



THIKA MUNICIPALITY

PROPOSED UPGRADING TO BITUMINOUS STANDARDS OF KILIMAMBOGO MAKUTANO TOWNSHIP ROADS AND STREET LIGHTING OF JUJA ESTATES IN THIKA MUNICIPALITY

TENDER NO. CGK/MAUD/KUSP/TKA/1-2/19/20

BID DOCUMENT

CLOSING DATE: 17th MARCH, 2020 AT 11:00 AM

**CHIEF OFFICER,
MUNICIPAL ADMINISTRATION & URBAN
DEVELOPMENT (MAUD)**

**COUNTY GOVERNMENT OF KIAMBU
P.O Box 2344-00900
KIAMBU, KENYA.**

**MUNICIPAL MANAGER,
THIKA MUNICIPALITY**

**P.O Box 240-01000
THIKA, KENYA.**

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SECTION 1: FORM OF BID

FORM OF BID

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

NAME OF CONTRACT: PROPOSED UPGRADING TO BITUMINOUS STANDARDS OF KILIMAMBOGO MAKUTANO TOWNSHIP ROADS AND STREET LIGHTING OF JUJA ESTATES IN THIKA MUNICIPALITY

TENDER NO: CGK/MAUD/KUSP/TKA/1-2/19/20

TO: Chief Officer,
Municipal Administration & Urban Development (MAUD)
County Government of Kiambu
P.O Box 2344-00900
KIAMBU, KENYA.

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 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 10% 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 (ATB)

APPENDIX TO FORM OF BID
(This appendix forms part of the bid)

CONDITIONS OF CONTRACT	CLAUSE	AMOUNT
Bid Security (Bank Guarantee Only)		2% of Bid Sum
Amount of Performance Security (Unconditional Bank Guarantee)	10.1	10 per cent of BID Sum in the form of Unconditional Bank Guarantee or cash retentions
Program to be submitted	14.1	Not later than 21 (twenty-one) days after issuance of Order to Commence
Cash flow estimate to be submitted	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 Contract sum
Period for commencement, from Engineer's order to commence	41.1	14 days
Time for completion	43.1	9 (Nine) months
Amount of liquidated damages	47.1	Kshs. 90,000.00 per day
Limit of liquidated damages	47.1	10% of Contract Value
Defects Liability period	49.1	6 (Six) Months
Percentage of Retention	60.3	10% of Interim Payment Certificate
Limit of Retention	60.3	5% of Contract Price
Minimum amount of interim payment certificates	60.2	Kshs.8,000,000
Time within which payment to be made after Interim Payment Certificate signed by Engineer	60.10	90 days
Time within which payment to be made after Final Payment Certificate signed by Engineer	60.10	90 days
Appointer of Arbitrator/Adjudicator	67.3	The Chartered Institute of Arbitrators (Kenya)
<p>Completed tender documents in plain sealed envelopes clearly marked with the relevant Tender Numbers should be dropped in the Tender box located outside room 15B at Thika Town Hall offices or Addressed to Chief Officer, Municipal Administration& Urban Development (MAUD) County Government of Kiambu P.O Box 2344-00900 <u>KIAMBU, KENYA.</u></p> <p>To reach the above mentioned on/or before 17th March,2020 at 11:00 AM, after which the tender documents Will be opened in the presence of the tenderers or their representatives who may choose to attend at the Thika Sub-County Chambers.</p> <p>The date for Pre-tender site visit shall be 3rd March,2020. The venue shall be Thika Sub-County Roads Offices next to Thika Fire Offices at 10:00 AM.</p>		

Notice to Employer and Engineer	68.2	<p>Chief Officer, Municipal Administration & Urban Development (MAUD) County Government of Kiambu P.O Box 2344-00900 <u>KIAMBU, KENYA.</u></p> <p>The Engineer's address is: Municipal Engineer (Civil Engineering Services) Thika Municipality P.O Box 240-01000 THIKA, KENYA.</p>
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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 and 70.4

Table A Approximate Weightings for Price Adjustment

<i>Description of Index</i>	<i>% Range of Weighting</i>
Fixed ("A")	8
Labour	8 – 12
Fuels and Lubricants	12 – 22
Equipment and Spares	35 – 40
Cement	8 – 12
Reinforcement and Steel products	1 – 3
Explosives	1 – 5
Bitumen and Bituminous products	15 - 25
Total	100

NOTE: ^aDenotes 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: Local Currency

<i>Index Code</i>	<i>Index Description</i>	<i>Source of Index</i>	<i>Base value and date</i>	<i>Bidder's related currency amount</i>	<i>Bidder's proposed weighting</i>
	Non-adjustable	Kenya National Bureau of Statistics	_____	_____	A: _____ b: _____ c: _____ d: _____ e: _____
			Total		1.00

Signature of Bidder.....Date

SECTION 3: FORM OF BID SECURITY.

FORM OF BID SECURITY

BID BANK GUARANTEE

(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 **PROPOSED UPGRADING TO BITUMINOUS STANDARDS OF KILIMAMBOGO MAKUTANO TOWNSHIP ROADS AND STREET LIGHTING OF JUJA ESTATES IN THIKA MUNICIPALITY**, 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 **Chief Officer, Municipal Administration & Urban Development (MAUD)** (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 thisday of20.....

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 twenty-eight (28) 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

..... DATE

NAME OF SIGNATORY

.....

TITLE OF SIGNATORY

NAME OF THE WITNESS

SIGNATURE OF THE WITNESS DATE

ADDRESS OF THE WITNESS

SECTION 4: INSTRUCTIONS TO BIDDERS

SECTION 4: INSTRUCTIONS TO BIDDERS

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CONDITIONS OF BID AND INSTRUCTIONS TO BIDDERS

A. GENERAL

1 SCOPE OF BID

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 102 of the Special Specifications – “Location and extent of the Works”

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.

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

The source of funding is World Bank (WB) Through Kenya Urban Support Programme (KUSP)

3 CORRUPT PRACTICES

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;

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

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

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

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 NCA as a Contractor is mandatory.

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.

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.

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

5 QUALIFICATION OF THE BIDDER

Bidders shall as part of their bid:

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

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

1. evidence of access to lines of credit and availability of other financial resources
2. financial predictions for the current year and the two subsequent years, including the effect of known commitments
3. work commitments
4. current litigation information; and
5. availability of critical equipment

Bidders shall also submit proposals of work methods and schedule in sufficient detail to demonstrate the adequacy of the bidders' proposals to meet the technical specifications and the completion time referred to in Clause 0 above.

6 ONE BID PER BIDDER

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

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.

8 SITE VISIT

The bidder is informed that pre-BID 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 costs of visiting the site shall be at the bidder's own expense.

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.

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.

B. BIDDING DOCUMENTS

9 CONTENTS OF BIDDING DOCUMENTS

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

- Invitation to Bid
- Instructions to bidders
- Qualification Criteria
- Conditions of Contract - Part II
- Conditions of Contract - Part I
- Standard Specifications
- Special Specifications
- Form of Bid, Appendix to Form of Bid and Bid Security
- Bills of Quantities
- Schedules of Supplementary information
- Form of Contract Agreement
- Form of Performance Security
- Drawings
- BID addenda (BID notices)

The bidder is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the bidding documents. Failure to comply with the requirements of bid submission will be at the bidder's own risk. Bids that are not substantially responsive to the requirements of the bidding documents will be rejected.

10 CLARIFICATION OF BIDDING DOCUMENTS

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.

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

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.

The Addendum thus issued shall be part of the bidding documents pursuant to Sub-Clause 0 and shall be communicated in writing or cable to all purchasers of the bidding documents. Prospective bidders shall promptly acknowledge receipt of each Addendum in writing or by cable to the Employer.

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 22.

C. PREPARATION OF BIDS

12 LANGUAGE OF BID

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

The bid to be prepared by the bidder shall comprise:

- Duly filled-in the Form of Bid and Appendix to form of bid;
- Bid security;
- Priced Bills of Quantities;
- Schedules of information
- Qualification Criteria

Any other materials required to be completed and submitted in accordance with the Instructions to Bidders embodied in these bidding documents.

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

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

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.

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.

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.

15 CURRENCIES OF BID AND PAYMENT

Bids shall be priced in Kenya Shillings.

16 BID VALIDITY

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.

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

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

The bid security shall be in the form of unconditional bank guarantee from a reputable bank selected by the bidder and located in Kenya. 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 28 days beyond the original validity period for the bid, and beyond any period of extension subsequently requested under Sub-Clause 0.

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

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.

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

The bid security may be forfeited:

if a bidder withdraws his bid, except as provided in Sub-Clause 0.

or

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

- (i) sign the Contract Agreement or
- (ii) furnish the necessary performance security

18 NO ALTERNATIVE OFFERS

The bidder shall submit one offer, which complies fully with the requirements of the bidding documents.

The bid submitted shall be solely on behalf of the bidder. A bidder who submits or participates in more than one bid will be disqualified.

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.

19 PRE-BID MEETING

The bidders designated representative and who must be one of the technical persons listed as a key staff in the Schedule No 6 is invited to attend a pre-bid meeting, which will take place at the **venue and time indicated in the invitation to Bid**. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

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.

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

The bidder shall prepare one 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 copies of the bid clearly marked "COPIES". In the event of discrepancy between them, the original shall prevail.

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 0. The person or persons signing the bid shall initial all pages of the bid where entries or amendments have been made.

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.

D. SUBMISSION OF BIDS

21 SEALING AND MARKING OF BIDS

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.

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 0, 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.

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. If the outer envelope discloses the bidder's identity the Employer will not guarantee the anonymity of the bid submission, but this shall not constitute grounds for rejection of the bid.

22 DEADLINE FOR SUBMISSION OF BIDS

Bids must be received by the Employer at the address specified in Sub Clause 0 not later than **the time and date indicated in the invitation to bid.**

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

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

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.

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.

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

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 0.

E. BID OPENING AND EVALUATION

25 BID OPENING

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, **at the time, date and location indicated in the Invitation to Bid.** The bidders' representatives who are present shall sign a register evidencing their attendance.

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.

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.

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

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

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

To assist in the examination, evaluation, and comparison of bids, the Employer may, at its discretion, ask any bidder for clarification of its 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.

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.

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

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.

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.

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

No Correction Of Errors

30 EVALUATION AND COMPARISON OF BIDS

The Employer will then evaluate and compare only the bids determined to be substantially responsive in accordance with Clauses 27 and 28. Any variation, deviation and alternative offers will be rejected and shall not be taken into account in bid evaluation.

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 PREFERENCE FOR DOMESTIC BIDDERS

This will be applicable for this bid.

F. AWARD OF CONTRACT

31 AWARD

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.

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

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.

33 NOTIFICATION OF AWARD

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").

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.

34 SIGNING OF AGREEMENT

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.

After 21 days of receipt of the Agreement, the successful bidder shall sign the Form of Agreement and return it to the Employer, together with the required performance security.

35 PERFORMANCE SECURITY

After 21 days of receipt of the Letter of Acceptance from the Employer, the successful bidder shall furnish to the Employer a performance security in the form stipulated in the Conditions of contract. The form of performance security provided in Section 8 of the bidding documents shall be used.

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

Failure by the successful Bidder to lodge the required Performance Guarantee within 60 days of the receipt of the Letter of Acceptance shall constitute sufficient grounds for the annulment of the Award and forfeiture of the Bid Surety; in which event the Employer may make the award to another bidder or call for new bids.

36 CONTRACT EFFECTIVENESS

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

37 BID QUESTIONNAIRE

Please fill in block letters

Name of Contract: **PROPOSED UPGRADING TO BITUMINOUS STANDARDS OF KILIMAMBOGO MAKUTANO TOWNSHIP ROADS AND STREET LIGHTING OF JUJA ESTATES IN THIKA MUNICIPALITY**

TENDER NO: CGK/MAUD/KUSP/TKA/1-2/19/20

Full name of Bidder

.....

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

.....

Telephone number(s) of Bidder

Fax number(s) of Bidder

Name of Bidder's representative to be contacted on the matter of the BID during the BID period.

.....

Detail of Bidder's nominated agent (if any) to receive BID Notices. This is essential if Bidder does not have his registered address in Kenya (name, address, telephone and telex).

.....

.....

.....

.....

Date

.....

Signature of Bidder

Make copy and deliver to:

COUNTY GOVERNMENT OF KIAMBU
P.O Box 2344-00900
KIAMBU, KENYA.

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.

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Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
1. Eligibility							
1.1	Eligibility	Nationality in accordance with Sub-Clause 4.1.	Must meet requirement	Existing or intended JV must meet requirement	Must meet requirement	N / A	Section 7, Schedule 1
1.2	Conflict of Interest	No conflicts of interest in Sub-Clause 4.2.	Must meet requirement	Existing or intended JV must meet requirement	Must meet requirement	N / A	Section 7, Schedule 1
1.3	Employer Ineligibility	Not having been declared ineligible by the Employer, as described in Sub-Clause 4.3.	Must meet requirement	Existing JV must meet requirement	Must meet requirement	N / A	Section 7, Schedule 1
1.4	Incorporation & Registration	Pursuant to subclause 4.1 the following shall be provided; - Certified Copy of Certificate of incorporation to show that the applicant is a registered company and legally authorised to do business in Kenya - Proof of registration with the NCA Category NCA 5 and above for	Must meet requirement	Must meet requirement	Must meet requirement	N/A	Section 7, Schedule 1

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
		Road Works and NCA 6 and above for Electrical Works -ERC/EPRA license Minimum T1 and C2 For Electrical Works					

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
2. Historical Contract Non-Performance							
2.1	History of Non-Performing Contracts	Non-performance\ of a contract did not occur within the last five (5) 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 7, Schedule 7
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.	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 7, Schedule 10

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
3. Financial Situation							
3.1	Financial Performance	Submission of audited balance sheets or if not required by the law of the applicant's country, other financial statements acceptable to the Employer, for the last five [5] years to demonstrate: (a) the current soundness of the applicant's financial position and its prospective long-term profitability, and (b) capacity to have a cash flow amount of min Kshs 50 Million equivalent working capital	Must meet requirement (a) Must meet requirement (b) Must meet requirement	N / A (a) N / A (b) Must meet requirement	Must meet requirement (a) Must meet requirement (b) N / A	N / A (a)N / A (b) N / A	Section 7, Schedule 9
3.2	Average Annual Construction Turnover	Minimum average annual construction turnover of Kshs. 200 Million [Two Hundred million], calculated as total certified payments received for contracts in progress or completed, within the last three [(3)] years	Must meet requirement	Must meet requirement	Must meet ((100-50)/(n-1)) % of the requirement where n= number of joint venture members	Must meet fifty (50%) percent of the of the requirement	Section 7, Schedule 9

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
4. Experience							
4.1	General Construction Experience	Experience under construction contracts in the role of contractor, subcontractor, or management contractor for at least the last Seven [7] years prior to the applications submission deadline	Must meet requirement	N / A	Must meet requirement	N / A	Section 7, Schedule 7
4.2 (a)	Specific Construction Experience	Participation as contractor, management contractor or subcontractor, in at least two (2) contracts within the last five (5) years, each with a value of at least Kshs. 100 Million (One hundred 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	Must meet requirement	Must meet requirement	N / A	Must meet requirement for one contract	Section 7, Schedule 7

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
		described in Section 6, Scope of Works					
4.2 (b)		b) For the above or other contracts executed during the period stipulated in 4.2(a) above, a minimum construction experience in at least one (1) of: <ul style="list-style-type: none"> - Repair & Re-seal Projects - Repair & rehabilitation of bitumen roads. - New Construction to bitumen standards. 	Must meet requirements	Must meet requirement	N / A	Must meet requirement	Section 7, Schedule 7

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
4.3	Work Methodology	Submission of a brief work methodology in accordance with subclause 5.3	Should demonstrate understanding of the scope of works and other general requirements	Should demonstrate understanding of the scope of works and other general requirements	N/A	N/A	Section 7, Schedule 11
5. Current Commitments							
6. Site Staff							
	Site Agent	The site staff shall possess minimum levels set below; Qualification = BSc. Civil Eng. (Reg. Eng.) General Experience = 10 yrs. Specific Experience = 8 Yrs.	Must meet requirements	Must meet requirements	N/A	N/A	Section 7, Schedule 5
	Dep. Site Agent/ Site Engineer	Qualification = BSc. Electrical Eng. General Experience = 5yrs.					
	Snr Foreman(electrical)						

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
	Senior Foreman (Road works)	B. Tech Electrical Engineering Specific Experience = 5 Yrs.					
	Deputy Foreman (Electrical)	Specific Experience = 5 Yrs. Qualification = H.N.D. Civil Eng. General Experience = 7 yrs. Specific Experience = 5 Yrs.					
	Site Surveyor	Qualification = Diploma Electrical Engineering general experience=5 years specific experience=3 years					
		Qualification = Diploma. Survey General Experience = 7 yrs.					

Qualification Criteria		Compliance Requirements			Documentation		
No.	Subject	Requirement	Single Entity	Joint Venture			Submission Requirements
				All Parties Combined	Each Party	One Party	
	Foremen (Road Works)	Specific Experience = 5 Yrs.					
	Safety Officer	Qualification = Dip. Civil Eng. General Experience = 6 yrs. Specific Experience = 4 Yrs.					
	Sociologist	Qualification = Certificate in Safety General Experience= 3yrs					
	Environmental Officer	Qualification = Diploma in Sociology or relevant Field General Experience=3yrs					
		Qualification = Bachelor's degree in Environmental Sciences or Relevant Field General Experience=3yrs					

7 Schedules 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 of 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	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
1	General Plants Primary/Secondary Crusher Unit/Power Screen Min capacity – 60t/hr. Concrete batching plant Min Cap 20 m ³ /hr Asphalt Concrete batching plant				
2	Bituminous Plants Bitumen Pressure distributor Asphalt concrete paver	1 1			
3	Compactors Vibrating compaction plate 300 mm wide Vibrating compaction plate 600 mm wide	1 1			
4	Mobile Compressors Single tool (1.8 m ³ /min) Two tool (2.8 – 7.3 m ³ /min) Four tool (11.3 – 25.3 m ³ /min) Medium rock drill (1.5 m ³ /min) Heavy rock drill (2.4 m ³ /min)	1 1 1 1			

Item No.	Equipment Details	Minimum Number Required for the Contract Execution	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
5	Concrete Equipment				
	Mobile concrete mixers	2			
	Truck mounted mixers	Optional			
6	Concrete vibrators	2			
	Transport (Tippers, dumpers, water tankers)				
	4X2 tippers payload 7 – 12 tonnes	5			
	6X4 tippers payload 16 – 20 tonnes	3			
	8X4 tippers payload 16 – 20 tonnes	4			
	Articulated trailers	2			
	Dump trucks	5			
	Flatbed lorries	1			
	Water tankers (18,000 – 20,000 lts. capacity)	2			
7	Earth – Moving Equipment				
	Tractor dozers with dozer attachment (D6-D9 equivalent)	2			
	Tractor loaders	Optional			
	Wheeled loaders	3			
	Motor scrapers	Optional			
	Motor graders (93 - 205kW)	2			
	Trench excavator	2			

Item No.	Equipment Details	Minimum Number Required for the Contract Execution	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
8	<p>Diesel Generators</p> <p>Diesel generators (15 – 200Kva)</p>	1			
9	<p>Excavators</p> <p>Hydraulic crawler mounted (7 – 10 tonnes) – 0.25 – 0.4 m3 SAE bucket.</p> <p>Hydraulic crawler mounted (10 – 16 tonnes) – 0.40 – 0.60 m3 SAE bucket.</p> <p>Hydraulic wheel mounted (7 – 10 tonnes) – 0.25 – 0.4 m3 SAE bucket.</p> <p>Hydraulic wheel mounted (10 – 16 tonnes) – 0.40 – 0.6 m3 SAE bucket.</p> <p>Hydraulic wheel mounted back loader (7 – 10 tonnes) – 0.25 – 0.4 m3 SAE bucket.</p>	1 1 1 1 1			
10	<p>Rollers</p> <p>Self-propelled single drum vibrating (various types)</p> <p>Pneumatic rubber tyre (1-2 tonnes/wheel)</p> <p>Sheep’s foot roller</p> <p>Double drum vibrating pedestrian rollers</p>	2 1 1 2			
11	<p>Electrical Equipment</p> <p>Man lift (bucket carrier vehicle)</p> <p>climbing clamps</p> <p>Clamp meter</p>	1 2 1			

Item No.	Equipment Details	Minimum Number Required for the Contract Execution	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
	Truck mounted with Crane	1			
	Pickup	1			
	Complete Solar Kit	1			
	Insulation resistance tester	1			
	Multimeter	1			
	Lux meter	1			
	Impedance tester	1			

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.

.....
(Signature of Contractor)

.....
(Date)

EVALUATION CRITERIA

Three stages will be considered;

Stage 1: Mandatory Requirements

No.	Requirement	Responsive Or Non Responsive
1	Attach a copy of KRA PIN certificate (confirmable)	
2	Attach a copy of valid tax compliance certificate (confirmable)	
3	Attach a copy of certificate of incorporation/ certificate of business name registration	
4	Attach a copy of current CR12/ 13 for the last 6 months (No more than one company with the same director/directors will be accepted. Breach of this leads to automatic disqualification.)	
5	Attach valid single business permit/trading license	
6	Attach a copy of current registration certificate with NCA 4,3,2, and 1 in Road works (confirmable)	
7	Valid NCA Registration certificate (NCA 6,5,4,3,2, and 1 for Electrical Works) (confirmable)	
8	Valid EPRA Registration Certificate minimum C2 for the firm (Confirmable and Certified by Commissioner of Oaths)	
9	At least one staff member with valid ERC/EPRA license Minimum T1 and C2. (Confirmable and Certified by Commissioner of Oaths)	
10	Valid Registration Certificate with EPRA as a Solar PV Contractor. (Confirmable and Certified by Commissioner of Oaths)	
11	Attach current NSSF and NHIF certificate	
12	Attach a copy of litigation history of the company authored by commissioner of oaths	
13	Attach duly signed and stamped pretender site visit certificate by the Municipal Engineer	
14	Attach 2% Valid bid bond in form of a bank guarantee valid for 120 days (confirmable)	
15	Attach duly filled confidential business questionnaire/S33	
16	Duly filled and signed form of tender	
17	Attach valid DOSH certification evidence for ongoing or complete projects (payment receipts will be admissible)	
18	One (1) ORIGINAL and a COPY of the original properly bound document and MUST be paginated/pages be sequentially numbered. In case of any conflict between original and copy, original will prevail.	
19	A copy of the signed Joint Venture/Consortium Agreement where applicable	

Please note the following;

- **Items 3, 4, 5,11,17 and 19 above must be certified by a commissioner of oaths**
- **For a Joint venture/consortium partners: All partners shall individually provide item 1-5 above**
- **Items 1-18 above is mandatory to the individual firms**
- **Item 18 only one submission is required for the Joint Venture/ Consortium**
- **Item 19 introduces the Joint Venture/Consortium**
- **In the Joint Venture/Consortium at least one of the partners SHALL satisfy items 6-18 as applicable based on their specialization**
- **Item 19 above is mandatory for the Joint Venture or consortium partners**

BIDDERS WHO FAIL TO MEET THE MANDATORY REQUIREMENTS SHALL NOT PROCEED TO THE NEXT STAGE.

Stage 2: Technical Evaluation

SECTION 2A: TECHNICAL EVALUATION (80 MARKS)			
No.	Parameter	Maximum Score	Award
1	Relevant Experience	20	
A	Experience as prime contractor in the Construction of at least two (2) projects of similar nature and complexity funded by the World Bank.		
	a) Completion certificates (2 no. each 6 marks)	12	
B	Details of Electrical works of similar magnitude and complexity for the last five (5) years with completion Certificates successfully undertaken or proof of work done. Each project completed successfully (1 mark) <i>Attach three (3) completion certificates from public entities/county government/ central government.</i>	3	
	Details of solar works of similar magnitude and complexity for the last five (5) years with completion certificates of work Successfully undertaken. Each project completed successfully (1 mark) <i>Attach 5 completion certificate from public entities/County government/ central government.</i>	5	
2	Key Equipment	25	
	a) Bitumen Pressure distributor/hand pump sprayer (1 mark)	1	
	b) Asphalt concrete paver (1 mark)	1	
	c) Self-propelled single drum vibrating (various types) (1mark)	1	
	d) Pneumatic rubber tyre (1-2 tonnes/wheel) (1 mark)	1	
	e) Sheep's foot roller (1 mark)	1	
	f) Double drum vibrating pedestrian roller (1 mark)	1	
	g) Tandem Roller(double drum) (1 mark)	1	
	h) Excavator(crawler tracked) (1 mark)	1	
	i) Trench excavator(backhoe) (1 mark)	1	
	j) Motor grader (93 - 205kW) (1 mark)	1	
	k) Water tankers (18,000 – 20,000 lts. capacity) (1 mark)	1	
	l) Tippers (16 – 20 tonnes) (1 mark)	1	
	m) Vibrating compaction plate 600 mm wide (1 mark)	1	
	n) Mobile concrete mixers (1 mark)	1	
	o) Concrete vibrators (1 mark)	1	
	p) Man lift (bucket carrier vehicle) (1mark)	1	

	q) climbing clamps-2pairs (1mark)	1	
	r) Clamp meter (1 mark)	1	
	s) Truck mounted with Crane (1 mark)	1	
	t) Pickup (1 mark)	1	
	u) Complete Solar Kit (1 mark)	1	
	v) Insulation resistance tester (1mark)	1	
	w) Multimeter (1 mark)	1	
	x) Lux meter (1mark)	1	
	y) Impedance tester (1 mark)	1	
	NB-Proof of ownership must be provided i.e. logbooks and serial numbers. No hiring/leasing will be accepted. <i>Give location and proof of availability of the equipment for view.</i>		
3	Key Personnel attach academic certificates, curriculum vitae and Letter from employer / commissioner of oaths showing proof of the years experienced. <i>Attach letter of employment and a proof of current presence in the company.</i>	30	
	a) Site Agent- BSc. Civil Engineering with 10 years general experience and 8 years specific experience (4 marks)	4	
	b) Site Engineer- BSc. Electrical Engineering with 8 years general experience and 5 years specific experience (4 marks)	4	
	c) Senior Foreman- HND Civil Engineering with 7 years general experience and 5 years specific experience (3 marks)	3	
	d) Deputy site Agent-Diploma in Electrical Engineering with 5 years Specific Experience.(3marks)	3	
	e) Site Surveyor- HND Survey with 7 years general experience and 5 years specific experience (3 marks)	3	
	f) Foreman- Diploma Civil Engineering 6 years general experience and 4 years specific experience (3 marks)	3	
	g) Foreman- Diploma Electrical Engineering 5 years general experience and 3 years specific experience (3 marks)	3	
	h) Health and Safety Officer (diploma/certificate as applicable)- with 3 years general experience (3 marks)	3	
	i) Environment officer- Degree in Environmental Sciences/relevant field- with 3 years general experience (2 marks)	2	
	j) Sociologist (diploma in sociology/community development- with 3 years general experience (2 marks)	2	
4	Work Methodology	2	
	Proposed program (Work methodology and schedule for all		

	works) (2marks)		
5	Preference of Works	3	
	Local Preference (For bidders with valid Business Permit from Kiambu County). <i>Attach a valid Business Permit</i> (3 marks)		
	Total B	80	
SECTION 2C: TECHNICAL EVALUATION FINANCIAL			
1	Financial Capacity <i>Must have handled a project of at least equivalent amount. (For the joint Venture/Consortium, only one submission is required)</i>	20	
	a) Audited Accounts- financial capability of the firm based on information provided in the last 3 years audited account (2 mark for each year audited i.e. 3 marks total)	3	
	b) Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$ A ratio of 1 and above (3 marks)	3	
	c) Bank's letter of credit worthiness for an amount of at least 20% of the tendered sum- verifiable (8 marks)	8	
	d) Annual turnover in the last 2 years shall be: over Ksh 100 million (3 marks)	3	
	e) Bank statements (last six months to 31 th January 2020) <i>The statement must be genuine.</i> (3 marks)	3	
	TOTAL C	20	
	TOTAL (A+B+C)	100	

- **Only bidders who score a minimum of 70% of the technical score (A+B+C) above shall be evaluated in stage 3.**

Stage 3: RECOMMENDATION

To consider for award the lowest responsive evaluated bidder shall be the one who satisfies section 86 sub section 1 item (a) of the Public Procurement and Assets Disposal Act 2015 which states:

86. (1) The successful tender shall be the one who meets any one of the following as specified in the tender document

(a) The tender with the lowest evaluated price;

This must be read in the full understanding of section 79 sub section 1 which states:

79. (1) A tender is responsive if it conforms to all the eligibility and other mandatory requirements in the tender documents.

NB: The procuring entity will conduct due diligence to verify information submitted by the bidders. Any form of mis-information shall be interpreted as conjecture and will lead to automatic non responsiveness of the bid.

SECTION 6: CONDITIONS OF CONTRACT

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

The Conditions Of Contract Part 1 – General Conditions, shall be those forming Part 1 of the Conditions of Contract for works of Civil Engineering Construction Fourth Edition 1987, reprinted in 1992 with further amendments, prepared by the Federation Internationale des Ingenieurs Conseils (FIDIC)

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

FIDIC Secretariat
P.O.Box 86
1000 Lausanne 12

Switzerland

Fax: 41 21 653 5432

Telephone: 41 21 653 5003

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

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

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CONDITIONS OF CONTRACT PART II (CONDITIONS OF PARTICULAR APPLICATION)

SUBCLAUSE 1.1 – DEFINITIONS

Amend this sub-clause as follows:

- (a) (i) The “Employer” is the County Government of Kiambu represented by the Chief Officer -Municipal Administration and Urban Development (MAUD)
- (iv) The “Engineer” is the Municipal Roads Engineer, Thika Municipality.
- (b) (i) Insert in line 2 after the “Bills Of Quantities”, the following, “the rates entered by the Contractor (whether or not such rate be employed in computation of the Contract Price),”

Amend subparagraph (b) (v) of Subclause 1.1 by adding the following words at the end:

The word “BID” is synonymous with “bid” and the word “Appendix to BID” with “Appendix to Bid” and the word “BID documents” with “bidding documents”.

Add the following at the end of this subclause:

- (h) (i) “Materials” means materials and other things intended to form or forming part of the Permanent Works.

SUBCLAUSE 2.1 - ENGINEER’S DUTIES AND AUTHORITY.

With reference to Sub Clause 2.1 (b), the following shall also apply: The Engineer shall obtain the specific approval of the Employer before taking any of the following actions specified in Part 1:

- (a) Consenting to the subletting 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 51;
- (e) Fixing rates or prices under Clause 52

SUBCLAUSE 5.1 - LANGUAGE AND LAW

The Contract document shall be drawn up in the ENGLISH LANGUAGE. Communication between the Contractor and the Engineer’s Representative shall be in this given language.

The Laws applicable to this Contract shall be the Laws of the Republic of Kenya.

SUBCLAUSE 5.2 – PRIORITY OF CONTRACT DOCUMENTS

Delete the documents listed 1-6 and substitute:

- (1) The Contract Agreement (if completed)
- (2) The Letter Of Acceptance;
- (3) The Bid and Appendix to Bid;
- (4) The Conditions of Contract Part II;
- (5) The Conditions of Contract Part I;
- (6) The Special Specifications;
- (7) The Standard Specification for Road and Bridge Construction, 1986;

- (8) The Drawings;
- (9) The priced Bills of Quantities
- (10) Other documents as listed in the Appendix to form of Bid

SUB-CLAUSE 6.3 DISRUPTION OF PROGRESS

Add to Sub-Clause 6.3, the following:

“The Contractor shall give 2 weeks' notice in writing to the Engineer or the Engineer's Representative of any further drawings or specifications that may be required for the execution of the Works or otherwise under the Contract.”

