KENYA SCHOOL OF GOVERNMENT
Empowering the Public Service

TENDER DOCUMENT FOR
PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2- CIVIL WORKS

TENDER NO: KSG/81/2018-2020 CLOSING DATE:
WEDNESDAY NOVEMBER 21, 2018 AT 10:30AM.
REPUBLIC OF KENYA

MINISTRY OF TRANSPORT, INFRASTRUCTURE, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT
STATE DEPARTMENT OF PUBLIC WORKS

PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2 - CIVIL WORKS

TENDER DOCUMENT FOR: CIVIL ENGINEERING WORKS

INSTRUCTIONS TO TENDERERS
CONDITIONS OF CONTRACT
SPECIAL SPECIFICATIONS
BILLS OF QUANTITIES

DIRECTOR GNENERAL
KENYA SCHOOL OF GOVERNMENT
P.O. BOX 23030 - 00604
LOWER KABETE.

PRINCIPAL SECRETARY
STATE DEPARTENT OF PUBLIC WORKS
P.O. BOX 30743 - 00100
NAIROBI.

ARCHITECT
CHIEF ARCHITECT
STATE DEPARTMENT OF PUBLIC WORKS
P.O. BOX 30743 – 00100
NAIROBI.

CIVIL/STRUCTURAL ENGINEER
CHIEF ENGINEER (STRUCTURAL)
STATE DEPARTMENT OF PUBLIC WORKS
P.O. BOX 30743 – 00100
NAIROBI.

QUANTITY SURVEYOR
CHIEF QUANTITY SURVEYOR
STATE DEPARTMENT OF PUBLIC WORKS
P.O. BOX 30743 – 00100
NAIROBI.

MECHANICAL ENGINEER
CHIEF ENGINEER (MECHANICAL) STATE DEPARTMENT PUBLIC OF WORKS P.O. BOX 30743 – 00100
NAIROBI.

ELECTICAL ENGINEER
CHIEF ENGINEER (ELECTRICAL)
STATE DEPARTMEN OF PUBLIC WORKS
NOVEMBER, 2018
REPUBLIC OF KENYA

MINISTRY OF TRANSPORT, INFRASTRUCTURE, PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT

PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2- CIVIL WORKS

INVITATION TO TENDER

The Kenya School of Government intends to undertake civil engineering works associated with builder’s works at the above site. The brief overview of the scope of works is as described here below:-

a) Construction of storm water drainage.
b) Construction of driveway and parking.
c) Construction of foot paths.
d) Construction of boundary wall

Tenders are hereby invited for this project from contractors with the necessary experience in Civil Engineering works giving the following information:-

- Proof of current registration with National Construction Authority-NCA 6 and above
- Company dossier with proof of incorporation.
- List of similar civil works and their value undertaken within the last Three years.
- List of on-going works.
- List of plant and equipment owned by the firm including registration numbers and year of manufacture and their current condition.
- List of Personnel proposed for execution of the works and their detailed qualification and experience (attach copies of CV’S and certificates).
- Reports on financial standing of the firm including profit and loss statements, balance sheets and auditor’s reports for the last three years.
- Evidence of access to lines of credit and availability of other financial resources.
- Litigation history of the company.
- Form of Authorisation.
- Dully filled Confidential Business Questionnaire.
- Certificate of Tenderer’s visit to site.
- Copy of Valid Tax Compliance certificate.

The tender documents will be issued at the Procurement Office, Administration Block, 2nd Floor, room 212, upon payment of a non-refundable fee of KShs. ................ in form of banker’s cheque, or cash receipt payable to the DIRECTOR GENERAL, KENYA SCHOOL OF GOVERNMENT, P.O. BOX 23030 – 00604, LOWER KABETE at the cash office during normal working hours.

Application in plain sealed envelopes and clearly marked with the name of the project must be sent to the Procurement Office, Kenya School of Government-Lower Kabete, P.O. Box 23030 - 00604, Lower Kabete or deposited into the Tender Box on the Room 212, 2nd floor of Administration Block so as to reach him on or before ..................at noon.

The Bid documents should be accompanied by a tender security of Kshs. ................. (..............................
...........................................................................................................................................................................................................
shillings).
Tender Opening will take place immediately thereafter in the conference room on ........, Administration Block-Kenya School of Government-Lower Kabete Campus, in the presence of Tenderers or their representatives who choose to attend.

The mandatory site visit will take place on....................... Commencing at 10.00 a.m. Tenderers or their representatives are advised to assemble at the Kenya School of Government-Lower Kabete campus, by 10.00 a.m. so as to be shown around the site by the Engineer's Representative. Tenderers are expected to make their own travel arrangements to and from the site.

The government reserves the right to accept or reject any application and is not bound to give any reason for acceptance or rejection thereof.

QsA. N. Okweto
Works Secretary
For: PRINCIPAL SECRETARY
STATE DEPARTMENT OF PUBLIC WORKS
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SECTION A:

TENDER FORMS
FORM OF TENDER

To:

The Director General,
Kenya School of Government,
P.O. Box 23030 - 00100
NAIROBI.

RE: PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2- CIVIL WORKS

CIVIL ENGINEERING WORKS

1. In accordance with the Instructions to Tenderers, Conditions of Contract, Specifications and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct, install and complete such Works and remedy any defects therein for the sum of:

Kshs…………………………………………………………………………[Amount in figures]

Kenya Shillings……………………………………………………………………..[Amount in words]

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Employer’s Representative’s notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.

3. We agree to abide by this tender for a period of 120 days from the date of tender opening, and shall remain binding upon us and may be accepted at any time before the expiry of that period.

4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us.

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

Dated this ................................... day of .................................................... 20.....

Signature ..........................................................

in the capacity of ..................................................duly authorized to sign tenders for and on behalf of:..........................................................

.......................................................... [Name of Tenderer]

of.......................................................... [Address of Tenderer]

P.I.N No. ..........................................................

V.A.T CERTIFICATE No. ..........................................................
Witness: Name

Address

Signature

Date
## APPENDIX TO FORM OF TENDER

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>CLAUSE</th>
<th>LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Performance Guarantee</td>
<td>(10) (1)</td>
<td>5% of Tender Sum</td>
</tr>
<tr>
<td>2</td>
<td>Minimum amount of third party insurance( per number of occurrences unlimited)</td>
<td>(23)(2)</td>
<td>2% of Tender Sum</td>
</tr>
<tr>
<td>3</td>
<td>Time of Commencement</td>
<td>(41)(1)</td>
<td>14 days from Engineer's order to commence</td>
</tr>
<tr>
<td>4</td>
<td>Time for completion</td>
<td>(43)(1)</td>
<td>12 weeks</td>
</tr>
<tr>
<td>5</td>
<td>Amount for liquidated damages</td>
<td>(47 (1)</td>
<td>Kshs 100,000.00 per Calendar week</td>
</tr>
<tr>
<td>6</td>
<td>Defects liability Period</td>
<td>(49) (1)</td>
<td>6 months</td>
</tr>
<tr>
<td>7</td>
<td>Limit of Retention money</td>
<td>(60) (2)</td>
<td>10% (Percentage of Contract sum)</td>
</tr>
<tr>
<td>8</td>
<td>Percentage of Retention</td>
<td>(60) (2)</td>
<td>10% (percentage of Interim Certificate)</td>
</tr>
<tr>
<td>9</td>
<td>Minimum amount of Interim Certificate</td>
<td>(60)(2)</td>
<td>Kshs. 1,000,000.00</td>
</tr>
<tr>
<td>10</td>
<td>Time within which payment To be made after Signing of the certificate By the Engineer</td>
<td>(60) (4)</td>
<td>30 (days)</td>
</tr>
<tr>
<td>11</td>
<td>Contract</td>
<td>A Binding contract will be Constituted after signing the Contract Agreement</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Party to appoint the Arbitrator</td>
<td>(67)(3)</td>
<td>Chairman, Institution of Engineers of Kenya</td>
</tr>
</tbody>
</table>

.......................................................... ........................................
SIGNATURE OF TENDERER DATE

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SECTION B:

INSTRUCTIONS TO TENDERERS.
INSTRUCTIONS TO TENDERERS

Note: The tenderer must comply with the following conditions and instructions and failure to do so is liable to result in rejection of the tender.

GENERAL

1. Definitions

   (a) “Tenderer” means any person or persons partnership firm or company submitting a sum or sums in the Bills of Quantities in accordance with the Instructions to Tenderers, Conditions of Contract Parts I and II, Specifications, Drawings and Bills of Quantities for the work contemplated, acting directly or through a legally appointed representative.

   (b) “Approved tenderer” means the tenderer who is approved by the Employer.

   (c) Any noun or adjective derived from the word “tender” shall be read and construed to mean the corresponding form of the noun or adjective “bid”. Any conjugation of the verb “tender” shall be read and construed to mean the corresponding form of the verb “bid.”

   (d) “Employer” shall be: The Kenya School of Government of the Republic of Kenya, represented by The Director General-KSG

2 Eligibility and Qualification Requirements

2.1 This invitation to tender is open to all tenderers who have been qualified.

2.2 To be eligible for award of Contract, the tenderer shall provide evidence satisfactory to the Employer of their eligibility under Sub clause 2.1 above and of their capability and adequacy of resources to effectively carry out the subject Contract. To this end, the tenderer shall be required to submit the following information:

   (a) Details of experience and past performance of the tenderer on the works of a similar nature within the past eight years and details of current work on hand and other contractual commitments.

   (b) The qualifications and experience of key personnel proposed for administration and execution of the contract, both on and off site.

   (c) Major items of construction plant and equipment proposed for use in carrying out the Contract. Only reliable plant in good
working order and suitable for the work required of it shall be shown on this schedule. The tenderer will also indicate on this schedule when each item will be available on the Works. Included also should be a schedule of plant,

\[(d)\] Equipment and material to be imported for the purpose of the Contract, giving details of make, type, origin and CIF value as appropriate.

\[(e)\] Details of subcontractors to whom it is proposed to sublet any portion of the Contract and for whom authority will be requested for such subletting in accordance with clause 4 of the Conditions of Contract.

\[(f)\] A draft Program of Works in the form of a bar chart and Schedule of Payment which shall form part of the Contract if the tender is accepted. Any change in the Program or Schedule shall be subjected to the approval of the Engineer.

\[(g)\] Details of any current litigation or arbitration proceedings in which the tenderer is involved as one of the parties.

\[(h)\] Details of Annual turnover and the financial statements for the last three years.

### 2.3 Joint Ventures

Tenders submitted by a joint venture of two or more firms as partners shall comply with the following requirements:

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

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

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

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

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

3 **Cost of Tendering**

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

4 **Site Visit**

4.1 The tenderer is advised to visit and examine the Site and its surroundings and obtain for himself on his own responsibility, all information that may be necessary for preparing the tender and entering into a contract. **The Pre-tender site visit is mandatory.** The costs of visiting the Site shall be the tenderer’s own responsibility.

4.2 The tenderer and any of his personnel or agents will be granted permission by the Employer to enter upon premises and lands for the purpose of such inspection, but only upon the express condition that the tenderer, his personnel or agents, will release and indemnify the Employer from and against all liability in respect of, 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.

4.3 The Employer shall organize a mandatory site visit at a date to be notified. A representative of the Employer will be available to meet the intending tenderers at the Site.

Tenderers must provide their own transport. The representative will not be available at any other time for site inspection visits.

Each tenderer shall complete the Certificate of Tenderer’s Visit to the Site, when he visits the Site at the time of the organized site visit.

**TENDER DOCUMENT**

5 **Tender Documents**

5.1 The Tender documents comprise the documents listed here below and should be read together with any Addenda issued in accordance with Clause 7 of these instructions to tenderers.

a. Form of Invitation for Tenders
b. Instructions to Tenderers
c. Form of Tender
d. Appendix to Form of Tender  
e. Form of Tender Surety  
f. Statement of Foreign Currency Requirements  
g. Tender and Confidential Business Questionnaires  
h. Details of Sub contractors  
i. Schedules of Supplementary Information  
j. General Conditions of Contract – Part I  
k. Conditions of Particular Application – Part II  
l. Specifications  
m. Bills of Quantities  
n. Drawings

5.2 The tenderer is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the tender documents. Failure to comply with the requirements for tender submission will be at the tenderer’s own risk. Pursuant to clause 23 of Instructions to Tenderers, tenders which are not substantially responsive to the requirements of the tender documents, will be rejected.

5.3 All recipients of the documents for the proposed Contract for the purpose of submitting a tender (whether they submit a tender or not) shall treat the details of the documents as “private and confidential”.

6 **Clarification of Tender Documents**

6.1 A prospective tenderer requiring any clarification of the tender documents may notify the Employer in writing or by telex, telephone or facsimile at the Employer’s mailing address indicated in the Invitation to Tender. The Employer will respond in writing to any request for clarification, which he receives earlier than 30 days prior to the deadline for the submission of tenders. Written copies of the Employer’s response (including the query but without identifying the source of the inquiry) will be sent to all prospective tenderers who have purchased the tender documents.

7 **Amendment of Tender Documents**

7.1 At any time prior to the deadline for submission of tenders the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective tenderer, modify the tender documents by issuing Addenda.

7.2 Any Addendum will be notified in writing or by cable, telex or facsimile to all prospective tenderers who have purchased the tender documents and will be binding upon them.

7.3 If during the period of tendering, any circular letters (tender notices) shall be issued to tenderers by, or on behalf of, the Employer setting forth the interpretation to be paced on a part of the tender
documents, or to make any change in them, such circular letters will form part of the tender documents and it will be assumed that the tenderer has taken account of them in preparing his tender. The tenderer must promptly acknowledge (in writing or by cable to the Employer) any circular letters he may receive.

7.4 In order to allow prospective tenderers reasonable time in which to take the Addendum into account in preparing their tenders, the Employer may, at his discretion, extend the deadline for the submission of tenders.

PREPARATION OF TENDERS

8 Language of Tender

8.1 The tender and all correspondence and documents relating to the tender exchanged between the tenderer and the Employer shall be written in the English language. Supporting documents and printed literature furnished by the tenderer with the tender 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 tender, the English language shall prevail.

9 Documents Comprising the Tender

9.1 The tender to be prepared by the tenderer shall comprise: the Form of Tender and Appendix thereto, a Tender Surety, the Priced Bills of Quantities and Schedules, the information on eligibility and qualification, and any other materials required to be completed and submitted in accordance with the Instructions to Tenderers embodied in these tender documents. The Forms, Bills of Quantities and Schedules provided in the tender documents shall be used without exception (subject to extensions of the schedules in the same format and to the provisions of clause 13.2 regarding the alternative forms of Tender Surety).

10 Tender Prices

10.1 All the insertions made by the tenderer shall be made in INK and the tenderer shall clearly form the figures. The relevant space in the Form of Tender, and Bills of Quantities shall be completed accordingly without interlineations or erasures except those necessary to correct errors made by the tenderer in which case the erasures and interlineations shall be initialed by the person or persons signing the tender.

10.2 A Price or rate shall be inserted by the tenderer for every item in the Bills of Quantities, whether the quantities are stated or not. Items against which no rate or price is entered by the tenderer will not be paid for by
the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bills of Quantities.

The prices and unit rates in the Bills of Quantities are to be the full [all-inclusive] value of the Work described under the items, including all costs and expenses which may be necessary and all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based. All duties, taxes (except VAT) and other levies payable by the Contractor under the Contract, or for any other cause as of the date 30 days prior to the deadline for submission of tenders, shall be included in the rates and prices and the total Tender Price submitted by the tenderer.

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

Every rate entered in the Bills of Quantities, whether or not such rate be associated with a quantity, shall form part of the Contract. The Employer shall have the right to call for any item of work contained in the Bills of Quantities, and such items of work to be paid for at the rate entered by the tenderer.

10.3 Unless otherwise specified the tenderer must enter the amounts representing 25% of the sub-total of the summary of the Bills of Quantities for Contingencies and Variation of Prices [V.O.P.] payments in the summary sheet and add them to the sub-total to arrive at the tender amount.

10.4 The tenderer shall furnish with his tender written confirmation from his suppliers or manufacturers of basic unit rates for the supply of items listed in the Conditions of Contract clause 70 where appropriate. The Employer may require the tenderer to justify such rates so obtained from the suppliers or manufacturers.

10.5 The rates and prices quoted by the tenderer are subject to adjustment during the performance of the Contract only in accordance with the provisions of the Conditions of Contract. The tenderer shall complete the schedule of basic rates and shall submit with his tender such other supporting information as required under clause 70 of the Conditions of contract part II.

11 Currencies of Tender and Payment

11.1 Tenders shall be priced in Kenya Shillings and the tender sum shall be in Kenya Shillings.

11.2 Tenderers are required to indicate in the Statement of Foreign Currency Requirements, which forms part of the tender, the foreign currency
required by them. Such currency should generally be the currency of the country of the tenderer’s main office. However, if a substantial portion of the tenderer’s expenditure under the Contract is expected to be in countries other than his country of origin, then he may state a corresponding portion of the contract price in the currency of those other countries.

However, the foreign currency element is to be limited to two (2) different currencies and a maximum of 30% (thirty percent) of the Contract Price.

11.3 The rate or rates of exchange used for pricing the tender shall be selling rate or rates of the Central Bank ruling on the date thirty (30) days before the final date for the submission of tenders.

11.4 Tenderers must enclose with their tenders, a brief justification of the foreign currency requirements stated in their tenders.

12 **Tender Validity**

12.1 The tender shall remain valid and open for acceptance for a period of one hundred and twenty days (120) from the specified date of tender opening or from the extended date of tender opening (in accordance with clause 7.4 here above) whichever is the later.

12.2 In exceptional circumstances prior to expiry of the original tender validity period, the Employer may request the tenderer for a specified extension of the period of validity. The request and the responses thereto shall be made in writing or by cable, telex or facsimile. A tenderer may refuse the request without forfeiting his Tender Surety. A tenderer agreeing to the request will not be required nor permitted to modify his tender, but will be required to extend the validity of his Tender Surety correspondingly.

13 **Tender Surety**

13.1 The tenderer shall furnish as part of his tender, a Tender Surety in the amount stated in the Appendix to Instructions to Tenderers.

13.2 The Tender Surety shall be in Kenya Shillings and be in form of a certified cheque, a bank draft, an irrevocable letter of credit or a guarantee from a reputable Bank approved by the Employer located in the Republic of Kenya.

The format of the Surety shall be in accordance with the sample form of Tender Surety included in these tender documents; other formats may be permitted subject to the prior approval of the Employer. The Tender Surety shall be valid for thirty (30) days beyond the tender validity period.
13.3 Any tender not accompanied by an acceptable Tender Surety will be rejected by the Employer as non-responsive.

13.4 The Tender Sureties of unsuccessful tenderers will be returned as promptly as possible as but not later than thirty (30) days after expiration of the tender validity period. The Tender Surety of the successful tenderer will be returned upon the tenderer executing the Contract and furnishing the required Performance Security.

