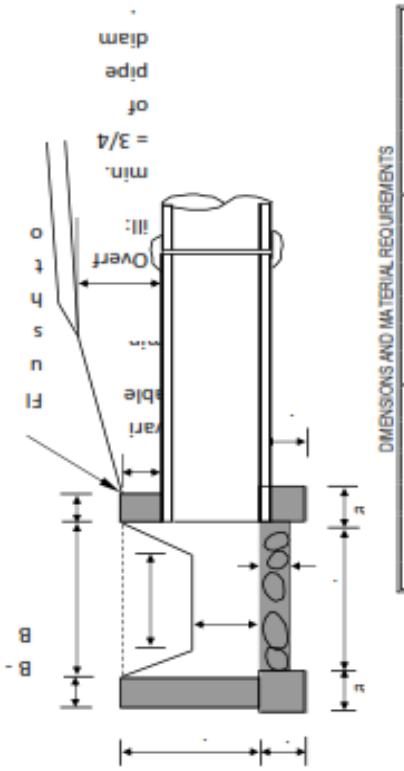
FIGURE C.2 - HEADWALL TYPE 1 (HEAD AND WINGWALLS)



PIPE DIAMETER IN (M)			MATERIAL REQUIREMENTS									
			TYPE A (CONCRETE BLOCKS				TYPE B (STONE MASONRY)					
	DIMENSION	UNIT	450	600	900		450	600	900			
a	FOUNDATION	m	0.30	0.30	0.30		0.40	0.40	0.60			
B	FOUNDATION	M	0.30	0.30	0.40		0.30	0.30	0.40			
c	FOUNDATION		2.20	2.35	2.89		2.20	2.35	2.89			
d	APRON	m	1.00	1.00	1.20		1.00	1.00	1.20			
e	APRON	m	0.20	0.30	0.20		0.30	0.30	0.20			
f	WALL	m	0.20	0.20	0.20		0.40	0.40	0.40			
g	WALL	m	0.30	0.30	0.30		0.30	0.30	0.30			
h	WALL	m	1.15	1.15	1.39		1.15	1.15	1.39			
i	WALL	m	0.20	0.20	0.20		0.40	0.40	0.40			
k	APRON	m	1.05	1.20	1.50		1.05	1.20	1.50			
MATERIAL REQUIREMENT												
FOUNDATION												
(Concrete)		m³	0.3	0.32	0.51		0.4	0.42	1.03			
HEAD/WINGWALLS												
(Concrete/Masonry)		m³	0.4	0.47	0.67		0.8	0.93	1.35			
APRON												
(Concrete)		m³	0.33	0.36	0.53		0.33	0.36	0.53			

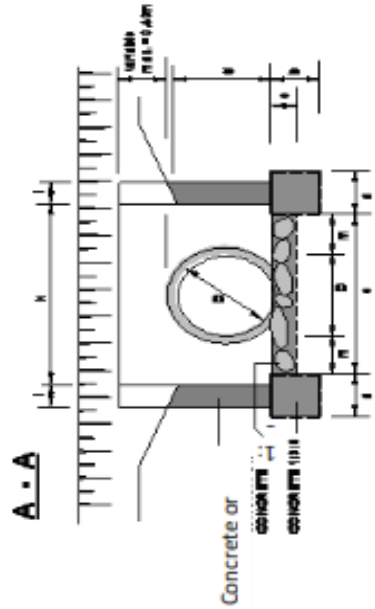
CULVERT PIPES	
X-SECTION WIDTH	No. of Pipes
4.50	6.00
5.50	7.00
6.50	8.00

FIGURE C.3 - HEADWALL TYPE 2 (DROP INLET)