SUB-CLAUSE 6.6 AS BUILT DRAWINGS

On Completion of the works, the Contractor shall arrange to furnish to the Employer at his own cost two (2) bound sets of all ‘As Constructed’ drawings (in scale of 1:2000 Horizontal to 1: 200 Vertical) for every component of the Work, such copies being on polyester film and a digitized copy of the drawings in a compact disc of format to be approved by the Engineer or his Representative. The Taking-Over Certificate of the works, whole or parts, as per the provisions of Clause 48.1 and 48.2 hereof shall not be issued by the Engineer in the event of the Contractor’s failure to furnish the aforesaid drawings for the entire Works.

SUB-CLAUSE 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.

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

SUB-CLAUSE 6.8 SUFFICIENCY OF DRAWINGS AND SPECIFICATIONS

The Drawings and Specifications included in the Contract are believed to be full and sufficient to enable the Contractor to carry out the work required by the Contract. Should the Contractor discover any error, omission, fault and other defect or deficiency in the Drawings and Specifications he shall promptly notify the Engineer's Representative of the same and the error, omission, fault, defect or deficiency will be rectified by the Engineer.

No payment will be made to the Contractor for undertaking any kind of design work other than that specifically required by the terms of the Contract. Payment for design work 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

SUB-CLAUSE 7.4 APPROVAL OF DRAWINGS NOT TO ABSOLVE THE CONTRACTOR

Non-examination by the Engineer of any document submitted by the Contractor of the Temporary Works nor the approval expressed by the Engineer in regard thereto either with or without modifications SHALL NOT absolve the Contractor from any liability imposed upon him by any provision of the Contract.

SUB-CLAUSE 7.5 APPROVED DRAWINGS TO BE MODIFIED

Should it be found at any time after approval has been given by the Engineer to any drawings submitted by the Contractor that the said drawings do not comply with the terms and conditions of the Contract, or that the details do not agree with any drawings submitted previously, such alterations and additions as may be deemed necessary by the Engineer shall be made therein by the Contractor and the work carried out accordingly without extra payment to the Contractor thereof.

SUB-CLAUSE 7.6 SIZE OF DRAWINGS

All drawings submitted by the Contractor shall for convenience in filing be as far as possible of a uniform size being not more than 101 cm x 68 cm overall (A1-size). All drawings shall be numbered and dated.

SUB-CLAUSE 8.1 CONTRACTOR'S GENERAL RESPONSIBILITIES

Add to Sub-Clause 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 supervisory personnel. The Contractor shall maintain this office throughout the Contract period. All correspondence sent to this office shall be deemed to have been sent to the Contractor's legal domicile.
- (b) A foreign Contractor or a Kenyan-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.

SUBCLAUSE 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 within 60 days after receipt of the Letter of Acceptance. The Performance Security shall be in the form of a bank guarantee as stipulated by the Employer in the Appendix to Bid. *The Performance Security shall be issued by a bank incorporated in Kenya.* The Contractor shall notify the Engineer when providing the Performance Security to the Employer.

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, the Contractor, at the Engineers written request, shall promptly increase the value of the Performance Security by an equal percentage.”

SUBCLAUSE 10.2 - VALIDITY OF PERFORMANCE SECURITY

The Performance Security shall be valid until a date 28 days after the date of issue of the Substantial Completion Certificate. The security shall be returned to the Contractor within 14 days of expiration.

SUBCLAUSE 10.3- CLAIMS UNDER PERFORMANCE SECURITY

Delete the entire sub-clause 10.3.

SUBCLAUSE 10.4- COST OF PERFORMANCE SECURITY

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

SUBCLAUSE 11.1- INSPECTION OF SITE

In line 17 after “affect his BID” add

“and the Contractor shall be deemed to have based his BID on all the aforementioned”

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.

SUBCLAUSE 11.2 - ACCESS TO DATA

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

SUBCLAUSE 14.1 PROGRAM TO BE SUBMITTED

The time within which the program shall be submitted shall be as specified in the Appendix to the Form of Bid.

This detailed program shall be based upon the program submitted by the Contractor as part of his BID, where this was required, and shall in no material manner deviate from the said program.

The program shall be in the form of a Critical Path Method Network (CPM Network) showing the order of procedure and a description of the construction methods and arrangements by which the Contractor proposes to carry out the works. It should also be supplemented by a time –bar chart of the same program. The program shall be coordinated with climatic, groundwater and other conditions to provide for completion of the works in the order and by the time specified. The program shall be revised at three-month intervals and should include a chart of the principle quantities of work forecast for execution monthly.

The Contractor shall submit to the Engineer not later than the day or date mentioned in the Appendix to the Form of Bid, a general description of his proposed arrangements and methods for the execution of the Works, including temporary offices, buildings, access roads, construction plant and its intended production output, working shift arrangements, labour strength, skilled and unskilled, supervision arrangements, power supply arrangements, supply of materials including a materials utilization program, stone crushing, aggregate production and storage, cement handling, concrete mixing and handling, methods of excavation, dealing with water, testing methods and facilities.

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

If details of the Contractors proposals for Temporary Works are required by the Engineer for his own information the Contractor shall submit such details 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 as will achieve a continuous and consecutive output of fully completed road works inclusive of all bridge works and culverts within the time limits specified in the Contract. Generally, the Contractor shall start at one end of the road and progress continuously towards the other without leaving any isolated section or sections of uncompleted road provided always that the site of the works has been acquired in its entirety and the encumbrances and services thereon removed.

The Contractor shall allow in his programme for the following public holidays per calendar year during 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
- Moi Day (10th October)
- Mashujaa Day (20th October)
- Jamhuri day (12th December)
- Christmas Day (25th December)
- Boxing day (26th December)

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

SUBCLAUSE 14.3- CASH FLOW ESTIMATE

The time within which the detailed cash flow estimate shall be submitted shall be as specified in the Appendix to the Form of Bid.

SUBCLAUSE 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.”

Add the following Sub-clause 15.2

SUBCLAUSE 15.2 - LANGUAGE ABILITY AND QUALIFICATIONS OF CONTRACTOR’S AUTHORISED AGENT

The Contractor’s Agent or Representative on the site shall be a Registered Engineer as 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 and write English fluently.

The Contractor’s Agent or Representative shall have at least 10 years relevant experience as an Engineer.

SUBCLAUSE 16.2- ENGINEER AT LIBERTY TO OBJECT

At the end of this Clause add

“by a competent substitute approved by the Engineer and at the Contractors own expense.”

Add the following Sub-Clauses 16.3 and 16.4:

SUBCLAUSE 16.3- QUALIFICATION AND LANGUAGE ABILITY OF SUPERINTENDING STAFF

The Contractor’s superintending staff shall meet the following minimum qualifications:

- (a). Should have a working knowledge of English or Kiswahili. Should any of the superintending staff not be able to meet this condition, the Contractor shall propose to the Engineer arrangements for provision of a sufficient number of interpreters of approved qualifications. The Engineer, at his discretion, may amend, approve or reject such arrangements or reject deployment of superintending staff not meeting the language requirements. The Engineer may at any time during the duration of the Contract amend any approved arrangements made for interpreters, which shall be implemented at the Contractors expense.
- (b) The key staff listed below must have academic qualifications from Government recognised institutions or equivalent institutions of the levels set out in Section 5, Part 6 and as below.
 - (c) Site Agent: BSc. Civil Eng. and Registered with Engineers Board of Kenya
 - (d) Deputy Site Agent: BSc. Civil Eng.
 - (e) Site Engineer: BSc. Civil Eng.
 - (f) Senior Foreman: Higher National Diploma – Civil Engineering
 - (g) Senior Foreman: Senior Foreman B.Tech. Electrical Engineering
 - (h) Site Surveyor: Diploma – Surveying
 - (i) Foremen: Ordinary National Diploma – Civil Engineering
 - (j) Foreman: Diploma -Electrical Engineering.
 - (k) Safety Officer Certificate in Safety/Occupational Health
 - (l) Sociologist Diploma in Sociology or related Field
 - (m) Environmental Officer Bachelor’s degree in Environmental Sciences or related Field

(n) The key staff listed below must have minimum experience set out in Section 5, Part 6 and as below:

- Site Agent: 10 years
- Deputy Site Agent: 8 years
- Site Engineer: 8 years
- Senior Foreman: 7 years
- Electrical 5 Years
- Site Surveyor: 7 years
- Foremen: 6 years
- Electrical 6 years
- Safety Officer 3 years
- Sociologist 3 years
- Environmental Officer 3 years

(o) Qualifications as above shall be subject to verification and approval on site by the Engineer or his representative on site before commencement of the said works.

SUBCLAUSE 16.4 – EMPLOYMENT OF LOCAL PERSONNEL

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

SUBCLAUSE 19.1- SAFETY, SECURITY AND PROTECTION OF THE ENVIRONMENT

Add Sub-Clause-paragraph (d) of Sub-Clause 19 as follows:

Notwithstanding the Contractor's obligation under Sub-Clause-paragraph (a), (b) and 9(c) of Sub-Clause 19.1 of the Conditions of Contract, the Contractor shall observe the following measures with a view to reducing or elimination of adverse environmental effects by the site works:

- (i) All quarries and borrow pits shall be filled and landscaped after extraction of construction material to the satisfaction of the Engineer and the National Environmental Management Authority
- (ii) Soil erosion due to surface runoff or water from culverts or other drainage structures should be avoided by putting in place proper erosion control measures that shall include, but are not limited to grassing and planting of trees
- (iii) Long traffic diversion roads shall be avoided so as to minimize the effect of dust on the surrounding environment. In any case all diversions shall be kept damp and dust free
- (iv) Spillage of oils, fuels and lubricants shall be avoided and if spilt, shall be collected and disposed off in such a way as not to adversely affect the environment
- (v) Rock blasting near settlement areas shall be properly coordinated with the relevant officers of the Government so as to minimize noise pollution and community interference.

SUBCLAUSE 20.4 – EMPLOYER'S RISKS

The Employer's risks are: -

- (a) Insofar as they directly affect the execution of the Works in the country 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, military or usurped power, or civil war,
 - (iii) ionizing 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 traveling 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;
- (b) 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
- (c) any operation of the forces of nature (insofar as it occurs on the Site) that 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:
 - A. Prevent loss or damage to physical property from occurring by taking appropriate measures, or
 - B. Insure against such loss or damage.

SUBCLAUSE 21.1 - INSURANCE OF WORKS AND CONTRACTOR 'S EQUIPMENT

Add the following words at the end of Sub-paragraph (a) and immediately before the last word of Sub-paragraph (b) of Sub-Clause 21.1:

“It being understood that such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred”

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:”

SUBCLAUSE 21.2 – SCOPE OF COVER

Amend sub-paragraph (a) of Sub-Clause 21.2 as follows:

Delete words “from the start of work at the site” and substitute the words “from the first working day after the Commencement Date”

Add the following as Sub-Clause (c) under Sub-Clause-Clause 21.2

- (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.

SUBCLAUSE 21.4 - EXCLUSIONS

Amend Sub-Clause 21.4 to read as follows:

“There shall be no obligation for the insurances in Sub-Clause 21.1 to include loss or damage caused by the risks listed under Sub-Clause 20.4 sub-paragraph (a) (i) to(iv) of the Conditions of Particular Application.”

SUBCLAUSE 23.2 – MINIMUM AMOUNT OF INSURANCE

Add the following at the end of this Clause:

“.. with no limits to the number of occurrences”.

SUBCLAUSE 25.1 – EVIDENCE AND TERMS

Amend Sub-Clause OF INSURANCE 25.1 as follows:

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 Sub-Clauses 25.6, 25.7

SUBCLAUSE 25.6 – INSURANCE NOTICES

Each policy of insurance effected by the Contractor for purposes 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. This shall not be more than thirty (30) days before that date and the policy shall remain in force until thirty (30) days after the giving of such notice.

SUBCLAUSE 25.7 – NOTIFICATION TO INSURERS

It shall be the responsibility of the Contractor to notify insurers under any of the insurance referred to in the preceding clauses 21, 23 and 24 on any matter or event, which by the terms of such insurance are required to be so notified. 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 Sub-Clause whether as a result of avoidance of such insurance or otherwise.

SUBCLAUSE 28.2 – ROYALTIES

Add at the end of this Sub-Clause the following sentence:

“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.”

SUBCLAUSE 29.1 – INTERFERENCE WITH TRAFFIC

Supplement Sub-Clause 29.1 by adding the following sentence at the end:

“The Contractor will be permitted to use existing public roads for access to the site. The Contractor shall pay vehicle license tax and road maintenance duty in accordance with relevant regulations and shall obtain any necessary permits or licenses from relevant authorities for transporting his equipment.”

Add the following subclause 29.2:

SUBCLAUSE 29.2 – REINSTATEMENT AND COMPENSATION FOR DAMAGES TO PERSONS AND 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 as specified and 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 which shall become due to the Contractor.

The Contractor shall refer to the Employer without delay all claims which may be considered to fall within the provisions of Clause 22.1.

Add the following Sub-Clause 34.2 to 34.15

SUBCLAUSE 34.2 – CONDITIONS OF EMPLOYMENT OF LABOUR

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.

SUBCLAUSE 34.3 – FAIR WAGES

The Contractor shall, in respect of all persons employed anywhere by him in the execution of the Contract, and further in respect of all persons employed by him otherwise than in the execution of the Contract in every factory, Workshop or place occupied or used by him for the execution of the Contract, observe and fulfil the following conditions:

- (a) The Contractor shall pay rates of wages, observe hours of labour and provide conditions of labour, housing, amenities and facilities not less favourable than those required by the latest Regulation of Wages (Building and Construction Industry) Order as at the time of bid submission, and subsequent amendments thereto, or in any wage scales, hours of work or conditions agreed by the Ministry of Labour or other Government Departments in consultation with the appropriate wage fixing authority and generally recognized by other employees in the district whose general circumstances in the trade or industry in which the Contractor is engaged are similar.
- (b) In the absence of any rates of wages, hours or conditions of labour so established the Contractor shall pay rates of wages and observe hours and conditions of labour which are not less favourable than the general level of wages, hours and conditions observed by other Employers whose general circumstances in the trade or industry in which the Contractor is engaged are similar.
- (c) Where the absence of established rates of wages, hours and conditions of labour or the dissimilarity of the general circumstances in the trade of industry in which the Contractor is engaged prevent the Contractor from observing rates of wages, hours and conditions of labour ascertained under sub-paragraph (a) and (b) above the Contractor in fixing the rates of wages, hours and conditions of labour of his employees shall be guided by the advice of the Labour Department.
- (d) The Contractor shall recognize the freedom of his employees to be members of trade unions.
- (e) The Contractor shall maintain records in English of the time worked by, and the wages paid to, his employees. The Contractor shall furnish to the Engineer or Employer, if called upon to do so, such particulars of the rates, wages and conditions of labour as the Employer or Engineer may direct.
- (f) The Contractor shall at all times during the continuance of the contract display, for the information of his employees in every factory, workshop or place occupied or used by him for the execution of the Contract, a copy of this clause together with a notice setting out the general rates of wages, hours and conditions of labour of his employees.
- (g) The Contractor shall be responsible for the observance of this clause by sub-Contractors employed in the execution of the works.

SUBCLAUSE 34.4 – BREACH OF FAIR WAGES CLAUSE

Any Contractor or Sub-Contractor who is found to be in breach of Fair Wages Clause shall cease to be approved as a Contractor or Sub-Contractor for such period as the Permanent Secretary for the Ministry of Roads may determine.

Should a claim be made to the Employer alleging the Contractor's default in payment of Fair Wages of any workman employed on the Contract and if proof thereof satisfactory to the Employer is furnished by the Labour Authority, the Employer may, failing payment by the Contractor, pay the claims out of any monies due or which may become due to the Contractor under the Contract.

SUBCLAUSE 34.5 – RECRUITMENT OF UNSKILLED LABOUR

Any additional unskilled labour which is required by the Contractor for the works and which is not in his employment at the time of the acceptance of the BID shall be recruited by the Contractor from the Labour Exchange or Exchanges nearest to the site or sites of the work.

SUBCLAUSE 34.6 – COMPENSATION FOR INJURY

The Contractor shall in accordance with the Workmen's Compensation Act of the Laws of Kenya and any other regulations in force from time to time pay compensation for loss or damage suffered in consequence of any accident or injury or disease resulting from his work to any workman or other person in the employment of the Contractor or any Subcontractor.

SUBCLAUSE 34.7 – LABOUR STANDARDS

- (a) the Contractor shall comply with the existing local labour laws, regulations and labour standards
- (b) the Contractor shall formulate and enforce an adequate safety program with respect to all work under his contract, whether performed by the Contractor or subcontractor. The Contractor has assurance from the Employer of cooperation where the implementation of these safety measures requires joint cooperation.
- (c) Upon written request of the Employer the Contractor shall remove or replace any of his employees employed under this Contract.

SUB-CLAUSE 34.8 HIV/AIDS AND GENDER ISSUES

The Contractor shall, in respect of all persons employed anywhere by him in the execution of the Contract, and further in respect of all persons employed by him otherwise than in the execution of the Contract in every factory, workshop or place occupied or used by him for the execution of the Contract, be responsible for making all arrangements for and shall bear all costs relating to the following for the duration of the contract:

- 1) Instituting an HIV/AIDS and Gender Issues awareness campaign amongst his workers;
- 2) Instituting an HIV/AIDS prevention campaign amongst his workers; and
- 3) Instituting an HIV/AIDS training programme including employing and designating a qualified HIV/AIDS expert.

SUB-CLAUSE 34.9 REPATRIATION OF LABOR

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 Kenya shall have left Kenya.

SUB-CLAUSE 34.10 ACCIDENT PREVENTION OFFICER; ACCIDENTS

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

SUB-CLAUSE 34.11 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 service 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.

SUB-CLAUSE 34.12 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 labor of the dangers of bilharzia and wild animals.

SUB-CLAUSE 34.13 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

SUB-CLAUSE 34.14 FESTIVALS AND RELIGIOUS CUSTOMS

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

SUB-CLAUSE 34.15 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.

Add the following Sub-Clause 35.2 and 35.3.

SUBCLAUSE 35.2 – RECORDS OF SAFETY AND HEALTH

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 from time to time prescribe.

SUBCLAUSE 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 whenever the Laws of Kenya require such a report.

SUBCLAUSE 41.1 – COMMENCEMENT OF WORKS

Amend Sub-Clause 41.1 as follows:

Delete the words “as soon as is reasonably possible” in the first sentence and replace with “within the period stated in the Appendix to Bid”.

SUBCLAUSE 43.1 – TIME FOR COMPLETION

Amend Sub-Clause 43.1 as follows:

Delete the words “within the time” to “such extended time” and substitute “by the date or dates stated or implied in Clause 14 of these Conditions of Particular Application.

SUBCLAUSE 44.1 – EXTENSION OF TIME FOR COMPLETION

Add at the end of Sub-Clause 44.1 the following:

“Neither rains falling within the rainy seasons as occurs in Kenya nor floods caused by such rains shall be deemed exceptional weather conditions such as may fairly entitle the Contractor to an extension of time for the completion of the work.”

SUBCLAUSE 45.1 – RESTRICTION ON WORKING HOURS

Add at the end of Sub-Clause 45.1 the following:

“If the Contractor requests permission to work by night as well as by day, then if the Engineer shall grant such permission the Contractor shall not be entitled to any additional payments 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 or in carrying out night work and from and against all claims, demands, proceedings, costs, charges and expenses whatsoever in regard or in relation to such liability.

“In addition, the Contractor will be required to provide, for any work carried out at night or recognized days of rest, adequate lighting and other facilities so that the work is carried out safely and properly.

“In the event of the Engineer granting permission to the Contractor to work double or rotary shifts or on Sundays, the Contractor shall be required to meet any additional costs to the Employer in the administration and supervision of the Contract arising from the granting of this permission.”

SUBCLAUSE 47.2 – REDUCTION OF LIQUIDATED DAMAGES

Add the following paragraphs at the end of this Sub-Clause:

“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.

The Employer shall pay no bonus for early completion of the Works to the Contractor.

The sum stated in the Appendix to Bid as liquidated damages shall be increased by a sum equivalent to any additional amount payable by the Employer to the Contractor under clause 70.1 in respect of an increase in costs in such a 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.”

SUBCLAUSE 52.1 – VALUATION OF VARIATIONS

Add new Clause 52.2(c)

No change in the unit rates or prices quoted shall be considered for items included in the schedule of Dayworks rates, or Provisional Sums and items, or for any item in the BOQ.

SUBCLAUSE 52.4 – DAYWORKS

Add the following at the end of Sub-Clause 52.4:

The work so ordered shall immediately become part of the works under the contract. The Contractor shall, as soon as practicable after receiving the Dayworks 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 Dayworks basis, the Contractor shall give an advance notice to the Engineer stating the exact time of such commencement.

SUBCLAUSE 54.1 – CONTRACTORS EQUIPMENT, TEMPORARY WORKS AND MATERIALS: EXCLUSIVE USE FOR THE WORKS

Amend Sub-Clause 54.1 as follows:

Line 5: add “written” between “the” and “consent”.

For the purpose of these Clauses, the term “Equipment” shall be read as “Contractor’s equipment” where the context so requires

Delete Sub-Clauses 54.2 and 54.5 entirely.

Add the following Sub-Clauses 54.9 to 54.11

SUB-CLAUSE 54.9 EQUIPMENT AND PLANT

Only equipment suitable to produce the quality of work and materials required will be permitted to operate on the contract.

The Contractor shall provide adequate and suitable equipment and plant to meet the above requirements and when ordered by the Engineer shall remove unsuitable equipment from the Site and discontinue the operation of unsatisfactory plant.

In transporting equipment to and from the Site and in using it on the Site, the Contractor shall comply with the country applicable laws.

SUB-CLAUSE 54.10 WATER, FUEL, LIGHT AND POWER

The Contractor shall at his own expense, make all his own arrangements for the supply and distribution of water, fuel, light and power to all points where they are required for all the operations under the Contract and for this purpose, he shall provide and use all the necessary construction equipment, Temporary Works, Transport, Materials and things of every kind necessary to supply and distribute the supplies to the various parts of the works.

In the event of the Contractor obtaining water, fuel, light or power from any existing controlled supply, he shall comply with any regulations laid down by the Authority concerned and shall pay for rent and all other charges as required.

The cost of all the foregoing shall be included in the Rates and Lump Sums as entered in the Bill of Quantities

SUB-CLAUSE 54.11 EXISTING SERVICES

The Contractor shall acquaint himself with the position of all existing services such as drains, telephone and electricity lines and poles, water mains and the like, before commencing any excavation or other which is likely to affect the existing services.

The Contractor will be held liable for all damage to roads, irrigation ditches, main pipes, electric cables, lines or services of any kind caused by him or his Sub-Contractors 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's Representative.

The Contractor will be required to make all necessary arrangements with local authorities, corporations and owners before executing relocation of existing services. The Contractor shall pay the costs of such works on behalf of the Employer and shall be reimbursed thereafter by the Employer.

SUBCLAUSE 55.2 – OMMISIONS OF QUANTITIES

Items of Works described in the Bills 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.

Add the following Sub-Clause 58.4:

SUBCLAUSE 58.4 – PROVISIONAL ITEMS

Provisional items shall be read as Provisional Sums and shall be operated as such in accordance with Sub-Clauses 58.1 to 58.3.

CLAUSE 60: – CERTIFICATES AND PAYMENTS

Clause 60 of the General Conditions is deleted and substituted with the following: -

SUBCLAUSE 60.1 – MONTHLY STATEMENT

The Contractor shall submit a statement to the Engineer at the end of each month, in a tabulated form approved by the Engineer, showing the amounts to which, the Contractor considers himself to be entitled. The statement shall include the following items, as applicable;

- the value of the Permanent Work executed up to the end of previous month
- such an amount (not exceeding 75 percent of the value) as the Engineer may consider proper on account of materials for permanent work delivered by the Contractor in the site
- 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
- adjustments under Clause 70
- any amount to be withheld under retention provisions of Subclause 60.3
- any other sum to which the Contractor may be entitled under the Contract

If the Engineer disagrees with or cannot verify any part of the statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes and corrections in the statement as may be directed by the Engineer. In cases where there is difference in opinion as to the value of any item, the Engineer's view shall prevail.

SUBCLAUSE 60.2 - INTERIM PAYMENT CERTIFICATE

The Contractor shall forward to the Engineer an Interim Payment Certificate based on the statement as corrected above and, should it be necessary in the Engineers opinion, shall promptly make any further amendments and corrections to the Interim Payment Certificate.

The Engineer shall not unreasonably withhold certifying an Interim Payment Certificate and in case of likely delay in establishing the value of an item, such item may be set aside and the remainder certified for payment.

Within 30 days after receipt of the Interim Payment Certificate and subject to the Contractor having made such further amendments and corrections as the Engineer may require, the Engineer will forward to the Employer the certified Interim Payment Certificate.

Provided that the Engineer shall not be bound to certify any payment under this Clause if the net amount thereof, after all retentions and deductions, would be less than the minimum amount of Interim Payment Certificate's stated in the Appendix to Form of Bid. However, in such a case, the uncertified amount will be added to the next interim payment, and the cumulative unpaid certified amount will be compared to the minimum amount of interim payment.

SUBCLAUSE 60.3 – PAYMENT OF RETENTION MONEY

A retention amounting to the percentage stipulated in the Appendix to Bid shall be made by the Engineer in the first and following Interim Payment Certificates until the amount retained shall reach the "Limit of Retention Money" named in the Appendix to Form of BID.

Upon the issue of the Taking-Over Certificate, with respect to the whole of the works one half of the retention money shall become due and shall be paid to the Contractor when the Engineer shall certify in writing that the last section of the whole works has been substantially completed.

Upon expiration of the Defects Liability Period for the works, the other half of the Retention Money shall be certified by the Engineer for payment to the Contractor.

Provided that in the event of different Defects Liability Periods being applicable to different Sections of the Permanent Works pursuant to Clause 48, the expression “expiration of the Defects Liability Period “shall, for the purpose of this subclause, be deemed to mean the expiration of the latest of such periods.

Provided also that if at such time, there remain to be executed by the Contractor any work instructed, pursuant to Clause 49 and 50, in respect of the works, the Engineer shall be entitled to withhold certification until completion of any such work or so much of the balance of the Retention money as shall in the opinion of the Engineer, represents the cost of the remaining work to be executed.

Bank Retention Guarantees shall be accepted in lieu of cash retentions

SUBCLAUSE 60.4– CORRECTION OF CERTIFICATES

The Engineer may in any Interim Payment Certificate make any correction or modification to any previous Interim Payment Certificate signed by him and shall have authority, if any work is not being carried out to his satisfaction to omit or reduce the value of such work in any Interim Payment Certificate.

SUBCLAUSE 60.5– STATEMENT AT COMPLETION

Not later than 84 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, in a form approved by the Engineer;

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

- a) Any further sums which the Contractor considers to be due; and
- b) An estimate of amounts that the Contractor considers will become due to him under the Contract.

Estimate amounts shall be shown separately in the Statement at Completion. The Contractor shall amend and correct the Statement as directed by the Engineer and submit a Certificate at Completion to be processed as in Sub Clause

60.2.

SUBCLAUSE 60.6 – FINAL STATEMENT

Not later than 56 days after the issue of the Defects Liability Certificate pursuant to Sub-Clause 62.1, the Contractor shall submit to the Engineer for consideration a draft final statement with supporting documents showing in detail, in the form approved by the Engineer;

- a) The final value of all work done in accordance with the Contract
- 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.

SUBCLAUSE 60.7– 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 Sub-Clause 60.8 has been made and the Performance Security referred to in Sub-Clause 10.1 has been returned to the Contractor.

SUBCLAUSE 60.8 – FINAL PAYMENT CERTIFICATE

Upon acceptance of the Final Statement as given in Sub-Clause 60.6, 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:

The final value of all work done in accordance with the Contract;

- a) 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.
- b) 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.

SUBCLAUSE 60.9– CESSATION OF EMPLOYERS LIABILITY

Unless the Contractor notifies the Engineer of his objection to the Final Certificate within 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 done under the Contract including any variations and omissions thereof but excluding any variations and claims previously made in writing.

SUBCLAUSE 60.10 – TIME FOR PAYMENT

The amount due to the Contractor under any Interim Payment Certificate or Final Payment Certificate issued pursuant to this Clause or to any other term of the Contract, shall, subject to Clause 47, be paid by the Employer to the Contractor as follows:

- a) In the case of Interim Payment Certificate, within the time stated in the Appendix to Form of Bid, after the Engineer has signed the Interim Payment Certificate.
- b) In the case of the Final Payment Certificate pursuant to Subclause 60.8, within the time stated in the Appendix to Form of Bid, after the Engineer has signed the Final Payment Certificate.
- c) In the event of the failure of the Employer to make payment within the times stated, the Employer shall make payment to the Contractor of simple interest at a rate equal to two percentage points above the average bank lending rates obtained from Central Bank of Kenya. The provisions of this subclause are without prejudice to the Contractor's entitlements under Clause 69 or otherwise.

SUBCLAUSE 60.11 – CURRENCY OF PAYMENT

The Contract Price shall be designated in Kenyan Currency.

All work performed by the Contractor under the Contract shall be valued in Kenya Shillings using the rates and prices entered in the Bills of Quantities together with such other increases to the Contract Price, except for variation of price payments in accordance with Clause 70.1.

SUBCLAUSE 60.12 MATERIALS FOR PERMANENT WORKS

With respect to materials brought by the Contractor to the site for incorporation into the permanent works, the Contractor shall,

- Receive a credit in the month, in which these materials are brought to site,
- Be charged a debit in the month in which these materials are incorporated in the permanent works.

Both such credit and debit to be determined by the Engineer in accordance with the following provisions.

- a) No credit shall be given unless the following conditions shall have been met to the Engineer's satisfaction
 - (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 Contractors 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 plant 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.
- b) The amount to be credited to the Contractor shall not be more than 75% of the Contractor's reasonable cost of the materials delivered to site, as determined by the Engineer after review of the documents listed in subparagraphs (a) (iv) above;
- c) The amount to be debited to the Contractor for any materials incorporated into the works shall be equivalent to the credit previously granted to the Contractor for such materials pursuant to Clause (b) above as determined by the Engineer.

SUBCLAUSE 67.1 – ENGINEER'S DECISION

Delete the entire subclause 67.1 and insert the following;

“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. “

SUBCLAUSE 67.2 – AMICABLE SETTLEMENT

Delete the entire subclause 67.2 and add the following;

“Where notice to of intention to commence adjudication as to a dispute has been given in accordance with subclause 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 – ARBITRATION

Delete all the words from line 6 onwards beginning with the words "unless otherwise" up to line 8 ending with the words "... under such rules", and substitute with the following:

"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.

SUBCLAUSE 68.2 – NOTICES TO EMPLOYER AND ENGINEER

Delete in Sub-Clause 68.2 the words "nominated for that purpose in Part II of these conditions" and insert;

a) The Employer’s address is:

Chief Officer,
Municipal Administration & Urban Development (MAUD)
County Government of Kiambu
P.O Box 2344-00900
KIAMBU, KENYA.

b) The Engineer’s address is:

Municipal Engineer
Thika Municipality
P.O Box 240-01000
THIKA, KENYA.