13.5 The Tender Surety may be forfeited:

(a) if a tenderer withdraws his tender during the period of tender validity: or

(b) In the case of a successful tenderer, if he fails, within the specified time limit

(i) to sign the Agreement, or
(ii) to furnish the necessary Performance Security

(c) If a tenderer does not accept the correction of his tender price pursuant to clause 24.

14 **No Alternative Offers**

14.1 The tenderer shall submit an offer, which complies fully with the requirements of the tender documents.

Only one tender may be submitted by each tenderer, either by himself or as partner in a joint venture. A tenderer who submits or participates in more than one tender will be disqualified.

14.2 The tenderer shall not attach any conditions of his own to his tender. The tender price must be based on the tender documents. The tenderer is not required to present alternative construction options and he shall use without exception, the Bills of Quantities as provided, with the amendments as notified in tender notices, if any, for the calculation of his tender price.

Any tenderer who fails to comply with this clause will be disqualified.

15 **Pre-tender Meeting**

15.1 The tenderer’s designated representative is invited to attend a pre-tender meeting, which if convened, will take place at the venue and time in the Invitation to Tender. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
15.2 The tenderer is requested as far as possible to submit any questions in writing or by cable, to reach the Employer not later than seven (7) days 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 following:

(a) 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 tender documents. Any modification of the tender documents listed in Clause 9 which may become necessary as a result of the pre-tender meeting shall be made by the Employer exclusively through the issue of a tender notice pursuant to Clause 7 and not through the minutes of the pre-tender meeting.

(b) Non-attendance at the pre-bid meeting will not be cause for disqualification of a bidder.

16 Format and Signing of Tenders

16.1 The tenderer shall prepare his tender as outlined in clause 9 above and mark appropriately one set “ORIGINAL” and the other “COPY”.

16.2 The copy of the tender and Bills of Quantities shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the tenderer. Proof of authorization shall be furnished in the form of the written power of attorney which shall accompany the tender. All pages of the tender where amendments have been made shall be initialed by the person or persons signing the tender.

16.3 The complete tender shall be without alterations, interlineations or erasures, except as necessary to correct errors made by the tenderer, in which case such corrections shall be initialed by the person of persons signing the tender.

SUBMISSION OF TENDERS

17 Sealing and Marking of Tenders

17.1 The Tenderer shall be issued with tender documents: The tenderer shall seal the original set and copy of the tender in separate envelopes, clearly marking the envelopes as “ORIGINAL” and “COPY”. The envelopes shall then be sealed in an outer separate envelope.

17.2 The inner and outer envelopes shall be addressed to the Employer at the address stated in the Appendix to Instructions to Tenderers and bear the name and identification of the contract stated in the said
Appendix with a warning not to open before the date and time for opening of tenders stated in the said Appendix.

17.3 The inner envelopes shall each indicate the name and address of the tenderer to enable the tender to be returned unopened in case it is declared “late”, while the outer envelope shall bear no mark indicating the identity of the tenderer.

17.4 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 tender. A tender opened prematurely for this cause will be rejected by the Employer and returned to the tenderer.

18 Deadline for Submission of Tenders

18.1 Tenders must be received by the Employer at the address specified in clause 17.2 and on the date and time specified in the Letter of Invitation, subject to the provisions of clause 7.4, 18.2 and 18.3.

Tenders delivered by hand must be placed in the “tender box” at the office of the Procurement Officer, Administration Block—KSG, Lower Kabete, provided by the office of the Employer.

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

18.2 The Employer may, .at his discretion, extend the deadline for the submission of tenders through the issue of an Addendum in accordance with clause 7, in which case all rights and obligations of the Employer and the tenderers previously subject to the original deadline shall thereafter be subject to the new deadline as extended.

18.3 Any tender received by the Employer after the prescribed deadline for submission of tender will be returned unopened to the tenderer.

19 Modification and Withdrawal of Tenders

19.1 The tenderer may modify or withdraw his tender after tender submission, provided that written notice of the modification or withdrawal is received by the Employer prior to prescribe deadline for submission of tenders.

19.2 The tenderer’s modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions for the submission of tenders, with the inner and outer envelopes additionally marked “MODIFICATION” or “WITHDRAWAL” as appropriate.
19.3 No tender may be modified subsequent to the deadline for submission of tenders.

19.4 No tender may be withdrawn in the interval between the deadline for submission of tenders and the period of tender validity specified on the tender form. Withdrawal of a tender during this interval will result in the forfeiture of the Tender Surety.

19.5 Subsequent to the expiration of the period of tender validity prescribed by the Employer, and the tenderer having not been notified by the Employer of the award of the Contract or the tenderer does not intend to conform with the request of the Employer to extend the period of tender validity, the tenderer may withdraw his tender without risk of forfeiture of the Tender Surety.

**TENDER OPENING AND EVALUATION**

20 **Tender Opening**

20.1 The Employer will open the tenders in the presence of the tenderers or their representatives who choose to attend at the time and location (…………………………………………………… Boardroom) as indicated in the Letter of Invitation to Tender. The tenderers’ representatives who are present shall sign a register evidencing their attendance.

20.2 Tenders for which an acceptable notice of withdrawal has been submitted, pursuant to clause 19, will not be opened. The Employer will examine the tenders to determine whether they are complete, whether the requisite Tender Sureties have been furnished, whether the documents have been properly signed and whether the tenders are generally in order.

20.3 At the tender opening, the Employer will and announce the tenderer’s names, total tender price, tender modifications and tender withdrawals, if any, the presence of the requisite Tender Surety and such other details as the Employer, at his discretion, may consider appropriate. No tender shall be rejected at the tender opening except for late tenders.

20.4 The Employer shall prepare minutes of the tender opening including the information disclosed to those present.

20.5 Tenders not opened and read out at the tender opening shall not be considered further for evaluation, irrespective of the circumstances.
21 **Process to be Confidential**

21.1 After the public opening of tenders, information relating to the examination, clarification, evaluation and comparisons of tenders and recommendations concerning the award of Contract shall not be disclosed to tenderers or other persons not officially concerned with such process until the award of Contract is announced.

21.2 Any effort by a tenderer to influence the Employer in the process of examination, evaluation and comparison of tenders and decisions concerning award of Contract may result in the rejection of the tenderer’s tender.

22 **Clarification of Tenders**

22.1 To assist in the examination, evaluation and comparison of tenders, the Employer may ask tenderers individually for clarification of their tenders, including breakdown of unit prices. The request for clarification and the response shall be in writing or by cable, facsimile or telex, but no change in the price or substance of the tender shall be sought, offered or permitted except as required to confirm the correction of arithmetical errors discovered by the employer during the evaluation of the tenders in accordance with clause 24.

22.2 No tenderer shall contact the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. If the tenderer wishes to bring additional information to the notice of the Employer, he shall do so in writing.

23 **Determination of Responsiveness**

23.1 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender is substantially responsive to the requirements of the tender documents.

23.2 For the purpose of this clause, a substantially responsive tender is one which conforms to all the terms, conditions and specifications of the tender documents without material deviation or reservation and has a valid tender Bank Guarantee. A material deviation or reservation is one which affects in any substantial way the scope, quality, completion timing or administration of the Works to be undertaken by the tenderer under the Contract, or which limits in any substantial way, inconsistent with the tender documents, the Employer’s rights or the tenderers obligations under the Contract and the rectification of which would affect unfairly the competitive position of other tenderers who have presented substantially responsive tenders.

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

23.4 A tender determined to be not substantially responsive will be rejected by the Employer and may not subsequently be made responsive by the tenderer by correction of the non-conforming deviation or reservation.

24 Correction of Errors

Tenders determined to be substantially responsive shall be checked by the Employer for any arithmetic errors in the Computations and summations. Errors will be corrected by the Employer as follows:

(a) Where there is a discrepancy between the amount in figures and the amount in words, the amount in words will govern.

(b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will prevail, unless in the opinion of the Employer, there is an obvious typographical error, in which case adjustment will be made to the entry containing that error.

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

(d) The Error Correction Factor shall be computed by expressing the difference between the tender amount and the corrected tender sum as a percentage of the corrected builder’s work (i.e. corrected tender sum less P.C. and Provisional Sums).

(e) The Error Correction Factor shall be applied to all builder’s work (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuations of variations.

(f) The amount stated in the tender will be adjusted in accordance with the above procedure for the correction of errors and, with concurrence of the tenderer, shall be considered as binding upon the tenderer. If the tenderer does not accept the corrected amount, the tender may be rejected and the Tender Security may be forfeited in accordance with clause 13.

25 Conversion to Single Currency

25.1 For compensation of tenders, the tender price shall first be broken down into the respective amounts payable in various currencies by
using the selling rate or rates of the Central Bank of Kenya ruling on the date thirty (30) days before the final date for the submission of tenders.

25.2 The Employer will convert the amounts in various currencies in which the tender is payable (excluding provisional sums but including Dayworks where priced competitively) to Kenya Shillings at the selling rates stated in clause 25.1.

26 Evaluation and Comparison of Tenders

26.1 The Employer will evaluate only tenders determined to be substantially responsive to the requirements of the tender documents in accordance with clause 23.

26.2 In evaluating tenders, the Employer will determine for each tender the evaluated tender price by adjusting the tender price as follows:

(a) Making any correction for errors pursuant to clause 24.

(b) Excluding Provisional Sums and provision, if any, for Contingencies in the Bills of Quantities, but including Dayworks where priced competitively.

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

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

26.5 If the lowest evaluated tender is seriously unbalanced or front loaded in relation to the Employer’s estimate of the items of work to be performed under the Contract, the Employer may require the tenderer to produce detailed price analyses for any or all items of the Bills of Quantities, to demonstrate the relationship between those prices, proposed construction methods and schedules. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in clause 29 be increased at the expense of the successful tenderer to a level sufficient to protect the Employer against financial loss in the event of subsequent default of the successful tenderer under the Contract.

26.6 Firms incorporated in Kenya where indigenous Kenyans own 51% or more of the share capital shall be allowed a 10% preferential bias provided that they do not sub-contract work valued at more than 50% of the Contract Price excluding provisional sums to a non-indigenous sub-contractor.
AWARD OF CONTRACT

27  Award

27.1 Subject to Sub-clause 27.2, the Employer will award the Contract to the tenderer whose tender is determined to be substantially responsive to the tender documents and who has offered the lowest evaluated tender price subject to possessing the capability and resources to effectively carry out the Contract Works as required in Sub-clause 2.1 and 2.2 above.

27.2 The Employer reserves the right to accept or reject any tender, and to annul the tendering process and reject all tenders, at any time prior to award of Contract, without thereby incurring any liability to the affected tenderers or any obligation to inform the affected tenderers of the grounds for the Employer’s action.

28  Notification of Award

28.1 Prior to the expiration of the period of tender validity prescribed by the Employer, the Employer will notify the successful tenderer by telephone, telefax or telex and confirm in writing by registered letter that his tender has been accepted. This letter (hereinafter and in all Contract documents called “Letter of Acceptance”) shall name the sum (hereinafter and in all Contract documents called “the Contract Price” which the Employer will pay to the Contractor in consideration of the execution and completion of the Works as prescribed by the Contract.

28.2 Notification of award will constitute the formation of the Contract only upon signing of the contract agreement.

28.3 At the same time that the Employer notifies the successful tenderer that his tender has been accepted, the Employer will send to the tenderer the Form of Contract Agreement for his signature.

28.4 Within thirty(30) days of receipt of the Form of Contract Agreement from the Employer, the successful tenderer shall sign the form and return it to the Employer together with the required Performance Security.

28.5 Upon the furnishing of a Performance Security by the successful tenderer, the unsuccessful tenderers will promptly be notified by the Employer in writing or by cable that their tenders have been unsuccessful. Subsequently their tender securities shall be returned as promptly as possible in accordance with sub-clause 13.4
29 **Performance Guarantee**

29.1 Within thirty (30) days of receipt of the notification of award from the Employer, the successful tenderer shall furnish the Employer with a Performance Security in the amount stated in the Appendix to Instructions to Tenderers and in the format stipulated in the Conditions of Contract.

29.2 The Performance Security to be provided by the successful tenderer shall be an unconditional Bank Guarantee issued at the tenderer’s option by a reputable Bank approved by the Employer and located in the Republic of Kenya and shall be divided into two elements namely, a performance security payable in foreign currencies (based upon the exchange rates determined in accordance with clause 60(5) of the Conditions of Contract) and a performance security payable in Kenya Shillings.

The value of the two securities shall be in the same proportions of foreign and local currencies as requested in the form of foreign currency requirements.

29.3 Failure of the successful tenderer to lodge the required Performance Security shall constitute a breach of Contract and sufficient grounds for the annulment of the award and forfeiture of the Tender Security and any other remedy under the Contract. The Employer may award the Contract to the next ranked tenderer.

30 **Advance Payment**

An advance payment, if approved by the Employer, shall be made under the Contract, if requested by the Contractor, in accordance with clause 60(1) of the Conditions of Contract. The Advance Payment Guarantee shall be denominated in the proportion and currencies named in the form of foreign currency requirements. For each currency, a separate guarantee shall be issued. The guarantee shall be issued by a Bank located in the Republic of Kenya, or a foreign Bank through a correspondent Bank located in the Republic of Kenya, in either case subject to the approval of the Employer.
APPENDIX TO INSTRUCTIONS TO TENDERERS

CLAUSE

17.2  
(i) The Address of the employer for the purpose of Submission of tenders is:-

The Director General,
Kenya School of Government
P.O. Box 23030-00604,
LOWER KABETE.

(ii) The name of the proposed works and where available the contract Number is:-

PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2- CIVIL WORKS

(iii) The tender opening date and time is:...........................................day of ....................................................20.....................................................at.........................................................

29. Performance Guarantee

The amount of performance security is a Bank Guarantee of 5 % of the value of the tender figure

TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in 3 stages, namely:

1. Preliminary Evaluation;
2. Technical Evaluation; and

STAGE 1: PRELIMINARY EVALUATION

This stage of evaluation shall involve examination of the mandatory requirements as set out in the Tender Advertisement Notice or Letter of Invitation to Tender and any other conditions stated in the bid document.

These conditions shall include the following:

1.1. PRELIMINARY EVALUATION

<table>
<thead>
<tr>
<th>S/No</th>
<th>MANDATORY REQUIREMENTS(MR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR1</td>
<td>Valid Copy of certificate of incorporation/ Registration.</td>
</tr>
<tr>
<td>MR2</td>
<td>Valid Copy of current KRA tax compliance certificate</td>
</tr>
<tr>
<td>MR3</td>
<td>Valid copy of NCA 7 and above and current annual contractors practicing license from NCA</td>
</tr>
<tr>
<td>MR4</td>
<td>Dully filled and signed form of tender</td>
</tr>
<tr>
<td>MR5</td>
<td>Dully filled and signed Confidential business questionnaire</td>
</tr>
<tr>
<td>MR6</td>
<td>Anticorruption Pledge duly signed and stamped</td>
</tr>
<tr>
<td>MR7</td>
<td>Submission of original &amp; a copy of tender document properly book bound and paginated in the correct sequence and all pages MUST be initialled. NB: Spiral Binding and use of Spring or Box Files will not be allowed and will result in automatic disqualification.</td>
</tr>
<tr>
<td>MR8</td>
<td>Mandatory pre bid conference on 9th November 2018 attach proof of attendance</td>
</tr>
<tr>
<td>MR9</td>
<td>Valid Copy of Single Business permit</td>
</tr>
<tr>
<td>MR10</td>
<td>Tender Security (Bid Bond) of Kshs. <strong>100,000.00</strong> valid for 150 days from the date of Tender Opening.</td>
</tr>
<tr>
<td>MR11</td>
<td>Submission of Latest valid CR12 form showing the list directors/shareholding and National Identity Card, for Sole Proprietor attach copy of ID card</td>
</tr>
<tr>
<td>MR12</td>
<td>Dully filled bills of quantity in the format provided</td>
</tr>
</tbody>
</table>

**Note:**
The tenderers who do not satisfy any of the above mandatory requirements shall be considered Non-Responsive and their tenders will not be evaluated further.
STAGE 2: TECHNICAL EVALUATION

The tender document shall be examined based on clause 2.2 of the Instructions to Tenderers which states as follows:

In accordance with clause 2.2 of Instruction to Tenderers, the tenderers will be required to provide evidence for eligibility of the award of the tender by satisfying the employer of their eligibility under sub clause 2.1 of Instructions to Tenderers and their capability and adequacy of resources to effectively carry out the subject contract. In order to comply with provisions of clause 2.2 of Instruction to Tenderers, the tenderers shall be required:

a) To fill the Standard Forms provided in the bid document for the purposes of providing the required information. The tenderers may also attach the required information if they so desire;
b) To supply equipment/items which comply with the technical specifications set out in the bid document. In this regard, the bidders shall be required to submit relevant technical brochures/catalogues with the tender document, highlighting the Catalogue Numbers of the proposed items. Such brochures/catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:
   (i) Standards of manufacture;
   (ii) Performance ratings/characteristics;
   (iii) Material of manufacture;
   (iv) Electrical power ratings; and
   (v) Any other necessary requirements (Specify).

The bid will then be analyzed, using the information in the technical brochures, to determine compliance with General and Particular technical specifications for the works as indicated in the tender document. The tenderer shall also fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipment they propose to supply.

The award of points considered in this section shall be as shown below:

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>MAXIMUM POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Compliance with Technical Specifications</td>
<td>40</td>
</tr>
<tr>
<td>(ii) Tender Questionnaire</td>
<td>3</td>
</tr>
<tr>
<td>(iii) Key Personnel</td>
<td>12</td>
</tr>
<tr>
<td>(iv) Contract Completed in the Last Five (5) Years</td>
<td>9</td>
</tr>
<tr>
<td>(v) Schedules of On-going Projects</td>
<td>4</td>
</tr>
<tr>
<td>(vi) Schedules of Contractors Equipment</td>
<td>12</td>
</tr>
<tr>
<td>(vii) Audited Financial Report for theLast 3 Years</td>
<td>6</td>
</tr>
<tr>
<td>(viii) Evidence of Financial Resources</td>
<td>9</td>
</tr>
<tr>
<td>(ix) Name, Address and Telephone of Banks (Contractor to Provide)</td>
<td>3</td>
</tr>
<tr>
<td>(x) Litigation History</td>
<td>2</td>
</tr>
</tbody>
</table>

TOTAL                              100

The pass-mark under the Technical Evaluation is 70 percent.
The detailed scoring plan shall be as shown in table 1.