DIMENSIONS AND MATERIAL REQUIREMENTS

PIPE DIAMETER IN (M)			TYPE A (CONCRETE BLOCKS)			TYPE B (STONE MASONRY)		
DIMENSION		UNIT	450	600	900	450	600	900
a	FOUNDATION	m	0.30	0.30	0.30	0.40	0.40	0.40
B	FOUNDATION	M	0.30	0.30	0.30	0.30	0.30	0.30
c	FOUNDATION	m	1.10	1.10	1.40	1.20	1.20	1.50
d	APRON	m	0.90	0.90	0.90	1.00	1.00	1.00
e	APRON	m	0.20	0.20	0.20	0.20	0.20	0.20
f	DROP INLET	m	0.60	0.60	0.60	0.60	0.60	0.60
g	DROP INLET	m	0.30	0.40	0.60	0.30	0.40	0.60
h	DROP INLET	m	0.60	0.80	1.20	0.60	0.80	1.20
i	DROP INLET	m	0.20	0.20	0.20	0.40	0.40	0.40
k	DROP INLET	m	1.20	1.20	1.50	1.20	1.20	1.50
l	DROP INLET	m	1.00	1.00	1.00	1.00	1.00	1.00
m	DROP INLET	m	0.36	0.30	0.30	0.36	0.30	0.30
MATERIAL REQUIREMENT								
FOUNDATION (Concrete)		m^3	0.47	0.47	0.52	0.72	0.72	0.79
HEADWINGWALLS (Concrete/Masonry)		m^3	0.53	0.69	1.11	1.24	1.63	2.61
APRON (Concrete)		m^3	0.24	0.24	0.30	0.24	0.24	0.30



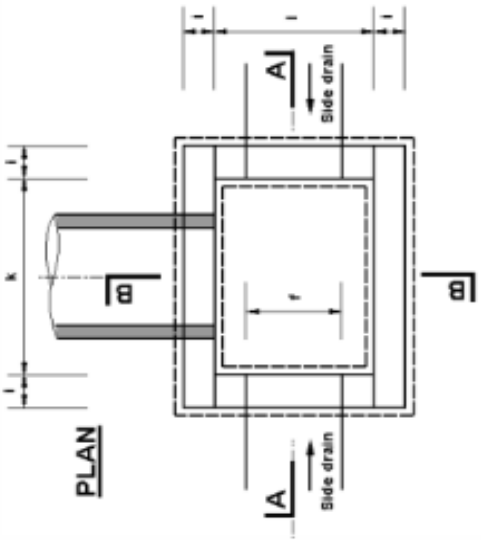


FIGURE C.4 - HEADWALL TYPE 3A (CONCRETE BLOCK HEADWALLS)