SUBCLAUSE 68.4 – CORRESPONDENCES

All letters and notices from the Contractor to the Employer and/Engineer must be signed by the Managing Director or the person given written power of Attorney.

CLAUSE 69 – DEFAULT OF EMPLOYER

Delete in Sub-Clause 69.1 (a) the words ("28 days") and insert the words "ninety (90) days".

Delete Sub-Clause 69.1 (c)

Delete in Sub-Clause 69.4 line 4 the words “(28 days)” and insert the words “sixty (60) days”.

In Sub-Clause 69.4 add at the end of first paragraph the following “the period of such suspension shall be as agreed upon by both parties and in any case not more than six (6) months”.

In Subclause 69.4 of General Conditions of Contract Part I, insert at the end -----“The amounts of such costs which shall be added to the Contract Price shall exclude any cost due to idle time for equipment, plant and labour.”

CLAUSE 70 – CHANGES IN COST AND LEGISLATION

Delete Clause 70 in its entirety, and substitute:

SUB-CLAUSE 70.1- PRICE 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 applying to such amounts the formulae prescribed in this clause.

SUB-CLAUSE 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.

SUB-CLAUSE 70.3-ADJUSTMENT FORMULAE

The adjustment to the Interim Payment Certificates in respect of changes in cost and legislation shall be determined from separate formulae for each of the currencies of payment and each of the types of construction work to be performed and Plant to be supplied. The formulae will be of the following general type:

$$pn = A + b \frac{Ln}{Lo} + c \frac{Mn}{Mo} + d \frac{En}{Eo} + etc.$$

Where:

pn is a price adjustment factor to be applied to the amount in each specific currency for the payment of the work carried out in the subject month, determined in accordance with Paragraph 60.1 (d), and with Paragraphs 60.1 (e) and (f), where such variations and daywork are not otherwise subject to adjustment;

A is a constant, specified in the Appendix to Bid, representing the nonadjustable portion in contractual payments;

b, c, d, etc., are weightings or coefficients representing the estimated proportion of each cost element (labour, materials, equipment usage, etc.) in the Works or sections thereof, net of Provisional Sums, as specified in the Appendix to Bid; the sum of A, b, c, d, etc., shall be one;

Ln, Mn, En, etc., are the current cost indices or reference prices of the cost elements in the specific currency of origin for month "n," determined pursuant to Sub-Clause 70.5, applicable to each cost element; and

Lo, Mo, Eo, etc., are the base cost indices or reference prices corresponding to the above cost elements at the date specified in Sub-Clause 70.5.

If a price adjustment factor is applied to payments made in a currency other than the currency of the source of the index for a particular indexed input, a correction factor **Zo/Zn** will be applied to the respective component factor of **pn** for the formula of the relevant currency. **Zo** is the number of units of currency of the country of the index, equivalent to one unit of the currency of payment on the date of the base index, and **Zn** is the corresponding number of such currency units on the date of the current index.

SUB-CLAUSE 70.4 - SOURCES OF INDICES AND WEIGHTINGS

The sources of indices shall be those listed in the Appendix to form of Bid, as approved by the Engineer. Indices shall be appropriate for their purpose and shall relate to the Contractor's proposed source of supply of inputs on the basis of which his Contract Price and expected foreign currency requirements shall have been computed. As the proposed basis for price adjustment, the Contractor shall have submitted with his bid the tabulation of Weightings and Source of Indices in the Appendix to Bid, which shall be subject to approval by the Engineer.

SUB-CLAUSE 70.5 - BASE, CURRENT, AND PROVISIONAL INDICES

The base cost indices or prices shall be those prevailing on the day 28 days prior to the latest date for submission of bids. Current indices or prices shall be those prevailing on the day 28 days prior to the last day of the period to which a particular Interim Payment Certificate is related. If at any time the current indices are

not available, provisional indices as determined by the Engineer will be used, subject to subsequent correction of the amounts paid to the Contractor when the current indices become available.

SUB-CLAUSE 70.6 - ADJUSTMENT AFTER COMPLETION

If the Contractor fails to complete the Works within the time for completion prescribed under Clause 43, adjustment of prices thereafter until the date of completion of the Works shall be made using either the indices or prices relating to the prescribed time for completion, or the current indices or prices, whichever is more favourable to the Employer, provided that if an extension of time is granted pursuant to Clause 44, the above provision shall apply only to adjustments made after the expiry of such extension of time.

SUB-CLAUSE 70.7 - WEIGHTINGS

The weightings for each of the factors of cost given in the Appendix to Bid shall be adjusted if, in the opinion of the Engineer, they have been rendered unreasonable, unbalanced, or inapplicable as a result of varied or additional work already executed or instructed under Clause 51 or for any other reason.

SUB-CLAUSE 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 that 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 taken into account in the indexing of any inputs to the Price Adjustment Formulae in accordance with the provisions of Sub-Clauses 70.1 to 70.7.

CLAUSE 72 – RATES OF EXCHANGE COST

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.

CLAUSE 73 – BRIBERY AND COLLUSION

Add new Clause 73.1:

“The Contractor shall not:

- a) Offer or give or agree to give to any person in the service of the Government of Kenya any gift or consideration or any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract to which the Government of Kenya is a party or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract for the Government of Kenya.
- b) Enter into this or any other contract with the Government of Kenya in connection with which commission has been paid or agreed to be paid by or on his behalf or to his knowledge, unless before the contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Employer.

Any breach of this condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) or the commission of any offence by the Contractor or by anyone employed by him or acting on his behalf in relation to this or any other contract to which the Government of Kenya is a party shall entitle the Employer to determine the Contract (See Condition 63 hereof) and/ or to recover from the Contractor the amount or value of any such gift, consideration or commission.

Any dispute or difference of opinion arising in respect of either the interpretation, effect or application of this condition or of the amount recoverable hereunder by the Employer from the Contractor shall be decided by the Employer, whose decision shall be final and conclusive.

CLAUSE 74: - CONTRACT TO BE CONFIDENTIAL

Add new Clause 74.1:

The Contractor shall treat the details of this Contract as Private and Confidential and shall not publish or disclose the same or any particulars thereof in any trade or technical paper or elsewhere (save in so far as may be necessary for the purpose thereof) without the previous consent in writing of the Government. If any dispute arises as to the necessity of any publication or disclosures for the purposes of this Contract the same shall be referred to the decision of the Engineer mentioned in the said Conditions of Contract whose award shall be final.

SECTION 7: SCHEDULES OF SUPPLEMENTARY INFORMATION

SECTION 7: SCHEDULES OF SUPPLEMENTARY INFORMATION

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SCHEDULE 1: CONFIDENTIAL BUSINESS QUESTIONNAIRE

This Confidential Business Questionnaire of the Government of Kenya shall be completed by the Bidder.

REPUBLIC OF KENYA

CONFIDENTIAL BUSINESS QUESTIONNAIRE

You are requested to give the particulars indicated in Part 1 and either Part 2 (a), 2(b) or 2(c) 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

.....

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 one time:

Kshs.....

Name of your bankers

Branch.....

Are you an agent of the Kenya National Trading Corporation? YES/NO

Part 2(a) - Sole Proprietor:

Your name in full

.....

Age.....

NationalityCountry of origin

*Citizenship details

Part 2(b) - Partnership:

Give details of partners as follows:

Name	Nationality	Citizenship Details*	Shares
1.....			
2.....			
3.....			
4.....			
5.....			

Part 2(c) - Registered Company:

Private or public (attach Certificate of Incorporation)

State the nominal and issued capital of the company-

Nominal Kshs.

Issued Kshs.

Give details of all directors as follows:

Name	Nationality	Citizenship Details*	Shares
1.....			
2.....			
3.....			
4.....			
5.....			

Part 2(d)- Interest in the Firm:

Is there any person / persons in the **County Government of Kiambu** who has interest in this firm? Yes /No**

.....
Date

.....
Signature of Bidder

* Attach proof of citizenship
(Compulsory)
** Delete as necessary

Bidder Information Form

Date: _____

Bidder's name
In case of Joint Venture (JV), name of each member:
Bidder's actual or intended country of registration: [indicate country of Constitution]
Bidder's actual or intended year of incorporation:
Bidder's legal address [in country of registration]:
Bidder's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above. <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement. <input type="checkbox"/> In case of Government-owned enterprise or institution documents establishing: <ul style="list-style-type: none">• Legal and financial autonomy• Operation under commercial law• Establishing that the Bidder is not dependent agency of the Employer
2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Information Form for JV Bidders

(to be completed by each member of Joint Venture)

Date: _____

Bidder's Joint Venture name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above. <input type="checkbox"/> In case of a Government-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and absence of dependent status. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

SCHEDULE 2: 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 receive on his behalf correspondence in connection with the Bid.

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

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

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

Alternate:

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

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

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

*To be filled by all Bidders.

SCHEDULE 3: 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 the **Proposed Upgrading to Bituminous Standards of Kilimambogo Makutano Township Roads and Street Lighting of Juja Estates in Thika Municipality**

held on

.....day of.....20.....

Signed.....

(Employer’s Representative)

..... **Municipal Engineer – Thika Municipality**

(Name of Employer’s Representative)

(Designation)

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

SCHEDULE 4: SCHEDULE OF BASIC RATES OF MATERIALS

Bidders shall complete the blank section of this schedule only, and shall make no alterations to any item nor insert any additional materials. The prices inserted shall be those prevailing 30 days before submission of Bids and shall be quoted in Kenya shillings. The prices shall be supported by bona fide quotations.

ITEM NO	DESCRIPTION	COUNTRY OF ORIGIN	NAME OF SUPPLIER	UNIT	RATE KSHS.	CTS
1	Cut-back Bitumen MC 30in bulk			Litre		
2.	Cut-back Bitumen MC 30in drums			Litre		
3.	Cut-back Bitumen MC 3000 in bulk			Litre		
4.	Cut-back Bitumen MC 3000 in drums			Litre		
5.	Bitumen 80/100 in bulk			Kg		
6.	Bitumen 80/100 in drums			Kg		
7	Bitumen Emulsion K1-60 in bulk			Litre		
8.	Bitumen Emulsion K1-60 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.	Industrial Fuel Oil			Litre		
14.	Kerosene Fuel			Litre		
15.	Oils			Litre		
16.	Lubricants			Kg		
17.	Ordinary Portland Cement			Tonne		
18.	Flex beam Guardrail			Metre		
19.	Gabion Mesh			No.		
20.	Reinforcing Steel			Tonne		
21.	Lime			Tonne		

I certify that the above information is correct.

.....
(Signature of Bidder)

.....
(Date)

SCHEDULE 5: MAJOR ITEMS OF CONSTRUCTION EQUIPMENT

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

The Bidder shall enter in this schedule all major items of 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.

I certify that the above information is correct.

.....
(Signature of Bidder)

.....
(Date)

SCHEDULE 6: KEY PERSONNEL

DESIGNATION	NAME	NATIONALITY	SUMMARY OF QUALIFICATIONS AND EXPERIENCE		
			Qualifications	General Experience (Yrs)	Relevant Experience (Yrs)
Headquarters Partner/Director or other key staff (give designation)					
Site Office Site Agent Deputy Site Agent/Site Engineer. Senior Foreman Construction Supervisors Site Surveyor Safety Officer Sociologist Environmental Officer Other Key Staff Foremen (i) Earthworks (ii) Bituminous works (iii) Concrete (iv) Pavement (v) Drainage					

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 signed and certified CVs of all key staff.

I certify that the above information is correct.

.....
(Signature of Bidder)

.....
(Date)

SCHEDULE 8: SCHEDULE OF ONGOING PROJECTS

DESCRIPTI ON OF WORKS	NAME AND ADDRESS OF CLIENT	DATE OF COMMENCEME NT	DATE OF COMPLETI ON	VALUE OF WORKS (KSHS)	VALUE COMPLETE D UP TO DATE %	PHYSICA LLY COMPLET ED UP TO DATE %

I certify that the above works are being carried out by me and that the above information is correct.

.....
(Signature of Bidder)

.....
(Date)

SCHEDULE 9: SCHEDULE OF LOCAL LABOUR BASIC RATES

LABOUR CATEGORY	MONTH/SHIFT/HOUR	UNIT	RATE SHS

NOTE: Categories to be generally in accordance with those used by the Kenya Building Construction Engineering and Allied Trade Workers Union

I certify that the above information is correct.

.....
Date

.....
Signature of Bidder

SCHEDULE 10: 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 five (5) financial years. Quote in millions and decimal thereof.

	Year	Year	Year	Year	Year
	Ksh.	Ksh.	Ksh.	Ksh.	Ksh.
Roadworks					
Other Engineering works(electrical)					
Other (specify)					
Total					

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

	Year	Year	Year
	KShs.	KShs.	KShs.
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+3-5)			

- (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 years.

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

SCHEDULE 11: OTHER SUPPLEMENTARY INFORMATION

1. Financial reports for the last three years, balance sheets, profit and loss statements, auditors’ reports etc. List them below and attach certified 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 Contracting Authority.

.....

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.

.....
 Date

.....
 Signature of Bidder

SCHEDULE 11: WORK METHODOLOGY

Give a brief description of how you intend to carry out the work including traffic management, quality assurance of works and any designs to be carried out by the Bidder, in not less than five (5) pages and not more than fifteen (15) pages.

SECTION 8: FORM OF AGREEMENT

SECTION 8: FORM OF AGREEMENT

THIS AGREEMENT is made on the day of 20 between the County Government of Kiambu, Municipal Administration & Urban Development (MAUD) . P.O Box 2344-00900, KIAMBU, KENYA. hereinafter called "the Employer" of the one part and hereinafter called "the Contractor" of the other part.

WHEREAS the Employer is desirous that certain works should be executed, viz.

Proposed Upgrading to Bituminous Standards of Kilimambogo Makutano Township Roads and Street Lighting of Juja Estates in Thika Municipality and has accepted a Bid by the Contractor for the execution completion and maintenance of such works

NOW THIS AGREEMENT WITNESSETH as follows:

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.

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

- The said BID dated
- The Conditions of Contract
- The Standard and Special Specifications
- The Priced Bill of Quantities
- The Letter of Acceptance
- Schedules of Supplementary Information
- The Drawings
- Other documents as may be agreed and listed

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

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.

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:.....

Chief Officer,
Municipal Administration & Urban Development (MAUD)
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)

**SECTION 9: FORMS OF PERFORMANCE BANK GUARANTEE AND ADVANCE
PAYMENT GUARANTEE (UNCONDITIONAL)**

PERFORMANCE BANK GUARANTEE

To
Chief Officer,
Municipal Administration & Urban Development (MAUD)
County Government of Kiambu
P.O Box 2344-00900
KIAMBU, KENYA

WHEREAS (hereinafter called “the Contractor”)

has undertaken in pursuance of TENDER NO. CGK/MAUD/KUSP/TKA/1-2/19/20

Dated **to execute the Proposed Upgrading to Bituminous Standards of Kilimambogo Makutano Township Roads and Street Lighting of Juja Estates in Thika Municipality, (hereinafter called the “Contract”)**

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified in the Appendix to Form of Bid 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 in figures)

Kshs.....

.....(amount in words)

and we undertake to make payment to you, upon your first written demand and without cavil or argument, any sum or sums within and up to the limits as aforesaid without your needing to prove or show grounds or reasons for the sum specified therein.

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

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 thereunder 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 such change, addition or modification.

This Guarantee shall be valid until 28 days after issuing of the Taking Over Certificate.

SIGNATURE AND SEAL OF BANK.....

Name of Signatory.....

Name of bank.....

Address.....Date.....

SECTION 10: STANDARD SPECIFICATIONS

SECTION 10: STANDARD SPECIFICATIONS

The Standard Specifications referred to in this document is the *Standard Specifications for Road and Bridge Construction, 1986 Edition* published by the Ministry of Transport and Communications. This document shall form part of The Contract

Work shall be carried out in accordance with the Standard Specification except as supplemented or revised in the Special Specification.

SECTION 11: SPECIAL SPECIFICATIONS

SECTION 11: SPECIAL SPECIFICATIONS

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SECTION 1 - GENERAL

100 SPECIAL SPECIFICATIONS.

Special specification is supplementary to the Standard Specifications 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

When the term “Period of Maintenance” has been used in the Standard Specifications, it shall be changed to “Defects Liability Period”.

101 LOCATION AND EXTENT OF THE CONTRACT.

The site of the works shall be the area within the road reserve and any other places as may be designated in the Contract. The works involve re-construction to bitumen standard of the project road including junctions, and also installation of drainage facilities such as pipe culverts etc. all as per drawings and relevant documentation issued for the works. Any other works shall be as directed by the Engineer.

102 EXTENT OF CONTRACT.

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

1. Site clearance and top soil removal.
2. Earthworks and laying of improved subgrade to receive the pavement layers as per the design and specifications.
3. Construction of a 225mm thick layer of natural gravel as subbase for the carriageway and shoulders.
4. Construction of a 150mm thick layer of hand packed blue stone as base for the carriageway and shoulders.
5. Apply a 50mm asphaltic concrete Type 1 wearing course.
6. Construction of standard pipe culverts, and other drainage works
7. Installation of road furniture including road marking
8. Works auxiliary to the main works.
9. Maintenance of passage of traffic through and around the works.
10. Maintenance of the works during construction. The defects liability period shall be 6 months.

The road carriageway shall be 6.0m wide with footpath of 1.5m width. The side ditch shall be trapezoidal with its invert level being at least 0.7m below the road formation level.

103 CONTRACT DRAWINGS

Contract drawings have been bound in a book of drawings accompanying these Contract Documents as a separate volume. Additional copies of these drawings that may be required by the

Contractor can be obtained from the Engineer, in which case the Contractor will be required to reimburse the cost of producing such additional copies.

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

The changed drawings shall entitle the Contractor such reasonable additional payments as provided for in the Contract, including any abortive work carried out by the Contractor prior to notice of intent to undertake changes having been given. The Contractor may be required to demolish, alter and/or correctly rebuild at his own expense any part of the Works not in conformity with the current drawings issued to him within a reasonable prior notice.

Documents

The following manuals that are important and relevant to the contract, will not be issued with the tender documents but will be available for inspection during normal working hours at the offices of the Municipal Engineer

Thika Municipality

P.O Box 240-01000

THIKA, KENYA.

Road Design Manual:

Part 1: Geometric Design of Rural Roads

Part 3: Materials and Pavement Design for New Roads

Manual for Traffic Signs:

Part 1: Road Markings

Part 2: Traffic Signs.

104 PROGRAMME OF EXECUTION OF THE WORKS

The contractor shall provide the works programme, required under clause 14 of the Conditions of Contract, within 21 days of receipt of the Engineer's Order to commence work.

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

The Contractor shall carry out the contract in accordance with the programme agreed with the Engineer, but he shall in no manner be relieved by the Engineer's approval of the programme, of his obligation to complete the works in the prescribed order and by the prescribed completion date and he shall from time to time review his progress and make such amendments to his rate of execution of the works as may be necessary to 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 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.

107 TAKING OVER CERTIFICATE

The minimum length of the road for which a certificate will be issued is the whole length of the project road when substantially completed.

109 NOTICE OF OPERATIONS

Add the following sub- Clause.

Notification Terms

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

Explosive and Blasting

- a) The requirements of the Laws of Kenya governing explosives and other requirements and regulations of Government of Kenya and other authorities shall be complied with.
- b) No explosives of any kind shall be used without prior written consent of the Engineer.
- c) The Contractor shall be solely responsible for the provision, handling, storage and transporting of all explosives, ancillary materials and all other items of related kind whatsoever required for blasting.

111 NATIONAL SPECIFICATIONS

Add the following at the end of this clause

“The Contractor shall provide all such specifications not more than 60 days after commencement of contract and at least 14 days before the execution of work to which the specification is applicable.”

117 HEALTH, SAFETY AND ACCIDENTS

Add the following:

In addition to providing, equipping and maintaining adequate first aid stations throughout the works in accordance with the laws of Kenya, the contractor shall provide and maintain on site during the duration of the Contract, a fully equipped dispensary. This shall be with a qualified Clinical Officer / Nurse who shall offer the necessary medical advice on HIV and related diseases to the Engineer's and Contractor's site staff. The Contractor shall allow for this in the rates and be responsible for all site welfare arrangements at his own cost.

121 DIVERSION OF SERVICES

- (a) The Contractor shall acquaint himself with the location of all existing services such as telephone lines, electricity cables, water pipes, sewers etc., before execution of any works that may affect the services. 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 BID rates.
- (b) Subject to the agreement with the Engineer, the Contractor shall be responsible for removal of alteration and relocation of existing services.

Such work will be reimbursed at Contractor's actual expenditure plus overhead and profit under a Prime Cost Sum in Bill 1.

- (c) The Contractor shall indemnify the Employer against claims originating from damage to existing services or works.

123 LIAISON WITH GOVERNMENT AND POLICE OFFICIALS

The Contractor shall keep in close touch with the Police and the other Government officials of the area regarding their requirements in the control of traffic, or other matters, and shall provide all assistance or facilities, which may be required by such officials in the execution of their duties.

124 LAND FOR ALL CAMPS SITES AND FOR THE CONTRACTOR'S OWN PURPOSES, INCLUDING TEMPORARY WORKS.

Notwithstanding Clause 124 of the Standard Specification all requirements of land for temporary works and construction purposes shall be to the approval of the Engineer but the Contractor will make all necessary arrangements with the property owners concerned and pay all charges arising there from. On or before completion of the Contract, the Contractor shall remove all temporary works and shall restore all such land to the condition in which it was immediately prior to the occupation thereof as far as is reasonable and practicable. No separate payment will be made to the Contractor on account of these items and the Contractor must make due allowance for them in his rates.

Notwithstanding Clause 120 of the Standard Specifications, the Contractor shall be required to appoint competent surveyors who will liaise with the Engineer on matters related to the demarcation of the existing road reserve, site measurements, removal and reinstatement of existing services.

126 MATERIALS AND MANUFACTURED GOODS

Notwithstanding the provisions of Clause 126 of the Standard Specification, the Contractor's attention is drawn to his obligations with regard to quality and delivery schedule of materials and goods obtained from suppliers.

Should the Engineer at any time be dissatisfied with any goods and materials intended for use by the Contractor upon the Works, he shall be empowered to reject the goods and materials and shall order that others of acceptable quality replace them. Any more work that may

consequently have to be redone and the costs of the new supplies shall be borne by the Contractor.

127 INFORMATION FROM EXPLORATORY BORINGS AND TEST PITS

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

127.1 FACTUAL MATERIALS REPORT

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

127.2 TRIAL SECTIONS

The Contractor shall allow in his programme for constructing trial sections and carrying out tests upon them as directed by the Engineer. Trials would normally be required at the start of each pavement layer and if changes of materials, method or equipment deem it necessary as directed by the Engineer.

The time for completion of the Contract shall not be extended because of the time needed to construct trial sections and evaluate the tests on them.

At least fourteen days before the work of laying any pavement layer is commenced, the contractor shall construct trial sections of at least 100 m in length and to the full construction width and the specified pavement layer thickness. For each trial section, the Contractor shall use the materials, mix proportions, mixing, laying, compaction 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.

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

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

128 STORAGE OF MATERIALS

All materials shall be stored on site in a manner approved by the Engineer and the Contractor shall carefully protect from the weather all work and materials which may be affected thereby.

129 TEST CERTIFICATES

When instructed by the Engineer the Contractor shall submit certificates of test from the suppliers of materials and goods required in connection with the works as the Engineer may require.

Such certificates shall certify that the materials or goods concerned have been tested in accordance with the requirements of the specifications and shall give the results of all the tests carried out. The Contractor shall provide adequate means of identifying the materials and goods delivered to the site with the corresponding certificates.

130 PROGRESS PHOTOGRAPHS

Notwithstanding the provision of Clause 130 of the Standard Specifications, the Contractor shall not be responsible for taking of progress photographs. Progress Photographs shall be taken by the Engineer's Representative and relevant costs charged to the Contractor who will be reimbursed under Miscellaneous Accounts

131 SIGNBOARDS

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

132 HOUSING ACCOMMODATION FOR THE RESIDENT ENGINEER AND HIS STAFF, OFFICE AND LABORATORY INCLUDING FURNITURE

Add the following sub-clauses:-

132.1 HOUSING AND ACCOMMODATION FOR THE ENGINEER'S SENIOR STAFF

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

Type I and II Houses shall be in accordance with the book of drawings and shall be constructed with permanent materials subject to approval of the Engineer. The Engineer shall approve the design and construction of the same. They shall be paid for in accordance with Clause 141 of the Standard Specification, under Bill items 1.01 and 1.02.

The walls shall be made of masonry. All material used shall be new strong, durable and weatherproof. Ceilings and floor must be properly insulated against heat with approved insulated material. The floor shall have a level smooth finish covered with PVC tiles. The wet areas shall have non-slip ceramic tiles. All windows shall be glass, able to be opened, and with mosquito nets. The building materials shall be mosquito and termite proofed and painted inside and out with two coats of paint/ varnish, all to the approval of the Engineer.

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

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

All houses are to be provided with a fire extinguisher. All storerooms shall be fitted with at least 3 substantial shelves and kitchens shall be fitted with shelves, drawers and cupboards as instructed.

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

All houses shall be provided with a piped supply of drinkable water, electricity, gas and kerosene for the consumption of the Engineer and his staff and the Contractor shall provide all necessary waterborne sanitation and disposal systems to the satisfaction of the Engineer.

The Contractor shall pay for water, electricity, gas and kerosene consumed, and for the statutory charges associated therewith.

The Contractor shall be responsible for rubbish disposal by providing outside bins and daily collection to a central area located to the satisfaction of the Engineer.

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

The compound on which the houses will be constructed shall be fenced with a 2m high chain linked fence and gate with padlock and chain.

This senior staff will generally comprise the following:

<u>Designation</u>	<u>Number</u>
Resident Engineer	1
Assistant Resident Engineer	2
Materials Engineer	1
Senior Surveyor	1

132.2 HOUSING ACCOMMODATION FOR ENGINEER'S JUNIOR STAFF

The Contractor shall provide, equip, furnish and maintain 5 No. Type III, 7 No. Type IV houses and 10 No. Type V houses for the Engineer's junior staff, to be located adjacent to Resident Engineer's offices and laboratory (refer to the book of drawings for design details). The actual location of houses on site shall be subject to approval by the Engineer.

This staff will generally comprise the following:

<u>Designation</u>	<u>Number</u>
--------------------	---------------

Senior Materials Technician	1
Assistant Surveyor	1
Assistant Materials Technician	1
Senior Inspector	2
Inspector	2
Site Administrator	1
Clerk / Typist	1
CAD Operator	1
Levellers	2
Chainmen	6
Laboratory Attendants	6

132.3 LIST OF FURNITURE FOR ENGINEER'S STAFF HOUSES

Each house shall be provided with new furniture, equipment and fittings as listed in the Appendices to this Special Specifications (see Appendix A) and all to the approval of the Engineer.

All the Engineer's staff houses and furniture / equipment provided as above mentioned shall revert to the contractor after the completion of the contract.

132.4 MAIN OFFICE

The Contractor shall construct and maintain for the duration of the Contract, a furnished and equipped main office for the Engineer of durable and weather-proof construction, provided with mosquito-proof and burglar-proof windows and lockable doors and suitably insulated against heat and cold, all to the satisfaction of the Engineer in respect of the construction, design and location.

The office shall comply with the details shown in the drawings and shall have a clear height of not less than 2.6 m. The floor shall be of floated concrete, and adequately damp and termite-proof.

A telephone shall also be provided for the Resident Engineer's office for his exclusive use.

The Contractor shall be responsible for paying all the charges and fees related to the use of the telephone and shall be reimbursed the same on production of proof of payment.

The office of the Resident Engineer shall be completely separate from that of the Contractor and shall be fenced with a 2m high chain linked fence and gate with padlock and chain.

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

Unless the offices are accessible via an existing paved road the Contractor shall provide an access road at least 3m wide to the office. Contractor shall also provide 100 square meters covered car parking area. Both access road and car park shall be surfaced with at least 150 mm of consolidated gravel properly graded, cambered, drained and culverted.

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.

132.5 MAIN LABORATORY

The Contractor shall provide and maintain for the duration of the Contract, a main laboratory complying with details shown on the standard drawings or equivalent, to the satisfaction of the Engineer. The building shall be of durable and weatherproof constructions, provided with mosquito-proof and burglar proof windows and lockable doors and suitably insulated. The laboratory shall be sited adjacent to the Resident Engineer's main office.

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

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

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

The following rooms and facilities shall be provided in the Laboratory: -

a) Office

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

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

b) Main Laboratory Room

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

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

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

c) Store Rooms

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

d) Concrete Slab for Sample Drying

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

The Engineer's laboratory 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 laboratory.

132.6 LABORATORY EQUIPMENT

To be provided as per list provided in the Appendices to this Special Specifications (see Appendix C).

132.7 SURVEY EQUIPMENT

The survey equipment to be provided shall be as per list included in Appendix C to this Special Specifications.

The payment to comply with this requirement is provided in the relevant item of the Bills of Quantities and ownership of all equipment shall revert to the Employer after the completion of the Works.

132.8 MOBILE PHONES FOR ENGINEER'S STAFF AND OFFICE

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 air-time for these mobile phones as directed by the Engineer and be reimbursed against Engineer's miscellaneous account.

133 TIME FOR ERECTION OF THE ENGINEER'S STAFF HOUSES, OFFICE AND LABORATORY

Amend the following: -

133.1 COMPLETION TERMS

All houses, office and laboratory shall be available not later than ninety days after the Engineer's order to commence work.

The Contractor's attention is drawn to Clause 133 of the Standard Specification which states that the Contractor is responsible for the cost of any temporary arrangement for accommodation, transport etc., if he should fail to provide the same within this period.

133.2 TEMPORARY ACCOMMODATION AND OFFICE FOR THE ENGINEER'S STAFF

During the period between the Engineer's order to commence and the time at which the Contractor becomes responsible for the Engineer's accommodation, the Contractor will be instructed to pay the cost of temporary accommodation and office for the Engineer's staff. Reimbursement of these costs will be made under a separate item in Bill No. 1 of the Bills of Quantities.

134 INSURANCE AND OWNERSHIP OF THE ENGINEER'S STAFF HOUSES, OFFICES, LABORATORIES, FURNITURE AND EQUIPMENT

Amend the following: -

134.1 INSURANCE

All buildings, furniture and equipment provided by the Contractor for the Engineer's staff houses, offices and laboratory shall be insured by the Contractor against any loss or damage by accident, fire and theft for the duration of the Contract Works, until the buildings revert to the Contractor. Theft insurance shall include all furniture and personal effects of the occupants of the houses as well as the items in office and laboratory. No separate payment will be made for this provision and all costs for complying with the above will be deemed to have been included in the Contractor's rates.

134.2 OWNERSHIP

Amend the following: -

The office and the laboratory provided as per the foregoing details shall revert to the Contractor at the end of the contract. However, the equipment and furniture to be provided and as per list given under Appendix C to this Special Specifications shall revert to the Employer. No separate payment will be made for the transfer of ownership of the latter and costs in meeting this requirement will be deemed to have been included in the Contractor's rates.

135 MAINTENANCE OF THE ENGINEER'S STAFF HOUSES, OFFICES LABORATORIES, FURNITURE AND EQUIPMENT

In 1st paragraph, delete "until the end of the Period of Maintenance" and substitute "till the issuance of the Taking-Over Certificate for the whole of the Works, and if required for a period thereafter until the Contractor has completed any outstanding work."