**TABLE 1: Technical Evaluation**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Points Scored</th>
<th>Max. Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Compliance with Technical Specifications</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>• Compliant -------------------- 30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Non-compliant------------------ 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Program of Works ..................... 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(Note: Tender Evaluation Committee to carryout analysis showing how decision on this requirement has been arrived at. Attach analysis on this as an Appendix)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Tender Questionnaire Form</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>• Completely filled -------------------------- 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Not filled ---------------------------------- 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Key Personnel (Attach evidence)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Director of the firm</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>• Holder of degree in relevant Engineering field ------------------- 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Holder of diploma in relevant Engineering field ------------------- 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Holder of certificate in relevant Engineering field --------------- 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Holder of trade test certificate in relevant Engineering field ------- 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No relevant certificate -------------------------------------------------- 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least 1 No. degree/diploma holder of key personnel in relevant field</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>• With over 10 years relevant experience ---------------------------- 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With over 5 years relevant experience ------------------------------- 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With under 5 years relevant experience ------------------------------ 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least 1 No certificate holder of key personnel in relevant field</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>• With over 10 years relevant experience ----------------------------- 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With over 5 years relevant experience ------------------------------- 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With under 5 years relevant experience ------------------------------ 0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>At least 2 No artisan (trade test certificate in relevant field)</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>• Artisan with over 10 years relevant experience -------------------- 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Artisan with under 10 years relevant experience --------------------- 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Non skilled worker with over 10 years relevant experience ----------- 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Contracts completed in the last five (5) years (Max of 3 No. Projects)- Provide Evidence</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>• Project of similar nature, complexity or magnitude ---------------- 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Project of similar nature but of lower value than the one in consideration ------- 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• No completed project of similar nature -------------------------- 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Points Scored</td>
<td>Max. Point</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>5</td>
<td>On-going projects – <strong>Provide Evidence</strong>&lt;br&gt;• No Project of similar nature, complexity and magnitude -------------- 4&lt;br&gt;• Three and below Projects of similar, nature complexity and magnitude ------------------ 3&lt;br&gt;• Four and above Projects of similar nature, complexity and magnitude ------------------ 2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Schedule of contractors equipment and transport (proof or evidence of ownership/Lease)&lt;br&gt;a) Relevant Transport&lt;br&gt;• Means of Transport (Vehicle) ----------------------------- 6&lt;br&gt;• No means of Transport ----------------------------- 0</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>b) Relevant Equipment&lt;br&gt;• Has relevant equipment for work being tendered ------------------------ 6&lt;br&gt;• No relevant equipment for work being tendered ------------------------ 0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Financial report&lt;br&gt;a) Audited Financial Report (Last Three (3) Years)&lt;br&gt;• Average Annual Turn-over equal to or greater than the cost of the project -- --------------- 6&lt;br&gt;• Average Annual Turn-over above 50% but below 100% of the cost of the project -- 3&lt;br&gt;• Average Annual Turn-over below 50% of the cost of the project ----- 1</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>b) Evidence of Financial Resources (cash in hand, lines of credit, over draft facility etc.)&lt;br&gt;• Has financial resources to finance the projected monthly cash flow*&lt;br&gt;  for three months ---------------------------------------- 9&lt;br&gt;• Has financial resources equal to the projected monthly cash flow*----------------------- 6&lt;br&gt;• Has financial resources less the projected monthly cash flow*------------------- 3&lt;br&gt;• Has not indicated sources of financial resources -------------------------- 0</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Name, Address and Telephone of Banks (Contractor to Provide)&lt;br&gt;• Information Provided----------------------------------- 3&lt;br&gt;• No Information Provided----------------------------------- 0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Litigation History&lt;br&gt;• Duly Filled ---------------------------------------- 2&lt;br&gt;• Not filled ---------------------------------------- 0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Any bidder who scores 70 points and above shall be considered for further evaluation.<br>*Monthly Cash Flow = Tender Sum/Contract Period
STAGE 3 - FINANCIAL EVALUATION

Upon completion of the technical evaluation a detailed financial evaluation shall follow.

The evaluation shall be in three stages
   a) Determination of Arithmetic Errors
   b) Comparison of Rates; and
   c) Consistency of the Rates.

A) Determination of Arithmetic Errors

Arithmetic Errors will be corrected by the Procuring Entity as follows:

   i) In the event of a discrepancy between the tender amount as stated in the form of Tender and the corrected tender figure in the Main summary of the Bills of Quantities, the amount as stated in the Form of Tender shall prevail. Pursuant to Section 82 of the Public Procurement and Asset Disposal Act 2015, the tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity;

   ii) Error correction factor shall be computed by expressing the difference between the amount and the corrected tender sum as a percentage of the corrected contract works (i.e. corrected tender sum less P.C; and Provisional Sums);

   iii) The Error correction factor shall be applied to all contract works (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.

B) Comparison of Rates

Items that are under priced or overpriced may indicate potential for non-delivery and front loading respectively. The committee shall promptly write to the tenderer asking for detailed breakdown of costs for any of the quoted items, relationship between those prices, proposed construction/installation methods and schedules.

The evaluation committee shall evaluate the responses and make an appropriate recommendation to the procuring entity giving necessary evidence. Such recommendations may include but not limited to:

   a) Recommend no adverse action to the tenderer after a convincing response;
   b) Employer requiring that the amount of the performance bond be raised at the expense of the successful tenderer to a level sufficient to protect the employer against potential financial losses;
   c) Recommend non-award based on the response provided and the available demonstratable evidence that the scope, quality, completion timing, administration of works to be undertaken by the tenderer, would adversely be affected or the rights of the employer or the tenderers obligations would be limited in a substantial way.

C) Consistency of the Rates

The evaluation committee will compare the consistency of rates for similar items and note all inconsistencies of the rates for similar items.

STAGE 4 - RECOMMENDATION FOR AWARD

The successful bidder shall be the tenderer with the lowest evaluated tender price.
SECTION C:

CONDITIONS OF CONTRACT – PART 1

(GENERAL CONDITIONS)

Note

i. The standard text of the General Conditions of Contract must be retained intact to facilitate its reading and interpretation by tenderers. any amendments and additions to the General Conditions, specific to a given Contract, should be introduced in the Conditions of Particular Application or in the Appendix to Form of Tender.

ii. The Conditions of Particular Application take precedence over the General Conditions of Contract.

iii. 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 D:

CONDITIONS OF CONTRACT PART II

(CONDITIONS OF PARTICULAR APPLICATION)
CONDITIONS OF CONTRACT – CONDITIONS OF PARTICULAR APPLICATION

GENERAL

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

1. **Definitions and Interpretation**

1.1(a) (i) The said “Employer” shall be: **The Kenya School of Government,** Represented by **The Director General, Kenya School of Government.**

   (iv) The said “Engineer” shall be the **Chief Engineer (Structural), State Department of Public Works, P.O. BOX 30743 - 00100, Nairobi,** or any other competent person appointed by the Employer, and notified to the contractor, to act in replacement of the “Engineer”.

(b)(i) Insert in line 2 after “the Bill of Quantities”, the following, “the rates entered by the Contractor (whether or not such rate be employed in computation of the Contract Price)”.

Add the following sub-clause;

2. **Engineer’s Duties and Authority**

2.1(b) The Engineer shall obtain specific approval of the Employer before taking any of the following actions specified in Part 1:

   (i) Consenting to the sub-letting of any part of the Works under clause 4.

   (ii) Certifying additional cost determined under Clause 12

   (iii) Determining an extension of time under Clause 44

   (iv) Issuing a variation under Clause 51 except in an emergency situation as reasonably determined by the Engineer.

   (v) Fixing rates or prices under clause 52
Assignment and Sub-contracting

4.1 **Delete the second and third sentence and substitute:**

No single subcontract may be for more than 10 percent of the Contract Price nor shall the sum of all subcontracts exceed 25 percent of the Contract price. No one subcontractor may be awarded subcontracts to a total value greater than 10 percent of the Contract Price. All subcontracts greater than 2 percent of the Contract Price are to have the prior consent of the Engineer.

The Contractor shall however, not require such consent for purchases of materials or to place contracts for minor details or for any part of the Works of which the manufacturer of supplier is named in the Contract. Any such consent shall not relieve the Contractor from any liability or obligation under the Contract and he shall be responsible for the acts, defaults and neglects of any subcontractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen.

**Contract Documents**

5.1(a) **the language governing this Contract shall be English.**

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

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

5.2 **Delete the documents listed 1-6 and substitute:**

(1) The Contract Agreement;
(2) The Notification of Award;
(3) Tender and Appendix to Form of Tender;
(4) The Conditions of Contract Part II;
(5) The Conditions of Contract (FIDIC);
(6) The Special Specifications;
(7) The Standard Specifications for Road and Bridge Construction, MOT&C – 1986;
(8) Clarifications and rectifications accepted by the Employer; and
(9) The Drawings;
(10) The priced Bills of Quantities; and
(11) Schedules and other documents forming part of the contract.
**General Obligations**

8.1 **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. The said office shall be the legal domicile of the Contractor, and all correspondence sent to this office shall be deemed to have been sent to the Contractor’s head office.

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

10.1 **Performance Security**

In lines 1, 2 and 3 delete the words “if the Contract... within 28 days” and substitute

“The Contractor shall obtain a Performance Security within 30 days.............”.

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

**The Performance Security shall be issued by a Bank incorporated in Kenya.** The amount of guarantee shall be as stated in the Appendix to Form of Tender.

The bank guarantee shall be issued either (a) by an established and reputable bank approved by the Employer and located in Kenya or a foreign bank through a correspondent established and reputable bank located in Kenya and approved by the Employer or (b) directly by a foreign bank acceptable to the Employer. The performance security shall normally be in the currency or currencies requested for payment by the Contractor and in the same proportions as those requested for payment in the Contract.

The performance security may, subject to the approval of the Engineer, be adjusted at the end of each period of 12 months to reflect the residual value of the Contract Works.

10.2 The performance guarantee shall be valid until a date 30 days after the date of issue of the Taking-Over Certificate. The security shall be returned to the Contractor within 30 days of the expiration.
10.3 Delete sub-clause 10.3

11.1 **Inspection of Site**

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

Delete the last paragraph completely and replace with the following:-

“The Employer in no way guarantees completeness nor accuracy of the soil, materials, subsurface and hydrological information made available to the Contractor at the time of tendering 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 tender shall be deemed to have been priced accordingly.

14.1 **Programme of works to be Submitted**

The time within which the Programme of works shall be submitted shall be Fourteen (14) days after the date of letter of acceptance by the employer. This detailed Programme shall be based upon the programme submitted by the Contractor as part of his tender and shall, in no material manner, deviate from the said programme.

The Contractor shall allow in his Programme for the following 10 public holidays per calendar year in Kenya upon which the Contractor shall not be permitted to work

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

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

14.2 Add the following at the end of this sub clause:-

The Employer shall have the right to withhold payment at any time if the Contractor fails to submit the contractual construction programmes in accordance with sub clause 14.1 above or revise construction programmes due to his negligence, failure or omission.
14.3 **Cash Flow Estimate to be submitted**

The time limit within which a detailed cash flow estimate is to be submitted shall be thirty (30) days after the date of letter of acceptance by the employer.

In preparing the estimates, the Contractor shall make provision for Advance payment, repayment of advance, retention, payment for services provided by the Employer and timing implications of sub clause 60 – Certificates and Payments.

15 **Contractor’s Superintendence**

Add the following at the end of the first paragraph of sub-clause 15.1:

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:

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

16.2 **Engineer at Liberty to object**

At the end of this clause add “by a competent substitute approved by the Engineer at the Contractor’s own expense”.

The Contractor is encouraged to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications who are Kenyan citizens or foreigners with work permits.

**Safety, Security and Protection of the Environment**

19.1 Add at the end of sub clause 19.1 the following:-

The formulation and enforcement of an adequate safety program shall be the obligation of the Contractor with respect to all the Works under this Contract, regardless of whether performed by the Contractor or his subcontractors. The Contractor shall, within 14 days after commencement of the Works, meet the Engineer to present and discuss his plan for the establishment of such safety measures as may be necessary to provide against accidents, unsafe acts and so forth. Within 28 days after commencement of the Works, the Contractor shall submit a written safety program to the Engineer covering the overall Works and based on the laws and regulations of Kenya. In addition, he shall prepare special safety programs for blasting and handling of explosives as stipulated in the General and Special Specifications.
Notwithstanding the foregoing, the Contractor shall observe the following measures with a view to reducing or eliminating adverse environmental effects by the Site Works:

(i) All quarries and borrow pits shall be filled and landscaped to their original state after extraction of construction material

(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 not limited to grassing, planting of trees, gabions etc.

(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 at the Contractor’s expense.

(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.

(vi) Dumping shall be done only at designated dumping areas and not haphazardly on surroundings.

Insurance of Works & Contractor’s Equipment

21.1 (a) 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 the works to the satisfaction of the Employer.”

(b) Add the following words at the end of sub-paragraph (a) and immediately before the last word in (b)

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

In sub clause 21.1(b), delete the words “or as may be specified in Part II of These Conditions”.

21.2 (a) Delete the words “from the start of Work at the Site” and substitute with the words “from the first working day after the commencement date”
(c) Add the following sub-clause: “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”.

23.1 Third Party Insurance

Add the following at the beginning of this sub-clause:-

“Prior to commencement of the Works ………………………..”

23.2 Minimum Amount of Insurance

Add the following at the end of this sub-clause:

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

25.1 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 25.5 to 25.7

25.5 Insurance Notices

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

25.6 Re-insurance in Kenya

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

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

Add the following sub-clause 26.2;-

The Employer will repay or allow to the Contractor all such sums as the Engineer shall certify to have been properly payable and paid by the Contractor in respect of such fees. Provided always that, without prejudice to sub clause, nothing contained in this clause shall be deemed to render the Employer liable to all claims which may be considered to fall within the provisions of clause 22.1.

Royalties

28.2 Add the following at the end of this sub-clause;

"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."

Interference with Traffic and Adjoining Properties

29.2 Add new sub-clause 29.2;

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

If in the opinion of the Engineer the Contractor shall have failed to take reasonable and prompt action to discharge his obligations in the matter of reinstatement, the Engineer will inform the Contractor in writing of his opinion, in which circumstances the Employer reserves the right to employ others to do the necessary work of reinstatement and to deduct the cost thereof from any money due or to become due to the Contractor. The Contractor shall promptly refer to the Employer, all claims, which may be considered to fall within the provisions of Clause 22.1.

LABOUR

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.

34.3 Fair Wages

The Contractor shall, in respect of all persons employed anywhere by him in the execution of the Contract, observe and fulfil the following conditions:
(a) The Contractor shall pay the rates of wages, observe hours of labour and provide conditions, housing amenities and facilities not less favourable than those required by the Regulation of wages (Building and Construction Industry) Order 1974, and any subsequent amendments thereto, or in any ministry of labour or other government department in consultation with the district whose general circumstances in the trade or industry in which the Contractor is engaged are similar. The Contractor shall at all times during the continuation of the Contract display, for the information of his employees, a notice setting out the general rates of wages, hours and conditions of labour of his employees and a copy of this clause.

(b) In the absence of any rates for wages, hours or conditions of labour so established, the Contractor shall pay rates or wages and observe hours and conditions for labour, which are not less favourable than the general circumstances in the trade, or industry in which the Contractor is engaged.

(c) Where the absence of established rates of wages, hours and conditions of labour or the dissimilarity of the general circumstances in the trade or 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) or (b) above, the Contractor in fixing the rates of wages, hours and conditions of labour of his employees shall be guided by the advise 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 of the times worked by, and the wages paid to his employees. The Contractor shall furnish to the Employer, if called upon such to do particulars of the rates of wages, hours and conditions of labour as the employer may direct.

(f) The Contractor shall be responsible for observance by his sub-Contractors of the foregoing provisions.

34.4 Breach of Fair Wages Clause

Should a claim be made to the Employer alleging the Contractor’s default in payment of fair wages to any workman employed on the Contract and if proof thereof satisfactory to the Employer is furnished by the labour department, 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.
34.5 **Recruitment of Unskilled Labour**

Any additional unskilled labour which may be required by the Contractor for the Works and which is not in his employ at the time of the acceptance of the tender shall be recruited by the Contractor from the labour office nearest to the Site of the Works.

34.6 **Compensation for injury**

The Contractor shall, in accordance with the Workman’s Compensation Act Chapter 236 of the laws of Kenya and any other regulations in force from time to time in Kenya, 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 sub-contractor.

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 this Contract, whether performed by the Contractor or his sub-contractors. 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 will remove or replace any of his employees employed under this Contract.

34.8 **Recruitment**

The Contractor shall not induce personnel of the employer or the Engineer to leave their regular employment and shall not, without the prior consent in writing of the Employer, employ personnel who have resigned from such service within the preceding twelve months.

35 Add the following sub-clauses 35.2 and 35.3:-

35.2 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.

35.3 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(s) whenever such report is required by the law.
41.1 Commencement and Delays

Insert immediately after the Works......”on Site within 28 days” and before the word....... after

41.2 Definition of Commencement

For the purposes 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 representative of the Contractor is resident in the project area and is giving his whole time to the superintendence of the Works.

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

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

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

42.4 Possession of Site and Access Thereto

Add the following to this clause 42.4:-

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

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

Extension of Time for completion

44.1 Add at the end of sub-clause 44.1 the following:

Neither rains falling between 1st November and 31st December (inclusive) and between 1st February and 31st May (inclusive) 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.

45. Working Hours

Delete sub-clause 45.1 and substitute:

“Subject to any provision to the contrary contained in the Contract, the Contractor shall have the option to work continuously by day and by night and on locally recognized days of rest”.

If the Contractor requests for permission to work by day and night and if the Engineer shall grant such permission, the Contractor shall not be entitled to any additional payment for so doing. All such work at night shall be carried out without unreasonable noise or other disturbance and the Contractor shall indemnify the Employer from and against any liability for damages on account of noise or other disturbance created while 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 shall be required to provide, for any work carried out by 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.

47.2 **Reduction of Liquidated Damages**

Delete sub-clause 47.2 and substitute with the following:-

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

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

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

**Defects Liability**

49.2 Add at the end of this sub-clause the following sentence:-

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

52 **Valuation of Variations**

52.1 Add the following final sentence to this sub-clause:
The agreement, fixing or determination of any rates or prices as aforesaid shall include any foreign currency and the proportion thereof.

52.4 **Day works**

The Work so ordered shall immediately become part of the Works under the Contract. The Contractor shall, as soon as practicable after receiving the Day works 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 Day work basis, the Contractor shall give a notice to the Engineer stating the exact time of such commencement.

54. **Plant, Temporary Works and Materials**

Delete sub-clauses 54.3 to 54.4 entirely.

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

54.1 Line 5: - Add “written” between “the” and “consent”.

**Quantities**

55.1 Delete sub-clause 55.1 and substitute with the following:

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

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

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

55.2 Add as a new sub-clause:

“Items of Work 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.

**Measurement**

56.1 Delete sub-clause 56.1 and replace with the following:-
The Contractor shall prepare and submit to the Engineer all necessary field notes and other records taken and computations made for the purpose of quantity measurements, of which the forms shall be approved by the Engineer, for the monthly progress payment. The measurement of work quantities made by the Contractor shall be verified and certified by the Engineer based on the above-mentioned documents.

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

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

57.1 Delete sub clause 57.1 and substitute with the following:-
The Works shall be measured net with deductions made in accordance with the principles of the latest edition of the Civil Engineering Standard Method of Measurement. All measurements shall be given in metric (SI) units.

**Provisional Sums**

58.4 **Prime Cost sum**

Wherever an item in the Bills of Quantities has been referred to as a “P.C. Sum” (Prime Cost Sum), that item shall be construed as a Provisional sum and the provisions of Sub-clauses 58.1 to 58.3 will apply.