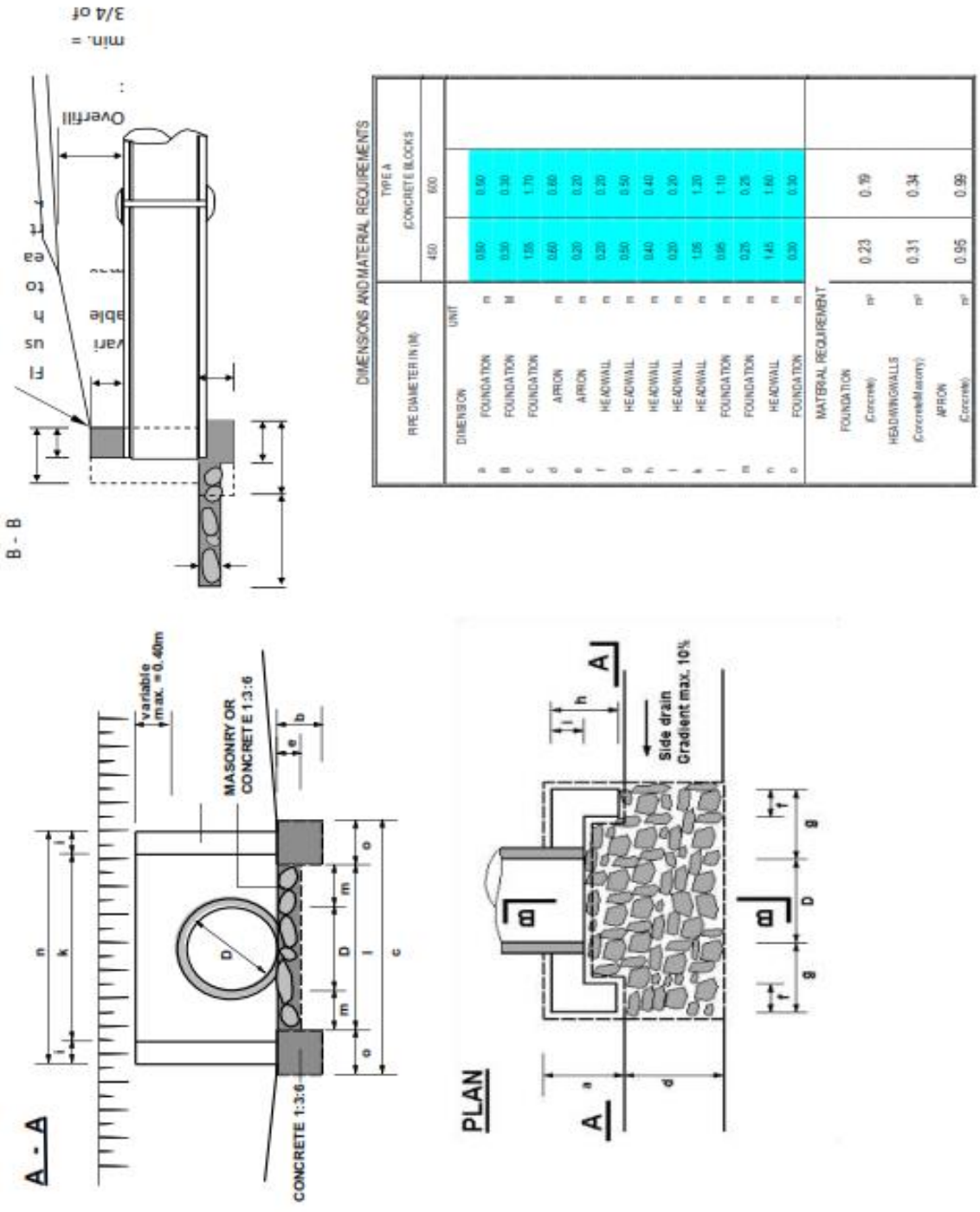
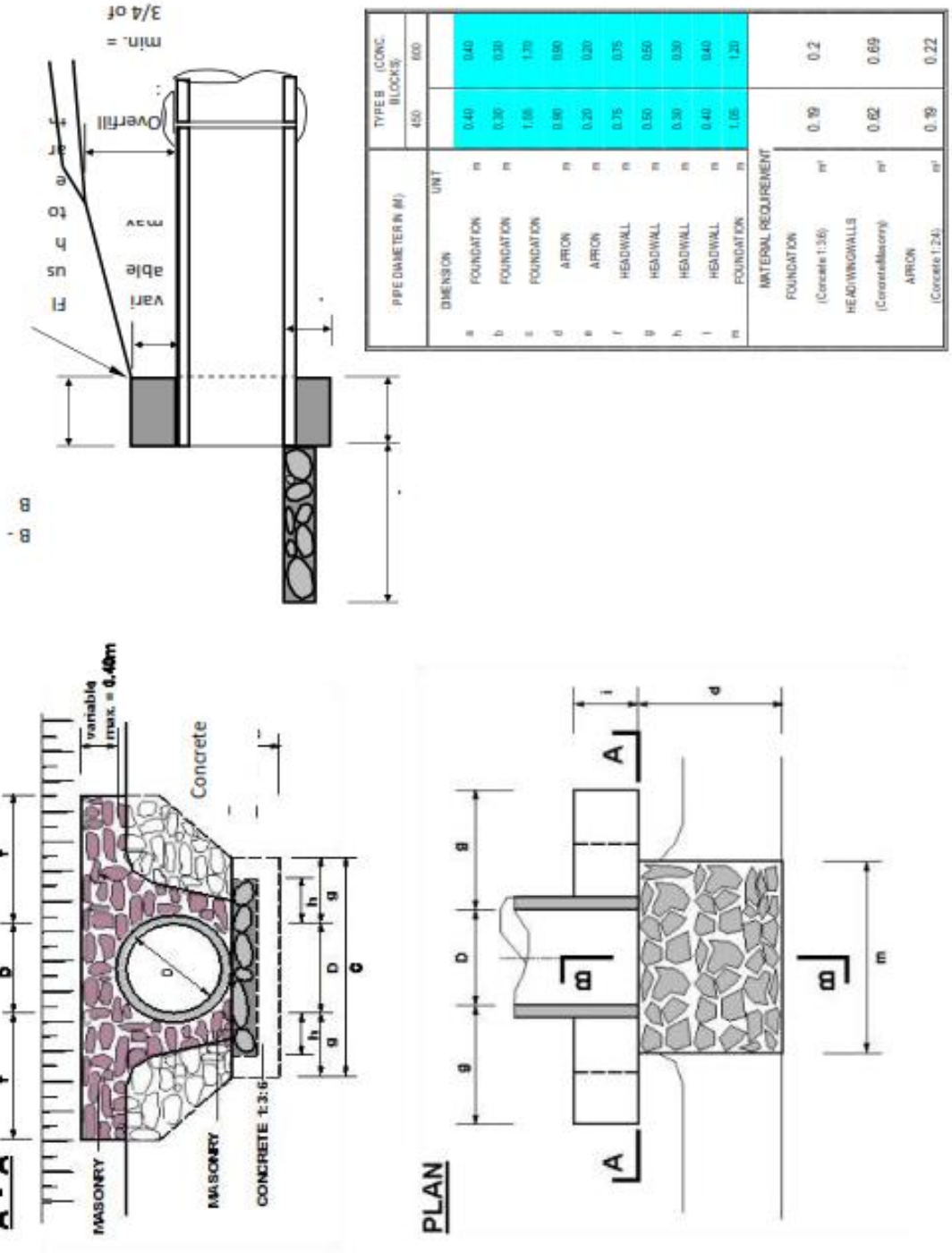