Add the following at the end: -

135.1 PROVISION OF MAINTENANCE AND SECURITY

The Contractor shall maintain all furniture and equipment provided by him in a useable state of repair and shall replace promptly any item that becomes unserviceable or is lost.

The Contractor shall provide cleaners, day and night watchmen for housing camp and offices as directed or instructed by the Engineer on site, the cost of which shall be included in the rates for providing houses, offices and laboratory.

137 ATTENDANCE UPON THE ENGINEER AND HIS STAFF

The Contractor shall pay wages (including all overtime) to fulfil the requirements of Clause 137 of the Standard Specification including all allowances for the following: -

Administrative Assistant	1 No.
Clerk / Typist	1 No.
Chainmen	6 No.
CAD Technician	1 No.
Laboratory Attendants	4 No.
Levellers	2 No.
Labourers	6 No.

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.

138 VEHICLES AND DRIVERS FOR THE ENGINEER AND HIS STAFF AND METHOD OF PAYMENT

The Contractor shall when instructed to do so provide and maintain in good working condition for the exclusive use of the Engineer and his staff throughout the contract, brand new vehicles, right hand drive, diesel powered and fitted with air-conditioner, CD/mp3 music player, Air bags and power steering as described below. The Engineer will approve the type of vehicle and confirm the number of each type to be provided.

1No. Type 2 – new Turbo diesel propelled 4WD Twin Cab Pick-up vehicle of minimum engine capacity 2800cc.

The Contractor shall insure comprehensively the vehicles for any licensed drivers and shall provide competent drivers during normal working hours and whenever required by the Engineer.

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

Payment for the vehicles (up to 4,000Km per veh. month), shall be by vehicle months. Payment for mileage above 4,000Km per vehicle month, shall be made at a rate per Kilometre. These payments shall be inclusive of all fuels, lubricants, servicing, insurance, maintenance, drivers and repairs. The rate shall include any overtime the drivers might be due or any other allowances in addition to the normal working hours. Payment shall be made under appropriate items in the Bills of Quantities.

The vehicle shall revert to the Client at the end of the contract.

139 MISCELLANEOUS ACCOUNTS

The Contractor maybe instructed by the Engineer to make payments of general receipted accounts for such items as stationary, stores and equipment, or make payments for claims and allowances for the supervision personnel; 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 STAFF

In the last line delete the words “shall be at the Contractor’s expense” and substitute with “including the approved percentage for administrative overheads shall be paid by the Contractor to the Engineer”.

Add the following;

If the Contractor wishes to execute permanent works outside the Engineer’s normal working hours as stated in Clause 108 of the Standard Specification, then the payment for overtime for the Engineer’s junior staff shall be reimbursed in full by the Contractor to the Engineer plus a 20 percent additional amount to cover for the Engineer’s administrative overheads.

In addition to the support staff provided by the contractor under Clause 137 above, the following Engineer’s staff shall also be considered inclusive with regard to implementation of provisions under this Clause 140;

Designation	Number
Assistant Resident Engineer	1
Materials Engineer	1
Senior Surveyor	1
Senior Materials Technician	1
Assistant Surveyor	1
Assistant Materials Technician	1
Senior Inspector	1
Inspector	1

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, plus twenty (20%) percent additional amount to cover for the Engineer’s administrative overheads shall be reimbursed in full by the Contractor to the Engineer. In addition, the Contractor shall provide the required accommodation for such staff at his own cost. The Contractor shall not be reimbursed any of these costs.

141 MEASUREMENT AND PAYMENT

Item: Preliminary Item

Delete the contents of Sub-Clause 141 (a) entirely and substitute with: -

“No Preliminary item has been included in this Contract. All Contractor’s mobilisation and general costs shall therefore be included in relevant rates in the Bill of Quantities.”

Item: Progress Photographs

Delete this Sub-Clause

142 ENVIRONMENTAL PROTECTION

Further to the requirements of Clause 19.1 of the Conditions of Contract, the Contractor shall be responsible for the following measures to protect the environment:

1. 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.
2. 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 temporarily cease operations and/or remove from the site vehicles or plant which do not comply with this requirement, until such time that he is satisfied that best practicable means to reduce environmental pollution to a minimum are being used.
3. 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 proper approved disposal.
4. 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.
5. The Contractor shall be responsible for the provision of adequate sanitary facilities for his workforce, and that of his sub-contractors, at all construction and ancillary sites. The Contractor shall not allow the discharge of any untreated sanitary waste to groundwater or any surface watercourse.

Prior to the mobilization of the workforce the Contractor shall provide details of proposed sanitary arrangements to the Engineer for approval, such as will allow him to assess whether

or not the proposed facilities are adequate and are unlikely to pollute water resources, and also that the facilities will be properly operated and maintained.

6. All concrete and asphalt plants shall be operated and maintained in accordance with the original manufacturer's specifications and manuals, and in such a manner as to minimize emissions of hydrocarbons and particulates. If, in the opinion of the Engineer, the operation of such plant is causing, or is likely to cause nuisance or health problems to 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.
7. The Contractor shall regularly douse with water all exposed dirt surfaces to reduce dust levels.
8. The Contractor shall take all reasonable measures, at all sites under his control, to prevent spillage and leakage of materials likely to cause pollution of water resources. Such measures shall include, but not be limited to the provision 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.
9. The Contractor shall be responsible for ensuring that exposed surfaces are re-vegetated as construction progresses, all to the satisfaction of the Engineer. The removal of trees shall be kept to the minimum necessary to accommodate the Permanent Works.
10. 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 replant another approved tree at no additional cost to the Employer.
11. 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 local to parts of the Works which constitute particular fire hazards.
12. The contractor shall as instructed by the Engineer carry out off – road mitigation measures to the approval and satisfaction of the Engineer and to the required standards. The contractor shall obtain Environmental mitigation licence for the same and also comply with Environmental Management Coordination Act (EMCA) 1999, and Environmental Impact Assessment (EIA) and Environmental Audit (EA) Regulations 2003.

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 cost of complying with the requirements of this Clauses.

143 RECTIFICATION OF TITLE DEEDS

Properties acquired during construction of the road will need to have their title deeds rectified with the Commissioner of Lands. The Contractor shall pay, on instruction from the Engineer, the cost of rectification of title deeds of the affected properties. Contractor will be reimbursed under the Prime Cost sum allowed for land acquisition in Bill 1.

Contractor's overhead shall cover his administration and liaison with the Commissioner of Lands.

Payment will be under appropriate items in the BOQ.

144 COPIES OF ORDERS AND REQUISITIONS

The Contractor shall provide the Engineer with copies of all orders for supply of materials and goods required in connection with the works as the Engineer may require.

145 SHORTAGE OF BITUMEN AND OTHER MATERIALS

The Contractor shall make provisions for obtaining bitumen and other materials required for the Contract if they are not available locally. In particular, the Employer shall not be liable for any additional costs due to local lack of bitumen or any other materials.

147 COMPLIANCE WITH SPECIFICATIONS

All materials, plant, labour and workmanship in and connected with the execution of the works shall be the best of their respective kinds without regard to any trade terms and the Contractors shall comply in these and all other respect with the relevant clauses and shall carry out the contract in a proper and workmanlike manner and in strict accordance with the working drawings and instructions of the Engineer.

148 BOREHOLE FOR CONSTRUCTION WATER

The Contractor will source competitively for a drilling sub-contractor registered with the Water Resources Management Authority (WARMA) to undertake the following tasks;

- (i) Carry out a hydrogeological survey for likely ground water sites along the project road and produce report on the likely construction water sites for the Engineers approval and a final report for submission to the local water board, WARMA and NEMA.
- (ii) Obtain the necessary water extraction and drilling permit for 1 No. borehole.
- (iii) Drill for the borehole to the recommended depth and install 152mm diameter slotted black pipe or PVC pipe casings as instructed by the Engineer.
- (iv) Install an approved 'GRUNDFOS' submersible pipe with an approved control panel.
- (v) Provide a 20,000-litre plastic water tank of type 'ROTO' or similar on a concrete or masonry plinth raised at least 2.5metres above ground.
- (vi) Run and Service the borehole for the duration of the Contract.

The Contractor will make arrangement to acquire land for the borehole and the whole borehole infrastructure shall revert to the Employer at the end of the contract.

The Contractor will be paid on a prime cost basis for his expenses and a percentage to cover cost, profit and overheads, under relevant items in Bill No. 1.

The Contractor will be reimbursed his expenses for Land acquisition under the relevant item in Bill No. 1.

149

GENERAL STD AND HIV/AIDS ALLEVAITION MEASURES

The Contractor shall advise all Site staff and labour (including all the Contractor's employees, all Sub-Contractors' and Consultants' employees, and all truck drivers and crew making deliveries to Site) of the dangers and impact of Sexually Transmitted Diseases (STD) in general and HIV/AIDS in particular. To this end, the Contractor shall conduct Information, Education and Consultation (IEC) campaigns at least every other month, addressed both to the aforementioned Site staff and labour and to the immediate local communities.

The Contractor shall throughout the Contract (including the Defects Liability Period) also provide, maintain and operate at least one STD, HIV/AIDS clinic on each Site or make alternative arrangements with an existing suitably qualified and equipped local clinic. Each clinic shall be suitably staffed and equipped for the screening, diagnosis and counselling of STD, HIV/AIDS cases within the Site staff and labour (as defined above). Each clinic shall also provide free treatment of the general STD cases, while the HIV/AIDS cases shall be put in touch with/referred to the local National HIV/AIDS programme coordinated by the Ministry of Health.

The Contractor shall also make available at least 100 condoms per year for each member of the above-mentioned Site staff and labour.

The Contractor shall, throughout the Contract, liaise with the Department of Health Kiambu County and their designated local representatives or agents, to report progress.

SECTION 2 - MATERIALS AND TESTING OF MATERIALS

All materials testing shall be in accordance with Section 2 of the Standard Specifications.

202 TESTING BY THE CONTRACTOR

Add the following: -

202.1 CONTRACTOR'S TESTING

The provision of the Engineer's laboratory and testing equipment, as specified in Section 1 of this Special Specification, does not relieve the Contractor of his obligation to provide laboratory and testing equipment and execute his own testing, in conformity with the specified requirements in the Standard Specification.

204 SIEVES

Add the following: -

204.1 SIEVE SIZES

A standard set of sieves for general use shall consist of the following sieve sizes mm: 100-63-50-37.5-25-20-14-10-6.3-5-4-2-1-0.6-0.5-0.425-0.300-0.150-0.075 mm. The sieves from 0.425 to 0.075 mm shall be suited for wet sieving.

205 SOILS AND GRAVEL

Whenever in the Contract Document a minimum California Bearing Ratio (CBR) is specified, the CBR of the material shall be determined at the specified state of compaction;

- a) After four days soaking in the case of neat materials and
- b) After seven days curing plus seven days soaking in the case of cement/lime improved materials

211 BITUMINOUS BINDERS

(c) Requirements

- (i) Straight run bitumen

In addition to the requirements of the Standard Specification the ash content of penetration grade bitumen shall not exceed 5 % by weight

SECTION 3 - SETTING OUT & TOLERANCES

301 SETTING OUT

a) General

Add the following:

If the traverse points to be used for the setting out are close to the existing carriageway and interfere with construction works then the Contractor will have to relocate them to a location where they will not be disturbed. The co-ordinates and heights of all traverse points so located shall be listed and provided to the Engineer for checking and/or approval. Contractor shall also monument the new centreline every 200m along straight and all salient points along curves by a pin in the concrete beacon before commencement of any works.

The road reserve boundary posts shall have 12mm diameter steel pins embedded in concrete, 200mm long with 25mm exposed to the air, sticking out from its top surface. This pin shall be co-ordinated and heighted and result of the same shall be provided to the Engineer for approval. Cost of these works shall be included in the rates as no separate item has been provided.

Commencement of the works shall not be permitted until this basic survey data has been provided and approved by the Engineer for at least 5 Kms of the road.

b) Detailed Setting Out

Add the following:

Reference pegs shall be 50mm by 50mm in section 600mm long driven 400mm firmly into ground and painted white above the ground. The offset from centre line shall be indicated by small nail 20mm to 25mm long with its head driven flush with the top of the peg. Chainages, offset and reference elevation shall be clearly indicated to the sides of the peg to the satisfaction of the Engineer.

After cutting of benches and prior to commencement of earthworks or subgrade works, Contractor shall take cross-sections again and submit the copy of the same to Engineer for agreement. These cross-sections shall then be used as basis of measurement for all subsequent layers, unless otherwise stated.

302 TOLERANCES

Add the following:

(j) Pavement Widths

For Pavement widths for subbase, base and wearing course, the allowable tolerances shall be 0 to +50 mm.

(k) Pipe Culverts

The maximum deviation from the specified line of a drainage pipe shall be: -

Horizontal - 25mm in 3.0 m

Vertical - 30 mm in 10.0 m

SECTION 4 - SITE CLEARANCE AND TOP SOIL STRIPPING

401 SITE CLEARANCE

Site Clearance shall be carried out as directed by the Engineer.

Add the following as the last paragraph in Sub-clause (a):

Site clearance is not required over the gravelled width of existing road and shoulders. No measurement and payment for site clearance will be made for this width. The remaining area within the road reserve including sides of existing embankments and cuttings shall be cleared as instructed by the Engineer. This operation shall also include the removal of all trees, except for some 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 the assistance of the Contractor, shall mark out the trees to be removed. After removal, the trunks and branches of these trees shall be cut up into pieces not more than 2.0m in length, transported and neatly stored at the nearest County Offices or otherwise in a position to be indicated by the Engineer. No additional payment shall be made for complying with these requirements and it is deemed the Contractor will have included its cost in the rates for site clearance.

402 REMOVAL OF TOPSOIL

Topsoil shall include up to 200mm depth of any unsuitable material encountered in existing or newly constructed drains, drainage channels, and accesses.

403 REMOVAL OF STRUCTURES, FENCES AND OBSTRUCTIONS

When instructed by the Engineer, the Contractor shall demolish or remove any structure and payment for this shall be made on day works basis.

SECTION 5 - EARTHWORKS

504 PREPARATION PRIOR TO FORMING EMBANKMENT

Add the following at the end:

Where benching is required for existing pavement or embankment slope to accommodate earthworks, subgrade or subbase for widening the road, the rate for compaction of existing ground shall be deemed to cover this activity.

Excavation in the existing road shall be kept dry. In the event of water penetrating the underlying layer, construction of the subsequent layers shall be postponed until the underlying layers are dry enough to accommodate the construction plant without deforming or otherwise showing distress.

Step construction shall be carried out per layer at the joint where excavating both vertically and perpendicular to the direction of the travel. The step shall be 500 mm perpendicular to the direction of the travel and 150 mm vertical unless otherwise instructed by the Engineer.

Special care shall be taken when compacting the new material at the joint ensuring that specified density is achieved.

In cuttings, the contractor shall excavate to a level that would accommodate the 325mm subgrade and the existing ground below this **MUST** be processed and compacted in accordance with clause 504 of the standard specifications.

505 CONSTRUCTION OF EMBANKMENTS

Only material approved by the Engineer shall be used for fill in embankments. Material with high swelling characteristics or high organic matter content and any other undesirable material shall not be used, unless specifically directed by the Engineer.

Unsuitable material shall include:

- (i) All material with CBR Values of less than 2%
- (ii) All material containing more than 5% by weight of organic matter (such as topsoil, material from swamps, mud, logs, stumps and other perishable material)
- (iii) All material with a swell of more than 3% (such as black cotton soil)
- (iv) All clay of plasticity index exceeding 50.
- (v) All material having moisture content greater than 105% of optimum moisture content (Standard Compaction)

Subgrade

Improved Subgrade layer, 325mm thick shall be required below the formation layer and shall be formed as below;

- (i) Existing pavement layers shall be scarified and spread to required width, extra material added from approved borrow sites as necessary, and the whole layer processed and compacted as specified to a thickness of 325mm.

- (ii) The material forming the improved subgrade shall be of Soil Class S4 minimum with CBR of not less than 10% and a swell of less than 1% measured after a 4-day soak. The full layer of 325mm shall be compacted to a 100% MDD (AASHTO T99).

Payment for laying the improved subgrade as per requirements in (i) and (ii) above shall be done under item 5.06 of BOQ. No extra payment will be made for haulage of supplementary subgrade material from borrow pits and all costs shall be deemed to have been factored in the rate entered against item 5.06.

Where the insitu material shall be deemed substandard or weak due to say wet spots, the Engineer may instruct that the material forming the existing pavement first be removed to stockpile and the resultant exposed surface be scarified, re-processed and re-compacted as specified under Clause 504 before laying the improved subgrade material. The removal to stockpile of the existing pavement material shall be paid for under item 5.03 of BOQ.

Where the Engineer shall deem it necessary to protect the pavement layer from water seepage, subsoil drains in form of rockfill wrapped in filter fabric shall be installed at suitable depths below the pavement as instructed (refer to Clause 814 of the Special Specifications). The rockfill and the filter fabric shall be measured in terms of cubic metres and by square metres respectively and payments made under appropriate items of the BOQ.

Embankment repair

Where directed by the Engineer, any localised filling in soft or hard material shall be executed in accordance with Clause 505.

508

COMPACTION OF EARTHWORKS

At pipe culverts, all fill above ground level around the culverts shall be compacted to density of 100% MDD (AASHTO T.99) up to the level of the top of the pipes or top of the surround(s), if any and for a width equal to the internal diameter of the pipe on either side of the pipe(s) or surround(s) as applicable.

At locations adjacent to structures (up to 100m away from structure), all fill above ground level up to the underside of the subgrade shall be compacted to density of 105% MDD (AASHTO T.99). In case of fill around box culverts this should be carried out for the full width of the fill and for a length bounded by the vertical plane passing through the ends of the wingwalls.

Notwithstanding the provision of clause 503 of the standard Specification, Compaction of subgrade material (i.e. material immediately below formation) in cut areas shall not be carried out by the contractor in areas where the formation is formed in hard material, unless specific instructions to the contrary are issued by the Engineer.

Where improved sub-grade material shall be required, the material shall have a CBR greater than 14% and this shall be compacted and finished to the same standards and tolerances as those required for normal subgrade and clauses in the specifications applying to normal subgrade shall also apply.

509 MASS-HAUL DIAGRAM

Delete Clause 509 entirely and substitute “No Mass-Haul diagram has been provided with the Documents. The Contractor shall be responsible for locating suitable materials for constructing earthworks along the alignment and elsewhere and shall include in his rates for fill, spoil and for the cost of haulage”.

511 BORROW PITS

The first part of the Standard Specification is amended as follows: -

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 contrary to what has been stated.

515 SIDE DRAINS

Whenever excavation works in side drains constitutes a separate operation from the bulk earthworks, such excavation shall be classified as catchwater drains under Section 8 of the Specifications

517 MEASUREMENT AND PAYMENT

Notwithstanding the provisions of clause 517 of the standard specifications, the rate for compaction of fill in soft material shall allow for the requirements of clause 508 of the special specification and no extra payment shall be made for compaction around pipe culverts (100% MDD AASHTO T.99).

(h) Delete the text and replace: -

Item: Fill in soft material for improved subgrade
Unit: m³

The rate shall include;

- Scarifying and spreading the existing pavement material to the required pavement width
- Provision of additional subgrade material meeting the specified quality – where required – from approved borrow sites
- Trimming, shaping and compaction of the improved subgrade to 100% MDD (AASHTO T99) in two layers as to achieve the total thickness of 325mm.

SECTION 6 - QUARRIES, BORROW PITS, STOCKPILES AND SPOIL AREAS

601 GENERAL

Notwithstanding any indications to the contrary in the Standard specification the Engineer will not make available to the Contractor any land for quarries, borrow pits, stockpiles and spoil areas, except for those areas in road reserves specifically approved by him.

The contractor will be entirely responsible for locating suitable sources of materials complying with the Standard and Special Specifications, and for the procurement, Winning, haulage to site of these materials and all costs involved therein. Similarly, the contractor will be responsible for the provision and costs involved in providing suitable areas for stockpiling materials and spoil dumps. Should there be suitable sites for spoil dumps or stockpiles within the road reserve forming the site of the works the Contractor may utilise this subject to the approval of the Engineer.

No additional payment will be made to the Contractor to cover costs arising from the requirements for this Clause and the Contractor must include these costs in the rates inserted into the Bills of Quantities.

605 SAFETY AND PUBLIC HEALTH REQUIREMENT

Add the following to Clause 605:

When working the material sites, the Contractor shall time and arrange his works in such a way that at no times the public safety is endangered in any way.

607 SITE CLEARANCE AND REMOVAL OF TOPSOIL AND OVERBURDEN

Add the following to Clause 607:

Faces of quarries or borrow pits being higher than 4 metres shall be shaped and stepped with benches 1.5 m wide, sloping 1:10 out of the face at an interval of 4 metres height. All quarries and borrow pits shall be permanently fenced with 5-strand barbed wire which shall be located 5 metres off the edge of the face.

SECTION 7 - EXCAVATION AND FILLING FOR STRUCTURES

703 EXCAVATION OF FOUNDATIONS FOR STRUCTURES

Unless otherwise instructed by the Engineer, all excavated surfaces in material other than hard material, on which foundations for structures shall be placed, shall be compacted to 100% MDD (AASHTO T.99) immediately before structures are constructed.

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

707 BACKFILLING FOR STRUCTURES

Unless otherwise instructed by the Engineer, all backfilling material shall be compacted to a minimum of 100% MDD (AASHTO T.99).

709 EXCAVATIONS FOR RIVER TRAINING AND NEW WATER COURSES

Payments for river training and establishment of new watercourses shall only be made where such work constitute permanent works. Works done for road deviation or other temporary works shall not qualify for payment.

710 STONE PITCHING

Stone pitching to drains, inlets and outlets of culverts to embankments and around structure shall consist of sound unweathered

rock approved by the Engineer. The stone as dressed shall be roughly cubical in shape with minimum dimensions of 150 x 150mm for normal thickness of stone pitching. Cement mortar Grouting will be done for all stone pitching areas and the top line of the stone pitching should be grouted/sealed with concrete class 15/20. The cement shall be mixed with sand in the ratio of 1:3 by volume to form the grout.

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. Soil erosion is rampant along the project location and this can be minimised by ensuring that proper protection works is carried out along the drains using stone pitching. Most of the sections shall be stone pitched especially areas where we have steep slopes to minimise undermining of the road by rain water or as may be instructed by the Engineer.

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 Specifications.

711 GABIONS

Where instructed by the Engineer the Contractor will install gabions as protection works to washout areas or bridge Piers and or Abutments. Gabions shall be constructed in accordance with Clause 711 of the Standard Specification.

In cases where existing gabions have been damaged, the Contractor shall identify them and notify the Engineer for his agreement of the extent of the Work required and his approval and instructions to proceed with the Works.

The Works shall involve removal of the damaged gabions / rocks, excavation to the correct levels and grades as directed by the Engineer, and in accordance with Clause 711 of the Standard Specifications and reconstruction with new gabions and other necessary materials as necessary. The damaged gabions shall be recovered and transported to the County Government of Kiambu yard.

712 RIP-RAP PROTECTION WORK

Quarry waste or similar approved material shall be used to backfill scoured and eroded side, outfall and cut-off drain. The material shall be compacted to form a flat or curved surface preparatory to stone pitching of drainage channels, existing and new scour checks as directed by the Engineer.

The surface to receive the pitching shall be compacted and trimmed to slope and the stone hand laid, interlocked and rammed into the material to give an even finished surface. The interstices of the Pitching shall be rammed with insitu material. The insitu material immediately behind the pitching shall be compacted to minimum density of 100% MDD compaction (AASHTO T.99)

714 BACKFILL BELOW STRUCTURES

Where instructed this shall be carried out in compliance with the requirements of Clause 507 and 804 of the Standard Specification.

SECTION 8 - CULVERTS AND DRAINAGE WORKS

804 EXCAVATION FOR CULVERTS AND DRAINAGE WORKS

In the Standard Specifications, make the following amendments: -

- (a) In paragraph 6, line 3, and in paragraph 7, line 5 and in paragraph 11, line 6, delete "95%" and insert "100%".

- (b) Removal of Existing Pipe Culverts

Where instructed by the Engineer, the Contractor shall excavate and remove all existing blocked or collapsed culvert pipes of 450mm, 600mm and 900mm diameter including concrete surround, bedding, inlet and outlet structures.

The void left after removal of culvert pipes shall be widened as necessary to accommodate new concrete bedding, pipe and haunching in order to accommodate replacement 600mm or 900mm diameter pipe culverts as shall be directed by the Engineer. The payment of this work shall be per linear metre of pipes removed.

- (c) Removal of Other Existing Drainage Structures

Where instructed by the Engineer, the Contractor shall demolish or remove any other structure and payment for this shall be made on day work basis.

- (d) Excavation for Culverts and Drainage Works

The Contractor shall carry out all excavations for new culverts and drainage works to the lines, levels, inclinations, and dimensions shown on the drawings or as instructed by the Engineer.

805 EXCAVATION IN HARD MATERIAL

In the Standard Specifications, Sub-clauses 805(a) and 805 (b) delete "95%" and insert "100%".

In sub-clause 809(a), paragraph 1, line 1, substitute "95%" with "100%".

In sub-clause 809(c), paragraph 2, line 4, between the words "compacted" and "and shaped" insert the words "to 100% MDD (AASHTO T.99)".

Hard material is material that can be excavated only after blasting with explosives or boring and wedging or the use of a mechanical breaker fitted with a rock point in good condition and operated correctly. Boulders of more than 0.2m³ occurring in soft material shall be classified as hard material.

809 BEDDING AND LAYING OF PIPE CULVERTS

Concrete pipes shall be laid on a 150mm thick concrete bed of class 15/40 and the pipes shall be bedded on 1:3 cement: sand mortar at least 50mm thick, 150mm wide and extending the full length of the barrel.

The rates inserted shall allow for compaction of the bottom of excavation to 100% MDD (AASHTO T.99).

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 bedding shall be Class 25/20.
- ii. The inner concrete barrel surface immediately in contact with the inflated balloon form during placing shall achieve Class F3 finish.

Payments for the bedding, pipe culvert and surround shall be made as specified in the standard specifications. No additional payments shall be made for complying with these requirements where the balloon method is adopted.

810 JOINTING CONCRETE PIPES

The concrete pipes for the culverts shall have ogee joints and will be jointed by 1:2 cement: sand mortar and provided with fillets on the outside as described in clause 810 of the Standard Specification.

812 BACKFILLING OVER PIPE CULVERTS

In the Standard Specifications, clause 812

- i. Delete paragraph 6 "for pipe culverts depth of 150mm", entirely.
- ii. Wherever the expression "dry density of 95% MDD (AASHTO T. 99)" occurs delete and replace with "dry density of 100% MDD (AASHTO T.99)".

The rates entered for laying of pipe culverts shall allow for backfilling to pipe culverts and compacting to 100% MDD (AASHTO T.99) and these works shall **not** be measured and paid for separately.

813 PRECAST CONCRETE OPEN CHANNELS

Add the following to the standard specification clause 813: -

813.1 HALF ROUND OPEN CHANNELS

These shall be provided as directed by the Engineer and in compliance with sections 813 and 820 of the standard specifications.

813.2 INVERT BLOCK OPEN CHANNELS

These shall be provided as directed by the Engineer and in compliance with sections 813 and 820 of the standard specifications.

Where instructed, the Contractor shall excavate, compact the excavated bed to 100% MDD AASHTO (T.99), backfill as necessary with selected material compacted to 100% MDD AASHTO (T.99) and remove surplus material to spoil, provide, lay and joint invert block drains of 300mm diameter with two side slabs

Precast concrete invert block side drains shall comply with the requirements of BS 340, and shall be laid in accordance with the drawings.

Precast concrete invert block drains and side slabs shall be formed of concrete of the class specified and to the dimensions shown on the drawing. Drains shall not normally be laid to a radius of a curvature less than 10 times the bed width or a diameter of the drain.

Invert block drains shall be constructed in the positions and to the levels and dimensions shown on the drawings or as directed by the Engineer. The earth sides to such channels shall be neatly finished to a slope of 1: 1 or such other slope as the Engineer may direct. Invert block drains and side slabs shall be neatly jointed with mortar consisting of 1:3 cement: sand by volume.

Payment for laying invert block drains of 300 mm dia. inclusive of two side slabs shall be by linear metre laid as instructed. The rate shall be inclusive of provision and transport of all materials, excavation, bed compaction and preparation, laying, jointing and disposal of spoil.

814.1 SUBSOIL DRAINS

In the event of excavation for repairs exposing local seepage, springs or unacceptably high-water table, the Engineer may instruct the provision of counter fort or French drains.

These drains shall consist of a trench excavated to the alignment, width, depth and gradient instructed by the Engineer, and backfilled with approved compacted clean hard crushed rock material as specified in clause 815 of the standard specification. Where these drains lie within the carriageway the carriageway shall be constructed only after the subsoil drain has been completed and approved by the Engineer

814.2 FILTER FABRIC TO SUBSOIL DRAINS

A filter fabric shall be placed under, around and over rock fill of the subsoil drains. The provisions and placing of the fabric shall be in accordance with manufacturer's instructions and complying with Clause 804 and 814 of the Standard Specification. Payment shall be in metre square of the fabric used.

818 SCOUR CHECKS

Scour checks are to be constructed in mass concrete in accordance with clause 818 of the standard Specifications and the drawings as shall be provided.

SECTION 9 - PASSAGE OF TRAFFIC

901 SCOPE OF THE SECTION

The Contractor shall so arrange his work to ensure the safe passage of the Traffic at all times and if necessary, construct and maintain an adequate diversion for traffic complete with all the necessary road traffic signs.

The contractor shall provide to the satisfaction of the Engineer adequate warning signs, temporary restriction signs, advance warning signs, barriers, temporary bumps and any other device and personnel equipped with two-way radios to ensure the safe passage of traffic through the works.

When carrying out the Works the Contractor shall have full regard for the safety of all road users.

The Contractor shall also provide sign posts and maintain to the satisfaction of the Engineer all deviations necessary to complete the works. The contractor should allow for the costs of complying with the requirements of this clause in his rates.

The contractor will 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 to the contractor for any expenditure on traffic control or the provision of deviations. The employer shall not be liable for inadequate prior investigations of this nature by the contractor.

903 MAINTENANCE OF EXISTING ROAD

The Employer shall hand-over the existing road to the Contractor at the commencement of the Contract. The Contractor shall be responsible for all repairs and maintenance during the duration of the Contract. The existing road is gravel and the Contractor shall maintain it with suitable approved gravel of minimum CBR 20%. 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.

904 CONSTRUCTION OF DEVIATIONS

a) General

In addition to requirement of this clause, the maximum length of deviation road shall be restricted to 5 Kms at any given time unless otherwise instructed. The Contractor shall construct and complete deviations to the satisfaction of the Engineer before commencing any permanent work on the existing road. Also, during these works the contractor is supposed to provide a detour of adequate pipe culverts for pedestrian and traffic crossing where there is bridge works.

Contractor will be allowed to open further 5 Km of the deviation road only when 80% of the permanent work has been completed on first one and he will not be allowed to open further 5 Km till he has completed first 10 Km of the road and has it opened to traffic.

Where there is an existing side road near the main road, the Contractor shall use this road as deviation road.

b) **Geometry**

The carriageway width of the deviations shall not be less than 6.5m wide and suitable for 2-way lorry traffic unless otherwise specified.

c) **Construction**

Unless otherwise instructed gravel wearing course for the deviation shall be 150 mm compacted thicknesses complying with section 10 of the Standard Specification. The Contractor shall allow in his rate for removal of any unsuitable material before placing of gravel wearing course, as this will not be paid for separately.