59.5 Add the following paragraph at the end of sub clause 59.5:-

If the Engineer desires to secure final payment to any nominated sub-contractor before final payment is due to the Contractor and if such sub-contractor has satisfactorily indemnified the Contractor against any latent defects, the Engineer may, in an interim certificate, include an amount to cover the said final payment, and thereupon the Contractor shall pay to such nominated sub-contractor the amount so certified.

Upon such final payment, the amount named in the Appendix to Form of Tender as Limit of Retention Money shall be reduced by the sum which bears the same ratio to the amount as does the subcontract and sub-contractor shall be discharged from all liability for the Work, materials or goods executed or supplied by such subcontractor under the Contract to which the payment relates.
Certificates and Payment

Delete sub-clause 60.1 to 60.10 entirely and substitute with the following:-

60.1 Advance Payment

In the event that an advance payment is granted, the following shall apply:-

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

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

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

d) Reimbursement of the lump sum advance shall be made by deductions from the Interim payments and where applicable from the balance owing to the Contractor. Reimbursement shall begin when the amount of the sums due under the Contract reaches 20% of the original amount of the Contract. It shall have been completed by the time 80% of this amount is reached.

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

\[ R = \frac{A \left( x^1 - x^{11}\right)}{80 - 20} \]

*Where:*

- \( R \) = the amount to be reimbursed
- \( A \) = the amount of the advance which has been granted

- \( x^1 \) = the amount of proposed cumulative payments as a percentage of the original amount of the Contract. This figure will exceed 20% but not exceed 80%.

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

(e) With each reimbursement the counterpart of the directly liable guarantee may be reduced accordingly.
60.2 Interim Payment Certificate

The Contractor shall submit to the Engineer, in the manner required by the Engineer after the end of each month a statement showing the estimated contract value of permanent Work properly executed and materials or goods for permanent works brought to Site up to the end of the previous month (if the value shall justify the issue of an interim certificate) together with any adjustments under clause 70 and any outstanding claims and sums the Contractor considers may be due to him.

The Contractor shall amend or correct his estimate as directed by the Engineer and the latter shall not accept it until he is satisfied that it is fair and reasonable. With respect to the said materials and goods, no payment for them shall be made unless:-

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

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

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

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

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

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

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

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

### 60.3 Final Account and Final Payment Certificate

As soon as possible after the issue of Taking - Over Certificate or the termination of the Contract and not later than the time of issue of Defects Liability Certificate, the Contractor shall prepare and submit to the Engineer (with a copy to the Employer), a Statement of Final Account showing in detail the total value of work done in accordance with the Contract together with all sums paid in previous payments.

Within thirty (30) days after receipt of such further information as may be reasonably required from the Contractor for its verification, the Engineer shall check the said statement, prepare and submit a Final Payment Certificate to the Employer (with a copy to the Contractor).

The Final Payment Certificate shall state:

1. **(a)** The (final) total value of all Work done in accordance with the Contract;
2. **(b)** After giving credit to the Employer for all amounts previously paid to the Contractor, the balance, if any, due from the Employer to the Contractor or the Contractor to the Employer, as the case may be.

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

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

1. **(a)** to the extent that fraud or dishonesty relates to or affects any matter dealt with in the Certificate, or
2. **(b)** if any arbitration or court proceedings under the Contract have been commenced by either party before the expiry of 84 days after the issue of the Final Certificate of Payment.
60.4 Payment of Certificates

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

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

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

60.5 Payment of Retention Money

One half of the retention money shall become due upon the issue of a Taking Over Certificate/Practical Completion Certificate and shall be paid to the Contractor when the Engineer shall certify in writing that the last section of the whole of the Works has been substantially completed and the other half shall be paid to the Contractor after the expiration of the Defects Liability Period and the issue of a Certificate under Clause 62.

Provided always that if such time there shall remain to be executed by the Contractor any Works ordered during such period pursuant to Clauses 49 and 50 thereof, the Employer shall be entitled to withhold payment [until the completion of such Works] of so much of the second half of the Retention Money as shall in the opinion of the Engineer represent the Costs of the Works so remaining to be executed.

Provided further that in the event of different Defects Liability Periods having become applicable to different parts of the Works pursuant to clause 48 hereof the expression “expiration of the Defect Liability Period” shall for the purpose of this Sub-clause be deemed to mean the expiration of the latest of such periods.

60.6 Currency of Payment

The Contract price shall be stated in Kenya Shillings. All payments to the Contractor shall be made in Kenya shillings and foreign currency(s) in the proportion indicated in the tender, or agreed prior to the execution of the Contract Agreement and indicated therein. The rate[s] of exchange for the calculation of the amount of foreign currency payment[s] shall be the rate of exchange indicated in the Tender. If the Contractor indicated foreign currencies for payment other than the currencies of the countries of origin of related goods and services, the Employer reserves the right to pay the equivalent at the time of payment in the currencies of the countries of such goods and services. The Employer and the Engineer shall be notified promptly by the Contractor of any changes in the expected foreign currency requirements of the Contractor during the execution of the Works as indicated in the Statement of Foreign Currency Requirements and the foreign
and local currency portions of the balance of the Contract Price shall then be amended by agreement between Employer and the Contractor in order to reflect appropriately such changes.

60.7 **Overdue Payments**

If the period laid down for payment to the Contractor upon each of the Engineer’s Certificate by the Employer has been exceeded, the Contractor shall be entitled to claim simple interest calculated pro-rata on the basis of the number of days delayed at a rate equal to three (3) percentage points above the prevailing Central Bank of Kenya average for base lending on the first day the payment becomes overdue.

The Contractor will be required to notify the Employer within fourteen [14] days of receipt of delayed payments of his intention to claim interest. The provisions of this sub-clause are without prejudice to the Contractor’s entitlements under clause 69.

Payment of the interest in delay shall be subject to the submission by the Contractor, in his next certificate or not later than the fifty sixth (56) calendar day following the day for payment of the Final Certificate, of a written request having the effect of statement of account.

60.8 **Correcting and With-holding**

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

60.9 **Completion by Sections.**

If a Taking-Over Certificate shall be issued for any section or part of the Works separately, the payments herein provided for on or after issue of such a Certificate shall be made in respect of such section or part and references to the Contract Price shall mean such part of the Contract Price as shall in the absence of agreement be apportioned thereto by the Engineer.

60.10 **Proportion of Foreign Currency**

Subject to the provision of sub clause 60.5 the proportion of foreign currency in any amount due to the Contractor or Employer shall be determined in the following manner:

- a) For all measured Work, the percentages of foreign currency for the appropriate section of the Bill of Quantities as stated in the schedule of foreign currency requirements shall be applied.
- b) Variations in the cost of imported materials shall be paid in foreign currency.
- c) Variations in the cost of locally purchased materials and those due to changes of legislation shall be paid in local currency.
d) For Dayworks labour and plant, the respective percentages of foreign currency stated in the schedule shall be applied.
e) For Dayworks materials and materials on site, payment in foreign currency will only be made for imported materials.
f) The provisions for the deduction and release of Retention Money and the payment of interest shall be applied similarly to both the local and foreign portions.
g) The advance mobilization loan, its repayment thereof and liquidated damages shall all be apportioned on the basis of the ration between local and foreign currency indicated in the Contract Price.

h) In the event that the payment is for an item not covered in the foregoing paragraphs, the Engineer shall determine the proportion of foreign and local currency based on the information given in the Schedule of Foreign Currency Requirements, together with any additional information he may request the Contractor to provide.

60.11 Statement at Completion

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

(a) The final value of all work done in accordance with the Contract up to the date stated in such Taking-Over Certificate.
(b) Any further sums which the Contractor considers to be due; and
(c) An estimate of amounts, which the Contractor considers, will become due to him under the Contract.

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

60.12 Final Statement

Not later than 56 days after the issue of the Defects Liability Certificate, the Contractor shall submit to the Engineer for consideration a draft final statement with supporting documents showing in detail, 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.
60.13 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 60.14 has been made and the Performance Security referred to in Sub-clause 10.1 has been returned to the Contractor.

60.14 Final Payment Certificate

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

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

(b) After giving credit to the Employer for all amounts previously paid by the Employer, the balance, if any, due from the Employer to the Contractor or the Contractor to the Employer as the case may be Final Certificate shall be issued for any sum due to the Contractor even if such is less than the sum said named in the Appendix to the Form of Tender.

60.15 Cessation of Employer’s 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.

62.1 Defects Liability Certificate

Delete the last sentence of this Sub-Clause beginning “Provided that the issue ......................... in Sub-Clause 60.3”.

Remedies

63.4 Assignment of Benefit of Agreement

Add the following at the end of this sub-clause:-

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

65 **Special Risks**

Add sub-clause 65.9 as follows:

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

(b) In the event of the Employer ordering the adjournment of the Contract before or after commencement of the Works for reasons not specified elsewhere in the Conditions of Contract, the Contractor shall be entitled to indemnity for any injury which he may have suffered as a consequence of such adjournment. The Engineer shall award the Contractor payment of such sum as in his opinion shall be reasonable giving regard to all material and relevant factors including the Contractor’s on costs and overheads, and the nature of the instruction to adjourn the Contract.

**Settlement of Disputes**

67.3 **Arbitration**

For the purposes of this Clause, the Arbitrator shall be a person to be agreed between the parties or failing agreement, the Arbitrator shall be appointed by the appointer designated in the Appendix to the Form of Tender.

Add the following paragraph after the last paragraph of sub-clause 67.3:

“Arbitration shall take place in Nairobi, Kenya. The language of all arbitration proceedings shall be in English. The cost of arbitration shall be apportioned by the Arbitrator according to his findings. Neither party shall have recourse to a court of law or other authority for the purpose of appealing against the decision of the Arbitrator, which will be binding to both the Employer and the Contractor”.

**Notices**

68.1 Add the following at the end of this sub-clause:-

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

68.2 Delete the words “nominated for that purpose in Part II of these Conditions” in this Sub-clause.

Default of Employer

69.1 Default of Employer

In paragraph (a) of this Sub-Clause, delete the words “within 28 days of expiry of the time stated in Sub-clause 60.10” and insert “within 90 days after the expiry of the time stated in Sub-Clause 60.4”.

69.4 Contractor’s Entitlement to Suspend Work

Delete the first four lines of this Sub-Clause and replace with the following:

“Without prejudice to the Contractor’s entitlement to interest under Sub-clause 60.7 and to terminate his employment under Sub-Clause 69.1, the Contractor may, if the Employer fails to pay the Contractor the amount due under any certificate of the Engineer within 90 days after the expiry of the time stated in Sub-Clause 60.4”.

Delete sub-clause 69.4 (b) and substitute with the following----“the amount of such cost, which shall be added to the Contract Price. However, the costs due to idle time for plant, equipment and labour shall not be included in the said costs and shall be borne by the Contractor.

69.5 Resumption of Work

In line 3 of this Sub-Clause delete the Words “Sub-Clause 60.10” and replace with “Sub-Clause 60.7”

Changes In Cost and Legislation

70.1 Delete the sub-clause 70.1 in its entirety and substitute with the following:

“The Contract Price shall be deemed to have been calculated in the matter set below and shall be subject to the adjustment in the event specified hereunder:

(a) The rates contained in the priced Bill of Quantities are based upon the rates of wages and other emoluments and expenses applicable at the site and the date of tender pricing (as defined in sub-clause 70.4 hereinafter);

(b) If the said rates of wages and other emoluments and expenses shall be increased or decreased by act, statute, decree, regulation and the like
after the said date of tender pricing then the net amount of increase the emoluments and expenses shall, as the case may be, paid to or allowed by Contractor;

(c) The rates contained in the price Bill of Quantities are based upon the rates of the Contractor’s compulsory contributions payable at the date of tender under or by virtue of any Act, Statue, Regulations and the like applicable at the site;

(d) If any of the said rates of contribution becomes payable after that date then the net amount of new statutory contribution becomes payable after that date then the net amount of increase or decrease of the emoluments and expenses shall, as the case may be, be paid to or allowed by the Contractor. Difference between what the Contractor actually pays in respect of work people engaged upon or in connection with the works and what he would have paid in respect of such person had any of the said rates not been increased or decreased or had a new contribution not become payable as aforesaid, shall as the case may be, be paid to or allowed by the Contractor. Provided always that the Engineer and the Contractor may agree a sum, which shall be deemed to be the net amount of the aforesaid difference, and such sum shall be deemed for the purpose of this Contract to be, that which is to be paid to or allowed by the Contractor by the virtue of this sub-paragraph;

(e) If the market price or any materials or goods specified as aforesaid shall be increased or decreased after the said Date of Tender Pricing, then the net amount of difference between the basic price and the market price payable by the Contractor and current when any such goods and materials are bought shall, as the case may be, be paid to or allowed by the Contractor. Orders for materials and goods listed as aforesaid shall have been placed within a reasonable time after the date at which sufficient information is available for the placing of such orders, and the placing of orders at that time shall be a condition precedent to any payments being made to the Contractor in respect of increased market prices.”

**Substitute and add the following sub-clauses:**

70.2 (a) If the Contractor shall decide subject to Clause 4 thereof to sub-let any portion of the work, he shall incorporate in the sub-contract provisions to the like effect as those contained in sub-clause (1) of this Clause;

(d) If the price payable under a sub-contract as aforesaid is increased above or decreased below the price in such sub-contract by reason of the operation of the incorporated provisions of sub-clause (1) of this clause then the net amount of such increase or decrease shall as the case may be, be paid to or allowed by the Contractor under this Contract.

70.3 The expression “the date of tender pricing” as used in this Clause means the date 28 days prior to the final date for submission of Tenders as determined by the Employer in the Tender documents.
70.4 For imported materials, the supplier’s/manufacturer’s Prime costs shall be C.I.F. cost at point of entry by the same means of transport as determined by the Contractor’s Basic Rate.

For locally produced materials, the supplier’s or manufacturer’s prime costs shall be at their nearest depot or the nearest railway station relevant to the works.

For materials, which are subject to Government Price Control, payments for price variations will be determined from the difference between the control price in force at a date 28 days prior to date for submission of Tenders and the price in force on the date of purchase.

70.5 The materials to which this Variation Clause applies are:
- Fuels, oils and lubricant
- Cement
- Lime
- uPVC pipes
- Reinforcing steel

70.6 The Contractor shall not change the supplier or manufacturer during the Contract without the approval of the Engineer.

70.7 No payments will be made for price variation related to expenses incurred by the Contractor in his Head Office in Kenya, or overseas.

70.8 All payments made pursuant to Clause 70 shall be in Kenya Shillings.

70.9 No payments will be made for the cost of preparing V.O.P. claims.

70.10 Add the following at the end of this clause.

“Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited as aforesaid if the same shall already have been taken into account in accordance with the provisions of sub-clause 70.1”.

**ADDITIONAL CLAUSES**

**Clause 73 Declaration against Waiver**

The condoning by the Employer of any breach or breaches by the Contractor or any authorized sub-contractor of any of the stipulations and Conditions contained in the Contract shall in no way prejudice or affect or be construed as a waiver of the Employer’s rights, powers and remedies under the Contract in respect of any breach or breaches as aforesaid.
Clause 74  Bribery and Collusion

The Employer shall be entitled to determine the Contract and recover from the Contractor the amount of any loss resulting from such determination if the Contractor shall have offered or given or agreed to give any person any gift or consideration of any kind as an inducement of regard for doing or forebearing to do or for having done or foreborne to do any action in relation to obtaining or the execution of the Contract or any other contract with the Employer or if any of the like acts shall have been done by any person employed by the Contractor or acting on his behalf (whether with or without the knowledge of the Contractor) or if the Contractor shall have come to any agreement with another contractor or number of contractors whereby an agreed quotation or estimate shall be tendered to the Employer by one or more contractors.

Clause 75  Contract Confidential

The Contractor shall treat the Contract and everything in connection there with as private and confidential. In particular, the Contractor shall not publish any information, drawings or photographs concerning the Works in any trade or technical paper etc, and shall not use the Site for the purpose of advertising except with the written consent of the Engineer and subject to such conditions as the Engineer may prescribe.

Clause 76  Employer’s Officials etc., Not Personally Liable

No official of the Employer or the Engineer or the Engineer’s Representative or anyone of their respective staffs or their employees shall be in any way personally bound or liable for the acts or obligations of the Employer under the Contract or answerable for default or omission in the observance or performance of any of the acts, matters or things which are herein contained.

Clause 77  Taxes and Duties

(1) The Contractor shall list in his tender the plant and vehicles which he intends to import for the execution of the Works. The Engineer will consider the list in the context of the program of the Works and will give his approval subject to any modifications that he may see fit to make. No appeal against the Engineer’s decision shall be permitted.

The Contractor will be permitted to import approved plant and vehicles required for the execution of the Works on the basis of temporary admission into Kenya and re-export thereafter upon completion of the Contract without payment of customs duties and Value Added Tax for them. If the plant and equipment shall not be re-exported, duties and taxes shall then be paid based upon their residual value at the date of completion of the Contract, or the date of withdrawal from the Works, if earlier. Plant and vehicles so imported shall not be utilized on other works.
not associated with the Contract unless specifically authorized by
the Engineer.

(2) The Contractor will be permitted to import approved spare parts,
tyres and tubes without payment of customs duty and Value
Added Tax for maintenance of any imported vehicles and plant
as provided in sub-clause 77.1 above, within a financial limit
indicated by himself. However, this limit will not exceed 16% of
the Contract Price excluding Contingencies.

(3) All materials approved by the Engineer to be incorporated into
the Works or temporary works, and whose importation into Kenya
is agreed to be essential shall be free of customs duties and
Value Added Tax. The Contractor shall submit a list of such
materials required with the tender. The Contractor shall be
required to satisfy the Engineer that such materials have actually
been incorporated into the Works.

Items produced in Kenya will not be permitted to be imported
without payment of customs duty and Value Added Tax.

Items produced in Kenya shall mean commercially recognized
goods or products that are either mined, grown, manufactured,
processed or assembled (whether the components are imported
or not) in Kenya.

Clause 78 Joint Ventures

78.1 If the Contractor is a joint venture, all partners of the joint
venture shall be jointly and severally liable to the Employer for the execution of the
entire Contract in accordance with its terms and Conditions.

78.2 One of the partners will be nominated as being in charge,
authorized to incur liabilities and receive instructions for and on
behalf of any and all partners of the joint venture.

78.3 The execution of the entire contract including payment shall be
done exclusively with the partner in charge.
SECTION E

CONTRACT FORMS
LETTER OF ACCEPTANCE

THE DIRECTOR GENERAL
KENYA SCHOOL OF GOVERNMENT
P.O. BOX 23030 - 00604
LOWER KABETE.

[(date)]

To: [name of the Contractor]

Of [address of the Contractor]

Dear Sir,

This is to notify you that your Tender dated ________________

for the execution of: ________________________________

[name of the Contract and identification number, as given in the Tender documents]

For the Contract price of Kshs ________________ [amount in figures]

[KenyaShillings______________________________(amount in words)] in accordance with the Instructions to Tenderers is hereby accepted.