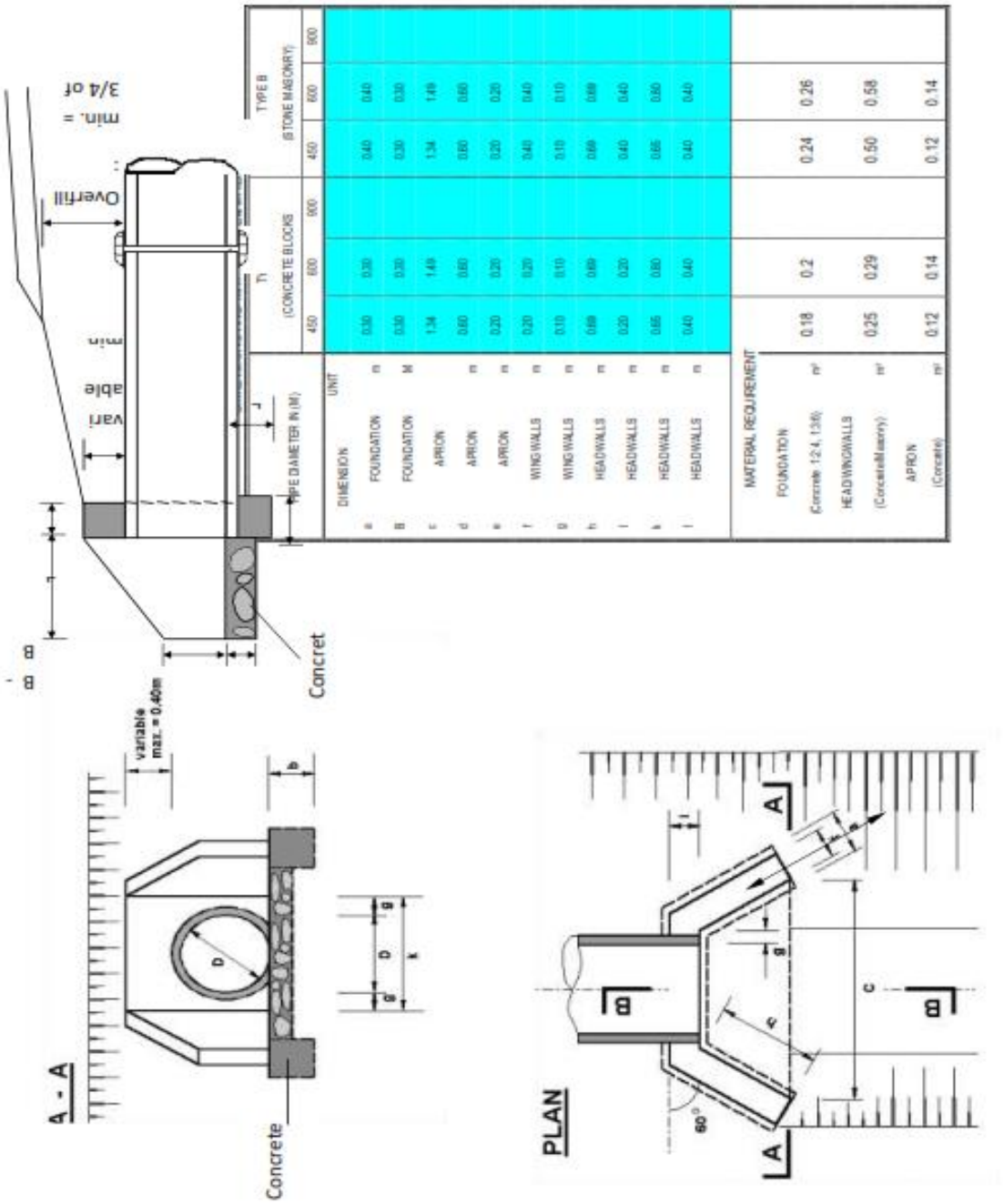