The Contractor shall be responsible for locating and obtaining suitable gravel for the construction of deviations. He shall be fully responsible for all payments necessary to enable him to purchase, excavate, stockpile, transport, lay and compact the gravel. These costs shall include but not limited to the following

- site clearance,
- stripping and removal of topsoil and any overburden,
- construction and maintenance of haul roads,
- Reinstatement of borrow areas after they become disused.

All works shall be executed in accordance with Clauses 604, 605, 606, 607 and 608 of Section 6 of the Specification. Contrary to provisions of Clause 610, no reimbursement for land acquisition shall be done.

In addition to provisions of this clause, Contractor is required to sprinkle water at least 4 times a day at the rate of 1 - 1.4 litres/m² in regular interval to minimise the effects of dust. Latest sprinkling time shall be one hour before the sunset.

906 PASSAGE OF TRAFFIC THROUGH THE WORKS

The Contractor shall arrange for passage of traffic through the works during construction whenever it is not practicable to make deviations. The contractor shall be reimbursed in accordance with the standard specifications.

Any damage caused by passing traffic through the works shall be made good at the contractor's own cost.

907 SIGNS, BARRIERS AND LIGHTS

Contractor shall provide signs, barriers and lights as shown in the drawings at the locations where the traffic is being carried off the existing road to the deviation and back again to

existing road. The Contractor shall provide ramps and carry out any other measures as instructed by the Engineer to safely carry traffic from the road to deviation.

Contrary to what has been specified in this clause the road signs provided shall be fully reflectorised and in conformity with clause 9.1 of the "Manual for Traffic Signs in Kenya Part II"

909 ASSISTANCE TO PUBLIC

In addition to provision of clause 909, Contractor shall maintain close liaison with the relevant authorities to clear any broken down or accident vehicles from the deviations and the main road, in order to maintain smooth and safe flow of the traffic.

912 MEASUREMENT AND PAYMENT

(a) Maintenance of existing road

The Contractor will be paid by the cubic metre of compacted gravel used to maintain existing road.

(b) Construct Deviation

The Contractor shall be paid only 50% of the rate for this when he completes deviation road to the satisfaction of the Engineer. The balance shall be paid in equal monthly instalments over the contract period, as he satisfactorily maintains the deviation (as per clause 904 and 905 above) when it is in operation.

The rate shall include for the construction of any drainage requirement found necessary.

(d) Passage of traffic through the works

Payment shall be made on Lump Sum basis.

(e) Add the following:

Source of gravel material shall be provided by the Contractor and is subject to approval by the Engineer.

(f) Delete this Sub-Clause.

There will be no payment for overhaul.

(i) Assistance to Public

The Contractor will be deemed to have included cost of this item in other items and no separate payment shall be made.

913 TRAFFIC MANAGEMENT PLAN

Separately with the program for the Execution for the Works, the Contractor shall submit a traffic management plan prepared at a suitable scale showing his proposals for the management and control of traffic during the period of construction.

The plan shall indicate the overall time sequence of construction for the project roads such that disruptions to traffic are minimised. The plan shall show the proposed deviations or where it is necessary to pass traffic through the works, the sequence of operations along the length of the road such that hindrance to traffic is kept to an absolute minimum.

Modifications may be made to the plan as necessary with the prior approval of the Engineer. No operations shall commence until such time that the Engineer has approved in writing the traffic management plan.

SECTION 11 – SHOULDERS TO PAVEMENT

1101 GENERAL

Shoulders shall be constructed to a width of 1.5m, to the same standard as the carriageway with the pavement layers being constructed concurrently. Thus sections 12, 14 and 15 of the specifications apply as appropriate.

SECTION 12 - NATURAL MATERIAL SUBBASE AND BASE

1201 GENERAL

Natural Material for subbase and base shall be sourced from approved gravel sites.

1203 MATERIAL REQUIREMENTS

Natural materials for base and subbase shall conform to the specifications given in Section 12 of the Standard Specifications for cement improved base and subbase.

1209 MEASUREMENT AND PAYMENT

a) Natural material for subbase and base

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.

Notwithstanding the provisions of the Standard Specifications as regards the different methods of measurement, the applicable method here shall be “method - A” irrespective of whether the source of material shall be available at the time of tender or not. The responsibility of locating suitable gravel sources meeting the requirements of Clause 1203 shall lie with the Contractor.

No extra payment will be made for haulage of gravel material as the overhaul costs shall be deemed to have been factored in the rates inserted in the Bills of Quantities.

b) Overhaul

No extra payment will be made for haulage of gravel material as the overhaul costs shall be deemed to have been factored in the rates inserted in the Bills of Quantities.

1210 HAND PACKED STONE

Hand packed stone base is a layer of hand laid stone of defined size and durable in nature, laid in a manner such that when proof rolled and compacted it forms a stable and dense matrix as a road base.

a) Material for Hand Packed Stone Base

This shall consist of durable stone with nominal base dimensions of 75 mm square and minimum height of 150 mm or when compacted to give a layer of 150 mm. The stone shall be class C with the following requirements:

LAA	45 max
ACV	32 max
SSS	12 max
FI	30 max
CR	60 min.

It shall be free from foreign matter. The fines passing 0.425 mm sieve shall be **NONPLASTIC**

b) Laying

The stone shall be laid by hand closely together. The stone shall be carefully bedded and tightly wedged with suitable spalls. The base of the stone shall alternate with the apex in all directions or as directed by the Engineer. The layer shall be proof rolled with a loaded scrapper or truck with a minimum axle load of 8 Tonnes in the presence of the Engineer who shall approve of its stability before compaction.

c) Compaction

This shall be by a steel wheeled roller of at least five Tonnes per metre width of roll. It shall consist of four static runs or until there is no movement under the roller. There shall follow vibratory compaction until an average dry density of 85% minimum of specific gravity of stone has been achieved. No result shall be below 82% of specific gravity. The surface of the compacted layer shall then be levelled by quarry dust (0/6 mm). The dust shall have the following specifications:

The stone shall be class C

Grading

(a) Sieve Size	(b) % Passing
10	100
6.3	90-100
4	75-95
2	50-70
1	33-50
0.425	20-33
0.300	16-28
0.150	10-20
0.075	6-12

The dust shall be free from foreign matter and fines passing 0.425 mm sieve shall be **NON-PLASTIC**. The maximum layer shall be 40 mm or as directed by the Engineer

d) Measurement and Payment

Payment shall be by the cubic metre laid (m^3). Measurement of volume shall be determined as the product of length and compacted thickness laid. The rate quoted for this item should include the cost for laying the levelling quarry dust layer, as no extra payment shall be made for this layer.

SECTION 14 - CEMENT TREATED MATERIALS

1401 CEMENT TREATMENT

a) Cement for Treatment

Cement for stabilisation will be **Ordinary Portland Cement** complying with clause 207 of the Standard Specifications. The cement content of the treated material shall be as indicated by the Engineer and will normally be about 2-4%. The Engineer shall exercise his discretion to any variation in the rate of application of the cement, which he may see fit to order from time to time.

b) Moisture content

The moisture content of the treated material shall be as directed by the Engineer but nevertheless within the range of 95% to 105% of the Optimum Moisture Content (AASHTO T180).

c) Mixing and Placing

The material to be treated and the cement shall be mixed by an approved mixing plant (i.e a mix-in place pulvimixer or a stationary plant).

1409 PROTECTION AND CURING

Protection and curing shall be carried out in accordance with the provisions of Clause 1409(i) of the Standard Specification but provision shall be made to wet the surface from time to time as directed by the Engineer.

1412 MEASUREMENT AND PAYMENT

Stabilizer

The provision of the stabilizer shall be measured by the tonne calculated as the specific weight of stabilizer added to the material.

Mix-in stabilizer

Mixing stabilizer into the material shall be measured by the cubic metre of treated material calculated as the product of the compacted sectional area treated and the length.

SECTION 15 - BITUMINOUS SURFACE TREATMENTS

PART A - GENERAL

SECTION 15 - BITUMINOUS SURFACE TREATMENTS

PART A - GENERAL

1501A GENERAL

Details of the bitumen spray rates and the chipping spread rates will be directed by the engineer but the rates given below can be used for general guidance purposes.

(a) Chippings

14/20mm size precoated chippings at a spread rate of 60-70 square metres per cubic metre.

10/14mm precoated chippings at a spread tare of 70-90 square metres per cubic metre.

10/14mm precoated chippings at a spread tare of 70-90 square metres per cubic metre.

(b) Bitumen Spray Rates

1.0-1.4l/m² for the first seal

0.8-1.0l/m² for the second seal

0.6-0.8/m² for the third seal

PART B - PRIME COAT

1502 MATERIALS FOR PRIME COAT AND TACK COAT.

For prime coat, the binder shall be a medium-curing cut-back MC30 for Cement Stabilised Base unless otherwise directed by the Engineer. The spray rate shall be 1.0-1.2 l/m²

The rate of spray of bituminous prime coat refers to the gross volume of the cut-back bitumen, that is the volume of the bitumen plus dilutant.

Prime Coat shall be applied to areas which are to receive single seal surface dressing, double seal surface dressing or bituminous mixes as directed by the Engineer.

The tack coat shall consist of K1-60 unless directed by the Engineer

The spray rates of the binder shall be as instructed by the Engineer and shall generally be within the range 0.3-1.04l/m²

PART C – SURFACE DRESSING

1502C MATERIALS FOR SURFACE DRESSING.

In addition to the requirements of the standard specifications, details of the bitumen spray rates and the chipping spread rates will be directed by the Engineer but the rates given below can be used for general guidance purposes.

(a) Binder

The bituminous binder shall be 80/100 penetration grade bitumen. Cut-back with Kerosene fuel in accordance with the prevailing road temperature and conforming to clause 211 of the standard specification.

(b) Chippings

Chippings shall be of Class I material and shall comply in all respects with clause 1502C of the Standard Specification. The Contractors attention is drawn to Clause 1501C of the Standard Specification with regard to cleanliness and dust content of the chippings for surface dressing. Should it prove necessary in the Engineers opinion to wash the chippings, no extra payment will be made to the Contractor for this operation.

1503C SPRAY AND SPREAD RATES OF BITUMEN AND CHIPPINGS.

Spray and Spread rates cannot be calculated until samples of the chippings to be used are available for the test.

After submission of samples and completion of Laboratory tests on chippings and binder, the contractor shall in the presence of the Engineer or his representative, lay trial sections of seal at various rates of spray and spread as directed by the Engineer and in accordance with clause 1503C of the Standard Specifications.

Should any change occur in the source of chippings or bitumen, the Contractor shall advice the engineer accordingly who will then decide if any revisions are required t the spray and spread rates

If any changes are required, the Contractor shall carry out further trials as instructed by the Engineer.

Payment for binder and chippings will be based on the instructed spray and spread rates used which may not necessarily those specified. The Engineer will specify the spray rates of bitumen as residual bitumen per square metre.

Actual bitumen spray and chippings spread rates shall be instructed by the Engineer, following site trials. Actual spray rates used by the Contractor must be adjusted to compensate for any cutback added.

1505C PRECOATED CHIPPINGS

Chippings used for surface dressing work shall be precoated in accordance with clause 1501C of the cutback bitumen emulsion.

The amount of bituminous binder used to precoat chippings will be instructed by the Engineer and will normally be between 0.4% and 1.0 % residual bitumen as percentage of the dry weight.

Prior to laying any precoated chipping's, the contractor shall prepare trial mixes of bitumen and chippings in the presence of the Engineer. After completion of trial mixes, the Engineer shall issue written instructions to the Contractor indicating the amount of binder to be added in

precoated chippings. The Contractor shall maintain this proportion unless the surface or nature of the chippings changes when the Contractor shall repeat the trials and the Engineer will issue revised instruction.

1511C MEASUREMENT AND PAYMENT

Payment for surface dressing shall be in accordance with direction 15 of the directions for measurement and pricing. The rates inserted by the Contractor for precoated chippings in the Bills of Quantities shall include provision of chippings, spreading and rolling the precoated chippings on the carriageway.

The rate inserted for bleeding 80/100 penetration grade bitumen with kerosene shall be the amount of cutter in litres used for the cut-back.

SECTION 16 - BITUMINOUS MIX BASES, BINDER COURSES AND WEARING COURSES

This section covers different types of bituminous mixes for surfacing (wearing and binder courses) and is divided into the following parts: -

PART A: GENERAL

PART B: ASPHALT CONCRETE FOR SURFACING

PART A – GENERAL 1601A SCOPE OF PART A

Part A comprises all the general requirements for bituminous mixes which apply to Part B as well.

1602A REQUIREMENTS FROM OTHER SECTIONS

The following sections of this Specification apply to Part B of this section and shall be read in conjunction therewith: -

Section 2	Materials and Testing of Materials
Section 3	Setting Out and Tolerances
Section 6	Quarries, Borrow Pits, Stockpile and Spoil Areas
Section 15	Bituminous Surface Treatments and Surface Dressing

1603A CONSTRUCTION PLANT

a) General

The Contractor shall submit to the Engineer in accordance with Section 1 of its Specification. Full details of the construction plant he proposes to use and the procedures he proposes to adopt for carrying out the permanent Works.

The Engineer shall have access at all times to construction plant for the purposes of inspection. The Contractor shall carry out regular calibration checks in the presence of the Engineer and shall correct forthwith any faults which are found.

All construction plant used in the mixing, laying and compacting of bituminous mixes shall be of adequate rated capacity, in good working condition, and shall be acceptable to the Engineer. Obsolete or worn-out plant will not be allowed on the work.

b) Mixing Plant

Bituminous materials shall be mixed in a plant complying with ASTM Designation D995 and shall be located on the Site unless otherwise agreed by the Engineer. It shall be equipped with at least three bins for the storage of heated aggregates and a separate bin for filler. All bins shall be covered to prevent the ingress of moisture.

The plant may be either the batch-mix type or the continuous-mix type and shall be capable of regulating the composition of the mixture to within the tolerances specified in Clause 1614A of this Specification.

The bitumen tank shall be capable of maintaining its contents at the specified temperature within a tolerance of 5°C and a fixed thermometer easily read from outside the tank. Any bitumen which has been heated above 180°C or has suffered carbonisation from prolonged heating shall be removed from the plant and disposed of.

c) **Laying Plant**

Bituminous materials shall be laid by a self-propelled spreader finisher equipped with a hopper, delivery augers and a heated adjustable vibrating screed. It shall be capable of laying bituminous materials with no segregation, dragging, burning or other defects and within the specified level and surface regularity tolerance. Delivery augers shall terminate not more than 200mm from the edge plates.

d) **Compaction Plant**

The Contractor shall provide sufficient rollers of adequate size and weight to achieve the specified compaction. Prior to commencing the laying of bituminous mixes in the permanent Works the Contractor shall carry out site trials in accordance with Section 2 of this Specification to demonstrate the adequacy of his plant and to determine the optimum method of use and sequence of operation of the rollers.

It is important to achieve as high a density as possible at the time of construction and it is expected that vibrating rollers will be required to produce the best results. However, it is essential that thorough pre-construction trials are carried out to ensure that: -

- (a) The roller is set up to have the optimum amplitude and frequency of vibration for the particular material being laid
- (b) That the roller does not cause breakdown of the aggregate particles.
- (c) That the optimum compaction temperatures are established which allow compaction without causing ripple effects or other distortions of the surfacing.

1604A PREPARATION OF SURFACE

Immediately before placing the bituminous mix in the pavement, the existing surface shall be cleaned of all material and foreign matter with mechanical brooms or by other approved methods. The debris shall be deposited well clear of the surface to be covered.

Any defect of the surface shall be made good and no bituminous mix shall be laid until the surface has been approved by the Engineer.

If instructed by the Engineer a tack coat shall be applied in accordance with Section 15 of this Specification. If the Engineer considers a tack coat is required prior to laying the bituminous mix or between layers of the bituminous mix, due solely to the Contractor's method of working, then such tack coat shall be at the Contractor's expense.

1605A DESIGN AND WORKING MIXES

At least two months prior to commencing work using a bituminous mix, the Contractor shall have demonstrated that he can produce aggregates meeting the grading requirements of the Specification, submit samples of each constituent of the mix to the Engineer. The Engineer will then carry out laboratory tests in order to decide upon the proportion of each constituent of the initial design mix or mixes to be used for site trials to be carried out in accordance with Clause 1606A of this Specification.

Should the Engineer conclude from the site trials that the mix proportion or aggregate grading are to be changed, the Contractor shall submit further samples of the constituents and carry out further site trials all as directed by the Engineer.

The Engineer may instruct the alteration of the composition of the -75-micron fraction of the aggregates by the addition or substitution of mineral filler. The Engineer may also instruct the alteration of all or part of the -6.3mm fraction of the aggregates by the addition or substitution of natural sand.

The Contractor shall make the necessary adjustments to his plant to enable the revised mix to be produced.

Following laboratory and site trials the Engineer will determine the proportions of the working mix and the Contractor shall maintain this composition within the tolerances given in Clause 1614A.

Should any changes occur in the nature or source of the constituent materials, the Contractor shall advise the Engineer accordingly. The procedure set out above shall be followed in establishing the new mix design.

1606A SITE TRIALS

Full scale laying and compaction site trials shall be carried out by the Contractor on all asphalt pavement materials proposed for the Works using the construction plant and methods proposed by the Contractor for constructing the Works. The trials shall be carried out with the agreement, and in the presence of the Engineer, at a location approved by the Engineer.

The trials shall be carried out to: -

- a) Test materials, designed in the laboratory, so that a workable mix that satisfies the specification requirements can be selected.
- b) To enable the Contractor to demonstrate the suitability of his mixing and compaction equipment to provide and compact the material to the specified density and to confirm that the other specified requirements of the completed asphalt pavement layer can be achieved.

Each trial area shall be at least 100 metres long and to the full construction width and depth for the material. It may form part of the Works provided it complies with this Specification. Any areas that do not comply with this Specification shall be removed.

The Contractor shall allow in his program for conducting site trials and for carrying out the appropriate tests on them. The trial on any pavement layer shall be undertaken at least 21 days ahead of the Contractor proposing to commence full-scale work on that layer.

The Contractor shall compact each section of trial over the range of compactive effort the Contractor is proposing and the following data shall be recorded for each level of compactive effort at each site trial: -

- i. The composition and grading of the material including the bitumen content and type and grade of bitumen used.
- ii. The moisture content of aggregate in the asphalt plant hot bins.
- iii. The temperature of the bitumen and aggregate immediately prior to entering the mixer, the temperature of the mix on discharge from the mixer and the temperature of the mix on commencement of laying, on commencement of compaction and on completion of compaction. The temperature of the mixture is to be measured in accordance with BS 598. Part 3, Appendix A.

- b. The type, size, mass, width of roll, number of wheels, wheel load, tyre pressures, frequency of vibration and the number of passes of the compaction equipment, as appropriate for the type of roller.
 - i. The target voids and other target properties of the mix together with the results of the laboratory tests on the mix.
 - ii. The density and voids achieved.
 - iii. The compacted thickness of the layer.

Any other relevant information as directed by the Engineer.

At least eight sets of tests shall be made by the Contractor and the Engineer on each 100 metres of trial for each level of compactive effort and provided all eight sets of results over the range of compactive effort proposed by the Contractor meet the specified requirements for the material then the site trial shall be deemed successful. The above data recorded in the trial shall become the agreed basis on which the particular material shall be provided and processed to achieve the specified requirements.

1607A MIXING OF AGGREGATES AND BITUMEN

The bitumen shall be heated so that it can be distributed uniformly and care shall be taken not to overheat it. The temperature shall never exceed 170°C for 80/100 or 60/70 bitumen,

The aggregates shall be dried and heated so that they are mixed at the following temperatures:

125-165°C when 80/100 bitumen is used

The dried aggregates shall be combined in the mixer in the amount of each fraction instructed by the Engineer and the bitumen shall then be introduced into the mixer in the amount specified. The materials shall then be mixed until a complete and uniform coating of the aggregate is obtained.

The mixing time shall be the shortest required to obtain a uniform mix and thorough coating. The wet mixing time shall be determined by the Contractor and agreed by the Engineer for each plant and for each type of aggregate used. It shall normally not exceed 60 seconds.

1608A TRANSPORTING THE MIXTURE

The bituminous mix shall be kept free of contamination and segregation during transportation. Each load shall be covered with canvas or similar covering to protect it from the weather and dust.

1609A LAYING THE MIXTURE

Immediately after the surface has been prepared and approved, the mixture shall be spread to line and level by the laying plant without segregation and dragging.

The mixture shall be placed in widths of one traffic lane at a time, unless otherwise agreed by the Engineer. The compacted thickness of any layer shall be at least 2.5 times the maximum size of the aggregate for wearing course and at least 2 times for binder course. The minimum thickness shall be 25mm.

Only on areas where irregularities or unavoidable obstacles make the use of mechanical laying impracticable, may the mixture be spread and compacted by hand.

1610A COMPACTION

Immediately after the bituminous mixture has been spread, it shall be thoroughly and uniformly compacted by rolling.

The layer shall be rolled when the mixture is in such a condition that rolling does not cause undue displacement or shoving.

The number, weight and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. The sequence of rolling operations shall be as agreed with the Engineer and proved during site trials. Initial rolling with steel tandem or three-wheeled roller shall follow the laying plant as closely as possible. The rollers shall be operated with the drive roll nearest the laying plant, at a slow and uniform speed (not exceeding 5 Km/Hr).

Rolling shall normally commence from the outer edge and proceed longitudinally parallel to the centreline, each trip overlapping one half of the roller width. On super elevated curves, rolling shall begin at the low side and progress to the high side. Where laying is carried out in lanes care must be taken to prevent water entrapment.

Intermediate rolling with a pneumatic tyred or vibratory roller shall follow immediately. Final rolling with a steel-wheeled roller shall be used to eliminate marks from previous rolling.

To prevent adhesion of the mixture to the rollers, the wheels shall be kept lightly moistened with water.

In areas too small for the roller, a vibrating plate compactor or a hand tamper shall be used to achieve the specified compaction.

1611A FINISHING, JOINTS AND EDGES

Any mixture that becomes loose and broken, mixed with dirt or foreign matter or is in any way defective, shall be removed and replaced with fresh hot mixture, which shall be compacted to conform to the surrounding area.

Spreading of the mixture shall be as continuous as possible. Transverse joints shall be formed by cutting neatly in a straight line across the previous run to expose the full depth of the course. The vertical face so formed shall be painted lightly with hot 80/100 penetration grade bitumen just before the additional mixture is placed against it.

Longitudinal joints shall be rolled directly behind the paving operation. The first lane shall be placed true to line and level and have an approximately vertical face. The mixture placed in the abutting lane shall then be tightly crowded against the face of the previously placed lane. The paver shall be positioned to spread material overlapping the joint face by 20-30mm. Before rolling, the excess mixture shall be raked off and discarded.

When the abutting lane is not placed in the same day, or the joint is destroyed by traffic, the edge of the lane shall be cut back as necessary, trimmed to line and painted lightly with hot 80/100 penetration grade bitumen just before the abutting lane is placed.

Any fresh mixture spread accidentally on the existing work at a joint shall be carefully removed by brooming it back on to uncompacted work, so as to avoid formation of irregularities at the joint. The finish at joints shall comply with the surface requirements and shall present the same uniformity of finish, texture and-density as other sections of the work.

The edges of the course shall be rolled concurrently with or immediately after the longitudinal joint. In rolling the edges, roller wheels shall extend 5Q to 100mm beyond the edge.

1612A SAMPLING AND TESTING OF BITUMINOUS MIXTURES

The sampling of bituminous mixtures shall be carried out in accordance with AASHTO T168 (ASTM Designation D979).

1613A QUALITY CONTROL TESTING

During mixing and laying of bituminous mixtures, control tests on the constituents and on the mixed material shall be carried out in accordance with Clause 1612A and Section 2 of this Specification

If the results of any tests show that any of the constituent materials fail to comply with this Specification, the Contractor shall carry out whatever changes may be necessary to the materials or the source of supply to ensure compliance.

If the results of more than one test in ten on the mixed material show that the material fails to comply with this Specification, laying shall forthwith cease until the reason for the failure has been found and corrected. The Contractor shall remove any faulty material laid and replace it with material complying with this Specification all at his own expense,

1614A TOLERANCES

Surfacing courses and base shall be constructed within the geometric tolerances specified in Section 3 of this Specification.

The Contractor shall maintain the composition of the mixture as determined from the Laboratory and site trials within the following tolerances, per single test: -

Bitumen Content	0.3% (by total weight of total mix)
Passing 10mm sieve and larger sieves	6% (by total weight of dry aggregate including mineral filler)
Passing sieves between 10mm and 1.0mm sieves	4% (by total weight of dry aggregate including mineral filler)
Passing sieves between 1.0mm and 0.075mm sieve	3% (by total weight of dry aggregate including mineral filler)
Passing 0.075mm sieve	2% (by total weight of dry aggregate including mineral filler)

The average amount of bitumen in any length of any layer, calculated as the product of the bitumen contents obtained from single tests and the weight of mixture represented by each test, shall not be less than the amount ordered.

The average amount of bitumen for each day's production calculated from the checked weights of mixes shall not be less than the amount ordered.

The average amount of bitumen in any length of any layer, calculated as the product of the bitumen contents obtained from single tests and the weight of mixture represented by each test, shall not **be** less than the amount ordered.

The final average overall width of the upper surface of a bituminous mix layer measured at six equidistant points over a length of 100m shall be at least equal to the width specified. At no point shall the distance between the centreline of the road and the edge of the upper surface of a bituminous mix layer be narrower than that specified by more than 13mm.

1615A MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for complying with the requirements of Clauses 1601A to 1614A inclusive and the Contractor shall be deemed to have allowed in his rates in Part B of Section 16 of this Specification for the costs of complying with the requirements of Part A of Section 16 of this Specification.

PART B - ASPHALT CONCRETE FOR SURFACING

1601B DEFINITION

Asphalt concrete means a thoroughly controlled, hot-mixed, hot-laid, plant mixture of well graded dried aggregate and penetration grade bitumen, which, when compacted forms a dense material. A distinction is drawn between asphalt concrete Type I (High Stability) and asphalt concrete Type II (Flexible). The asphalt concrete type will be Type I.

1602B MATERIALS FOR ASPHALT CONCRETE

a) Type of bituminous material

The type of material to be used on severe sites will be of the continuously graded type similar to Asphaltic Concrete or Close Graded Macadam. It is essential that these materials are sealed with a single or double surface dressing or a Cape seal.

b) Penetration Grade Bitumen

Bitumen shall be 80/100 penetration grade.

c) Aggregate

Coarse aggregate (retained on a 6.3mm sieve) shall consist of crushed stone free from clay, silt, organic-matter and other deleterious, substances. The aggregate class will be specified in the Special Specification-and it shall comply with the requirements given in Table 16B-1 (b):

The coarse aggregate shall be entirely crushed rock from a source which is known to give high values of stability (> 9kN) in the Marshall test. Crushed river gravel should not be used.

TABLE 16B-1 (b) - REQUIREMENTS FOR COARSE AGGREGATE

Coarse Aggregate Test	(Retained on a 6.3mm Sieve) Maximum Value
LAA	30
ACV	25
SSS	12
FI	25

Fine aggregate (passing a 6.3mm sieve) shall be free from clay, silt, organic and other deleterious matter and shall be non-plastic. Unless otherwise specified in the Special Specification it shall consist of entirely crushed rock produced from Los Angeles Abrasion of not more than 40. The Sand Equivalent of the fine aggregate shall not be less than 40 and the SSS not more than 12.

d) Mineral Filler

Mineral Filler shall consist of Ordinary Portland Cement

1603B GRADING REQUIREMENTS

The grading of the mixture of coarse and fine aggregate shall be within and approximately parallel to the grading envelopes given in Table 16B-1 (a), for 0/20mm as specified for binder course, as described below.

To arrive at a suitable design, it is necessary to investigate a number of gradings so that a workable mix which also retains a minimum of 3 % voids at refusal density is identified. The recommendations given in the SHRP SUPERPAVE system are provided in Tables 16B-1(c) and 16B-1 (d) as guidance towards identifying a suitable grading.

TABLE 16B-1(c) - SUPERPAVE AGGREGATE GRADING CONTROL POINT

Nominal Maximum Size (mm)	Sieve Size (mm)	Control Point (% Passing)	
		Minimum	Maximum
37.5	0.075	0	6
	2.36	15	41
	25.0	-	90
	37.5	90	100
	50.0	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 (mm)	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	22.3-28.3	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	11.4-11.4	13.7-13.7	15.5-15.5

The SUPERPAVE definition of Nominal Maximum Size of Aggregate is one sieve size larger than the first sieve to retain more than ten per cent of the aggregate. The largest particle size used should not be more than 25mm so that the requirements of the Marshall test method can be complied with.

Although the complete range of nominal maximum particle sizes is shown in the Tables, the total thickness of material laid should not be less than 75mm.

1604B REQUIREMENTS FOR ASPHALT CONCRETE

The mixture shall comply with the requirements given in Table 16B-2 as specified in the Specification. In addition, minimum Marshall Stability for 2 * 75 blows shall be 9 KN and maximum 18 KN and at compaction to refusal shall have 3% VIM.

The proportion, by weight of total mixture, of bitumen shall be 6%. This shall be termed the nominal binder content. The binder content of the working mix will be instructed by the Engineer following laboratory and site trials.

In order to determine the suitability of a course aggregate source a Marshall Test program shall be carried out. It will be advantageous to use a crushed rock which is known from past experience to give good results in this test procedure. A grading conforming to the Type I Binder Course detailed in Table 16B-1(a) 0/20 of this Specification should be tested (but with 100% passing the 25mm 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 the procedure described in BS 598 (Part 104: 1989), with one revision.

It should first be confirmed that compaction on one face of the sample gives the same refusal density as when the same compaction cycle is applied to both faces of the same sample. The procedure which gives the highest density must be used.

From the bitumen content-VIM relationship it will be possible to identify a bitumen content which corresponds to a VIM of 3%. If it is considered that the workability of the mix may be difficult then compaction trials should be undertaken. It is advisable to establish two or more gradings for compaction trials.

The mixes identified for compaction trials should be manufactured to the laboratory design bitumen content and to two other bitumen contents of +0.5% and +1% additional bitumen. Cores

will be cut to determine the density of the compacted material, having completed this the core will then be reheated to 145+/-5°C in the appropriate mould and compacted to refusal in the vibrating hammer test. To be acceptable the cores cut from the compaction trial must have a density equivalent to at least 95% of refusal density.

The compaction trials will identify a workable mix which can be made to a bitumen content which gives 3% VIM at refusal density.

1605B MIXING AND LAYING HEAVY DUTY ASPHALT

The temperature of the bitumen and aggregates when mixed shall be 110+/-3 C above the softening point (R&B) of the bitumen.

Compaction should 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 should be as follows: -

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

1606B COMPACTION

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

1607B MEASUREMENT AND PAYMENT

Item : Asphalt Concrete

Unit : m³

Asphalt concrete shall be measured by the cubic metre compacted on the road calculated as the product of the length instructed to be laid and the compacted cross-sectional area shown on the Drawings or instructed by the Engineer

The rate for asphalt concrete shall include for the cost of providing, transporting, laying and compacting the mix with the nominal binder content and complying with the requirements of Parts A and B of Section 16 of this Specification.

SECTION 17 - CONCRETE WORKS

1703 BEDDING 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, 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 be 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.