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

Authorized Signature .................................................................

Title of Signatory .................................................................

Date .................................................................

Attachment : Agreement
FORM OF AGREEMENT

THIS AGREEMENT, made the ........ day of ..........20......... between .......... 
                                                                                     
(hereinafter called “the Employer”) of the one part AND 
                                                                                     
(hereinafter called “the Contractor”) of the other part. 

WHEREAS THE EMPLOYER is desirous that the Contractor execute the ‘PROPOSED 
CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF 
GOVERNMENT ,LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, 
PHASE 2- CIVIL WORKS 
(Hereinafter called “the works”) 

Located at THE KENYA SCHOOL OF GOVERNMENT-LOWER KABETE CAMPUS- KIAMBU 
COUNTY [place/location of the works] and the Employer has appointed Chief 
Engineer (Structural) - State Department of Public Works whose registered office is 
situated at Hill Plaza, 2nd floor as the Engineer and the Project Manager for 
purposes thereof and has accepted the tender submitted by the Contractor for the 
execution and completion of the said Works and the remedying of any defects 
therein in the sum of KShs. ............................ (amount in figures) 

Kenya Shillings ......................................................................................... 

............................................................................................................ 

........................................................................... (amount in words) (hereinafter called the 
"Contract Price").
NOW THIS AGREEMENT WITNESSETH as follows:

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

2. The following documents shall be deemed to form and shall be read and construed as part of this Agreement i.e.
   (i) Letter of Acceptance
   (ii) Form of Tender and Appendix to Form of Tender
   (iii) Conditions of Contract Part I
   (iv) Conditions of Contract Part II
   (v) Specifications
   (vi) Drawings
   (vii) Priced Bills of Quantities

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor herby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

The common Seal of ................................................................. Was
hereunto affixed in the presence of ..........................................
Signed, Sealed and Delivered by the said: ......................................

Binding Signature of Employer ..................................................

Name of Witness ..........................................................................  

Binding Signature of Witness .......................................................  

Address..........................................................................................  

Date .................................................................

Binding Signature of Contractor ..................................................

Name of Witness ..........................................................................
Binding Signature of Witness ............................................................

Address ............................................................................................

Date ...................................................

In the presence of:

(i) Name ...........................................
    Address ...........................................
    Signature ........................................
    Date ..............................................

(ii) Name ...........................................
    Address ...........................................
    Signature ........................................
    Date ..............................................

Countersigned by:

...........................................................................................................

THE PRINCIPAL SECRETARY, NATIONAL TREASURY

Date: ...................................................

In the presence of:

(i) Name ...........................................
    Address ...........................................
    Signature ........................................
    Date ..............................................
FORM OF TENDER SECURITY

WHEREAS ..............................................................................................................................................

..............................................................................................................................................................(hereinafter
called

“the Tenderer”) has submitted his tender dated............................................................................................ for

PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF
GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1,
PHASE 2- CIVIL WORKS
(Name and Contract number)

KNOW ALL PEOPLE by these presents that WE ........................................................................................................

...........................................................................................................................................................................having our registered office
at

..............................................................................................................................................................................(hereinafter called “the
Bank”),

are bound unto ........................................... ................................. ...............................

..............................................................................................................................................................................(hereinafter
called “the Employer”)

in the sum of Kshs.............................................................................................................................................. for which payment well
and truly to be made to the said Employer, the Bank binds itself, its successors and
assigns by these presents, sealed with the Common Seal of the said Bank this ............... Day of .........................20..........

THE CONDITIONS of this obligation are:

1. If after tender opening the Tenderer withdraws his tender during the period of tender
validity specified in the instructions to tenderers
   Or

2. If the Tenderer, having been notified of the acceptance of his tender by the
Employer during the period of tender validity:

   (a) fails or refuses to execute the form of Agreement in accordance with the
       Instructions to Tenderers, if required; or

   (b) fails or refuses to furnish the Performance Security, in accordance with the
       Instructions to Tenderers;

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 one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including thirty (30) days after the period of tender validity, and any demand in respect thereof should reach the Bank not later than the said date.

[Signature of the Bank]

WITNESS

[Seal]

[date]

[witness]
PERFORMANCE BANK GUARANTEE (UNCONDITIONAL)

To: _____________________________ (Name of Employer)

______________________________ (Date)

______________________________ (Address of Employer)

Dear Sir,

WHEREAS _____________________________ (hereinafter called “the Contractor”) has undertaken, in pursuance of Contract No. _____________________________ dated __________ to execute _____________________________ (hereinafter called “the Works”);

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

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

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

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

We further agree that no change, addition or other modification of the terms of the Contract or of the Works to be performed 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 change, addition, or modification.

This guarantee shall be valid until the date 30 days after the date of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR ________________

Name of Bank _____________________________

Address _____________________________

Date _____________________________
FORM OF WRITTEN POWER-OF-ATTORNEY

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

.................................................................
(Name of Tenderer’s Representative in block letters)

.................................................................
(Address of Tenderer’s Representative)

.................................................................
(Signature of Tenderer’s Representative)
BANK GUARANTEE FOR ADVANCE PAYMENT

To: [name of Employer] [name of Employer] [Date]

[address of Employer] [address of Employer]

Gentlemen,

Ref: [name of Contract] [name of Contract]

In accordance with the provisions of the Conditions of Contract of the above-mentioned Contract,

[Name and Address of Contractor] [name and Address of Contractor] (hereinafter called “the Contractor”) shall deposit with [name of Employer] [name of Employer] a bank guarantee to guarantee his proper and faithful performance under the said Contract in an amount of Kshs. [amount of Guarantee] [amount of Guarantee] [amount in words].

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

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

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

This guarantee shall remain valid and in full effect from the date of the advance payment under the Contract until [name of Employer] [name of Employer] receives full payment of the same amount from the Contract.

Yours faithfully,

Signature and Seal ________________________________

Name of the Bank or financial institution ________________________________
Address
Date
Witness: Name: ________________________________
Address: ________________________________
Signature: ________________________________
Date: ________________________________
TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full names of tenderer

....................................................................................................................

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

....................................................................................................................

3. Telephone number(s) of tenderer

....................................................................................................................

4. Telefax address of tenderer

....................................................................................................................

5. Name of tenderer’s representative to be contacted on matters of the tender during the tender period

....................................................................................................................

6. Details of tenderer’s nominated agent (if any) to receive tender notices.

....................................................................................................................

....................................................................................................................

Signature and stamp of Tenderer

Make copy and deliver to: ______________________________(Name of Employer)
CONFIDENTIAL BUSINESS QUESTIONNAIRE

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

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

**Part 1 – General**

Business Name ............................................................................................................

Location of business premises; Country/Town......................................................

Plot No................................ Street/Road ..............................................................

Postal Address.............................. Tel No......................................................

Nature of Business.................................................................................................

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

Maximum value of business which you can handle at any time: Kenya pounds..................

Name of your bankers............................................................................................

Branch.....................................................................................................................  Part

**2 (a) – Sole Proprietor**

Your name in full................................. Age...........................................

Nationality........................................ Country of Origin...............................

Citizenship details ...........................................................

**Part 2 (b) – Partnership**

Give details of partners as follows:

<table>
<thead>
<tr>
<th>Name in full</th>
<th>Nationality</th>
<th>Citizenship Details</th>
<th>Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part 2(c) – Registered Company:**

Private of public ..........................................................

State the nominal and issued capital of the company-

Nominal Kshs..........................................................

Issued Kshs..........................................................
Give details of all directors as follows:


1. ...........................................................................................................
2. ...........................................................................................................
3. ...........................................................................................................
4. ...........................................................................................................

Part 2(d) – Interest in the Firm:

Is there any person/persons in the Ministry of Transport, Infrastructure, Housing and Urban Development or any other Public office (Name of Employer) who has interest in this firm? Yes/No ............... (Delete as necessary)

I certify that the above information is correct.

.................................................. ........................................... ...................................
(Title) (Signature) (Date)

* Attach proof of citizenship
STATEMENT OF FOREIGN CURRENCY REQUIREMENTS

(See Clause 60.6 of the Conditions of Contract)

In the event of our Tender for the execution of______________
______________ (name of Contract) being accepted, we would require in accordance with Clause 60(1) of the Conditions of Contract, which is attached hereto, the following percentage:

(Figures)............................................................. (Words)..............................................................

of the Contract Sum, (Less Variation of Price) to be paid in foreign currency.

Currency in which foreign exchange element is required:

..............................................................................................................................................................

......

Date: The ........... Day of............. 20..........

Enter 0% (zero percent) if no payment will be made in foreign currency.

Maximum foreign currency requirement shall be _____________(percent) of the Contract Sum, (less Variation of Price).

(Signature and stamp of Tenderer)
## SCHEDULE OF MATERIALS—BASIC PRICES
(Ref: Clause 70 of Conditions of Contract)

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>UNIT</th>
<th>ORIGIN AND PRICE</th>
<th>TRANSPORT COST FROM SOURCE OR ORIGIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>Tonnes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lime</td>
<td>Tonnes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diesel</td>
<td>LTRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular Petrol</td>
<td>LTRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Super Petrol</td>
<td>LTRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kerosene</td>
<td>LTRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guardrails</td>
<td>LM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gabion Mesh</td>
<td>SM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforcement Steel</td>
<td>Tonnes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explosives</td>
<td>Kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil and Lubricants</td>
<td>LTRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filter cloth TS 700</td>
<td>SM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sand</td>
<td>Tonnes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ballast</td>
<td>Tonnes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note**

Prices of imported materials to be quoted CIF Mombasa, whether materials are imported by the tenderer directly or through a local agent.

Transportation costs for imported materials to be quoted from Mombasa to Karen, Nairobi County whether materials are imported directly by the tenderer or through a local agent.
**SCHEDULE OF LABOUR:- BASIC RATES**  
*(Reference: Clause 70 of Conditions of Contract)*

<table>
<thead>
<tr>
<th>LABOUR CATEGORY</th>
<th>UNIT (MONTH/SHIFT/HOUR)</th>
<th>RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

SPECIAL SPECIFICATIONS
SECTION I

GENERAL

01. DESCRIPTION OF WORKS

1. Scope
   The main items of work consist of:
   
   e) Construction of storm water drainage.
   f) Construction of driveway and parking.
   g) Construction of footpaths.
   h) Construction of boundary wall

2. Location
   The works are located at THE KENYA SCHOOL OF GOVERNMENT-LOWER KABETE CAMPUS, KIAMBU COUNTY.
   
   (a) The contractor shall visit the site to acquaint himself with the topography, soil condition, access, source of construction materials and reliability of water source, water tides, and periods that execution of work will be possible etc. No claims incurred due to lack of knowledge of the site conditions will be considered.
   
   (b) The site can be approached by road via Lower Kabete road.

3. The Resident Engineer’s House.
   The contract has no provision for a resident Engineer and therefore no house for the same.

4. Drawings
   All drawings are deemed to be self-explanatory. However where doubts exist, the contractor should liaise with the Engineer before proceeding with the works.

5. Site Office
   Not provided for in this contract. The Engineer will use the site office for the building works.

6. Labour camp
   The contractor is not permitted to house labour on site. He will be responsible for the transportation of workmen to and from site at his own cost and risk.

02 THE MANAGEMENT OF THE CONTRACT

1. The Works Secretary, State Department of Public Works, will be responsible for the contract management and site supervision.

2. All materials and workmanship shall comply with the latest edition of the Ministry of Public Works specifications for Civil Engineering.
EXTENT OF CONTRACT AND ALTERATION OF DESIGN

1. The works specified under this contract shall include all general work preparatory to execution of all matters, things, requisites and work of any kind necessary for the due and satisfactory construction, completion and maintenance of the work to the intent and meaning of the drawings and this specification and further drawings and orders, that may be issued by the Engineer from time to time. Compliance by the Contractor with all the General Conditions of Contract, whether specifically mentioned or not in the clause of this specification, all materials, apparatus, plant, machinery, tools, fuel, water, timbering and tackle of every description, transport, offices, stores, workshops, staff, labour, the provision of proper and sufficient protective works, temporary fencing, lighting and watching required for the safety of the public and protection of the works and adjoining lands: first aid equipment, sanitary, accommodation for the staff and workmen; the effecting and maintenance of all insurances, the payment of all wages, salaries, fees, royalties, duties or other charges arising out of the execution of the works and the regular clearance of rubbish. Reinstatement and clearing and leaving perfect on completion. The Contractor will be deemed to have included in his rates the cost of complying with the requirements of this Specification and General Conditions of the Contract unless otherwise specified.

2. Should the Contractor have comments regarding soundness of the design of any part of the work, or should he consider that the execution of the design is impossible on any part of the Contract, the Contractor is required to notify the Engineer in writing at the time of the tender and provide factual evidence substantiating his opinion when required to do so by the Engineer.

3. Notices given by the Contractor in respect of the above after the tender is submitted will not be considered as the basis of a claim for additional costs or extensions of the time.

4. The Engineer may require to alter the design of any part of the structure should site conditions warrant such a change and the rates entered in the Bill of Quantities should be applicable for the similar items. The rates for the items of the work not covered by the Bill of Quantities shall be established by the Engineer.

PROGRAMMES FOR EXECUTION OF THE WORKS

1. In accordance with the terms of Clause 14 of the General Conditions of the Contract, the Contractor shall submit to the Engineer within 14 days from the order to commence fully detailed programme showing the order, procedure and method by which he proposes to carry out the construction and completion of the works.

2. The information to be supplied to the Engineer shall include drawings showing the general arrangement of the temporary offices and any other temporary structures, which the Contractor proposes to use together with details of the construction plant and temporary works and all other devices, which he proposes to adopt for the construction.
and completion of the whole of the works, and in addition to details of the labour strength, skilled and unskilled, and supervision arrangements.

3. The Order in which it is proposed to execute the permanent works is subject to adjustment and approval by the Engineer and the Contract Price shall be held to include for any reasonable and necessary adjustment required by the Engineer during the course of the Works.

4. The Contractor will be deemed to have considered the effect of seasonal weather variations, when programming his operations it must be clearly understood, that rains of up to 75mm per day will be deemed to be normal and expected. No claims by the Contractor for extension of time due to rains or floods less than 75mm per day as measured by the Meteorological Department will be considered by the Engineer.

5. The Contractor, when preparing his programme has to consider the time for the delivery of any imported material and the Engineer's normal working hours.

6. The Engineer's normal working hours shall be defined as 8a.m. to 5p.m. on weekdays with Saturdays and Sundays set aside for rest. If the Contractor wishes to execute permanent works outside these hours, he shall obtain the written permission of the engineer to make provision for supervision of such works.

7. 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 obligations to complete the works by the prescribed completion date, and he shall from time to time review his progress and make such amendments to his rate of execution of the works as may be necessary to fulfill his obligations.

8. If in the opinion of the Engineer the plant or the equipment used by the Contractor for any specific item of the work does not fulfill the requirements of the specifications in respect of the workmanship, quality and safety of structures, some items of plant and equipment shall be replaced with similar or equivalent items of plant or equipment to the satisfaction of the Engineer. No extra payment will be made in respect of such replacements.

9. The construction of Breakwaters shall commence immediately the project is handed over to the Contractor and shall comply with the requirements given in clause 1731.

05 **TEMPORARY WORKS**

1. After the Contract is placed and before the work commences, the Contractor shall submit to the Engineers drawings showing the general arrangement of his offices, quarters, workshops, etc and other temporary works with diagrams and descriptions showing how he
proposes to execute such temporary works and how they fit into his programme for the permanent works, all to be subject to adjustment and approval by the Engineer.

2. The Contractor shall be fully responsible for the sufficiency, stability and safety of all temporary works and their care in accordance with the Conditions of Contract.

3. The Contractor shall at his own expense, supply in advance to the Engineer for his approval detailed drawings and calculations of stability of such temporary works as the Engineer may direct, but no approval given or implied by the Engineer shall relieve the Contractor of his responsibilities in connection with the temporary works.

4. Unless otherwise instructed, upon completion of the contract and after receiving approval in writing from the Engineer, the Contractor shall take down and remove all structures forming part of his own camp and that of the Engineer, and shall arrange for the disconnection of water supply, remove all drains and culverts, backfill trenches, fill in all latrine pits, soak away and other sewage disposal excavations, with the exception of items and services to revert to the ownership of the Employer and shall restore the site as far as practicable to its original condition and leave it neat and tidy to the satisfaction of the Engineer.

06 SITE PERSONNEL

1. The Engineer will require the Contractor to submit a list of professional and sub-professional personnel to be employed on the site stating their qualifications and experience.

2. The Contractor shall be responsible for ensuring, that all personnel of Non-Kenyan origin employed on site by himself or his Sub-Contractors or who are otherwise connected with the construction contract through the Contractor must be approved and cleared individually in writing by the appropriate Government Official to work on the project. Where personnel are not approved, the Contractor shall be responsible at his own expense for obtaining and employing suitable and approved personnel.

1. The Engineer reserves the right to determine suitability of the persons employed by the Contractor and may request replacement at any time of any member of the team employed by the Contractor. If in the opinion of the Engineer the presence of such a person is deleterious to the execution of the Contract, the Engineer's decision is final and binding.

4. The Site Agent to be a Registered Engineer.

5. The Contractor shall keep constantly a literate English speaking Agent or Engineer as his representative on the site, competent and experienced in the type of works involved, who shall give his whole time to the Supervision of the Contractor's operations.
The name of such Agent or Representative shall be submitted in writing to the
Engineer for approval and he shall receive on behalf of the Contractor all
directions and instructions from the Engineer or his representative and such
directions and instructions shall be deemed to have been given to the
Contractor in accordance with the conditions of contract.

07  NOTICE OF OPERATIONS

1. No important operations shall be carried out without the consent of
the Engineer in writing, or without full and complete notice also in
writing, being given to the Engineer by the Contractor sufficiently in
advance of the time of the operation as to enable the Engineer to
make such arrangements, as he may deem necessary for its
inspection.

2. The Contractor shall supply, from time to time, to the Engineer in writing,
full information with respect of locations in which the work is being
prepared.

3. The Contractor shall give the Engineer not less than 24 hours notice of
his intentions to set out or give levels for any part of the works, in order
that arrangements may be made for checking. Any benchmarks,
setting out pegs or other line or level markings installed or made by
the Engineer shall be carefully preserved by the Contractor. Working
shall be suspended for such times as may be necessary for checking
the lines and levels on any part of the work.

08  SETTING OUT

1. It will be the responsibility of the Contractor to obtain before commencing
work the value and location of the benchmarks to be used for the works from
the Engineer. All temporary benchmarks will be referred hereto. The
Contractor shall construct such temporary benchmarks as the engineer may
direct and agree the level thereof with the Engineer. The establishment of
such temporary benchmarks will be deemed to be part of the Contractor's
responsibility in setting out the works and no additional payment will be
allowed.

2. Should the Contractor discover any error in the alignment or levels of the
basic setting out, he shall at once notify the Engineer, who will then issue
amended drawings or instructions regarding the correction of the error.