FIGURE C.5 - HEADWALL TYPE 3B (STONE MASONRY HEADWALLS)



PIPE DIAMETER IN (M)		UNIT	TYPE B (CONC BLOCKS) 450	600
DIMENSION				
a	FOUNDATION	m	0.40	0.40
b	FOUNDATION	m	0.30	0.30
c	FOUNDATION		1.85	1.70
d	APRON	m	0.80	0.80
e	APRON	m	0.20	0.20
f	HEADWALL	m	0.75	0.75
g	HEADWALL	m	0.50	0.50
h	HEADWALL	m	0.30	0.30
i	HEADWALL	m	0.40	0.40
m	FOUNDATION	m	1.05	1.20
MATERIAL REQUIREMENT				
FOUNDATION	(Concrete 1:3:6)	m³	0. 19	0.2
HEADWINGWALLS	(ConcreteMasonry)	m³	0.62	0.69
APRON	(Concrete 1:2:4)	m³	0. 19	0.22

FIGURE C.6 - HEADWALL TYPE 4 (FOR ACCESS CULVERTS)

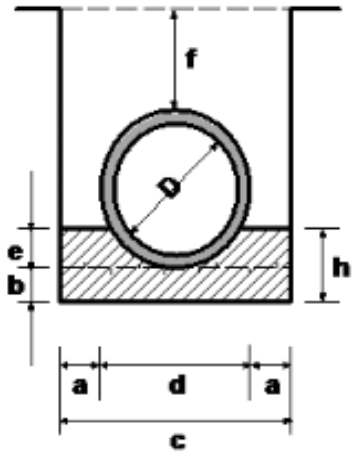


DIMENSION	UNIT	TYPE DIAMETER IN (M)				TYPE B (STONE MASONRY)			
		450	600	900		450	600	900	
a FOUNDATION	m	0.30	0.30			0.40	0.40		
B FOUNDATION	M	0.30	0.30			0.30	0.30		
c APRON		1.34	1.49			1.34	1.49		
d APRON	m	0.60	0.60			0.60	0.60		
e APRON	m	0.20	0.20			0.20	0.20		
f WINGWALLS	m	0.20	0.20			0.40	0.40		
g WINGWALLS	m	0.10	0.10			0.10	0.10		
h HEADWALLS	m	0.69	0.69			0.69	0.69		
i HEADWALLS	m	0.20	0.20			0.40	0.40		
k HEADWALLS	m	0.65	0.80			0.65	0.80		
l HEADWALLS	m	0.40	0.40			0.40	0.40		
MATERIAL REQUIREMENT									
FOUNDATION (Concrete 1:2:4, 1:3:6)	m³	0.18	0.2			0.24	0.26		
HEADWINGWALLS (Concrete/Masonry)	m³	0.25	0.29			0.50	0.58		
APRON (Concrete)	m³	0.12	0.14			0.12	0.14		

FIGURE C.7- BEDDING AND HAUNCH PROFILES TYPES I & II

PROFILE I

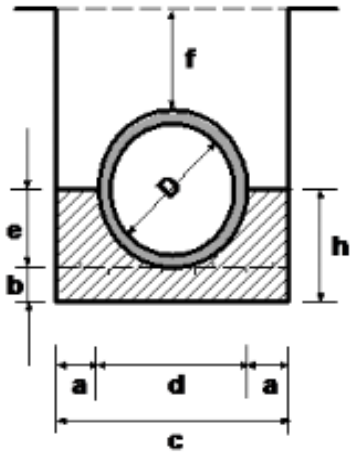
(CONCRETE)



Diameter (D)	450 (mm)	600 (mm)	900 (mm)
	Dimensions in (m)		
a	0.15	0.2	0.2
b	0.1	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.14	0.18	0.27
f (min.)	0.34	0.45	0.68
g	-	-	-
h	0.24	0.33	0.42
i	-	-	-
Concrete	Volume in (m3/m)		
	0.16	0.3	0.48
Application	- Fair subgrade condition; - Overfill > ¾ Diameter; - Seasonal waterflow only.		
Remarks	- Use gravel material for back/ overfill.		