1703A LEVELLING CONCRETE (CLASS 15/20) FOR BOTTOM SLAB INCLUSIVE OF COST OF FORM WORKS

This work shall consist of placing and levelling lean concrete class 15/20 over the prepared bed of stone boulders in the foundation for bottom slab and wing walls in accordance with these specifications and with 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 : 15N/mm²
- Maximum size of coarse aggregate : 20 mm
- Maximum cement content : 300 kg/m³.
- Maximum water/cement ration 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 and shall be set to the required lines and grades.

(c) Measurement and payment

Item	:	Levelling Concrete
Unit	:	m ³

Measurement for levelling concrete (class 15/20) shall be made in cubic metres of completed and accepted levelling concrete work measured in place, which is done in accordance with the Drawings and the Specifications.

Payment for this work shall be the full compensation for furnishing and placing all materials, labour, equipment and tools and other incidentals including any formworks to Specifications and as directed by the Engineer.

1703B REINFORCING BARS OF 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

Deformed reinforcing bars shall meet the requirements of British standard BS 4461, mild steel bars to BS 4449 and fabric reinforcement to BS 4483 unless otherwise called for in the drawings or approved by the Engineer.

No reinforcing bar shall be delivered without a certificate guaranteeing the yield stress. The reinforcing 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 reinforcing bars, the Contractor shall test the reinforcing bars, at his own expense, by means as directed by the Engineer.

(b) Construction Method

(i) Bar bending Schedule

The Engineer shall provide the Contractor with bending schedule showing the location, types, sizes, bending dimensions and cut lengths of the reinforcing 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 bar. Bends of other bars, where full tension in the bar may occur, shall be made around a pin having a diameter not less than 7.5 times the bar diameter as shown on the Drawings.

Reinforcing bars shall be accurately formed to the shapes and dimensions indicated on the Drawings, and shall be fabricated in a manner that will not injure the materials.

(c) Placing

Reinforcing bars shall be accurately placed in proper positions such that they are firmly held during placing of concrete.

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

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

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

(d) Splicing and Joints

When it is necessary to splice reinforcing bars at points, position and methods of splicing shall be determined based on strength calculations and approved by the Engineer.

In lapped splices, the bars shall be lapped by the required length and wired together at several points by using annealed iron wire larger than 0.9 mm.

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

Oxyacetylene welding joint of reinforcing steel shall be done only if authorised by the Engineer in writing.

(e) Measurement and Payment

Bending and installation of reinforcing bar of walls and slabs shall be measured in terms of tons. 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 authorised shall be used.

These weights are given in the following table: -

Bar type and the cross-section in millimetres	Weight of Bar in Kilogram per 12m length of bar
Y10	7.40
Y12	10.66
Y16	18.95
Y20	29.60
Y25	46.30

1703C FORMWORK FOR CULVERT WALLS AND SLABS

This work shall consist of all temporary moulds for forming the concrete for culvert walls and slabs together with all temporary construction required for their support. Unless otherwise directed by the Engineer, all formworks shall be removed on completion of the walls and slabs.

(a) Materials

Forms shall be made of wood or metal and shall conform to the shape, lines and dimensions shown on the Drawings.

All timber shall be free from holes, loose material, knots, and cracks, splits and warps or other defects affecting the strength or appearance of the finished structure.

Release Agents – Release agents shall be either neat oils containing a surface activating agent, cream emulsions, or chemical agents to be approved by the Engineer.

(b) Construction Method

(i) Formworks

Formworks shall be designed to carry the maximum loads, which may be imposed, and so be rigidly constructed as to prevent deformation due to load, drying and wetting, vibration and other causes. After forms have been set in correct location, they shall be inspected and approved by the Engineer before the concrete is placed.

If requested, the contractor shall submit to the Engineer working drawings of the forms and also, if requested, calculations to certify the rigidity of the forms.

Unless otherwise described in the Contract, all form joints for exposed surfaces of concrete shall form a regular pattern with horizontal and vertical lines continuous throughout each structure and all construction joints shall coincide with these horizontal and vertical lines. 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 placed, the forms 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 forms to drain away the water and rubbish.

(ii) Scaffolding

All scaffolding required to support the forms should be designed and constructed to provide necessary rigidity and support the loads without appreciable deflection or deformation.

Details, plans and structural and flexural calculations for scaffolding shall be submitted to the Engineer for approval, but in no case shall the Contractor be relieved of his responsibility for the results obtained by use of these plans, etc.

(iii) Removal of Formwork

The time at which the formwork is struck shall be the Contractor's responsibility and the forms shall not be removed until the concrete strength has reached 20 N/mm².

(c) Measurement and Payment

Formwork shall be measured as the net area, in square metres, in contact with the finished concrete surface of the walls and slabs. No measurement shall be allowed for formwork of temporary construction joints.

Payment for the formworks shall be full compensation for furnishing, erecting, jointing all the forms for the concrete including furnishing and applying release agent, and construction of the required scaffolding to support the forms, all conforming to the shape, lines, grade and dimensions of the structure as shown on the Drawings, all in accordance with the Drawings and as directed by the Engineer.

1703D CONCRETE WORKS (CLASS 30/20) OF CULVERT WALLS AND SLABS

This work shall consist of furnishing, mixing, delivering and placing of the concrete for the construction of culvert walls and slabs, in accordance with these Specifications and in conformity with the requirements shown on the Drawings.

Concrete class 30/20 shall be used for culvert walls and slabs.

Concrete Materials

A. Cement

Cement shall be of ordinary Portland cement complying with KS 1725:2001 CEM 1 42.5N or equivalent subject to Engineer’s approval.

The Contractor shall select only one type or brand of cement or other. Changing of type or brand of cement will not be permitted without a new mix design approved by the Engineer. All cement is subject to the Engineer’s approval, however, approval of cement by the Engineer shall not relieve the Contractor of the responsibility to furnish concrete of the specified compressive strength.

Conveyance of cement by jute bags shall not be permitted. Storage in the Contractor’s silo or storehouse shall not exceed more than two (2) months and age of cement after manufacture at mill shall not exceed more than four (4) months. The Contractor shall submit to the Engineer for his approval the results of quality certification tests undertaken by the manufacturer.

Whenever it is found out that cement has been stored for 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 following requirements:

(i) Grading of Fine Aggregates

Sieve Size	Percentage by Weight Passing
10 mm	100
5.0 mm	89-100
2.5 mm	60-100
1.2 mm	30-100
0.6 mm	15 -54
0.3 mm	5 - 40

0.15 mm	0 - 15
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(ii) Grading of Coarse Aggregates

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

Other requirements for aggregates are as follows:

(iii) Fine Aggregates

Fitness Modulus, AASHTO M-6	2.3 – 3.1
Sodium Sulphate Soundness, AASHTO T104	Max. 10% loss
Content of Friable Particles AASHTO 112	Max 1% by weight
Sand Equivalent, AASHTO T176	Min. 75

(iv) Coarse Aggregate

Abrasion, 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

The Engineer shall approve all sources of water to be used with cement. Water shall be free from injurious quantities of oil, alkali, 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.

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 designate any alteration.

Design compressive strength (28 days)	: 25N/mm ²
Maximum size of coarse aggregates	: 20 mm
Maximum water/cement ratio of 50%	with slump of 100 mm

(a) 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 the Engineer has approved its job-mix proportions.

(b) Concrete Work

(i) Batching

Batching shall be done by weight with accuracy of:

Cement	: ½ percent
Aggregate	: ½ percent
Water and Admixture	: 1 percent.

Equipment should be capable of measuring quantities within these tolerances for the smartest batch regularly used, as well as for larger batches.

The accuracy of batching equipment should be checked every month in the presence of the Engineer and adjusted when necessary.

(ii) Mixing and delivery

Slump of mixed concrete shall be checked and approved at an accuracy of +25mm 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 (33⁰c) during placement 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 forms shall be cleaned and approved by the engineer prior to placing concrete. All temporary members except tie bars to support forms shall be removed entirely from the forms and not buried in the concrete. The use of open and vertical chute shall not be permitted unless otherwise directed by the engineer.

The Contractor shall provide a sufficient number of vibrators to properly compact each batch immediately after it is placed in the forms.

(c) Measurement and Payment

Measurements for the concrete works Class 25/20 of culvert walls and slabs shall be made in cubic metres for the walls and slabs actually constructed, measured from their dimensions shown on the Drawings. Payment for the concrete works (Class 25/20) of culvert walls and slabs shall be the full compensation for furnishing all materials of the concrete mixing, delivering, placing and curing the concrete, equipment and tools, labour and other incidental necessary for the completion of the work in accordance with the Drawings and these Specifications and as directed by the Engineer.

SECTION 20 - ROAD FURNITURE

2001 ROAD RESERVE BOUNDARY POSTS

Road reserve boundary posts shall be provided as directed by the Engineer and in compliance with Standard Specification clause 2001. They shall be placed at 100m intervals along the boundary of the road reserve.

2003 EDGE MARKER POSTS

Edge marker posts shall be Verge Master MK 111 plastic posts manufactured by Glasdon Ltd. of Blackpool UK. They shall be provided as directed by the Engineer and in compliance with the requirements of Standard Specification clause 2003

2004 PERMANENT ROAD SIGNS

Permanent Road Signs shall be provided as directed by the Engineer and in compliance with the requirements of the "Manual for Traffic Signs in Kenya" Part II and standard Specification clause 2004.

The posts for the signs shall be cylindrical galvanised wrought iron tubes of minimum 75mm diameter and vandal-proofed by in-filling with concrete class 15/20.

The sign plates shall be made from approved metal or plastic sheet 3mm thick and vandal-proofed by the drilling of 3mm diameter holes at 100mm centres

The rate inserted for the signs shall include for all the costs of complying with this clause.

2004B EXISTING ROAD SIGNS

Where directed by the Engineer, the Contractor shall take down road signs including all posts, nuts, bolts and fittings, and remove and dispose of the concrete foundation and backfill the post holes. The signs shall be stored as directed by the Engineer.

Measurement and payment for taking down road signs shall be made by the number of signs of any type and size taken down, cleaned and stored as directed.

2005 ROAD MARKING

Paint for road marking shall be internally reflectorised hot applied thermoplastic material in accordance with Clause 219 of the Standard Specification.

The rates inserted in the Bills of Quantities for road marking shall include for prior application of approved tack coat.

2006 GUARDRAILS

Guardrail posts shall be concrete 210 x 210 mm set vertically at least 1.2m into the shoulder as per the drawings and as directed by the Engineer.

Beams for guardrails shall be "Armco Flex beam" or similar obtained from a manufacturer approved by the Engineer.

“Swareflex” ART 3240 or similar approved guardrail reflectors two way reflective one side red and another white shall be installed on the flex beams every 4m.

The rate inserted shall include for provision of the flex beams, posts, swarflex reflectors, flex beam end bits and installation in accordance with the standard specifications and drawings.

2007 KERBS

(a) Vertical Joints

Vertical joints between adjacent kerbs shall not be greater than 5 mm in width and shall mortar consisting of 1:3 cement: sand by volume.

(b) Transition between flush and raised kerbs

The transition between flush and raised kerbs (e.g. at bus bays) shall be termed as ramped kerbs and shall occur within a length of 2.0m

2008 KILOMETRE MARKER POSTS

Kilometre marker posts shall be provided as directed by the Engineer and in compliance with Standard Specification Clause 2008.

2011 BOLLARDS

Where directed by the Engineer, the contractor shall provide and install class 20/20 200mm diameter reinforced concrete bollards concreted 300mm into the ground.

2012 RETRO-REFLECTIVE ROAD STUDS “cat eyes”

All retro-reflective road studs shall comply with BS 873: Part 4. The contractor shall provide details and the manufacturer’s certificate of the studs he proposes to use in the works to the Engineer for approval. The studs shall be installed at locations shown on drawings or instructed by Engineer.

SECTION 22-DAYWORKS

2202 MEASUREMENTS AND PAYMENT

(a) Plant

Where items of major plant listed in the schedule of Dayworks are specified by type (e.g. Concrete mixer etc.) the power rating of such items of plant provided by the Contractor shall not be lower than the power ratings of such plant manufactured within the last two years prior to the date of BID. Any item of major plant employed upon Dayworks that has a power rating lower than specified above shall be paid for at rates lower than those in the schedule of Dayworks. The reduction in the rate payable shall be in proportion to the reduction in power rating below that specified above.

SECTION 24 – ELECTRICAL WORKS

1.0 Standard Specifications

GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

- 2.1 General
- 2.2 Standard of Materials
- 2.3 Workmanship
- 2.4 Procurement of Materials
- 2.5 Shop Drawings
- 2.6 Record Drawings
- 2.7 Regulations and Standards
- 2.8 Setting out Works
- 2.9 Labels
- 2.10 Earthing
- 2.11 Lighting Switches
- 2.12 lighting Fittings Street Lighting Lanterns
- 2.13 Street/Security Lighting Columns
- 2.14 Timing Control Switch
- 2.15 Testing on Site

2.1 GENERAL

This specification is to be read in conjunction with the drawings which are issued with it. Bills of quantities shall be the basis of all additions and omissions during the progress of the works.

2.2 STANDARD OF MATERIALS

Where the material and equipment are specifically described and named in the Specification followed by approved equal, they are so named or described for the purpose of establishing a standard to which the sub-contractor shall adhere.

Should the contractor install any material not specified herein before receiving approval from the Electrical Engineer, the Engineer shall direct the contractor to remove the material in question immediately. The fact that this material has been installed shall have no bearing or influence on the decision by the Engineer.

All materials condemned by the Electrical Engineer as not approved for use, are to be removed from the premises and suitable materials delivered and installed in their place at the expense of the Contractor. All materials required for the works shall be new and the best of the respective kind and shall be of a uniform pattern.

2.3. WORKMANSHIP

The workmanship and method of installation shall conform to the best standard practice. All work shall be performed by a skilled tradesman and to the satisfaction of the Electrical Engineer. Helpers shall have qualified supervision.

Any work that does not in the opinion of the Engineer conform to the best standard practice will be removed and reinstated at the contractor's expense.

Permits, Certificates or Licences must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licences exist under Government legislation.

2.4. PROCUREMENT OF MATERIALS

The contractor is advised that no assistance can be given in the procurement or allotment of any materials or products to be used in and necessary for the construction and completion of the work.

Contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required.

2.5. SHOP DRAWINGS

Before manufacture or Fabrication is commenced the contractor shall submit Two copies of detailed drawings of all ISSL system, including their components showing all pertinent information including sizes, capacities, construction details, etc, as may be required to determine the suitability of the equipment for the approval of the Electrical Engineer. Approval of the detailed drawings shall not relieve the contractor of the full responsibility of errors or the necessity of checking the drawings himself or of furnishing the materials and equipment and performing the work required by the plans and specifications.

2.6. RECORD DRAWINGS

These diagrams and drawings shall show the completed installation including sizes, and arrangements of the installation. The drawings shall be to scale not less than 1:50 and shall include plan views and section.

The drawings shall include all the details which may be useful in the operation, maintenance or subsequent modifications or extensions to the installation.

Three sets of diagrams and drawings shall be provided, all to the approval of the Electrical Engineer.

One coloured set of line diagrams relating to operating and maintenance instructions shall be framed and, mounted in a suitable location.

2.7. REGULATIONS AND STANDARDS

All work executed by the contractor shall comply with the current edition of the “Regulations” for the Electrical Equipment of Buildings, issued by the Institution of Engineering and Technology (IET), Regulations of the Energy and Petroleum Authority (EPRA) and National Construction Authority (NCA).

Where the sets of regulations appear to conflict, they shall be clarified with the Electrical Engineer. All materials used shall comply with relevant Kenya Bureau of Standards Specification.

2.8. SETTING OUT WORK

The contractor at his own expenses; is to set out works and take all measurements and dimensions required for the erection of his materials on site; making any modifications in details as may be found necessary during the progress of the works, submitting any such modifications or alterations in detail to the Electrical Engineer before proceeding and must allow in his bid for all such modifications and for the provision of any such sketches or drawings related thereto.

2.9 EARTHING

The earthing of the installation shall comply with the following requirements; -

- (i) It shall be carried out in accordance with the appropriate sections of the current edition of the Regulations, for the Electrical Equipment of Buildings issued by IET.
- (ii) The ISSL fitting shall be connected by a suitable earthing system.
- (iii) All tapes to be soft high conductivity copper, untinned except where otherwise specified and where run underground on or through walls, floors, etc., it shall be served with corrosion resisting tape or coated with corrosion compound and braided
- (iv) Where the earth electrode is located outside the building a removable test link shall be provided inside the building as near as possible to the point of entry to the tape, for isolating the earth electrode for testing purposes.
- (v) Earthing of sub-main equipment shall be deemed to be satisfactory where the sub-main cables are M.I.C.S. or conduit with separate earth wire, and installation is carried out in accordance with the figures stated in the current edition of the I.E.T Regulations.

- (vi) Where an earth rod is specified it shall be proprietary manufacture, solid hand drawn copper of 15mm diameter driven into the ground to a minimum depth of 1.6m. It shall be made up to 1.2m sections with internal screw and socket joints and fitted with hardened steel tip and driving cap.
- (vii) Earth plates will not be permitted
- (viii) Where an earth rod is used the earth resistance shall be tested in the manner described in the current edition of the IET Regulations, by the Contractor in the presence of the Engineer and the Contractor shall be responsible for the supply of all test equipment.
- (ix) Where copper tape is fixed to the building structure it shall be by means of purpose made non-ferrous saddles which space the conductor away from the structure a minimum distance of 20mm. Fixings, shall be made using purpose made plugs; No fixings requiring holes to be drilled through the tape will be accepted.
- (x) Joints in copper tape shall be tinned before assembly riveted with a minimum of two copper rivets and seated solid.
- (xi) Where holes are drilled in the earth tape for connection to items of equipment the effective cross-sectional area must not be less than required to comply with the IET regulations.
- (xii) Bolts, nuts and washers for any fixing to the earth tape must be of non-ferrous material.
- (xiii) Attention is drawn to the need for the earthing metal parts of lighting fittings and for bonding ball joint suspension in lighting fittings.

2.10 LIGHTING SWITCHES

There shall be a manual on and off switch provided on the ISSL fitting. The fitting should also have automatic dusk to dawn lighting mechanism. The ISSL should also be equipped with a dimming motion sensor to conserve energy when there is no vehicular or human traffic.

2.11 LIGHTING FITTINGS AS INTEGRATED SOLAR STREET LIGHT (ISSL)

This Contract shall include for the provision, handling charges, taking the delivery, safe storage, wiring (including internal wiring) assembling and erecting of all lighting fittings shown on the drawings.

The ISSL unit shall comprise of the following specifications.

- Solar panel monocrystalline 160Wp Cell Efficiency: > or = 22% life span 23 years
- Battery LiFePO4 Lithium at least 925WH, Lifespan 8+ years 2000 cycles
- Controller MPPT IP68, Sensor microwave radar with PIR
- LED with lumens greater than 11000, efficacy 170lm/W, lifespan over 58,000 hours with adjustable angle
- Bright mode 10 hrs and dim mode 48 hours
- Mounting height 8-12 meters with space between luminaires >40M
- Casing material aluminium
- The ISSL to have 3 years warranty

The ISSL lighting fittings are detailed for the purpose of establishing a high standard of finish and under no circumstances shall substitute fittings be permitted but only approved equivalent.

The whole of the metal work of each lighting fittings shall be effectively bonded to earth. In the case of ball and/or knuckle joints short lengths of flexible cable shall be provided, bonded to the metal work on either side of the joints. If the above provisions are not made by the manufacturers - , the contractor shall include cost of additional work necessary in his bid. Each lighting fitting shall be provided with number type and size of lamps as detailed on the drawings.

2.12 TESTING ON SITE

The contractor shall conduct during and at the completion of the installation and, if required, again at the expiration of the maintenance period, tests in accordance with the relevant section of the current edition of the Regulations for the electrical equipment of buildings issued by the I.E.T, the Kenya Energy Act 2019, NCA and the EPRA (former ERC).

- (a) NDT (Non Destructive Testing) tests shall be performed on the whole system and signed reports issued
- (b) Earthing test to be carried out
- (c) Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation made apparently by such inspections or tests shall be rectified by the Contractor at his own expense.
- (d) The contractor shall provide accurate instruments and apparatus and all labour required to carry out the above tests. The instruments and apparatus shall be made available to the QA Engineer to enable him to carry out such tests as he may require. The Contractor shall generally attend on other contractors employed on the project and carry out such electrical tests as may be necessary. The contractor shall test to the engineer's approval and as specified elsewhere in this specification or in standards and regulations already referred to, all equipment, plant and apparatus forming part of the works and before connecting to any power or other supply and setting to work.

Where such equipment, etc., forms part of or is connected to a system whether primarily or of an electrical nature or otherwise the contractor shall attend on and assist in balancing, regulating testing and commissioning, or if primarily an electrical or other system forming part of works, shall balance, regulate, test and commission the system to the engineer's approval.

APPENDIX TO GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

The electrical contractor shall comply with the following:-

- 1. Kenya Energy Act 2019.
- 2. Renewable Energy-Solar PV installation regulations
- 3. Energy and Petroleum Regulatory Authority (EPRA) formerly ERC
- 4. National Construction Authority (NCA)
- 5. Communications Authority of Kenya (CAK).

2.0 SPECIAL SPECIFICATIONS

PART 2 GENERAL SPECIFICATION

1.01 Description of the Works

The Works provided for under this Contract consist of; **Supply, Install, Test & Commission of Integrated Solar Street Lights (ISSL) at Kilimambogo town and other areas of Juja Areas of Thika Municipality.**

1.02 Location of the Works.

The Works will be carried out within Thika Municipality. The specific areas are as listed here below:

A) Juja areas: 90 No. solar off-grid standalone integrated street lights

B) Kilimambogo areas: 80 No. Solar off-grid integrated standalone

1.03 The Site and Access Thereto

The Electrical Engineer will, by notice from the Employer, give the Contractor possession of site, including but not necessarily limited to:

- a) A definite working area of roads and streets or way leaves or section of land thereof, within which the Contractor shall execute the Works.
- b) All classified/unclassified public junctions and accesses joining the project roads or section of the road.

1.04 Definition of Commencement

For the purpose of this clause, the works shall be deemed to have commenced when all of the following conditions are satisfied:

- a) The approved competent and authorized agent or the representative of the Contractor is resident in the Project Area and giving his whole time to the superintendence of the works.
- b) The Contractor has an established office in the Project Area with postal address/e-mail for the receipt of correspondence.
- c) The principal items of Constructional Plant have been brought onto site and put to work in the execution of the Permanent Works

1.05 Environmental and Social Safeguards

The Contractor shall provide adequate warning signs, barriers, and any other devices and personnel (if necessary) equipped to ensure the safe passage of traffic and of his employees throughout the works. The Contractor shall so arrange his work to ensure the safe passage of the traffic at all times and if necessary construct and maintain an adequate warning signs for traffic, complete with all the necessary road traffic signs.

When carrying out the Works the Contractor shall have full regard for the safety of all traffic and persons entitled to be upon the Site and shall ensure orderliness and convenience for all users. The Contractor shall ensure that the traffic disrupted by the execution of the Works shall not be held up for more than 15 minutes. The cost of the provision, placement and maintenance of all the necessary signs, barriers and the maintenance of deviations shall be included in the rate tendered in the Bill of Quantities. In selecting and positioning temporary signs, the Contractor shall:

The following is a list of "**must do**" for the Contractors/RE/Site Agents to solve the Environmental and Social Safeguards issues. The ESMP is part of the tender document

- a) Strict compliance with EIA Report and exhaustively the ESMP
- b) All project personnel to have reflector jacket, boots, helmet, gloves, and other forms of protective gears. Also have readily available reflectors and helmet for site visitors. All the above Personnel Protective Equipment (PPEs) should be in clean and serviceable condition at all times
- c) The following record books should be available on site at all times Grievance redress book (GRB), Injury Record Book (IRB) and Daily Occurrences book (DOB), which should be open to the public for day to day grievance recording and have a Grievance Redress Mechanism.
- d) The contractor should provide immediately a stakeholder engagement Plan (SEP) which should demonstrate all agreements between stakeholders and/with the contractor/clients. Issues of verandah demolitions, water disconnection, agreements with mama mboga, taxi operators etc should be captured in this plan.
- e) Contractor shall provide a Child Protection Strategy (CPS) on how to protect school going children and children playing near construction sites.
- f) The contractor should comply with Labour management standards and laws which include timely payment of site staff and affirmative action in recruitment of site staff.
- g) HIV/AIDS awareness campaign for the integrated project shall be carried out in conjunction with the main works contractor
- h) Ensure sanitary facilities are provided by the contractors-a site toilet for both male and female employees.
- i) The contractor should provide a signed code of conduct for all employees
- j) The contractor provides an Environmental and Social Plan (ESP).
- k) Monthly reports from both RE and Contractor should have a whole chapter on compliance to all environment and social safeguard issues.
- l) Prior to the start of any activity affecting road traffic, submit to the Engineer for approval, a plan of the traffic control measures and signs he intends to use to ensure the safety of such traffic.
- m) Use standard signs only.
- n) Use signs which are clean and in good condition.
- o) Display the standard signs in a standard layout in accordance with the drawings
- p) Ensure that the layout used gives drivers time to understand and respond to the information that the signs convey.
- q) All temporary signs must be removed as soon as the work they relate to is complete.

1.06 Disposal of Waste Material

i. General

Waste materials including, but not restricted to, refuse, garbage, sanitary wastes, industrial wastes, and oil and other petroleum products, shall be disposed of by the Contractor. Disposal of combustible materials shall be by burying, where burial of such materials is approved by the Engineer; by burning, where burning of approved materials is permitted in accordance with local laws; or by removal from the construction area. Disposal of noncombustible materials shall be by burying, where burial of such materials is approved by the Engineer, or by removal from the construction area. Waste materials removed from the construction area shall be dumped at an approved dump area

ii. Disposal of material by burying.

Only materials approved by the Engineer may be buried. Burial shall be in pits at locations shown on drawings or as otherwise approved by the Engineer. The pits shall be covered by at least 0.6 meters of earth material prior to abandonment.

iii. Disposal of material by burning

All burning shall be in accordance with local laws. All materials to be burned shall be piled in designated burning areas in such a manner as will cause the least fire hazards. Burning shall be thorough and complete and all charred pieces remaining after burning, except for scattered pieces, shall be removed from the construction area and disposed of as otherwise provided in this paragraph. The Contractor shall, at all times, take special precautions to prevent fire from spreading beyond the piles being burned and shall be liable for any damage caused by his burning operations. The Contractor shall have available, at all times, suitable equipment and supplies for use in preventing and suppressing fires and shall be subject to all laws and regulations locally applicable for pre-suppression, suppression and prevention of fires.

iv. Disposal of material by removal

Material to be disposed of by removal from the construction area shall be removed from the area prior to the completion of the work under these specifications. Materials to be disposed of by dumping shall be hauled to an approved dump. It shall be the responsibility of the Contractor to make any necessary arrangements with private parties and with local officials pertinent to locations and regulations of such dumping. Any fees or charges required to be paid for dumping of materials shall be paid by the Contractor.

The Contractor shall be responsible for the removal and disposal from the site of all spoil arising from the execution of the Works with the exception of materials suitable for re-use in the Works which shall be stockpiled for later use as directed by the Engineer. Spoil arising from excavations shall be disposed of in a spoil dump approved by the Engineer. Vegetation, debris and all other biodegradable waste arising shall be disposed in accordance with applicable statutory regulations.

The Contractor shall be responsible for the acquisition of the secluded spot suitable for Engineer disposal of the spoil.

1.07 Working Hours

At the commencement of the works, the Contractor shall submit in writing to the Engineer, the hours that shall be considered normal working hours for his approval, together with the day of the week that is to be set-aside for rest. When approved these shall be maintained throughout the duration of the contract. The Engineer's normal working hours shall be defined as 8.00a.m. To 5.00p.m. Excluding lunch hour on weekdays (Monday to Friday). Sundays will be set aside for the rest. Where the Contractor wishes to execute permanent work outside these hours, except for Saturdays between 7.45 am and 1.00pm, he shall obtain the written permission of the Engineer at least 24 hours in advance to enable the Electrical Engineer to make provision for proper inspection of any work.

The Engineer's staff that are required, for any reason whatsoever which relates to the supervision of the Works, to work hours which are additional to the normal working hours herein before defined, shall be paid overtime and the full cost of such overtime shall be reimbursed by the Contractor to the Engineer at no extra cost to the Employer.

1.08 Execution of the Works

The Works under this Contract shall include the routine maintenance activities set out in the Bills of Quantities and as specified in the General and Particular Conditions of Contract, Drawings, the Standard Specification and Special Specifications.

1.09 Contract Sign boards

The main works sign board shall capture the details/address of specialized works contractor.

1.10 Contractor's Site Office

The Contractor shall identify his base of operation for the contract within a distance of five (5) kilometres of the site of the Works. He shall maintain at such base a facility whereby the Engineer can contact the Contractor's representative to issue instructions for execution under the contract. Delivery of any information from Engineer to such base shall be deemed to be delivery to the Contractor

The Contractor shall provide for the establishment of the necessary facilities at his base of operations, all general needs of his personnel.

1.11 Monthly commitments

The Contractor shall provide for continued maintenance of the base of operations and all systems relating to the operations of the contract, for the entire period of the Contract, including any extension of the Contract agreed in terms of the Conditions of Contract. (These include passage of traffic, project supervision etc.)

1.12 Materials and Manufactured Articles

The Contractor's attention is drawn to his obligation with regard to quality and delivery schedule of materials and goods obtained from suppliers.

Should the Electrical Engineer at any time be dissatisfied with any goods and materials intended for use or used by the Contractor upon the works, he shall be empowered to reject such goods and materials and shall order that they be replaced by others of acceptable quality. Any more work that may consequently have to be redone and the cost thereof of the new supplies shall be borne by the Contractor.

A provisional sum is included in the Bill of Quantities for use by the Electrical Engineer for quality assurance testing of the materials and workmanship used in the execution of the Works, by an independent testing agency, as deemed necessary by him. The provision of such sum and the use thereof shall not alleviate the need for the Contractor to make his own arrangements to test materials and the Works to ensure these comply with the Specifications.

3.0 PARTICULAR SPECIFICATIONS

SPECIFICATIONS OF MATERIALS AND WORKMANSHIP FOR INTEGRATED SOLAR STREET LIGHTS (ISSL)

A. Scope of Works

Supply, deliver, erect/install, test, and commission of 170 number of Integrated Solar Street Lights (ISSL) Street lighting system complete in all respect, including the Civil works, foundations for installation of street lighting pole and its associated items. This will be in accordance with specifications and bills of quantities.

The Contractor shall include for lighting columns, lighting fittings and all apparatus and appliances not particularly called for in this Specification but which are necessary for the completion and satisfactory functioning of the Works. The contractor shall also carry out the excavation of all trenches and backfilling where necessary.

It is deemed that if, in the opinion of the Contractor at the time of quoting, there existed a discrepancy between the Specification and the actual work, that the Contractor clarifies this difference with the Electrical Engineer before quoting.

B. Specification

The work shall be executed and completed, unless expressly directed otherwise, in accordance with the following:-

- i) The specification
- ii) The current edition of the Institution of Engineering and Technology (I.E.T) regulations
- iii) Kenya Energy Act 2019
- iv) National Construction Authority
- v) Energy and Petroleum Regulatory Authority (EPRA)
- vi) Kenya Bureau of Standards
- vii) The British or Kenya Standard specification and relevant and applicable British code of practice.

C. Ordering

The Contractor shall order materials from the quantities taken from his own approved working drawings and not from the quantities shown on in the Specification.