3. All approved setting out points, lines, stations etc shall be marked by concrete
markers and steel pegs or as otherwise approved by the Engineer.

4. The contractor shall allow in the Bill of Quantities for complying with the
provisions of this Clause and any abortive setting out occasioned by errors in
the alignment of levels of the Contractor's basic setting out.
11. HEALTH, SAFETY ON SITE AND WELFARE

1. The Contractor shall ensure, so far as is reasonably practicable and to the satisfaction of the Engineer, the health, safety and welfare at work of his employees including those of his sub-contractors and of all other persons on the site.

2. From the time any portion of the works is commenced, until the end of the maintenance period, the Contractor shall be responsible for protecting the public from anything dangerous to persons or property and for the safe and easy passage of pedestrians and vehicular traffic.

3. The Contractor shall designate one of his senior staff, who shall have specific knowledge of safety regulations and experience of safety precautions on similar works and who shall advise on matters affecting the safety of workmen and on measures to be taken to promote safety in compliance with the factories Act Cap. 514 as a safety officer.

4. The Contractor shall provide protective clothing and equipment, first aid stations with such personnel and equipment as are necessary. The appropriate information, instruction, training and supervision will be arranged by the Contractor to ensure the safety and health of all the persons employed on the works, all in accordance with the laws of Kenya.

5. The Contractor shall provide adequate waterborne sanitation and refuse collection and disposal complying with the laws of Kenya and all local by-laws, and to the satisfaction of the Engineer, for all houses, offices, workshops erected on site. Construction of pit latrines will not be permitted unless the Engineer has given his approval in writing.

6. During the period of execution of the works the Contractor shall ensure that no pollution of existing water courses or of reservoir catchment areas is allowed to take place as a result of his operation.

7. 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 for a duration of contract a fully equipped dispensary. This shall be with a qualified Clinical Officer who shall offer the necessary medical advice on AIDS/HIV and related diseases to Engineers and Contractors site staff. The contractor shall allow for all costs of providing these facilities in his rates.

8. Welfare facilities:
The Contractor SHALL NOT provide welfare facilities.

12 PRIVATELY OWNED AND PUBLIC UTILITY SERVICES

1. The Contractor shall make him acquainted with the position of all existing works and services inter alia sewers, storm water drains, cables for electricity and telephone and lighting poles and water mains before any excavation commences.

2. The Contractor will be held responsible for damage caused in the course of the execution of the works to sum existing works and services and shall indemnify the Employer against any claims arising from such damage (including consequential damages). Any damage caused must be made good at the Contractor’s own expense.
1. Such existing works and services, where exposed the execution of the works, must be properly shored, hung-up and supported to the satisfaction of the Engineer and of the Authority concerned. The Contractor shall exercise special care, when refilling trenches or other excavations around sum existing works or services.

2. Poles supporting cables, etc adjacent to the works will be kept securely in place, until the work is completed and will then be made as safe and permanent as before.

3. Notwithstanding the foregoing requirements and without lessening the Contractor’s responsibility, the contractor shall inform the Engineer immediately when existing works have been exposed and conform to any requirements of the Authority concerned and of the Engineer.

4. Any damage to or interference with existing services occasioned during the progress of the works, will be deemed to be the responsibility of the Contractor who shall undertake to make good at his own expense any damage so caused to the existing underground services or other features, and shall be liable in respect of all claims arising from such damage or interference, however occasioned.

5. Only when and as directed by the Engineer the position of an existing work or service can be changed by the Contractor to meet the requirements of the proposed work. The cost of such work will be paid for on a day work basis, except where a specific item has been provided in the Bills of Quantities.

13. EXISTING ROADS AND ACCESES

1. The Contractor shall comply with all requirements of the Employer, owners or the competent Authority concerning the use of traded equipment or other construction plant on any public or private road.

2. The cost of providing all diversions, signs, operators, flagment and all reinstatement to the approval of the Engineer will be deemed to be included in the rates entered in the Bill of Quantities, as will the cost of any road opening permit.

3. Before excavating across any public road, the Contractor shall give 10 days notice in writing to the Engineer and the Local Authority his intention to excavate.

4. He shall satisfy the Engineer, the Local Authority and the Police as to the precautions he proposes to take and the signs and lights to be provided and operated. On any road or track at least 4 red lights shall be suitably placed on either side of the trench and diversions shall be clearly marked, signed and maintained.

5. The Contractor shall further give to the Engineer a 24 hours notice before excavating across a private road. Existing access to lands, property and all other things will be maintained by the Contractor during the continuance of
the Works to the Engineer's satisfaction. The cost of such maintenance will be deemed to be covered by and included in the rates entered on the Bills of Quantities.

6. When a road, used by the Contractor for transporting labour or construction plant or for delivery of any materials for the works, is closed under Section 71 of the traffic ordinance 1962, or amendments thereto, the Contractor shall obey such closure and shall use alternative roads.

14 COMPLIANCE WITH STATUTES AND REGULATIONS

1. In addition to the requirements of Clause 26 of the General Conditions of Contract, the Contractor shall be responsible for acquainting himself with all current valid statute ordinances or bye-laws or building regulations, which may affect the Works and shall include in his rates for all costs arising from compliance with the same. This applies in particular to the training levy and similar taxes for which no claims on the part of the Contractor will be entertained.

2. The Contractor shall also keep in close touch with Police and 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.

3. The Contractor's attention is drawn to legal Notice No.237 of October, 1971, which requires payment by the Contractor for Training Levy at the rate of 0.25% of the Contract sum on all contracts of more than KSh50,000.00 value and his tender must include for all costs arising or resulting thereof. The Training levy shall be paid by the Contractor without delay. The original receipt shall be given to the Engineer for verification. No payment certificate will be certified by the Engineer, until the Contractor complies with the above legal notice.

4. The Contractor’s attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1st September, 1993 which requires payment of VAT on all contracts.

The tenderer is advised that in accordance with Government public notice No. 35 & 36 Dated 11th September 2003 operational from 1st October 2003, withholding VAT will be levied against the contract by the Employer and remitted to the Commissioner of VAT through all interim certificates. It should however be noted that this is not additional tax but a new mode of payment for VAT, any excess payment will be refundable once the Contractor has submitted monthly returns to the Commissioner of VAT who will do the refunds when satisfied that the VAT regulations have been compiled with.

This item **SHALL** be priced at the Grand Summary page.
15. WATER SUPPLY

1. The Contractor shall provide clean and sufficient supply of fresh water both for construction of the works and for all offices and workshops, etc. includes the arrangement of pipe lines, meters, etc for connecting to local water main, the provision of storage tanks or water conveyance where necessary, payment of all fees and water charges.

2. The water shall be reasonably clear of suspended solids and free from any matter in quantities considered by the Engineer to be deleterious to the proposed work. Water supplied to the Engineer's offices, laboratories, etc. shall be drinkable to the satisfaction of the Medical Officer in the area. No separate payment shall be made for the provision of water or its attendant facilities and the Contractor shall allow for all these in his tender rates.

3. In the event that a water main is not available on or near the site, or that any available mains will not have sufficient capacity to provide water adequate for the works, then the Contractor shall provide temporary tanks or other means of collecting, storing and distributing water on the site.

16. LIGHTING, POWER AND TELEPHONE

1. The Contractor shall make his own arrangements for the supply of light, power and telephone required for the construction of the works and shall pay all fees and charges in connection therewith.

2. The Contractor shall arrange with the appropriate authority for a temporary meter and supply of electricity and provide all temporary wiring, power and lighting points as he may consider necessary. In the event no fixed electricity being available, the Contractor shall provide the necessary power generating plant at his own expense.

17. WORKING AREA

1. The Contractor shall restrict his operations to those areas made available to him by the Engineer and shall at all times provide and maintain an adequate access for the Employer's employees and vehicles to carry out their normal duties in and around the existing works.

2. The Contractor shall, before entering upon any land purchased, rented, or for the use of which compensation has been paid, ensure that all formalities have been completed and the agreement of the Owner, Tenant and the Engineer has been obtained.

3. 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 therefrom. 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.

18. CO-ORDINATION OF THE WORKS

1. The Employer reserves the right to execute works on the site which are not included in this Contract. He will employ for this purpose either his own employees or another Contractor. The Contractor shall ensure that neither his own operations nor trespass by his employees will interfere with the operations of the Employer nor his Contractor employed on such works.

2. The Contractor will be required to carefully co-ordinate his activities and work, both on and off site, with the activities and work of the other Contractors, Sub-Contractors, statutory, undertaking and all supervisory staff for the works appointed by the Employer. He shall allow all works to proceed without undue hindrance and will cooperate to expedite execution of the works.

3. If any dispute or difference of any kind whatsoever shall arise between the Contractor or statutory undertaking regarding the phasing, progress or execution of the works then the Engineer shall have full power to direct in what order the works, or any portion thereof shall be carried on or completed and he may from time to time require the whole or any portion of the works to be discontinued or the execution thereof postponed for such a period as he may think fit.

4. The Contractor shall respect any works executed by others and articles supplied or installed by others and will be held responsible for any loss or damage thereto, if caused by him or his Sub-Contractors.

19. COPIES OF ORDERS AND TEST CERTIFICATES

1. Before entering into any Sub-Contract for the supply of any material or article the Contractor shall obtain the Engineer’s approval in writing of the Sub-Contractor from whom he proposes to obtain such materials or goods. Should the Engineer at any time be dissatisfied with such materials or goods or with the method of operations carried out at such Sub-Contractor’s works or place or business, he shall be empowered to cancel his previous given approval of sub-contract and shall specify any other supplier whom he may choose, or shall approve another sub-contractor for the supply of such materials or goods. The Contractor shall then obtain such said materials or goods from such other supplier and shall bear any additional cost thereof, together with the costs and consequences of replacing any unsatisfactory materials already incorporated in the worn.
2. The Contractor shall deposit with the Engineer samples of materials and manufactured articles including the manufacturer's specification, when and where appropriate.

3. When instructed by the Engineer the Contractor shall submit test-certificates from the suppliers of the materials and goods to be used for the contract to the Engineer. 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 tests carried out. The Contractor shall provide adequate means of identifying the materials and goods delivered to the site with the corresponding certificates.

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

5. All materials and manufactured articles shall be stored on site in a manner acceptable to the Engineer. The Contractor shall carefully protect from weather and vermin all work, materials and manufactured articles, which may be affected.

20. PROGRESS PHOTOGRAPHS AND RECORD DRAWINGS

1. The contractor shall keep a record of progress photos and submit them to the Engineer Weekly or as directed.

2. The photographs shall be mounted on A4 loose-leaf sheets, minimum 200g, with transparent plasticsheets.

3. After the work has been completed, the Contractor shall furnish as built drawings, showing the works as constructed together with all other information that may either be required or be useful for the operation and maintenance of the works in the future, such as alignment and depth of cover of pipelines, type of soil, rock levels, type, dimensions and location of structures, size of pipelines and cables encountered during excavation.

4. All drawings shall be A1 in size to the ink border and drawn on a perm trace paper.

21. SURVEY EQUIPMENT FOR THE ENGINEER

1. The Contract has no provision for the supply of survey equipment.

2. The Contractor will provide two experienced chainmen for the assistance of the Engineer in checking the setting out of the works.
22. **MAINTENANCE AND INSURANCE OF BUILDINGS**

1. The Contractor shall keep all buildings provided by him, for the use of the Engineer and his staff, in a well maintained, clean and fully habitable condition, and shall maintain all access roads, car parks, footpaths, fences, gates, drains, potable water supplies and sewage disposal systems in a good state of repair, all to the satisfaction of the Engineer.

2. The Contractor shall also provide an adequate refuse collection service for the office, laboratory and other buildings provided by the Contractor for the use of the Engineer and his staff.

3. The Contractor shall maintain all furniture and equipment provided in a reasonable state of repair and usable condition and shall replace promptly any item which becomes unserviceable or is lost.

4. All buildings, furniture and any equipment provided by the Contractor for the Engineer’s use shall be insured by the Contractor against any loss or damage by accident, fire or theft for the duration of the Contract, in accordance with the general conditions of Contract. Theft shall include all personal belongings of the Engineer and his staff.

23. **ATTENDANCE ON ENGINEER AND STAFF**

1. The Contractor shall provide such labour as is reasonably necessary to attend to the day to day office requirements and maintenance, and to assist with office cleaning, site measurements and the checking and testing of the works. The Contractor shall replace any of his employees attending to the Engineer who is unable to carry out his duties due to illness or any other reason.

2. The Contractor shall provide adequate security by day and by night for all the buildings provided by him for the Engineer and his staff. This shall include the Provision of full-time attending permanent watchmen.

3. The Contractor shall include all the costs of complying with this Clause in the item for maintenance of Engineer’s office in the Bill of Quantities.

24. **SIGNBOARDS**

The Contractor to provide Signboards for the project.

25. **SITE MEETINGS**

The Contractor to provide for monthly site meetings to be held on site and where the Contractor would be expected to attend.
17. CONCRETE WORKS

1702. DEFINITIONS

1. Structural concrete is any class of concrete, which is used in reinforced concrete, prestressed or unreinforced concrete construction, which is subject to stress.

2. Non structural concrete is composed of materials complying with the specification, but for which no strength requirements are specified and which is used only for filling voids, building foundations and similar purposes, where it is not subjected to significant stress.

3. A formed surface is a face which has been cast against formwork, and an unformed surface is a horizontal or nearly horizontal surface preceded by screeding or trowelling to level and finished as required.

4. Moderate exposure shall refer to surfaces exposed from severe rain, buried concrete or concrete continuously under water.

5. Intermediate exposure shall refer to surfaces exposed to driving rain, alternate wetting and drying, traffic, corrosive fumes, and heavy condensation.

6. Severe exposure shall refer to surfaces exposed to sea water, any water having a PH of 4.5 or less, or ground water containing sulphates.

7. 'Formwork' or 'shuttering' shall include all temporary moulds for forming the concrete to the required shape, together with any special lining that may be necessary to produce the concrete finish required.

8. 'False work' or 'centering' shall consist of furnishing, placing and removal of all temporary construction such as framing, props, struts and piles required for the support of forms.

9. A pour refers to the operation of placing concrete into any mould, bay or formwork, etc., and also to the volume which has to be filled. Pours in vertical succession are referred to as lifts.

1703a CEMENT

1. Ordinary and Rapid Hardening Portland Cement shall be sampled and tested in accordance with and shall comply with all the requirements of Kenya Standard KS02-21.
2. The weight of magnesium oxide in the cement shall not exceed 5% and the content of total sulphur expressed as SO₃, shall not exceed 3.5%.

3. The minimum compressive strength of 3 mortar cubes shall be as follows:

<table>
<thead>
<tr>
<th>TABLE 1703 b-1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Cement</strong></td>
</tr>
<tr>
<td>Ordinary Portland Cement Rapid</td>
</tr>
<tr>
<td>Rapid Hardening Cement</td>
</tr>
</tbody>
</table>

4. Cement shall be free flowing and free of lumps. It shall be supplied in the manufacturer's sealed unbroken bags or in bulk. Bagged cement shall be transported in vehicles provided with effective means of ensuring that it is protected from the weather. Bulk Cement shall be transported in vehicles or in containers built and equipped for the purpose.

5. Cement in bags shall be stored in a suitable weatherproof structure of which the interior shall be dry and well ventilated at all times. The floor shall be raised above the surrounding ground level and shall be so constructed that no moisture rises through it.

6. Each delivery of cement in bags shall be stacked together in one place. The bags shall be closely stacked so as to reduce air circulation but shall not be stacked against an outside wall. If pallets are used, they shall be constructed so that bags are not damaged during handling and stacking. No stack of cement bags shall exceed 3m in height. Different types of cement in bags shall be clearly distinguished by visible markings and shall be stored in separate stacks.

7. Bulk cement shall be stored in weatherproof silos which shall bear a clear indication of the type of cement contained in them. Different types of cement shall not be mixed in the same silo.

8. The Contractor shall provide sufficient storage capacity on site to ensure that his anticipated programme of work is not interrupted due to lack of cement. Cement which has become hardened or lumpy or fails to comply with the specification in any way shall be removed from the site.
9. All cement used in the works shall be tested by the manufacturer or the Contractor in a laboratory acceptable to the Engineer. The tests to be performed shall be those set out in KS 02-21 and the Contractor shall supply two copies of each certificate to the Engineer.

10. Each set of tests carried out by the manufacturer or Contractor shall relate to not more than one day’s output of each cement plant, and shall be made on samples taken from cement which is subsequently delivered to the site. Alternatively, subject to the agreement of the Engineer, the frequency of testing shall be one set of tests for every 200 tonnes of cement delivered to site from each cement plant.

11. Cement which is stored on site for longer than one month shall be retested in the laboratory of the Materials Department of the Ministry of Transport, Infrastructure, Housing and Urban Development or at the Kenya Bureau of Standard at the rate of one set of tests for every 200 tonnes and at monthly intervals thereafter.

1703b FINE AGGREGATE

1. Fine aggregate shall be clean, hard and durable and shall be natural sand, crushed gravel sand or crushed rock sand complying with KS 02-95. All the material shall pass through a 5mm sieve and the grading shall be in accordance with Zones 1, 2, or 3 of KS 02-95. In order to achieve an acceptable grading, it may be necessary to blend materials from more than one source.

2. The fine aggregate shall not contain iron pyrites or iron oxides. It shall not contain mica, shale, coal or other laminar, soft or porous materials or organic matter unless the Contractor can show by comparative tests, on finished concrete as set out in KS 02-595, that the presence of such materials does not adversely affected the properties of the concrete.

3. Content passing a 75-micron BS sieve shall not exceed 3 per cent for natural or crushed gravel sand or 15 per cent for crushed rock sand.

4. Chlorides soluble in a 10 per cent solution by weight of nitric acid shall not exceed 0.05 per cent by weight expressed as Chloride iron when tested as set out in KS 02-1238, Subject also to the further restriction given on total chloride content in Clause 1703 d.

5. Sulphate soluble in a 10 per cent solution by weight of hydrochloric acid shall not exceed 0.4 per cent by weight expressed as $\text{SO}_3$, Subject also to the further restriction given on total sulphate content in Clause 1703 d.

6. Soundness: After five cycles of the test in AASHTO-T-104 the aggregate shall not show a weight loss of more than 10 per cent.
1703c  ADMIXTURES TO CONCRETE MIXES

1. The Contractor will not be permitted to use admixtures in the concrete without the express approval of the Engineer and in no circumstances will corrosive admixtures be allowed.

2. Admixtures shall not be used to replace cement. If admixtures are used to entrain air, to reduce the water/cement ratio, to retard or accelerate setting time or to accelerate the development of strength, they shall be used at the rate of dosages as directed by the Engineer. Admixtures shall be measured accurately into each batch by methods approved by the Engineer.