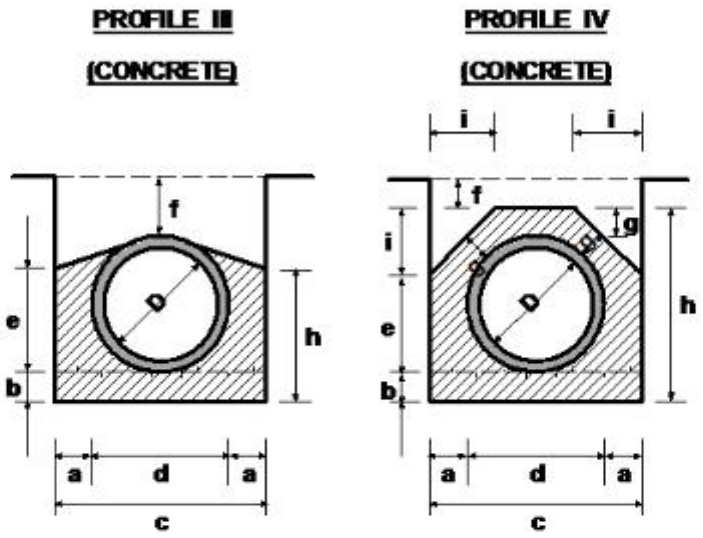
PROFILE II

(CONCRETE)



450 (mm)	600 (mm)	900 (mm)
Dimensions in (m)		
0.15	0.2	0.2
0.1	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.28	0.36	0.54
0.34	0.45	0.68
-	-	-
0.38	0.51	0.69
-	-	-
Volume in (m3/m)		
0.2	0.37	0.56
- Fair to poor subgrade Condition; - Overfill > ¾ Diameter; - Seasonal waterflow only.		
- Use gravel material for back/ overfill.		

FIGURE C.8 - BEDDING AND HAUNCH PROFILES TYPES III & IV



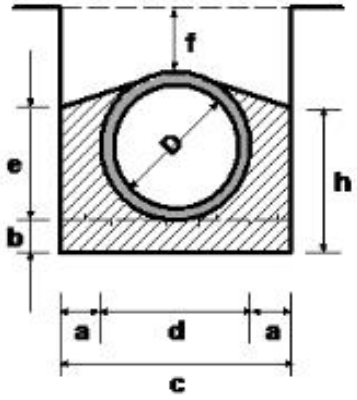
Diameter (D)	450 (mm)	600 (mm)	900 (mm)
	Dimensions in (m)		
a	0.15	0.2	0.2
b	0.1	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.42	0.54	0.81
f (min.)	0.23	0.3	0.45
g	-	-	-
h	0.52	0.69	0.96
i	-	-	-
Concrete	Volume in (m3/m)		
	0.26	0.47	0.71
Application	- Fair subgrade condition; - Overfill > ¾ Diameter; - Seasonal waterflow only.		
Remarks	- Use gravel material for back/ overfill.		

450 (mm)	600 (mm)	900 (mm)
Dimensions in (m)		
0.15	0.2	0.2
0.1	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.46	0.52	0.78
0.15	0.15	0.15
0.15	0.15	0.15
0.81	1.02	1.38
0.28	0.35	0.45
Volume in (m3/m)		
0.37	0.61	0.92
- Fair to poor subgrade Condition; - Overfill > ¾ Diameter; - Seasonal waterflow only.		
- Use gravel material for back/ overfill.		

FIGURE C.8 - BEDDING AND HAUNCH PROFILES TYPES III & IV

PROFILE III

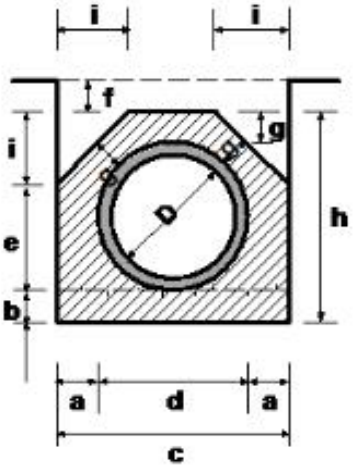
(CONCRETE)