D. Submission of materials and defective work

All materials to be installed must be new and the best of their respective kinds.

The Contractor must examine carefully any materials and /or apparatus submitted to him for installation and/or connection. Any defects detected must be communicated to the Electrical Engineer.

E. Samples and defective work

All materials to be used in the installation work must be made available for Inspection and approval and samples must be submitted upon request to the Electrical Engineer.

If the Contractor wishes to install or use other types of materials different from those specified in the Tender document, then the manufacturers technical and any other relevant pamphlets must be submitted to the Electrical Engineer for consideration and approval.

The right is expressly reserved to order at the Contractors expense the removal from site of all materials not conforming to the specifications and the Dismantling and re-execution of all works which by reason of inclusion of Improper, specified or defective materials and /or poor class or defective Workmanship are a contravention of any clause in the specification.

G. Street Lighting Poles

Street lighting poles shall be fabricated from pre-pressed concrete poles as KS 1933 standard and shall be as shown on the drawings.

The poles shall be installed at a minimum depth of 1500mm in the ground, with top diameter 190mm and bottom 330mm with earthing ferrule. The top bracket should be slanting

H. Light Fittings - ISSL

Lanterns for street lighting shall be of the completely enclosed type, and the entry of insects, dust and water must be safely prevented for side entry mounting on. The ingress protection rating of the unit should be at least IP65

I. Switching Control

The ISSL should have an automatic dusk to dawn switching system and a motion detection sensor to control brightness to conserve battery energy.

The initial adjustment shall be done with the approval of the Engineer.

O. Earthing of Street Lighting Installation.

The contractor shall ensure installation is earthed in accordance with the requirements of the current edition of the “Regulations for Electrical Installations”

P. Testing of the Installation

The Contractor shall carry out tests of the completed installation, copies of the test results shall be provided to the Electrical Engineer, a provisional sum is provided in the Bill of Quantities for the Electrical Engineer to carry out confirmatory and NDT tests.

Q. Earth Continuity

The resistance measured from every earth electrode to the farthest point of the installation shall not exceed 0.5 ohms.

R. Earth Electrode Resistance

Test for earth electrode resistance shall not exceed 3 ohms using a null balance tester

W. Guarantee of the Installation

The Contractor shall guarantee the whole installation for a period of 365 days from the date of final completion. During this period all defects arising out of faulty materials or workmanship shall be made good free of cost – fair wear and tear expected.

Any contravention of the clauses and conditions of the specifications discovered during the guaranteed period must be corrected free of charge. The submission of the completed Test Form cannot be offered by the Contractor as a final discharge of his responsibilities in respect of the soundness of the installation neither must it be inferred that the readings will necessary be made accepted.

The acceptance of the Form shall in no manner vitiate claims that may subsequently be made under the terms of the guarantee.

X. Clearing of Site and damages

The Contractor must include for the clearing away from site immediately, after completion, all the unused materials and any rubbish or litter as may have been caused by his works.

Y. Documents Establishing Goods' Eligibility and Conformity to Bidding Documents

- (a) The documentary evidence of the goods and services eligibility shall consist of a statement on the country of origin of the goods .
- (b) The documentary evidence of conformity of the goods and services to the bidding documents may be in the form of literature, drawings and data, and shall consist of:
 - i. A detailed description of the essential technical and performance characteristics of the goods;
 - ii. A list giving full particulars, including available sources and current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the goods for a period of two years, following commencement of the use of the goods by the Purchaser; and
 - iii. An item-by-item commentary on the Purchaser's Technical Specifications demonstrating substantial responsiveness of the goods and services to those specifications or a statement of deviations and exceptions to the provisions of the Technical Specifications.
- (c) For purposes of the commentary to be furnished pursuant to above, the Bidder shall note that standards for workmanship, material and equipment, and references to brand names or catalogue numbers designated by the Purchaser in its Technical Specifications are intended to be descriptive only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates to the Purchaser's satisfaction that the substitutions ensure substantial equivalence to those designated in the Technical Specifications.

The successful tenderer will be expected to complete the Works within the time for Completion specified in the tender documents. All tenderers shall provide a statement (hereinafter referred to as “the Method Statement”) giving a general description of the proposed work method, co-ordination of work to limit interference with traffic operations. The tenderer, at his own responsibility, cost and risk, is mandated to visit and examine the Site of the proposed Works and its surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The contact that the Tenderer shall liaise with for the purpose of examining the site of works shall be the Electrical Engineer.

SECTION 25 - HIV/AIDS, GENDER ISSUES, SOCIAL ISSUES AND LOCAL PARTICIPATION

2501 SCOPE

This specification sets out the Contractor's obligations with regard to on-site HIV/AIDS awareness campaign and preventive measures which are to be instituted.

2502 INTERPRETATION AND DOCUMENTATION

The following documents shall inter-alia be read in conjunction with this specification:

- The Instructions to Bidders;
- The Conditions of Contract;
- The Drawings;

2503 GENERAL REQUIREMENTS

(a) HIV/AIDS Awareness Campaign

The Contractor shall institute an HIV/AIDS awareness campaign amongst his workers for the duration of the contract. As part of the campaign the Contractor will be required to display AIDS awareness posters in all buildings frequented by workers employed on the contract, where such buildings fall under the control of the Contractor. In addition, 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 buildings and A3 size, or other approved size on vehicles. The message on the posters shall be supplied by the Employer through the Engineer before the posters are printed.

Aids awareness shall also be included in the orientation process of all workers employed on the contract.

(b) AIDS Prevention Campaign

The Contractor shall institute an HIV/AIDS prevention campaign amongst his workers for the duration of the contract. As part of the campaign the Contractor will be required to make condoms available to workers. The condoms shall be from an approved manufacturer and comply with the current ISO Standards or WHO/UNAIDS Specifications and Guidelines for Condoms, 1998, or any more recent publication. The Contractor shall make available condoms every month, through dispensing machines or other approved method of distribution. The Contractor shall at all times keep the site adequately supplied with condoms.

(c) HIV/AIDS Training

Introduction

HIV/AIDS is having a significant and increasing impact in Kenya. Interventions that stimulate the movement of people increase both the exposure to the HIV virus and the spread of the virus. Road construction has been identified as one such intervention. County Government of Kiambu is to integrate HIV/AIDS awareness and prevention into all road construction and rehabilitation programmes. This is in accordance with the Third

National Strategic Plan (2000-5) for HIV/AIDS prevention and control as approved by the Government of Kenya, International Bank for Reconstruction and Development (IBRD) and other organisations.

The project will involve both local labour and other contractor's labour. It is a contractual requirement for the Contractor to carry out HIV/AIDS awareness and prevention activities during the construction period as stipulated in this specification.

Objective

The objective of the HIV/AIDS training programme is to reduce the risk of exposure to and spread of the HIV virus in the area influenced by the construction. The target group will be local labourers and their supervisors employed by the works contractors. The wider community will benefit indirectly through their normal day-to-day interaction with the target group.

Scope of activities

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

- (i) Information posters in public places, both on and offsite (eating houses, bars, guest houses, etc.) and on contractor's vehicles.
- (ii) Availability of socially marketed condoms.
- (iii) Peer educators (reference people) drawn from the local labour and educated in HIV/AIDS issues for discussions with colleagues (estimate 1 per 50 employees).
- (iv) Small focus group discussions to disseminate information covering key issues.
- (v) Theatre groups and video presentations.
- (vi) Promotional events (such as football matches) to encourage openness and discussion of HIV/AIDS issues.
- (vii) Promotional bill boards to raise awareness of the integration of construction and HIV/AIDS activities.
- (viii) Inclusion of HIV/AIDS activities at site meetings with the District Aids Committee and other approved representatives.
- (ix) Availability of promotional materials such as T-shirts, caps, bumper stickers, key rings, etc.

The scope of activities may be tailored as required to meet the perceived needs and priorities of the 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 requirements of the target group. Education will cover:

- (a) preventive behaviours including partner reduction, condom use, awareness and appreciation of the importance of treatment of sexually transmitted infections (STIs);
- (b) skills including negotiating safer sex, correct condom use, purchase of condoms without embarrassment; and
- (c) Referral to local health centres and available services.

Tasks to be undertaken to support the above activities include:

- (a) Establishing the status and focus of all current and planned HIV/AIDS activities in the area to ensure complementarity and determining potential involvement in project activities.
- (b) Carrying out a brief review of regional activities combining road construction with HIV/AIDS campaigns to determine options, best practice key issues, constraints, etc.
- (c) Reviewing of Information, Education and Communication (IEC) materials available and their relevance to road construction, making recommendations for future development of IEC materials.
- (d) Providing education and training for site personnel, supervisors and peer educators for the scope of activities as above.
- (e) Providing supervision for peer educators to ensure sustained quality of education. Incentives for their continual work may be small promotional items such as T-shirts, caps, etc.
- (f) Providing mechanisms for the social marketing of condoms and distribution of materials.
- (g) Monitoring activities regularly to assess effectiveness and impact. This should include an initial, interim and final assessment of basic knowledge, attitude and practices (KAP) taking account of existing data sources and recognising the limitations due to the short time-frame to show behaviour change. The KAP will be supported by qualitative information from focus group discussions.

COLLABORATION

HIV/AIDS activities are co-ordinated nationally by the National Aids Control Council (NACC). County Government of Kiambu, in consultation with NACC and the Ministry of Health (MOH), will co-ordinate with the provincial, district and local representatives. Representatives of local health authorities will be invited to attend training and communication activities.

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

CONTRACTOR RESPONSIBILITIES

The Contractor will employ and designate a qualified HIV/AIDS expert fulltime, to be approved by the Engineer, who will work closely with the Client, MOH and other implementing agencies to support the HIV/AIDS awareness and prevention activities. This will ensure maximum effectiveness and integration with construction activities. Specific, but not exclusive, issues to be addressed by the Contractor are:

- (i) Scheduling appropriate timing and durations of the implementation of HIV/AIDS activities as part of workplan for labourers and supervisors. Designated rest times such as lunch breaks and pay days should be excluded.
- (ii) Identification of suitable individuals from recruitment records for education with the implementing organisation.
 - (iii) Provision of suitable sites for communication activities and for condom distribution.

- (iv) Monitoring of the implementation of peer educator activities.
- (v) Provision of support as necessary to the implementing organisation.

Inputs

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

Reporting

The implementing organisation will produce the following reports to be submitted to the Contractor, The Engineer, County Government of Kiambu and NACC:

- Monthly progress briefs for inclusion in site meetings.
- Quarterly reports detailing activities carried out, issues, follow up, etc.
- A review report of activities in the road construction sector,
- A review report of existing IEC materials with recommendations for development of materials specifically for the road sector.
- A final report detailing the methodology and activities carried out under this project including lessons learnt, impact, liaison with the Contractor and other parties, etc.

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

The final report and recommended approach will be presented to County Government of Kiambu, NACC and other interested organisations including private sector, funding agencies and NGO's.

Timing

Activities shall commence at the start of the construction period and continue through-out the 24 months to ensure a sustained impact. Reporting and dissemination activities shall continue for three months after the project is completed to ensure integration into current practice.

2504 MEASUREMENT AND PAYMENT

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 tendered rate shall include full compensation for equipment, labour and material required for the provision of the service.

Item: Instituting an HIV/AIDS prevention campaign

Unit: months

The unit of measurement shall be the calendar month or part thereof, measured over the duration of the campaign. The tendered rate shall include full compensation for equipment, labour and materials, including the procurement and distribution of condoms, required for the provision of the service.

Item: HIV/AIDS training

Unit: Provisional Sum

Compensation for HIV/AIDS Specialists for the implementation of Clause 25 03(c). Any amount required under this item will be approved by the Engineer and the Client (County Government of Kiambu) prior to expenditure. Handling costs and profit in respect of this sub-item will be paid as a percentage (%) of the Provisional Sum.

The following is a list of "**must do**" for the Contractors to solve the Environmental and Social Safeguards issues. The ESMP is part of the tender document

- a) Strict compliance with EIA Report and exhaustively the ESMP
 - b) All project personnel to have reflector jacket, boots, helmet, gloves, and other forms of protective gears. Also have readily available reflectors and helmet for site visitors. All the above Personnel Protective Equipment (PPEs) should be in clean and serviceable condition at all times
 - c) The following record books should be available on site at all times Grievance redress book (GRB), Injury Record Book (IRB) and Daily Occurrences book (DOB), which should be open to the public for day to day grievance recording and have a Grievance Redress Mechanism.
 - d) The contractor should provide immediately a stakeholder engagement Plan (SEP) which should demonstrate all agreements between stakeholders and/with the contractor/clients. Issues of verandah demolitions, water disconnection, agreements with mama mboga, taxi operators etc should be captured in this plan.
 - e) Contractor shall provide a Child Protection Strategy (CPS) on how to protect school going children and children playing near construction sites.
 - f) The contractor should comply with Labour management standards and laws which include timely payment of site staff and affirmative action in recruitment of site staff.
 - g) HIV/AIDS awareness campaign for the integrated project shall be carried out in conjunction with the main works contractor
 - h) Ensure sanitary facilities are provided by the contractors-a site toilet for both male and female employees.
 - i) The contractor should provide a signed code of conduct for all employees
 - j) The contractor provides an Environmental and Social Plan (ESP).
 - k) Monthly reports from both RE and Contractor should have a whole chapter on compliance to all environment and social safeguard issues.

- l) Prior to the start of any activity affecting road traffic, submit to the Engineer for approval, a plan of the traffic control measures and signs he intends to use to ensure the safety of such traffic.
- m) Use standard signs only.
- n) Use signs which are clean and in good condition.
- o) Display the standard signs in a standard layout in accordance with the drawings
- p) Ensure that the layout used gives drivers time to understand and respond to the information that the signs convey.
- q) All temporary signs must be removed as soon as the work they relate to is complete.

APPENDICES TO SPECIAL SPECIFICATION

Appendix A: Furniture and Equipment for Engineer's Staff Houses

Item No.	Description	No. of Items per House				
		I	II	III	IV	V
1	Double bed (5x6) with "Slumber land" mattress	1	1	1		
2	Single bed (3x6) with "Slumber land" mattress	2	1	1	1	1
3	Dressing table with mirror and stool	3	2	2		
4	Chest of 5No. drawers with mirror	3	2	2		
5	Wardrobe (movable)	3	2	2		
6	Resident table	1	1			
7	Bedroom chair	4	3	1		
8	600mm x 450mm high medicine cabinet with mirror	1	1	1		
9	Bathroom stool	1	1	1		
10	Towel rail	2	2	2	1	
11	Dining table (2m x 1m approx.)	1	1	1	1	
12	Dining chairs	6	6	4	4	2
13	Side board	1	1	1		
14	3-piece lounge chairs	4	4	2	2	1
15	Armchair with cushions	2	2	1		
16	Coffee table 40 x 45cm high	1	1	1		
17	Occasional tables, 70x70x45 cm high	1	1	1		
18	Book case (2m long with 3 shelves)	1	1	1		
19	Writing desk with chair	1	1	1		
20	Cupboards and Kitchen shelves (per sq. m)	5	5	3	2	2
21	Kitchen table (2m x 0.8m approx.)	1	1	1	1	1
22	Kitchen chair	1	1	1	1	1
23	Refrigerator (at least 19 cu.ft.) including a freezer compartment of about 3 cu.ft. capacity	1	1	1		
24	Refrigerator (at least 7 cu. ft) including a freeze compartment				1	1
25	Cold water storage tank of at least 400l capacity	1	1	1	1	1
26	Water filter at least 15 l capacity	2	2	1	1	1
27	Table lamps	1	1	1		
28	Electric fan	1	1			
29	Gas or Electric hot water unit for kitchen	1	1	1		
30	Gas or Electric hot water unit for bathroom	1	1	1		

Item No.	Description	No. of Items per House				
31	Electric & Gas cooker with 4 burners, a grill and an oven	1	1	1		
32	Electric cooker 2 elements				1	1
33	Primus stove				1	1
34	Pressure paraffin lamp	1	1	1	1	1
35	Dustbin					
36	Electrical rechargeable lamp	2	2	2	1	1
37	Water paper basket	1	1	1	1	1
38	Fire extinguisher at least 9 l capacity	2	2	1	1	1
39	Air conditioner unit (medium size)	1	1			
40	Pelmet boxes, runners and curtains	All windows				
41	Pendant / wall lights	$\frac{1}{6}$	12	7	5	2
42	13 amp. Power sockets	$\frac{1}{0}$	9	4	2	2
43	External security lights	4	4	4	2	2
44	Main electric switch and fuse box	1	1	1	1	1

Appendix B: Specifications for Equipment for Engineer’s Office (Computers / Photocopier etc.)

i)	<u>Photocopying Machine</u>	No	1 No.
	<p>Digital copier with the following minimum specifications:</p> <ul style="list-style-type: none"> • Copy Speed A4: 30 PPM • Print Speed A3: 15 PPM • Resolution: 600 x 600 dpi • 2x 500 sheet paper cassettes Standard • 200 sheets Multipurpose bypass Standard • Copier Memory 512MB Standard (Max 1GB) + 80 GB Standard • Printer Memory 512MB Standard (Max 1GB) + 80 GB Shared with copier • 25%- 400% Zoom • Paper size A6 – A3 • Recommended monthly volume 6000 copies • Type: Desktop 		
ii)	Desktop Computer Specifications	No	2 No.
	<p>The rate inserted for the PCs shall include for the provision of the UPS, a printer and the software specified below for each PC.</p> <ul style="list-style-type: none"> • Processor - <i>Intel Pentium IV Core 2 Duo - 3.2GHZ or higher</i> • RAM - <i>2GB (minimum)</i> • Hard Disk - <i>160 GB (minimum)</i> • Monitor - <i>17” TFT Color SVGA with accelerator card (10MB)</i> • Keyboard - <i>101 Keyboard</i> • Floppy drive - <i>3.5” disk drives</i> • Expansion slots - <i>4No.</i> • Ports - <i>6 USB ports (minimum)</i> • Operating system - <i>Windows Vista or XP Professional</i> • Fully multimedia - <i>4 speed CD ROM 52X (minimum) with sound card and two external speakers 10W minimum.</i> • Network card - <i>3Com or Compaq</i> • TV/FM CARD • DVD/CD Rom Writer • Three years warranty 		
iii)	Laptop Computer Specifications		3 No.
	<p>The rate inserted for the Laptop shall include for the provision of a Printer and the software specified below for each laptop.</p> <ul style="list-style-type: none"> • Processor - <i>Intel Pentium IV Core 2 Duo - 3.2GHZ or higher</i> • RAM - <i>2 GB (minimum)</i> 		

	<ul style="list-style-type: none"> • Disk Cache - 1024 MB (minimum) • Double Hard Disk - 160 GB minimum (each 80 GB minimum) • Monitor - 17" Colour SVGA with accelerator card (10MB) • Keyboard - 101 Keyboard • Floppy drive - 3.5" disk drives (either in-built or external) • Expansion slots - 4No. • Ports - 4 USB ports (minimum) • Operating system - Windows Vista or XP Professional • Fully multimedia - 4 speed Cd ROM 52X (minimum) with sound card and two external speakers 10W minimum. • Network card - 3Com or Compaq • TV/FM CARD • DVD/CD Rom Writer • Three years warranty 		
iv)	<p>Laser Jet Printer Specifications</p> <ul style="list-style-type: none"> • Speed - 20ppm • Memory - 32MB expandable to 80MB • Resolution - 1200Xx1200dpi • Compatibility - MS Windows 95/98/2000/XP/Vista • Power input - 220-240V • Paper size - A6 – A4 (A3 for 1No. printer) <p>1No. Laptop shall be supplied with a printer capable of printing in A3 paper size, while the rest PCs and laptops to be supplied with A4 LaserJet printers of model Hp2050 or better approved.</p>		
v)	<p>UPS Specifications</p> <ul style="list-style-type: none"> • Rating - 650 VAC (minimum) • Input Voltage - 220-240V (minimum) • Output - 220-240V (minimum) • Output frequency - 50-60HZ • Battery module - minimum 25 minutes backup time on 50% rated • Sealed Lead-acid • Short recharge time - max. 5 hours for 100% • Protection - Output overload • Input output short-circuit 		
v)	<p>Software</p> <ul style="list-style-type: none"> • Microsoft Office 2010 or later with licence (for all computers) • Nova POINT 17.2 or later (for 1No. Laptop) 		

	<ul style="list-style-type: none">• Antivirus: McAfee Virus Scan Professional (Latest Version - for all computers)• AutoCAD Release 2018 or later - (for all computers)• Microsoft Project - Latest Version (for all computers)		
<p>The Personal Computers, Photocopying machine and office furniture and equipment shall revert to the Employer at the end of the Project. The Contractor shall be paid for these as provided under the General Bill No. 1</p>			

Appendix C: Office / Laboratory Furniture and Equipment (Including Survey Equipment)

The Contractor shall provide, install and maintain in a good state of repair, new furniture and equipment as instructed and to the satisfaction of the Engineer for the duration of the Contract Period.

Item No	Description	Unit	Quantity
OFFICE FURNITURE			
1.	Refrigerator 200 litre	No.	1
2.	3 Drawer steel filing cabinet	No.	2
3.	Office desk 6 drawer	No.	5
4.	Office cupboard	No.	2
5.	Typist Desk and Stool	No.	1
6.	Office Chair	No.	10
7.	Executive Office Chair	No.	5
8.	Office table	No.	2
9.	Bookcase 3 shelves 1.0m	No.	3
10.	6 drawer plan chest	No.	1
11.	Drawing table and stools	No.	1
12.	Coat Hook	No.	10
13.	Water Filter – 2 candle	No.	4
14.	Pendant wall light	No.	12
15.	dust bins	No.	8
16.	Stapling Machine	No.	5
17.	Paper Punch	No.	5
18.	Office Electric Heater/Fan	No.	2
LABORATORY FURNITURE			
19.	3 Drawer steel filing cabinet	No.	2
20.	Office desk 6 drawer	No.	3
21.	Office cupboard	No.	1
22.	Office Chair	No.	5
23.	Executive Office Chair	No.	1
24.	Office table	No.	1
25.	Bookcase 3 shelves 1.0m	No.	1
26.	Coat Hook	No.	5
27.	water Filter – 2 candle	No.	2
28.	pendant wall light	No.	2
29.	Office Electric Heater/Fan	No.	1

Item No	Description	Unit	Quantity
30.	Fire Extinguisher	No.	4
31.	Desk 2.2x0.9m with drawers	No	3
OFFICE EQUIPMENT			
32.	Pentium IV laptop computer	No.	3
33.	Pentium IV Desktop computer	No.	1
34.	Digital camera (5.1 megapixels)	No.	2
35.	Uninterruptable Power Supply 1VA	No.	4
36.	A3 Laser printer	No.	1
37.	A4 Laser printer	No.	4
38.	Stapling machine	No.	6
39.	Paper punch	No.	6
40.	Office electric heaters/fan	No.	2
41.	Fire extinguisher	No.	2
42.	Filing trays	No.	10
43.	Pair of scissors regular size	No.	3
44.	Mobile phones	No.	4
45.	Electronic scientific calculators	No.	5
46.	Desk mounted pencil sharpeners	No.	3
47.	Refrigerator 220 litres capacity	No.	1
48.	First Aid kit	No.	5
49.	Photocopying machine	No.	1
50.	AutoCAD 2018 or later	No.	4
51.	Nova POINT 17.2 or later	No.	1
52.	Microsoft Office 2010 or later	No.	4
53.	Microsoft Project Latest	No.	4
SURVEY EQUIPMENT			
54.	A0 size drawing board with adjustable metal stand and parallel sliding cursor	No.	3
55.	250mm set squares (45 and 60 deg.)	No.	4
56.	150mm protractor (360 deg.)	No.	2
57.	Sets of fully divided scale rules of the following range: 1:20,1:25,1:100,1:500,1:1250, 1:1500,1:2500	Set	6
58.	Set of drawing instruments	Set	1

Item No	Description	Unit	Quantity
59.	Digital planimeter	No.	1
60.	Pair of scissors large size	No.	1
61.	Pair of scissors regular size	No.	1
62.	Desk mounted pencil sharpeners	No.	1
63.	Engineer's automatic level Wild NAK 2 or similar with tripod	No.	2
64.	Survey umbrellas	No.	5
65.	Plum-bobs, weight approximately 100g with 1. cords	No.	1
66.	5m levelling staff with levelling bubble Wild GNLE or similar	No.	4
67.	Total station reading 1"with tripod and setting on pole with datalogger and survey software to match Total Station Datalogger. Include data transfer program, and plotting modes, setting out calculations and Cogo facilities	No.	1
68.	3m Ranging rods	No.	20
69.	3m steel tapes	No.	6
70.	30m linen tape	No.	5
71.	50m steel tapes	No.	4
72.	100m steel tapes	No.	2
73.	Sledge hammer 2kg weight	No.	2
74.	Pangas	No.	10
75.	Spirit levels, 900mm	No.	2
76.	Erasing shield	No.	5
77.	Circular templates	No.	2
78.	HP AO size digital plotter, complete with stand	No	1
79.	Complete set of railway curves with wooden case	Set	1
80.	Assorted ring spanners, screw drivers, adjustable pliers and adjustable spanners	Set	1
81.	Programmable scientific calculators FX 880P or equivalent	No.	5
82.	Roll of Tracing Paper	No.	10
83.	Graph Paper A3 size	No.	100
84.	Marker Pens (Various Colours)	No.	30
85.			
LABORATORY EQUIPMENT			
General			

Item No	Description	Unit	Quantity
86.	Electric fan	No	3
87.	Programmable scientific calculators FX 880P or equivalent	No	6
88.	Stop Clock	No	10
89.	Metal Scoop	No	6
90.	Complete first aid kit	No	3
91.	Table - 0.8m ² surface area	No	4
92.	Steel cupboard, 0.45m ³ , lockable	No	2
93.	Heater, 2 plate, electric	No	2
94.	Fire extinguisher, CO ₂ type, 10 litre capacity - 5kg	No	4
95.	Hammer	No.	6
96.	Palette Knife 100mm long blade	No.	6
97.	Palette Knife 200mm long blade	No.	6
98.	Shovel	No.	10
99.	Pangas	No.	10
100.	Measuring Cylinder	No.	8
101.	Mercury thermometer range 0 ⁰ -150 ⁰	No.	2
102.	Laboratory thermometer range up to 250°C	No.	2
103.	Rain gauge	No.	2
104.	Digital thermometer	No.	2
105.	Air thermometer	No.	1
106.	Probe thermometer range 0°C-360°C minimum length	No.	2
107.	750mm dial 100mm complete with handle cotton waste in Kg	No.	10
108.	Karais(Jua kali suppliers acceptable)	No.	3
109.	Padlock	No.	2
110.	Scientific Calculator fx-992s	No.	2
111.	30m tape measure linen	No.	3
112.	Jerrycan 20 litres capacity	No.	2
113.	Pair of gloves (asbestos)	No.	6
114.	Spatulas	No.	2
115.	Paper punch	No.	1
116.	Stapler (Ofrex) and pins	No.	1
117.	Wood ruler	No.	4

Item No	Description	Unit	Quantity
118.	Tray lifting callipers	No.	4
119.	A4 Clipboards with clips	No.	8
120.	Moisture content bottles	No.	20
121.	Moisture content pans	No.	20
122.	Sieve brushes	No.	4
123.	Dustpan brush	No.	4
124.	Chisel (cold)	No.	4
125.	Laboratory Dust coats	No.	16
126.	Laboratory gumboots pairs	No.	20
127.	Safari boots	No.	8
128.	Heavy – duty plastic bags 24x16x500g	No.	150
129.	Small moisture plastic bags	No.	100
130.	Sieves (assorted)	No.	10
Reagents			
131.	Sodium Hexametaphosphate 500g container	No.	1
132.	Turpentine 500g	No.	1
133.	Trichloroethane 200 litres container	No.	1
134.	Dichloromethane 200 litres container	No.	2
Compaction Test (AASHTO T.99 and T.180, BS 1377)			
135.	Compaction mould complete with base plate and extension collar, 101.6mm internal diameter x 116.43 mm high.	No	4
136.	2.5 Kg compaction rammer, drop regulated to 304.8mm	No	4
137.	4.536Kg compaction rammer drop regulated to 457.2mm	No	4
138.	Straight edge 300mm long with handles	No	6
139.	Steel tamping (BS 1377) rod-Tamping Foot & Shank	No	4
140.	Compaction mould 152.4 mm dia. x 116.43 mm high complete with base plate and extension collar	No	4
141.	Galvanized sample tray 910 mm x 910 mm x 76mm deep	No	6
142.	75mm brush	No	10
143.	Semi-automatic Electronic balance, 25kg capacity accurate to 10g, including weights	No	1
144.	20mm BS Sieve, 300mm diameter	No	2
145.	Stop watch	No	2

Item No	Description	Unit	Quantity
146.	Electric oven, thermostatically controlled between 104 and 110°C 100 lit capacity	No	2
147.	Moisture tin, 90 mm diameter 20 mm deep, cadmium plated or aluminium alloy	No	100
148.	Cone penetrometer with gauge and automatically controlled test cup	No	1
149.	Test gauge	No	1
150.	Penetration test cup	No	2
151.	Penetration test cone	No	3
152.	Glass comparator	No	2
153.	Glass plate	No	2
154.	Evaporating dish 150 mm dia x 45 mm depth	No	4
155.	Metal containers (450mm dia.)	No	4
Density Test (Sand Replacement Method BS. 1377)			
156.	Stainless steel tray, 305mm diameter 50 mm deep	No	4
157.	Metal tray with 150mm diameter hole in the centre, 300mm x 300mm square or equivalent area, 40mm deep	No	3
158.	Metal tray with 200mm diameter hole in centre 500x500mm square, 50mm deep	No	3
159.	Steel pegs for fixing tray in position	No	20
160.	Sand pouring cylinder, 150mm diameter	No	5
161.	Sand pouring cylinder, 200mm diameter	No	5
162.	Cold steel chisel 20mm x 300mm long	No	6
163.	Cold steel chisel 10mm x 250mm long	No	6
164.	2 No 1.5kg, 2No 3.5kg mason hammers and 2 No 1Kg rubber mallet	Set	3
165.	Scoop for removing excavated material from hole, 250mm long handle	No	10
166.	100mm brush, soft	No	4
167.	50mm brush, soft	No	6
168.	Primus gas stove	No	3
169.	Calibration can 150mm diameter x 150mm deep, 250 mm dia rim	No	4
170.	Calibration can 200mm diameter x 250mm deep	No	4
Density Test (Nuclear Density Method: AASHTO T. 238)			
171.	Nuclear moisture density gauge (Troxler 3411B or similar approved)	No	1
172.	Hole-forming device (drill rod)	No	3
173.	Guide for above	No	3