3. Admixtures shall be dispensed in liquid form. Dispensers for liquid admixtures shall have sufficient capacity to measure at one time the full quantity required for each batch. Unless liquid admixtures are added to pre-measure water for the batch, their discharge into the batch shall be arranged to flow uniformly into the stream of water. Dosages of liquid admixtures shall not vary from the dosage ordered by the Engineer by more than 5%. Equipment for measurement shall be designed to provide convenient confirmation of the accuracy of the measurement. If more than one mixture is used, each shall be dispensed of separate equipment unless otherwise permitted by the Engineer.

4. In the event of permission being granted in principle, the tests described in the specification shall be carried out with the intended proportion of admixture incorporated and comparison shall be made with concrete manufactured without the admixtures to prove, the density has not been reduced by more than 5%.

5. Except as otherwise provided for air entraining agents, samples of admixtures proposed for use shall be submitted by the Contractor to the Engineer sufficiently in advance of intended use, to permit test arrangements for determining compliance with the claimed properties.

6. Any type of admixture shall be uniform in properties throughout its use in the works. Should it be found that the admixtures as furnished is not uniform in properties, its use shall be discontinued.

7. The Contractor may be permitted to use an air-entraining agent to facilitate the use of any construction procedure or equipment. If the Contractor selects to use an air-entraining agent, additional cement shall be included in the concrete mixture. The amount of additional cement shall conform to the weights set forth in table 1703c-1 within the range of air contents shown:
8. When an air entraining agent is used, the air content shall in no case exceed 6% by volume in the freshly mixed concrete.

9. Full compensation for furnishing and mixing the air entraining agent and the additional cement as provided above will be considered as included in the contract prices paid for the concrete involved and no additional compensation will be allowed.

10. When water reducing retarders are used, the permitted dosage of the admixture shall not exceed that which will result in an increase in the drying shrinkage of the concrete in excess of 10%.

11. Water reducers shall reduce the water demand of concrete for a given slump by at least 7% when used at the maximum dosage recommended by the manufacturer, but not more than that needed to obtain the desired retardation. The strength of the concrete containing the admixture shall at the age of 48 hours and after, be not less than that of similar concrete without the admixture.

**1703 d COARSE AGGREGATE**

1. Coarse aggregate shall be clean hard and durable crushed rock, crushed gravel or natural gravel complying with the requirements of KS 02-95. The material shall not contain any iron pyrites, iron oxides, flaky or laminated material, hollow shells, coal or other soft or porous material, or organic matter unless the Contractor can show by comparative tests on finished concrete as set out in KS02-595 that the presence of each material does not adversely affect the properties of the concrete. The pieces shall be angular, rounded or irregular as defined in KS 02-1238.

2. Coarse aggregate shall be supplied in the nominal sizes called for in the Contract and shall be graded in accordance with KS 02-95 for each nominal size as follows:
### TABLE 1703d-1

<table>
<thead>
<tr>
<th>Test Size</th>
<th>Normal size of single-size aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mm</td>
<td>20mm 15mm 10mm 5mm 2.5mm</td>
</tr>
<tr>
<td>40mm</td>
<td>85-100 100 0-20 - 0-5 0-2</td>
</tr>
<tr>
<td>20mm</td>
<td>0-20 80-100 - 0-20 0-5 0-2</td>
</tr>
<tr>
<td>15mm</td>
<td>- 100 0-20 0-5 0-2 0-5</td>
</tr>
<tr>
<td>10mm</td>
<td>- 0-20 0-5 0-2 0-5 0-5</td>
</tr>
<tr>
<td>5mm</td>
<td>- 0-5 0-2 0-5 0-2 0-5</td>
</tr>
<tr>
<td>2.5mm</td>
<td>- 0-2 0-2 0-5 0-2 0-2</td>
</tr>
</tbody>
</table>

3. The single sized aggregate shall be combined in proportions to give overall grading of coarse aggregate within the limits set out in Table 1703-2 as follows:

### TABLE 1703d-2

<table>
<thead>
<tr>
<th>Test Service</th>
<th>Normal size of Graded Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mm to 5mm</td>
<td>20mm-5mm 15mm-5mm</td>
</tr>
<tr>
<td>40mm</td>
<td>95-100 100 - -</td>
</tr>
<tr>
<td>20mm</td>
<td>30-70 95-100 100</td>
</tr>
<tr>
<td>15mm</td>
<td>- - 90-100</td>
</tr>
<tr>
<td>5mm</td>
<td>0-5 0-10 0-10</td>
</tr>
</tbody>
</table>

4. The proportion of clay, silt and other impurities passing a 75micron sieve shall be not more than one per cent by weight.

5. The content of hollow and flat shells shall not be such as will adversely affect the concrete quality when tested as set out in BS 1881. The total shell content shall not be more than the following:

a. 40mm nominal size and above  2% of dry weight

b. 20mm nominal size  5% of dry weight

c. 10mm nominal size  15% of dry weight

6. Soundness: After 5 cycles of the test in AASHTOT104 the aggregate shall not show a weight loss of more than 12 per cent.

7. Flakiness Index when tested in accordance with KS 02-1238 shall be not more than 40 for 40mm stone and above and not more than 35 for 20mm stone and below.
8. If the Flakiness Index of the coarse aggregate varies by more than five units from the average value of the aggregate used in the approved trial mix, then a new set of trial mixes shall be carried out if the workability of the mixes has been adversely affected by such variation.

9. Impact value shall not be more than 45 per cent when tested in accordance with KS02-1238 and the ten per cent fines shall not be less than 50 kN.

10. Coarse aggregate when mixed with other ingredients in the approved proportions for concrete and tested as set out in KS 02-595, the shrinkage factor shall not exceed 0.05 percent.

11. The aggregate shall not have a water absorption of more than 2.5 per cent when tested as set out in KS 02-1238. Aggregate Crushing Value not exceeding 35% and Los Angeles Abrasion (LAA) not exceeding 50%.

12. Chloride soluble in a 10 per cent solution by weight of nitric acid shall not exceed 0.05 per cent by weight expressed as chloride iron provided that the total chloride content arising from all Ingredients in a mix including cement water and admixtures shall not exceed 0.05 per cent for prestressed concrete, steam cured concrete or concrete containing sulphate resisting or super sulphated cement and 0.3 per cent for any other reinforced concrete.

13. Sulphate soluble in a 10 per cent solution by weight of hydrochloric acid shall not exceed 0.4 per cent by weight expressed as SO₃, provided that the total sulphate content expressed as SO₃ of all the ingredients in a mix including cement, water and admixtures shall not exceed 0.4 per cent by weight of fine aggregate or 4.0 per cent of the weight of cement in the mix, whichever is the lesser.

14. Aggregate which is potentially reactive when tested in accordance with ASTM Test C289-71 for the alkali aggregate reaction must not be used? The standard for acceptance being that test results shall plot to the left of the solid line which is shown in figure 2 of the test standard. The Engineer may require that any aggregate be tested for potential reactivity in accordance with ASTM-C289-71.

1703e TESTING OF AGGREGATE

1. The Contractor shall deliver to the Engineer samples containing not less than 50 Kg of any aggregate which he proposes to use in the Works and shall supply such further samples as the Engineer may require. Each sample shall be clearly labelled to show its origin and shall be accompanied by all the information called for in KS02-45.

2. Tests to determine compliance of the aggregates with the requirements of Clauses 1703c and 1703d shall be carried out by the contractor in a laboratory acceptable to the Engineer. If the tested materials fail to comply with the Specification, further tests shall be
made in the presence of the Contractor and the Engineer and acceptance of the material shall be based on such tests.

3. A material shall be accepted if not less than three consecutive sets of test results show compliance with the specification.

4. The Contractor shall carry out routine testing of aggregate for compliance with the Specification during the period that concrete is being produced for the works. The tests to be performed are: grading, silt and clay contents, moisture content and check on organic impurities.

5. The above tests shall be performed on aggregates from each separate source on the basis of one set of tests for each day on which aggregates are delivered to Site provided that no set of tests shaft represent more than 250 tonnes of fine aggregate nor more than 500 tonnes of coarse aggregate, and provided also that the aggregates are of uniform quality. If the aggregate from any source is variable, the frequency of testing shall be increased as instructed by the Engineer.

6. In addition to the above routine tests, the Contractor shall carry out moisture content as frequently as may be required in order to control the water content of the concrete and chloride contents test as frequently as may be required to ensure that the proportion of chloride does not exceed the limit specified.

7. The Contractor should take into account of the fact that when the chloride content is variable it may be necessary to test every load in order to prevent excessive amounts of chloride contaminating the concrete.

1703f. STORAGE OF AGGREGATES

1. Aggregates shall be delivered to site in clean and suitable vehicles. Different types or sizes of aggregate shall not be delivered in one vehicle.

2. Each type of size of aggregate shall be stored in a separate bin or compartment having a base such that contamination of the aggregate is prevented. Dividing walls between bins shall be substantial and continuous so that no mixing of types or sizes occurs.

3. The storage of aggregates shall be arranged so that as far as possible rapid drying out in hot weather is prevented in order to avoid sudden fluctuations in water content. Storage of fine aggregates shall be arranged so that they can drain sufficiently before use in order to prevent fluctuations in water content of the concrete.
1703g. **WATER FOR CONCRETE**

1. Seawater or brackish water containing more than 1000ppm chloride ion or 2000ppm sulphate iron shall not be used for mixing or curing concrete.

2. Water shall be clean and free from harmful matter and shall comply with the requirements of BS3148.

3. The Contractor shall carry out tests in accordance with BS 3148 to establish compliance with the Specification.

1704 a **CLASSIFICATION OF CONCRETE MIXES**

1. The concrete mixes to be used in the various parts of the works shall be as shown on the drawings and described herein and shall attain the strengths specified herein.

   These mixes are of two categories.

   a. Concrete Mix by proportion or prescribed mix.

   b. Guaranteed strength concrete or designed mix.

2. The class of concrete is denoted by a number for characteristic strength in N/mm². This number may be followed by a number for maximum size of aggregate in millimeter, e.g. class 30-(20) concrete is of compressive strength of 30 N/mm² with maximum size of aggregate of 20mm. The 'characteristic strength' being the 28-day works cube strength below which no more than 5% of the test results may be expected to fall.

3. A 'designed mix' shall mean a concrete, where the Contractor will be responsible for selecting the mix proportions in accordance with Clause 1704b in order to achieve the required strength and workability and the Engineer will be responsible for specifying the minimum cement content and any other requirements to ensure durability.

4. A 'prescribed mix' shall mean a concrete, where the Engineer will specify the mix proportions and specifications. The Contractor will undertake to provide a properly mixed concrete as specified in accordance with Clause 1704c. The Engineer will therefore be responsible for ensuring that the mix prescribed will provide the strength and durability required.

1704 b. **REQUIREMENTS FOR CONCRETE**

1. The Contractor shall submit to the Engineer full details of all materials which he proposes to use for making concrete. No concrete shall be placed in the works until the Engineer has approved the materials of which it is composed. Approved materials shall not thereafter be altered or substituted by other materials without the consent of the Engineer.
2. The amount of water to be used in any particular class of concrete shall ensure complete hydration and for thorough mixing and subsequent working of the concrete in place, taking into consideration the purpose for which the concrete is intended for and the method of compacting. Therefore for given aggregates the cement content shall be sufficient to provide adequate workability with a low water/cement ratio so that the concrete can be completely compacted with the means available.

3. The maximum cement content shall not exceed 500kg/m³ or as otherwise described in the contract or directed by the Engineer. Cement contents in excess of 500kg/m³ should not be used unless special consideration has been given in design to the increased risk of cracking due to drying shrinkage in the sections or to thermal stresses in thicker sections. Where the minimum dimension of concrete to be placed at a single time is greater than 600mm and especially where the cement content is likely to exceed 400kg/m³ or more, measures to reduce temperature, such as selection of the cement type with slower release of heat of hydration may be considered.

4. The minimum cement content to ensure sufficient durability shall not be less than described in Table 1704b-1

**TABLE 1704 b-1 MINIMUM CEMENT REQUIREMENT (kg/m³)**

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Nominal maximum size of aggregate (mm)</th>
<th>Plain concrete</th>
<th>Reinforced concrete</th>
<th>Prestressed concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>40 20 10</td>
<td>40 20 10</td>
<td>40 20 10</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td>220 250</td>
<td>260 290</td>
<td>300 300 340</td>
</tr>
<tr>
<td>Intermediate</td>
<td></td>
<td>300</td>
<td>340 370</td>
<td>310 330 370</td>
</tr>
<tr>
<td>Severe</td>
<td></td>
<td>240 280</td>
<td>290 320</td>
<td>320 400 410</td>
</tr>
<tr>
<td></td>
<td></td>
<td>330</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>270 310</td>
<td>320 400</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>360</td>
<td>410</td>
<td></td>
</tr>
</tbody>
</table>

5. The minimum cement content shown in the above table is required in order to achieve impermeability and durability. In order to meet the strength requirements, higher contents may be required.

6. The cement content given in table 1704 b-1 may be reduced when trial mixes have verified that concrete with the maximum free water/cement ratio not greater than that given for the particular condition can be consistently produced and that it is suitable for the conditions of placing and compacting.
1704c GUARANTEED STRENGTH CONCRETE (DESIGN MIXES)

1. The Contractor shall design all the concrete mixes called for on the drawings, making use of the ingredients which have been approved by the Engineer for use in the works and in compliance with clause 1704 b.

2. The aggregate portion shall be well graded from the nominal maximum size of stone down to the 150-micron size. The cement content shall be such as to achieve the strength called for in table 1704 c-1 but any case not than the minimum necessary for impermeability and durability.

3. The workability shall be consistent with ease of placing and proper compaction having regard to the presence of reinforcement and other obstructions.

4. The water/cement ratio shall be the minimum consistent with adequate workability, but in any case not greater than that shown in table 1704 b-1, taking due account of any water contained in the aggregates. The Contractor shall take into account that this requirement may in certain cases require the inclusion of workability agent in the mix.

5. At least six weeks before commencing placement of concrete in the permanent works trial mixes shall be prepared for each class of concrete specified.

6. For each mix of concrete for which the Contractor has proposed a design, he shall prepare three separate batches of concrete using the materials which have been approved for use in the works and the mixing plant which he proposes to use for the works. The volume each batch shall be the capacity of the concrete mixer, proposed for full production.

7. Samples shall be taken from each batch and the slump of the concrete shall be determined. Six test cubes shall be cast from each batch. In case of the concrete having a maximum aggregate size of 40mm or less, 150mm cubes shall be used. In case of concrete containing 75mm or larger aggregate, 200mm cubes shall be used and in addition any pieces of aggregate retained on an 85mm sieve shall be removed from the mixed concrete before casting the cubes.

8. Subject to the agreement of the Engineer, the compacting factor apparatus may be used in place of a slump cone. In this case the correlation between slump and compacting factor shall be established during preparation of the trial mixes.
9. Three cubes from each batch shall be tested for compressive strength at seven days and the remaining three at 28 days. The density of all the cubes shall be determined before the strength tests are carried out.

10. The average strength of the nine cubes tested at 28 days shall be not less than the target mean strength shown in table 1704c-1. The Contractor shall also carry out tests to determine the drying shrinkages of the concrete unless otherwise directed by the Engineer. The drying shrinkages shall not be greater than 0.05%.

11. Based on the results of the tests on the trial mixes, the Contractor shall submit full details on his proposals for mix design to the Engineer, including the type and source of each mix and the results of the tests on the trial mixes.

12. If the Engineer does not agree to a proposed concrete mix for any reason, the contractor shall amend his proposal and carry out further trial mixes. No mix shall be used in the works without the written consent of the Engineer.

**TABLE 1704 c-1**
**CONCRETE CLASSES AND STRENGTHS**

<table>
<thead>
<tr>
<th>Class of concrete</th>
<th>Nominal Strength (N/mm²)</th>
<th>Maximum nominal size aggregate (mm)</th>
<th>Maximum water/cement ratio</th>
<th>Trial mixes Target Mean Strength (N/mm²)</th>
<th>Early works test cubes Any one cube (N/mm²)</th>
<th>Ave. of any group of 4 cubes (N/mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/75</td>
<td>10</td>
<td>75</td>
<td>0.60</td>
<td>0.55</td>
<td>13.5</td>
<td>8.5</td>
</tr>
<tr>
<td>15/75</td>
<td>15</td>
<td>75</td>
<td>0.60</td>
<td>0.50</td>
<td>21.5</td>
<td>12.8</td>
</tr>
<tr>
<td>15/40</td>
<td>15</td>
<td>40</td>
<td>0.60</td>
<td>0.50</td>
<td>21.5</td>
<td>12.8</td>
</tr>
<tr>
<td>15/20</td>
<td>15</td>
<td>20</td>
<td>0.57</td>
<td>0.50</td>
<td>31.5</td>
<td>17.0</td>
</tr>
<tr>
<td>20/40</td>
<td>20</td>
<td>40</td>
<td>0.55</td>
<td>0.48</td>
<td>31.5</td>
<td>17.0</td>
</tr>
<tr>
<td>20/20</td>
<td>20</td>
<td>20</td>
<td>0.53</td>
<td>0.48</td>
<td>31.5</td>
<td>17.0</td>
</tr>
<tr>
<td>20/10</td>
<td>20</td>
<td>10</td>
<td>0.50</td>
<td>0.48</td>
<td>31.5</td>
<td>17.0</td>
</tr>
<tr>
<td>25/40</td>
<td>25</td>
<td>40</td>
<td>0.52</td>
<td>0.48</td>
<td>36.5</td>
<td>21.3</td>
</tr>
<tr>
<td>25/20</td>
<td>25</td>
<td>20</td>
<td>0.50</td>
<td>0.46</td>
<td>36.5</td>
<td>21.3</td>
</tr>
<tr>
<td>25/10</td>
<td>25</td>
<td>10</td>
<td>0.48</td>
<td>0.46</td>
<td>41.5</td>
<td>25.5</td>
</tr>
<tr>
<td>30/40</td>
<td>30</td>
<td>40</td>
<td>0.50</td>
<td>0.46</td>
<td>41.5</td>
<td>25.5</td>
</tr>
<tr>
<td>30/20</td>
<td>30</td>
<td>20</td>
<td>0.48</td>
<td>0.45</td>
<td>41.5</td>
<td>25.5</td>
</tr>
<tr>
<td>30/10</td>
<td>30</td>
<td>10</td>
<td>0.47</td>
<td>0.45</td>
<td>41.5</td>
<td>25.5</td>
</tr>
<tr>
<td>40/20</td>
<td>40</td>
<td>20</td>
<td>0.46</td>
<td>0.43</td>
<td>51.5</td>
<td>34.0</td>
</tr>
<tr>
<td>40/10</td>
<td>40</td>
<td>10</td>
<td>0.45</td>
<td>0.43</td>
<td>51.5</td>
<td>34.0</td>
</tr>
</tbody>
</table>
Note: Under water/cement ratio, column A applies to moderate and intermediate Exposure, and column B applies to severe exposure.

1704d  **PRESCRIBED MIXES FOR ORDINARY STRUCTURAL CONCRETE**

1. Unless otherwise specified, the concrete mix shall be as detailed in table 1704 d-1 which gives the weights of cement and total dry aggregates in kg to produce approximately one cubic metre of fully compacted concrete together with the percentages of sand in total dry aggregates.