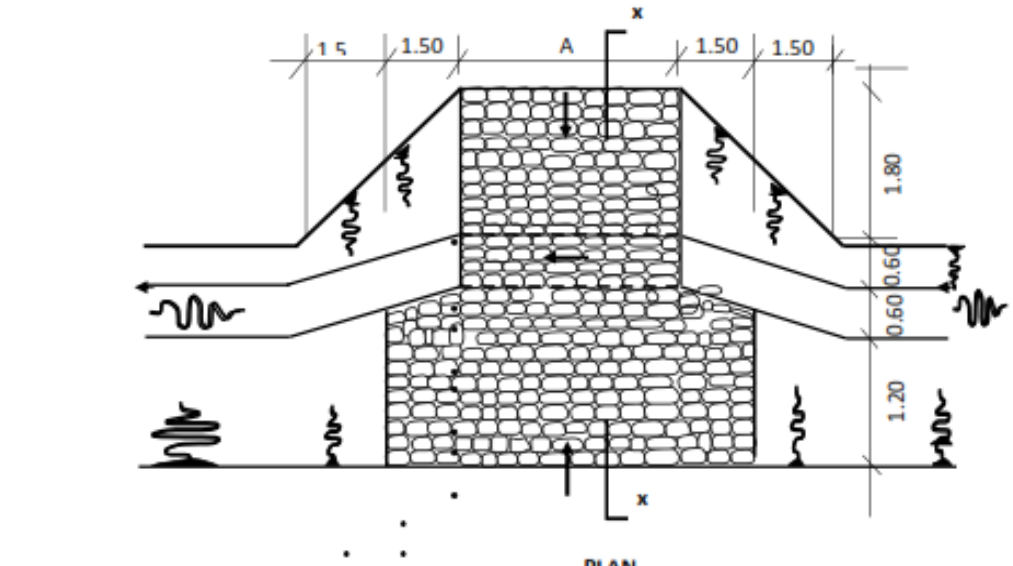
Diameter (D)	450 (mm)	600 (mm)	900 (mm)
	Dimensions in (m)		
a	0.15	0.2	0.2
b	0.1	0.15	0.15
c	0.86	1.12	1.48
d	0.56	0.72	1.08
e	0.42	0.54	0.81
f (min.)	0.23	0.3	0.45
g	-	-	-
h	0.52	0.69	0.96
i	-	-	-
Concrete	Volume in (m3/m)		
	0.26	0.47	0.71
Application	- Fair subgrade condition; - Overfill > ¾ Diameter; - Seasonal waterflow only.		
Remarks	- Use gravel material for back/ overfill.		

PROFILE IV

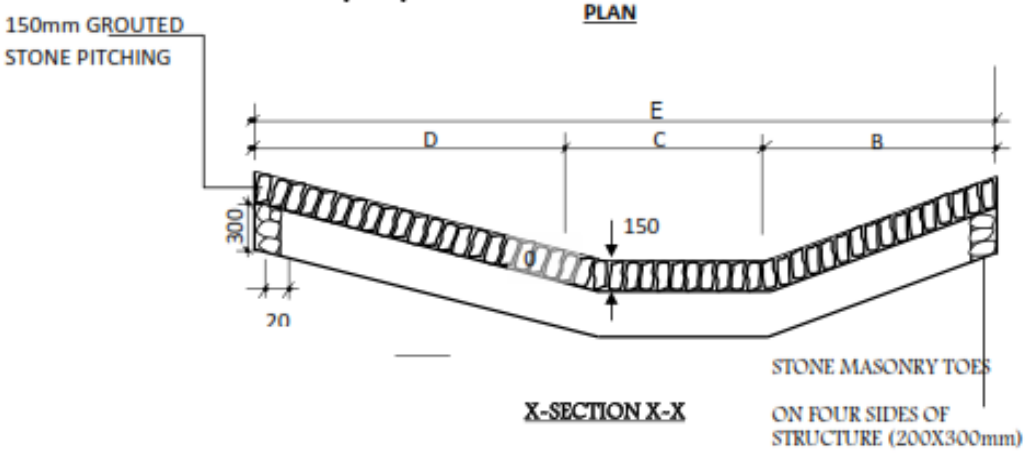
(CONCRETE)



450 (mm)	600 (mm)	900 (mm)
Dimensions in (m)		
0.15	0.2	0.2
0.1	0.15	0.15
0.86	1.12	1.48
0.56	0.72	1.08
0.46	0.52	0.78
0.15	0.15	0.15
0.15	0.15	0.15
0.81	1.02	1.38
0.28	0.35	0.45
Volume in (m3/m)		
0.37	0.61	0.92
- Fair to poor subgrade Condition; - Overfill > ¾ Diameter; - Seasonal waterflow only.		
- Use gravel material for back/ overfill.		