Item No	Description	Unit	Quantity
CBR Test (B.S. 1377)			
174.	50 KN CBR Load frame complete with stabilising bar	No	1
175.	CBR penetration piston including bracket	No	2
176.	Penetration gauge range 0 – 25mm travel x 0.01 mm divisions	No	2
177.	Proving ring for above of 50 KN capacity.	No	2
178.	Proving ring for above of 28KN capacity	No	1
179.	Proving ring for above of 10KN capacity	No	1
180.	ASTM CBR mould, 152.4 mm dia. X 178 mm high, complete with perforated base plate and extension collar 50.8mm high that can be fitted to either end of the mould.	No	50
181.	Perforated swell plate 150 mm dia. With an adjustable centre post of rustproof metal provided with a lock-nut	No	50
182.	Swell tripod	No	50
183.	Swell dial gauge	No	50
184.	5 lb split surcharge weight	No	15
185.	10 lb annular surcharge weights	No	30
186.	2.8 kg Solid base plate for CBR mould	No	4
187.	Central extruder, complete with 20 KN hydraulic jack and accessories	No	1
188.	Disc lifting handle	No	2
189.	Linear shrinkage mould	No	10
190.	Soaking tank for CBR mould sufficient to hold at least 100 moulds	No	2
Specific Gravity of Aggregates (BS 812)			
191.	200 mm dia. Wire mesh basket with apertures not greater than 6.5mm large enough to contain 2.5 kg of aggregates	No	1
192.	A stout watertight container in which the basket can be freely suspended	No	1
193.	Soft absorbent cloth (tea towel)	No	20
194.	Shallow tray of area not less than 0.065m ²	No	4
195.	An airtight container of similar capacity to the basket	No	2
196.	Pycnometer of 1 litre capacity	No	4
197.	Electronic automatic 5kg balance accurate to 0.1g to be of size and type to permit the basket containing the sample to be suspended in water (to be supplied with weights).	No	1
Sieve Analysis (BS 1377)			
198.	Warm air drier (Electric)	No	2

Item No	Description	Unit	Quantity
199.	BS Sieve 300mm diameter in sizes 75 mm	No	2
200.	BS Sieve 300mm diameter in sizes 63 mm	No	2
201.	BS Sieve 300mm diameter in sizes 50 mm	No	2
202.	BS Sieve 300mm diameter in sizes 37.5 mm	No	2
203.	BS Sieve 300mm diameter in sizes 28 mm	No	2
204.	BS Sieve 300mm diameter in sizes 20 mm	No	2
205.	BS Sieve 300mm diameter in sizes 14 mm	No	2
206.	BS Sieve 300mm diameter in sizes 10 mm	No	2
207.	BS Sieve 300mm diameter in sizes 6.3 mm	No	2
208.	BS Sieve 300mm diameter in sizes 5 mm	No	2
209.	BS Sieve 300mm diameter lid	No	2
210.	BS Sieve 300mm diameter receiver	No	2
211.	BS Sieve 200 mm diameter 2.00 mm	No	2
212.	BS Sieve 200 mm diameter 1.00 mm	No	2
213.	BS Sieve 200 mm diameter 600 mic	No	2
214.	BS Sieve 200 mm diameter 500 mic	No	2
215.	BS Sieve 200 mm diameter 425 mic	No	2
216.	BS Sieve 200 mm diameter 300 mic	No	2
217.	BS Sieve 200 mm diameter 75 mic	No	2
218.	BS Sieve 200mm diameter receiver	No	2
219.	BS Sieve 200mm diameter lid	No	2
220.	Sieve shaker	No	1
Sieve analysis (AASHTO T 27)			
221.	BS Sieve 200mm diameter receiver	No	2
222.	ASTM Sieve 200 mm diameter 1.18 mm stainless steel mesh	No	2
223.	ASTM Sieve 200 mm diameter 600 mic stainless steel mesh	No	2
224.	ASTM Sieve 200 mm diameter 300 mic stainless steel mesh	No	2
225.	ASTM Sieve 200 mm diameter 150 mic stainless steel mesh	No	2
226.	ASTM Sieve 200 mm diameter 75 mic stainless steel mesh	No	2
227.	ASTM lid 200 mm diameter	No	2
228.	ASTM receiver 200 mm diameter	No	2

Item No	Description	Unit	Quantity
229.	ASTM Sieve 200 mm diameter 9.50 mm stainless steel mesh	No	2
230.	ASTM Sieve 200 mm diameter 12.5 mm stainless steel mesh	No	2
231.	ASTM Sieve 200 mm diameter 19.0 mm stainless steel mesh	No	2
232.	ASTM Sieve 200 mm diameter 4.75 mm stainless steel mesh	No	2
233.	ASTM Sieve 200 mm diameter 2.0 mm stainless steel mesh	No	2
234.	ASTM lid 300 mm diameter	No	2
235.	ASTM receiver 300 mm diameter	No	2
236.	ASTM Sieve 300 mm diameter 25.0 mm stainless steel mesh	No	2
237.	ASTM Sieve 300 mm diameter 37.5 mm stainless steel mesh	No	2
238.	ASTM Sieve 300 mm diameter 50.0 mm stainless steel mesh	No	2
239.	ASTM Sieve 300 mm diameter 63.0 mm stainless steel mesh	No	2
240.	1.2 m x 1.2 m x 50 mm deep galvanized metal tray	No	15
241.	Set of riffle box with 50 mm (BS 1377)	No	1
242.	Set of riffle box with 25 mm (BS 1377)	No	1
243.	Set of riffle box with 7 mm (BS 1377)	No	1
Concrete: Slump test, Cube, Cylinder and Beam Manufacture (BS 1881)			
244.	Slump cone funnel	Set	2
245.	Tamping rod (for slump)	No	2
246.	Steel rule	No	2
247.	Base plate	No	2
248.	Cylinder moulds 150mm	No	20
249.	Large curing tank (capacity 50 No. cubes)	No	2
250.	Cube tamping rods and spanners for item	No	3
Concrete: Cube Compression Testing			
251.	Compact 1500 compression machine, to BS 1610 Grade A with 300mm gauge, rectangular platens, capacity 1560 kN with load pacer together with 100 kN flexural frame with accessories	No	1
252.	Set of safety guards	Set	1
253.	20 mm distance piece	No	1
254.	50 mm distance piece	No	1

Item No	Description	Unit	Quantity
255.	80 mm distance piece	No	1
256.	100 mm distance piece	No	1
257.	Assembly for beam tests	No	1
258.	Electro-mechanical load pacer, 100mm or equivalent distance piece	No	1
Aggregates and Chippings			
259.	Sand equivalent equipment to AASHTO T176 including a graduated plastic measuring cylinder, rubbers stopper, irrigator tube, weighed foot assembly, syphon assembly, 85ml tinned box (57mm dia), wide mouth funnel (100mm dia.), stop clock, mechanical sand equivalent shaker and 10 litres working calcium chloride solution	Set	1
260.	Beaker 250 ml	No	2
261.	Reagent grade silica gel, 500g container	No	100
	Tamping rod 8 mm diameter x 300 mm long and metal measure 115 mm dia x 180 mm deep for above (BS 812)	Set	1
Flakiness Test (BS 812)			
262.	Flakiness gauge (BS 812) passing 10.0 mm retain 6.3 mm	No	1
263.	Flakiness gauge (BS 812) passing 14.0 mm retain 10.0 mm	No	1
264.	Flakiness gauge (BS 812) passing 20.0 mm retain 14.0 mm	No	1
265.	Flakiness gauge (BS 812) passing 28.0 mm retain 20.0 mm	No	1
266.	Flakiness gauge (BS 812) passing 37.5 mm retain 28.0 mm	No	1
267.	Flakiness gauge (BS 812) passing 50.0 mm retain 37.5 mm	No	1
268.	Flakiness gauge (BS 812) passing 63.0 mm retain 50.0 mm	No	1
Bitumen Spray Test and Testing of Bituminous Mixtures			
269.	Transverse distribution test of Bitumen spray (depot tray test to BS 1707) equivalent	Set	1
270.	Rate of spread of coated chippings Tray and chains	No	4
271.	Calibrated spring balance	No	4
272.	Steel tray 306 x 306 x 38mm (for measuring bitumen spray rates)	No	10
273.	Marshall test 25 load frame	No	1
274.	Flow meter BS 598 dial gauge graduated 0.01 mm with 25 mm travel	No	1
275.	28 KN load measuring ring	No	1

Item No	Description	Unit	Quantity
276.	Breaking head complete with gauge disc conforming to BS 598	No	1
277.	Marshall compaction mould complete with collar	No	10
278.	Compaction pedestal	No	1
279.	Compaction hammer	No	3
280.	Steel block	No	4
281.	Percentage Refusal Density (PRD) split mould and base plate	No	1
282.	Small tamping foot 102 mm dia.	No	1
283.	Large tamping foot 146 mm dia.	No	1
284.	Bench-mounted mixer, 5 litre capacity with Isomantle electric heater	No	1
285.	3000 g capacity Asphalt centrifuge extractor	No	1
286.	Replacement bowl for 3000 g capacity Asphalt centrifuge extractor	No	1
287.	Filter discs (pack of 100)	No	10
288.	Solvent recovery Still	No	1
289.	Universal core drill with petrol motor unit	No	1
290.	s 150 mm dia	No	4
291.	ls 100 mm dia	No	4
292.	or 150 mm dia barrels	Set	1
293.	or 100 mm dia barrels	Set	1
Miscellaneous			
294.	Gas cylinders 13kg	No.	5
295.	Padlocks	No	6
296.	Plastic jerry cans 20litre capacity	No	6
297.	Paper punch	No	2
298.	Stapler with pins	No	2
299.	Tray Lifting Callipers	No	4
300.	Laboratory Dust Coats - brown	No	16
301.	Laboratory Dust Coats - white	No	6
302.	Asbestos gloves	Pairs	16

Item No	Description	Unit	Quantity
303.	Laboratory gum boots (assorted sizes)	Pairs	16
304.	Wheel barrow	No	4
305.	Dustpan plus brush	No	4
306.	Hand shovel	No	6
307.	Pick axe with handle	No	6
308.	Metal Scoop, large (120 x 190 x 70 mm), cast aluminium handle	No	4
309.	Metal Scoop, large (70 x 110 x 40 mm), cast aluminium handle	No	6
310.	Garden trowel	No	4
311.	Sample tray 306 x 306 x 38 mm	No	20
312.	Spatula 200 mm blade	No	6
313.	Spatula 100 mm blade	No	6
314.	BS sieve 450mm diameter, 37.5mm	No	1
315.	BS sieve 450mm diameter, 20mm	No	1
316.	BS sieve 450mm diameter, 5mm	No	1
317.	BS sieve 450mm diameter, 0.425mm	No	2
318.	BS sieve 450mm diameter, 0.3mm	No	2
319.	BS sieve 450mm diameter, 0.075mm	No	2
320.	Set of lid and receiver for item 212 to item 217	No	1
321.	BS Sieve brush double ended brass and nylon bristle	No	4
322.	Measuring cylinders plastic with sprout 100ml capacity	No	3
323.	Measuring cylinders cylinders plastic with sprout 250ml capacity	No	3
324.	Measuring cylinders cylinders plastic with sprout 500ml capacity	No	3
325.	Glass jar capacity 5 litres with lid	No	10
326.	200mm x 200mm x 20mm cadmium plated or aluminium tin	No	50
327.	Electronic Automatic balance, capacity 1000g, accurate to 0.01g	No	1
328.	Electronic Automatic Balance 2100g capacity accuracy to 0.1g	No	1
329.	Electronic Automatic Balance 20kg capacity accuracy to 0.1g	No	1
330.	Dial-0-Gram balance 310 g capacity accuracy to 0.1g	No	1
331.	Field and laboratory scale with scoop 10000 g capacity accuracy to 1.0 g	No	1
332.	Distilled water still	No	1

Item No	Description	Unit	Quantity
333.	Polythene or glass 20 litres storage vessels with tap at bottom	No	2
334.	Set of stiff broom and soft broom with handles	No	5
335.	Vernier callipers, 150mm, accurate to 0.1 mm	No	1
336.	As above but 200mm, accurate to 0.002 mm	No	1
337.	Pestle and mortar	No	2
338.	Linear shrinkage mould (BS 1377)	No	25
339.	Average least dimension gauge	No	2
340.	Lockable tool box containing: 1 pair "Molegrips" 2 x 150mm screwdriver, 2 x 200mm screwdriver, 2x 300mm screwdriver, (1 standard and 1 'Phillips' star head of each), adjustable spanners 200mm and 300mm, 1 pr. Round-nosed pliers, 1 pr general purpose pliers, 2 No plastic faced mallet (1 kg), 1 set imperial spanners 14" to 15/16", 1 set metric spanners 8mm to 20mm, 2 tyre pressure gauge range 0-100 P.S.I or equivalent approved	No	1
341.	Plastic or metal bucket including lid, 10 litres capacity	No	10
342.	Polythene wash bottle (500ml)	No	6
343.	A4 size clipboard	No	10
344.	Mercury thermometer, range – 1deg. Cent. to 15deg. Cent., glass (BS 593)	No	4
345.	Maximum and Minimum thermometer (BS 692)	No	2
346.	Daily Rain gauge	No	4
347.	Portable dial thermometer +5deg. Cent. to + 250o accurate to 3oC with 0.65m long stem	No	3
348.	As above but with 1m long stem	No	2
349.	5 litre capacity steel storage containers with leak and dustproof lids for storage of bitumen samples	No	100
350.	Hotplate 200mm diameter with simmerstat heat control unit	No	2
351.	450mm diameter x 150mm deep metallic karais	No	20
352.	MOT straight edge with accessories	No	1
353.	Metric wedge	No	1
354.	Transit case	No	1
Standard Specifications (Latest Editions)			
355.	KS 1725	No	1
356.	BS 12	No	1
357.	BS 812 : 1975 Parts 1 to 4 inc., methods for sampling and testing of mineral aggregates, sands and fillers.	No	1
358.	BS 882: 1201 Part 2, 1973, Aggregates from natural sources for concrete	No	1

Item No	Description	Unit	Quantity
359.	BS 1377: 1990, Methods of testing soils for civil engineering purposes	No	1
360.	BS 1881: Parts 1 to 6 incl, 1970/71, Methods of testing concrete	No	1
361.	BS 1924	No	1
362.	BS 5835 Part I	No	1
363.	BS 433: Part 1 and 2, Bitumen road emulsions	No	1
364.	BS 556: Part 2, 1972, Concrete cylindrical pipes and fittings	No	1
365.	BS 594, 598, Sampling of bituminous mixtures	No	1
366.	BS 890: 1972, Building limes	No	1
367.	BS 1194, Concrete porous pipes	No	1
368.	BS 1198, 1119 and 1200: 1976, Building sands from natural sources	No	1
369.	BS 1924, Methods of testing stabilised soils	No	1
370.	BS 3148, Test for water for making concrete	No	1
371.	BS 4449, Hot rolled bars for reinforcement of concrete	No	1
372.	BS 4466, Bending dimensions and scheduling of bars for the reinforcement of concrete	No	1
373.	BS 4483, Steel fabric for the reinforcement of concrete	No	1
374.	BS 445: Parts 1 to 3 incl., Methods of testing cement	No	1
375.	BS 5911: Parts 1 and 2, Precast Concrete pipes and fittings	No	1
376.	BS 8110: 1997, Structural use of concrete	No	1
377.	BS 2004: Foundations	No	1
378.	TRRL Road Note 39, Recommendations for road surface dressing	No	1
379.	AASHTO Part I: Standard Specifications	No	1
380.	AASHTO Part II: Materials Testing	No	1

All equipment shall be of approved manufacture, and shall be available to the Engineer for the Engineer's exclusive use throughout the Contract, not later than three (3) weeks after the Engineer's order to supply. All Laboratory items shall revert to the Employer on completion of the Contract.

SECTION 12: BILLS OF QUANTITIES

PREAMBLE TO BILL OF QUANTITIES

1. The Bills of Quantities forms part of the Contract Documents and are to be read in conjunction with the Instructions to Bidders, Conditions of Contract Parts I and II, Specifications and Drawings.
2. The brief description of the items in the Bills of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.
3. The Quantities set forth in the Bills of Quantities are estimated, representing substantially the work to be carried out, and are given to provide a common basis for bidding and comparing of 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 basis 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 Bills of Quantities will be used for valuing the work executed, and the Engineer will only measure the whole of the works executed in accordance with this Contract.
5. A price or rate shall be entered in ink against every item in the Bills of Quantities with the exception of items that 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 discounts if any. Bidders who fail to comply will be disqualified.
6. Provisional sums (including Dayworks) in the Bills of Quantities shall be expended in whole or in part at the discretion of the Engineer in accordance with Sub-Clause 52.4 and Clause 58 of Part I of the Conditions of Contract.
7. The price and rates entered in the Bills of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional plant to be used, labour, insurance, supervision, compliance testing, materials, erection, maintenance of works, overheads and profits, taxes and duties together with all general risks, liabilities and obligations set out or implied in the Contract, transport, electricity and telephones, water, use and replenishment of all consumables, including those required under the contract by the Engineer and his staff.
8. Errors in the pricing of the Bills of Quantities will **NOT** be corrected.
9. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
10. General directions and descriptions of work and materials are not necessarily repeated or summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
11. The method of measurement of completed work for payment shall be in accordance with *Standard Specification for Road and Bridge Construction* of the Ministry of Transport and Communications, 1986.
12. "Authorised" "Directed" or "Approved" shall mean the authority, direction or approval of the Engineer.
13. Unless otherwise stated, all measurements shall be net taken on the finished work carried out in accordance with the details shown on the drawings or instructed, with no allowance for extra cuts or fills, waste or additional thickness necessary to obtain the minimum finished thickness or dimensions

required in this contract. Any work performed in excess of the requirements of the plans and specifications will not be paid for, unless ordered in writing by the Engineer.

14. Units of Measurement and abbreviations used herein shall have the following meanings:

Unit	Abbreviation	Unit	Abbreviation
cubic meter	m ³ or cu m	millimetre	mm
hectare	ha	month	mth
hour	hr	number	No.
kilogram	kg	provisional sum	P.S.
kilometre	km	square meter	m ² or sq. m
lump sum	L.S.	square	mm ² or sq. mm
meter	m	millimetre	veh
metric ton (1,000 kg)	t	vehicle	wk.
		week	

BOQ For PROPOSED UPGRADING TO BITUMEN STANDARDS OF KILIMAMBOGO MAKUTANO TOWNSHIP ROADS AND STREET LIGHTING OF JUJA ESTATES IN THIKA MUNICIPALITY					
BILL NO. 1 - GENERAL					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
	NOTE: The following items for housing, offices and laboratory for the Resident Engineer shall be deemed to include all cost involved in providing and maintaining such buildings, including furniture/ fittings and access thereto and for provision of security, heating, lighting, power, water, sewage and refuse disposal as required for the duration of the contract. Prime cost sum for supervisory staff Include percentage of P.C sum in item 1.01 for Contractor's overhead and profit				
1.01	Allow a provisional sum of Kenya Shillings Two Million (KShs.2,000,000/-) for allowances ,ground breaking expenses and for Resident Engineer's Miscellaneous Account	PC	1	2,000,000	2,000,000
1.02	Include percentage of P.C sum in item 1.01 for Contractor's overhead and profit	%			
1.03	Allow for hiring of site inspector, leveller, social & safety Officers and facilitation of student attaches.	Months	9	150,000	1,350,000
1.04	Include percentage of sum in item 1.03 for Contractor's overhead and profit	%			
1.05	Provide, equip, fully furnished and maintain a site office for the exclusive use of the Resident Engineer and his staff. (Allow for all necessary things including a secretary, tea girl and messenger)	PC	1	1,500,000	1,500,000
1.06	Include percentage of P.C sum in item 1.05 for Contractor's overhead and profit	%			
1.07	Prime cost sum for quality control	PC	1	450,000	450,000

1.08	Include percentage of P.C sum in item 1.07 for Contractor's overhead and profit	%			
1.09	Provide ,erect and maintain Publicity sign boards as directed by the Engineer in accordance with the drawings	No.	2		
1.10	Provide Ksh.1,500,000 Prime cost sum for relocation of services	PC		1,500,000	1,500,000
1.11	Include percentage of P.C sum in item 1.10 for Contractor's overhead and profit	%			
1.12	Allow a provisional sum of Kenya Shillings Fifty Thousand only (KShs.50,000/-) for communication, media and documentary for the duration of contract	Pc Sum		50,000.00	50,000.00
1.13	Include percentage of P.C sum in item 1.12 for Contractor's overhead and profit	%			
Bill total carried forward to summary page					
BILL NO .4: SITE CLEARANCE AND TOP SOIL STRIPPING					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
					AMOUNT (KSHS)
4.01	Clear site on road reserve including removal of trees, hedges, bushes and other vegetation and other deleterious materials, grub up roots and backfill to 100% MDD (AASHTO T99) with approved material in accordance with the Special Specifications	HA.	1		
4.02	Remove trees of up to 2M girth and transport the logs to County Yard as directed by the Engineer	No	10		
4.03	Top soil removal to a maximum depth of 200mm along alignment or material sites including removal of grass and other vegetation as shall be directed by the Engineer Stockpile top soil for re-use.	m ³	1,800		
Total of Bill No.4 carried forward to summary page					

BILL NO. 5: EARTH WORKS					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
	No separate payments shall be made for the overhaul of material and the cost of such haulage shall be included in the rates and or price				
5.01	Fill in soft material for embankment to 95% MDD (AASHTO T99) as directed by the Engineer	M ³	2,500		
5.02	As item 5.01 but hard material	M ³	1,000		
5.03	Cut to spoil in Soft material	M ³	1,300		
5.04	As item 5.03 but hard material	M ³	600		
5.05	Compact 150mm layer below embankment or subgrade to 95% MDD (AASHTO T.99)	M ³	800		
5.06	Compact 300mm below formation in cutting to 100% MDD (AASHTO)	M ³	800		
	Total of Bill No.5 carried forward to summary page				
BILL NO. 7:EXCAVATION AND FILLING FOR STRUCTURE					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
	NOTE: No separate payment shall be paid for the haulage of spoil material				
7.01	Provide and place 150 mm thick stone pitching	M ²	2,000		
7.02	E.O item for 1:4 cement: sand mortar grouting to item 7.01 as directed	M ²	2,200		
	Total of Bill No.7 carried forward to summary page				

BILL NO.8: CULVERTS AND DRAINAGE WORKS					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT(KSHS)
	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 price				
8.01	Excavate for culverts and side drains in any material	M ³	1,500		
8.02	Excavate for mitre, catch water and outfall drains in any material	M ³	200		
8.03	E.O Item 8.01 to 8.02 for excavation in hard material	M ³	150		
8.04	Provide concrete class25/20 Scour checks	No.	50		
8.05	Provide and place Class 25(20) concrete to headwalls, wing walls and aprons, to pipe culverts including formwork and provisions and placing of reinforcements as shown in the drawings	M ³	250		
8.06	Provide and place A142 fabric mesh reinforcement to item 8.05	M ²	400		
8.07	Provide, place and compact class 15(20) concrete to beds ,surrounds an haunches	M ³	400		
8.08	Provide and lay 600mm I.D concrete pipes	M	450		
8.09	Ditto as 8.08 above but 900mm	M	28		
8.10	Ditto as 8.08 above but 450mm	M	150		
8.11	Excavate, remove and dispose existing pipe culverts of 1200mm diameter or less including demolition of inlet and outlet structures.	M	100		
8.12	Provide and place reinforced concrete manhole covers	No.	300		
8.13	Excavate in any material provide and joint 600x360 mm invert block drains (IBD) precast concrete channels with two precast side slabs of 600x225x75 mm on either side of drain as lining for storm water drain including bedding and backfilling with selected material as directed by the Engineer.	M	200		
8.14	Extra over item 8.13 for precast side slabs of 600x225x75mm.	M ²	100		
Total of Bill No. 8 carried forward to summary page					

BILL NO. 9: PASSAGE OF TRAFFIC					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
	NOTE: Not withstanding the provision of Section 9 of Standard Specification, no extra payments shall be due as all costs shall deemed to be included in the rates inserted herein				
9.01	Allow for the passage of traffic through and around the works	L.sum		900,000	900,000
9.02	Allow for provision of traffic Signs during construction as directed by the Engineer	L.sum		400,000	400,000
Total of Bill NO.9 carried forward to summary					1,300,000
BILL NO 11; FOOT PATH TO CARRIAGEWAY PAVEMENT					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
	The rate inserted should include the spreading procurement, haulage, and compacting				
11.01	Cut benches on foot path, widenings and busbays where directed by the Engineer including compaction to 100% MDD(AASHTO)	M ²	1,200		
Total of Bill No 11 carried forward to summary page					
BILL 12: NATURAL MATERIAL BASE AND SUBBASE					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
	The rate inserted should include the procurement, haulage, mixing in stabilizer, spreading, watering ,laying by paver and compaction				
12.01	Provide, place and compact Natural gravel subbase as directed by the Engineer	M ³	1,100		
12.02	Provide, place and compact hand packed hardcore base in pavement and repair areas including filling of voids with quarry dust as directed by the Engineer .	M ³	1,100		
Total of Bill No12 carried forward to summary page					

BILL NO . 15: BITUMINOUS SURFACE TREATMENTS AND SURFACE DRESSING					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
15.01	Prepare surface of carriageway, foot path, busbays accesses and junctions, provide, heat and spray MC 30 cutback bitumen prime coat at a rate of 0.8-1.0 litres per square metre	Ltrs	11,000		
Total of Bill No.15 carried forward to summary page					
BILL NO. 16: BITUMINOUS MIX BASES,BINDER COURSES AND WEARING COURSE					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
16.01	Prepare surface of carriageway, provide heat and spray KI-60 bitumen tack coat at a rate of spray of 0.3-0.8 litres per square meter on surface prepared under item 15.01	Ltrs	10,000		
16.02	Provide and lay 50mm thick asphalt concrete Type 1 to carriageway as directed by the Engineer	M ³	450		
Total of Bill No. 16 carried forward to summary page					
BILL NO 20-ROAD FURNITURE					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
20.01	Prepare road surface, provide approved reflectorised thermoplastic white paint and apply road marking as directed by the Engineer.	M ²	300		
20.02	As item 20.01 but approved reflectorised thermoplastic yellow paint	M ²	120		

20.03	Provide and erect permanent roads signs where instructed by Engineer and in accordance with the special specifications clause 2004 as follows:-				
	(a) Warning signs(750mm)	No	4		
	(b) Priority prohibitory and mandatory signs (750mm x 600mm)	No	2		
	© Standard informatory signs (400mm x300mm)	No	5		
	(d) Nonstandard informatory signs area				
	(i) Less than 1.0m ²	No	5		
20.04	Excavate for, provide, lay and joint 250x125mm precast concrete raised or ramped kerb haunched in 100mm thick class 15/20 concrete base bending and mortar joined in support to carriageway, busbays and junctions as directed by the Engineer				-
	(1)Straight Kerbs	M	2,400		
	(2)Kerb radius12m-6m	M	100		
	(3) Quadrant radius< 1m	M	100		
	(4) Straight Channel (125x100mm)	M	2,400		
20.05	Provide and erect concrete edge marker posts with two reflectors per post where directed	No	6		
20.06	Provide and erect Road reserve boundary posts where directed by the Engineer	No.	5		
20.07	Erect standard bumps using asphalt concrete type 1 where directed	M	21		
20.08	Provide and place 20/20 Bollard size 1.2m x0.1m x0.1m embedded to a depth 0.2m where directed by the Engineer	M	300		
Total of Bill No.20 carried forward to summary page					

BILL NO 24-ELECTRICAL WORKS					
24.01	Allow a provisional sum of ksh 300,000 for periodic monitoring and measurement of irradiance parameters with a programmable meter and print outs.	Item			
24.02	Allow a provisional sum of 400,000.00 for Environmental and Social Safeguards Compliance.	Item			
24.03	Allow for as built drawings	Item			
24.04	Allow a provisional cost of ksh 450,000 for testing of materials including and not limited to factory assessment costs as specified or directed by the Electrical engineer	Item			
24.05	Allow a provisional sum of Ksh. 50,000.00/= for project documentation and Drawings for electrical works	1	Item		
24.06	Provide 10m round pre -pressed reinforced concrete pole as KS1933 with Earthing ferrule	No	187		
24.07	Prepare foundation works as per specifications ditto.	No	187		
24.08	Provide brackets as specified for fitting the lighting system on to the concrete pole, including welding c/w accessories as instructed by the Engineer.	No	187		
24.09	Solar Panel of mono-crystalline type not less than 160Wp efficiency greater than 22%	No	187		
24.1	LiFePO4 Battery not less than 950WH with 2000 plus life cycle full charge 6 hours	No	187		
24.11	LED Chips rated power 100w of at least 11000 lumens, efficacy 150lm/W ,beam angle adjustable lifespan 6 years	No	187		
24.12	Maximum Power Point Tracking Charge Controller 10AMP	No	187		
24.13	Provide overcharge, discharge, short cct, open load and surge protection.	No	187		

24.14	Provide software to control illumination levels remotely and switch on and off the system automatically c/w short messaging services notifying system.	No	187		
24.15	Provide Earthing fastened to steel strap c/w accessories as specified .	No	187		
24.16	Provide project tablet as sumsung S6 256GB and 8GB Ram with S-pen and keypand cover for ISSL operation as New and phone as Oppo A9 as directed by the Electrical Engineer.	Item	2		
24.17	Angle grinder 900W-1500W as Makita, Bosch, Black & Decker or approved equivalent with 10 cutting disks 115mm.	Item	2		
24.18	Variable speed corded hand electric drill 5A-8A, c/with 6 drill bits as Bosch,Black & decker or approved equivalent.	Item	2		
24.19	MMA Welding machine with Inverter 180A, weight <10kg, >6KVA, and 100 rods (1.6-4mm) as Ingco or approved equivalent	Item	2		
24.2	Provide insulation resistance tester as Fluke 1587 fc-2-in 1 (50v-1000v) as Fluke complete with clamp or approved with test leads and a carry case	Item	2		
24.21	Fibre glass straight ladder 10M retractable	Item	2		
24.22	Laser continous and single distance measurer hand held range at least 100M as Tuirel T100 or approved equivalent	Item	2		
24.23	Allow sum of ksh 200,000 for Extra works as directed by the Engineer	Item	1		
24.24	Allow a provisional sum of Ksh. 450,000 for testing of the ISSL works including and not limited to NDT as directed by the Electrical Engineer	Item	1		
24.25	Electric tool box; metallic complete with tool sets as directed by Engineer list	Item	2		
Total of Bill No. 24 carried forward to summary					

BILL NO. 25 : HIV/AIDS					
ITEM	DESCRIPTION	UNIT	BILL QTY	UNIT RATE	AMOUNT (KSHS)
25.01	Implement HIV/AIDS awareness campaign amongst the workers for the duration of the contract.	Months	9	20,000	180,000
25.02	Allow for the availability of condoms to workers and staff for the duration of the contract	Months	9	2,000	18,000
25.03	Allow for participation of representation of Local Health Authorities, Provincial Director of Health and National AIDS Council to train and communication with workers. Allowance to include transport, meals, accommodation and any other reasonable allowances associated expenses and equipment expenses.	Months	9	20,000	180,000
25.04	Provide and erect environmental billboards of size greater than 5m at strategic positions as directed by engineer	No.	1		
25.05	Allow for provision of Washrooms along the project road as directed by the Engineer	Lump Sum		100,000	100,000
25.06	Allow for social safeguard trainings, monitoring and evaluation	Lump Sum		300,000	300,000
	Total of Bill No. 25 carried forward to summary				

SUMMARY PAGE		
Bill No.	Description	Tender Amount
1	General	
4	Site clearance	
5	Earthworks	
7	Excavation and filling for structures	
8	Culvert and drainage works	
9	Passage of traffic	
11	Footpath to carriageway	
12	Natural Material Base and Sub-base	
15	Bituminous surface treatment	
16	Bituminous mix bases, binder courses and wearing courses	
20	Road furniture	
24	Electrical Works	
25	HIV/AIDS	
A	Sub Total 1	
B	Add 1% Contingencies	
C	Add 1% Variations	
D	Sub Total 2	
E	Add 16% V.A.T	
	TOTAL	

Bidder's Signature & Stamp.....

SECTION 13: DRAWINGS

(See the Separate Book of Drawings)