PLAN



X-SECTION X-X

QUANTITIES TABLE

Cross section	DIMENSIONS					RED Excavation (m3)	Stone masonry (m³)	150mm Grouted stone pitching (m3)
	A	B	C	D	E			
A	4000	1600	600	1600	4200	7.50	1.30	21.75
	6000	1600	600	1600	4200	10.00	1.60	30.15
B	4000	1400	400	1600	3600	7.00	1.20	18.30
	6000	1400	400	1600	3600	9.00	1.50	25.50

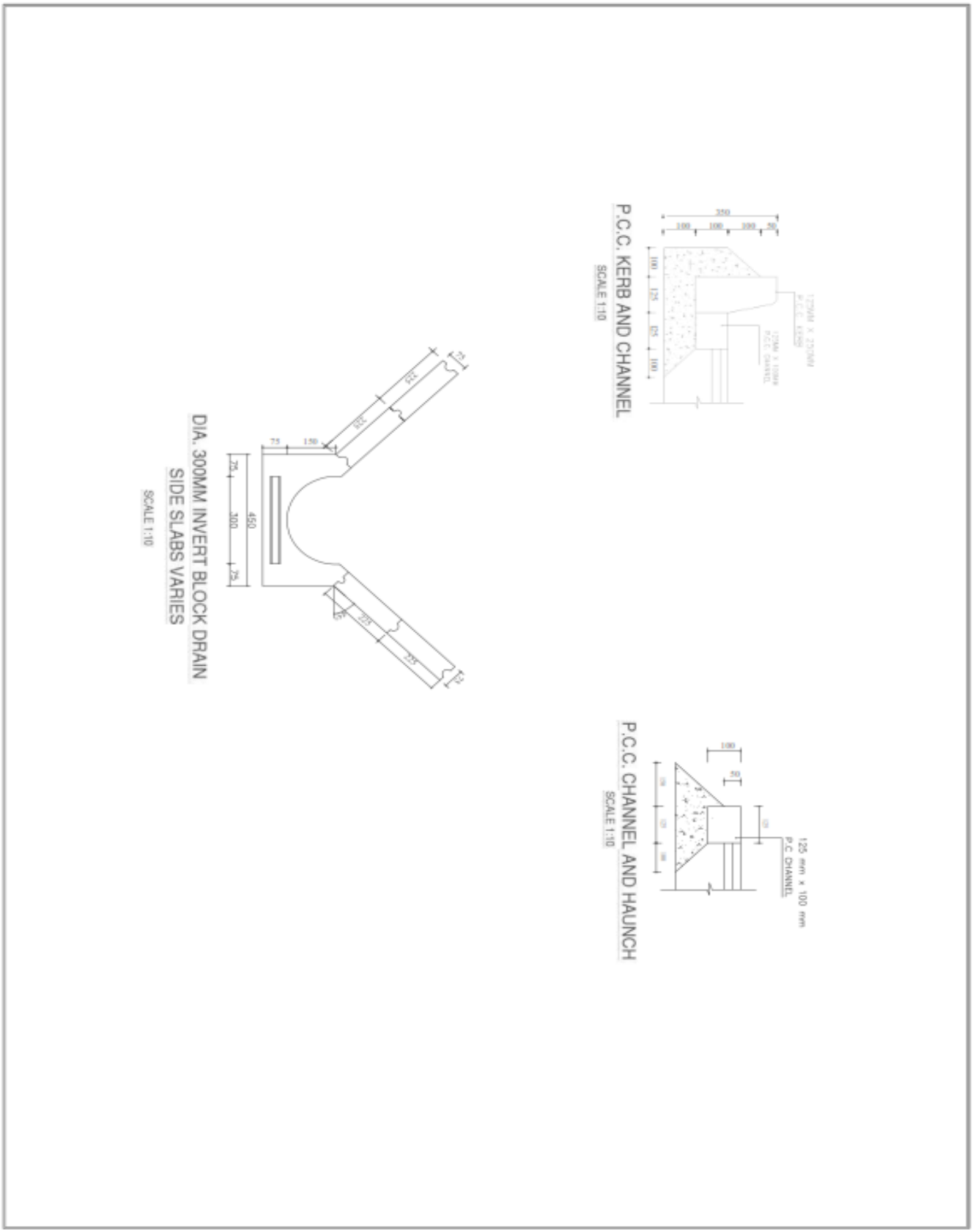

P.C.C. KERB AND CHANNEL
SCALE 1:10
350
100
100
100
50
100
125
125
100
DIA. 300MM INVERT BLOCK DRAIN
SIDE SLABS VARIES
SCALE 1:10
75
150
75
300
450
75
225
225
75
P.C.C. CHANNEL AND HAUNCH
SCALE 1:10
100
50
125 mm x 100 mm
P.C. CHANNEL

FIGURE 1 - PUBLICITY SIGN