2. Provided that the Engineer is satisfied that the materials used are in accordance with this specification and that correct methods of manufacture and practices of handling raw materials and manufacture of concrete have been used, the compliance of a prescribed mix for ordinary concrete should, unless otherwise specified, be judged on the basis of the specified mix proportions, workability and strength.

3. The Engineer shall arrange for preliminary strength tests to be carried out, unless satisfactory evidence is available from previous use of the mix. He shall also arrange for strength tests to be carried out during the progress of the work in accordance with clause 1704e to satisfy himself that the mix proportions are suitable.

4. The actual batch weights shall be calculated to suit the size of the mixer for the appropriate grade of concrete. Allowance shall be made for moisture content typical of the aggregates being used.

5. Where permitted, the aggregates for grades 10 and 15 may be batched by volume, in which case the bulk density of the damp aggregate may be taken as 1500kg/m³. One whole bag of cement may be taken as weighing 50 kg. With volume batching, stout gauge boxes approved by the Engineer shall be used.

6. Gauge boxes shall be soundly constructed of timber or steel to contain exactly the volume of the respective materials required for one batch of each mix. They shall have closed bottoms and be of such proportions that their depth exceeds the cube root of their volume. No measurements shall be made by estimating fractional parts of a box and all gauge boxes shall be completely filled and the top struck off level. Consolidation of aggregates in gauge boxes will not be allowed.

7. Prescribed mixes shall not be used as structural concrete for the construction of the Jetty, but may be used for other secondary purposes with the approval of the Engineer.
### TABLE 1704 d-1

**PRESCRIBED MIXES FOR 1m³ ORDINARILY STRUCTURAL CONCRETE**

<table>
<thead>
<tr>
<th>Grade of Concrete</th>
<th>Normal max. Size of aggregate (mm)</th>
<th>40</th>
<th>20</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Limits to slump (mm)</td>
<td>50-100</td>
<td>100-150</td>
<td>25-75</td>
</tr>
<tr>
<td>10</td>
<td>Cement (kg)</td>
<td>210</td>
<td>230</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>Total Aggr (kg)</td>
<td>1900</td>
<td>1850</td>
<td>1850</td>
</tr>
<tr>
<td></td>
<td>Sand (%)</td>
<td>30-40</td>
<td>30-45</td>
<td>35-45</td>
</tr>
<tr>
<td>15</td>
<td>Cement (kg)</td>
<td>250</td>
<td>270</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td>Total Aggr (kg)</td>
<td>1850</td>
<td>1800</td>
<td>1800</td>
</tr>
<tr>
<td></td>
<td>Sand (%)</td>
<td>30-40</td>
<td>35-45</td>
<td>35-45</td>
</tr>
<tr>
<td>20</td>
<td>Cement (kg)</td>
<td>300</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td>Total Aggr (kg)</td>
<td>1850</td>
<td>1750</td>
<td>1800</td>
</tr>
<tr>
<td></td>
<td>Coarse Sand (%)</td>
<td>35</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Medium sand (%)</td>
<td>30</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Fine Sand (%)</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>25</td>
<td>Cement (kg)</td>
<td>340</td>
<td>360</td>
<td>360</td>
</tr>
<tr>
<td></td>
<td>Total Aggr (kg)</td>
<td>1800</td>
<td>1750</td>
<td>1750</td>
</tr>
<tr>
<td></td>
<td>Coarse Sand (%)</td>
<td>30</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Medium sand (%)</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Fine Sand (%)</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>30</td>
<td>Cement (kg)</td>
<td>370</td>
<td>390</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>Total Aggr (kg)</td>
<td>1750</td>
<td>1700</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td>Coarse Sand (%)</td>
<td>35</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Medium sand (%)</td>
<td>30</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Fine Sand (%)</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

8. The proportion of cement to fine plus coarse aggregate measured separately shall not be altered, but the proportion of fine to coarse aggregates shall be varied to suit the type of grading of aggregates so as to produce, except where otherwise required, concrete of the maximum density consistent with proper workability and complying with the cube strength requirements.
9. Three cubes from each batch shall be tested for compressive strength at seven days the remaining three at 28 days. The density of all the cubes shall be determined before the strength tests are carried out.

10. The average strength of the nine cubes tested at 28 days shall be not less that the target mean strength shown in table 1704c-1. The Contractor shall also carry out tests to determine the drying shrinkages of the concrete unless otherwise directed by the Engineer. The drying shrinkages shall not be greater than 0.05%.

11. Based on the results of the tests on the trial mixes, the Contractor shall submit full details on his proposals for mix design to the Engineer, including the type and source of each mix and the results of the tests on the trial mixes.

12. If the Engineer does not agree to a proposed concrete mix for any reason, the Contractor shall amend his proposal and carry out further trial mixes. No mix shall be used in the works without the written consent of the Engineer.

1704e QUALITY CONTROL OF CONCRETE

1. The proportions of materials used in the works shall follow the proportions found to be acceptable in the trial mixes. The concrete shall be prepared under the control of a competent person, and dose control kept over quantities, and water content, care being taken to make due allowance for variations in the moisture content of the materials.

2. All samplings and testing of concrete shall be carried out in accordance with KS 02595. Compliance with the specific characteristic strength shall normally be based on tests made on cubes at an age of 28 days.

3. Unless otherwise directed by the Engineer, the rate of sampling shall be as given in the table below, but not less than one sample shall be taken on each day the concrete of that grade is used. A higher rate of sampling and testing should be adopted at the start of the works to establish the level of quality or during periods of production, when quality is in doubt.
TABLE 1704e-1  RATES OF SAMPLING AND TESTING

<table>
<thead>
<tr>
<th>Volume of concrete at risk</th>
<th>Sample from one batch selected at random and at intervals such that each sample represents an average volume of not more than:</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 m³</td>
<td>10 m³ or 10 batches – Highly stressed structural course</td>
</tr>
<tr>
<td>60 m³</td>
<td>20 m³ or 20 batches – Normal structural concrete</td>
</tr>
<tr>
<td>150 m³</td>
<td>50 m³ or 50 batches – Mass concrete</td>
</tr>
</tbody>
</table>

4. For each class of concrete in production at each plant for use in the works, samples of concrete shall be taken at the point of mixing or of deposition as instructed by the Engineer, all in accordance with the sampling procedures described in sub-clause 1704 e

5. Six 150mm or 200mm cubes as appropriate shall be made from each sample and shall be cured and tested all in accordance with KS 02-595, two at seven days and the other four at 28 days.

6. The slump of the concrete shall be determined for each batch from which samples are taken and in addition for other batch at the frequency instructed by the Engineer.

7. The slump of the concrete in any batch shall not differ from the value established by the trial mixes by more than 25mm or one third of the value, which ever is the greater.

8. The air content of air-entrained concrete in any batch shall be within 1.5 units of the required value and the average value of four consecutive measurements shall be within 1 unit of the required value, expressed as a percentage of the volume of freshly mixed concrete.

9. Until such time as sufficient test results are available to apply the method of control described in sub-clause 10 below, the compressive strength of the concrete at 28 days shall be such that no single result is less than the value shown in table 1704 c-1 under the heading ear1y works test cubes and also that the average value of any four consecutive results is not less than the value shown in table 1704 c-1 under the same heading.

10. When test cube results are available for at least 40 consecutive batches of any class of concrete mixed in anyone plant, compliance with the specified characteristic strength will be assumed, if the following requirements are met:
(a) The average strength determined from any group of four consecutive test cubes exceeds the specified characteristic strength by not less than 0.5 times the 'current margin'.

(b) Each individual test result is greater than 85% of the specified characteristic strength.

11. The 'current margin' shall normally be taken as 1.64 times the standard deviation of cube tests on at least 40 separate batches of the same specification produced during concreting of the last six months, but not less than 5N/mm² for grade 15 or 7.5N/mm² for grade 20 or above.

12. If anyone cube result fails to meet requirement 10(b), then that result will be considered to represent only the particular batch of concrete from which that cube was taken.

13. If average strength of any group of four consecutive test cubes fails to meet requirement 10(a), then all the concrete in all the batches represented by these cubes shall be deemed not to comply with the strength requirements. For the purposes of this sub-clause the batches of concrete represented by a group of four consecutive test cubes shall include the batches from which samples were taken to make the first and the last cubes in the group of four, together with all the intervening batches.

14. The action to be taken in respect of the concrete which is represented by the test cubes which fail to meet either of the requirements must be determined by the Engineer. This may range from qualified acceptance in less severe cases to rejection and removal in the most severe cases.

15. The Engineer may wish to carry out tests on the hardened concrete in the structure. These may include non-destructive methods or the taking of cored samples. The results of any such tests should not nullify the establishment of non-compliance with the testing plan, provided that this was based on valid cube test results.

16. If the Contractor disputes the results of such tests, he may arrange at his own expense to have confirmatory tests made on cubes of set concrete cut from that portion of the works in dispute. Such tests shall be carried out by an agreed authority having suitable facilities.
1706 READYMIXED CONCRETE

1. Ready mixed concrete as defined in BS 1926, batched off the site, may be used only with the agreement of the Engineer and shall comply with the requirements of the Contract. Mixing at a central plant shall conform to the requirements for mixing at the site. The organization supplying concrete shall have sufficient plant capacity and transporting to ensure continuous delivery at the rate required.

2. The concrete shall be carried in purpose made agitators operating continuously or truck mixers. The concrete shall be compacted in its final position within 75 minutes of the introduction of cement to aggregates unless a longer time is agreed by the Engineer.

3. The time of such introduction shall be recorded on delivery note together with the weight of the constituents of each mix. When truck mixed concrete is used, water shall be added under supervision either at the site or at the central batching plant as agreed by the Engineer, but in no circumstances shall water be added in transit. Unless otherwise agreed by the Engineer, truck mixer units and their mixing and discharge performance shall comply with the requirements of BS 4251. Mixing shall continue for the number and rate of revolutions recommended in accordance with BS 4251.

4. Each mixer, agitator and truck shall have attached thereto in a prominent place a metal plate or plates on which the equipment is designed, the manufacturers guaranteed capacity of the drum, and the speed of the rotation of mixing drum or blades.

5. Approval to the use of ready mixed concrete may be withdrawn, if the Engineer is not satisfied with the control of the materials being used and the control during mixing.

1. The Contractor shall provide adequate supervision to ensure that, the required standard in control of materials and workmanship are maintained.

2. Cement shall be stored in dry weatherproof sheds with raised floor or in silos. If in sheds each consignment shall be kept separate and distinct. Any cement that has become injuriously affected by damp or other causes shall be removed from the site immediately.

3. Single sized coarse aggregates and sand shall be used unless otherwise authorised by the Engineer. They shall be stored in
separate hoppers or different stacks which shall be separated from each other.

4. All aggregates shall be kept free from contact with deleterious matter with adequate provision for drainage and shall be stored and handled so as to avoid segregation.

5. The overall grading of the aggregates shall be such as to produce concrete of the specified quality that readily will work into position on without segregation and without use of excessive water. The overall grading shall be controlled throughout the work so that it conforms closely to that assumed in the selection of the mix proportions. Each delivery shall be inspected and if required by the Engineer, tested in accordance with KS02-1238.

6. The quantities of cement, sand and the various sizes of coarse aggregate shall be measured by weight, unless otherwise authorised by the Engineer.

7. The Contractor shall be responsible for calculating the correct batch proportions for each mix ensuring that they are used and that the quality of the concrete as placed complies with the requirement of the specification.

8. The Engineer may approve or direct the variation of the ratio of fine to coarse aggregates specified, but always in such a manner that the total volume of aggregate for 50kg of cement shall remain constant. This shall not be considered a variation of the rates and prices in the bill of quantities.

9. A separate weighing machine shall be provided for weighing the cement. Alternatively the cement may be measured by using a whole number of bags in each batch.

10. The quantity of water shall be measured and also any admixture to be added. If solid, the admixture shall be measured by weight. All measuring equipment shall be maintained in clean and serviceable condition. Its accuracy shall be checked over the range in use when set up at site, and maintained thereafter and periodically rechecked.

11. The accuracy of measuring equipment shall fall within +/-3% for the quantity of cement, water or total quantity of aggregate and within +/-5% for the quantity of admixtures. The minimum size of mixer shall allow for at least one bag of cement.

12. The mixing time shall be not less than 2 minutes after all the ingredients are present in the drum. Mixers that have been out of use for more than 30 minutes shall be thoroughly cleaned before any fresh concrete is mixed.
13. The water content of each batch shall, if necessary and subject to the approval of the Engineer, be adjusted to produce a concrete of the specified workability.

1707 MIXING OF CONCRETE

1. All concrete shall be mixed in mechanically operated mixers of the batch-type, complying with the requirements of BS 1305. When permitted by the Engineer, batches not exceeding 0.25m³ may be mixed by hand methods in accordance with provisions under Clause 1708.

2. Concrete mixers may be of the revolving drum or the revolving blade type and the mixing or blades shall be operated uniformly at the mixing speed recommended by the manufacturer. The pickup and throw over blades of mixers shall be restored or replaced when any part or section is 25mm or more below the original height of the manufacturer's design. Mixers and agitators which have an accumulation of hard concrete or mortar shall not be used. Mixers shall be fitted with an automatic recorder registering the number of batches discharged.

3. The temperature of the materials as charged into the mixer shall be such that the temperature of the mixed concrete at the time it is placed in final position does not exceed 30°egr.C

4. The batch shall be so charged into the mixer that some water will enter in advance of cement and aggregates. All water shall be in the drum by the end of the first ¼ of the specified mixing time. Mixing shall continue for at least 90 seconds, after all materials including water, which shall be added last of all, have been passed into the drum and before any portion of the batch is discharged.

5. Cement shall be batched and charged into the mixer by means that will not result in a loss of cement due to the effect of wind or in accumulation of on surfaces of conveyors or hoppers, or in the other conditions which reduce or vary the required quantity of cement in the concrete mixture.

6. The total elapsed time between the intermingling of damp aggregates and cement and the start of mixing shall not exceed 30 minutes. The concrete shall be discharged onto a watertight platform or into watertight containers for removal and depositioning as specified hereafter. The mixer drum shall be completely empty before recharging. Should there for any reason be a stoppage of greater than 10 minutes duration, the drum of the mixer and all handling equipment shall be thoroughly washed out with clean fresh water and rendered free from hardened concrete before mixing is resumed.
7. Uniformity of concrete mixes will be determined by comparing slump tests on two samples of mixed concrete from the same batch or truck load. Differences shall not exceed 25mm. Variations in the proportion of coarse aggregate will be determined from the results of tests from two samples of mixed concrete from the same batch or truck load. The difference between the two results shall not exceed 100kg/m$^3$. 

8. Concrete shall be mixed in such quantities that any batch can be placed in the works within 30 minutes. The retampering of concrete which has received its initial set will not be permitted under any circumstances. Mixing shall be performed at a point not farther away than 300m by haul route from the position of placement of the concrete.

9. Any mix, considered to be unsatisfactory by the Engineer for any reason, will be discharged to waste at Contractor's expense, as and where directed by the Engineer, will clear of all mixing and placing of concrete.

10. Uniformity of concrete mixes will be determined by comparing slump tests on two samples of mixed concrete from the same batch or truck load. Differences shall not exceed 25mm. Variations in the proportion of coarse aggregate will be determined from the results of tests from two samples of mixed concrete from the same batch or truck load. The difference between the two results shall not exceed 100kg/m$^3$. 

11. Concrete shall be mixed in such quantities that any batch can be placed in the works within 30 minutes. The retampering of concrete which has received its initial set will not be permitted under any circumstances. Mixing shall be performed at a point not farther away than 300m by haul route from the position of placement of the concrete.

12. Any mix, considered to be unsatisfactory by the Engineer for any reason, will be discharged to waste at Contractor's expense, as and where directed by the Engineer, will clear of all mixing and placing of concrete.

**1708 MIXING OF CONCRETE BY HAND**

1. Where it is not practical to employ machine mixing and approval has been obtained from the Engineer, concrete shall be mixed by hand as near as practicable to the site where it is to be deposited. Hand mixed concrete shall be made in batches of not more than 0.25 m$^3$.

2. The mixing shall be done on a clean watertight, non-absorbent platform approve by the Engineer. The cement and fine aggregate shall then be added and mixed dry until the mixture is thoroughly blended and uniform in colour. The coarse aggregate shall then be added and mixed until the coarse aggregate is uniformly distributed throughout the batch. The correct quantity of water shall be added using a can with a nose nozzle and the mixing continued until the entire batch of concrete is homogenous and has the desired consistency.
3. Mixing shall be carried out until the whole batch has been turned at least three times dry and three times wet.

4. For hand mixing the cement content shall be increased by 10% over that required for machine mixing.

5. The platform shall be emptied before a subsequent batch is mixed and thoroughly cleaned, if not in use for more than 30 minutes, before the next batch is prepared.

1709 TRANSPORT OF CONCRETE

1. Concrete shall be taken from the place of mixing to the place of deposition by means of barrows, carts, chutes or by any other approved method which will prevent the drying out and consolidation of the concrete, the segregation and loss of the ingredients and which are sufficiently rapid to ensure that the concrete does not commence to set before it is finally compacted in position.

2. During transportation the concrete shall be protected from any adverse effects of sun, wind and rain. The concrete shall be deposited as near as possible to its final position in the works and no concrete shall be dropped freely or deposited by means of mutes through a depth exceeding 1.5m.

3. Chuting shall be approved by the Engineer before use and shall not exceed a 45 degree slope. It is to be dean and free at all times from the gradual deposition of concrete. All mixers, barrows, spades and other mixing and distributing equipment shall be kept free of partly set concrete, which shall not be used in the works.

4. Concrete shall be guarded from harmful vibration and vibration during the setting period and transportation and similar activities executed on and adjacent to such works will be forbidden. No planks or ways for skips, etc shall be supported on either formwork or reinforcement.

5. In no case shall more than 30 minutes elapse between mixing and placing of any batch of concrete in its final position.

1710 PLACING OF CONCRETE

1. No concrete shall be placed in any part of the works until written permission to do so has been obtained from the Engineer. Well in advance of the intention to place concrete, the contractor shall forward to the Engineer for his approval full information about the order in which he proposes to place concrete in the various parts of the works, the height of each lift of concrete, details of the shuttering being proposed to employ with relevant calculations and positions of all construction joints.
2. During hot weather the Contractor shall take all measures necessary to ensure that the temperatures of concrete at the time of placing in the works does not exceed 30 degrees centigrade and that the concrete does not lose any moisture during transporting and placing. Such measures may include, but may not necessarily be limited to shielding aggregates from direct sunshine, use of mist water spray on aggregates and sun shields on the mixing plants and transporting equipment.

3. Areas in which concrete is to be placed shall be shielded from direct sunshine. Rock or concrete surfaces shall be thoroughly wetted to reduce absorption of water from the concrete placed on or against them.

4. The entire area of the bottom of the excavation shall be blinded with a layer of class 15 (mix 1:3:6) concrete of a minimum thickness of 50mm. The concrete shall be as dry as practicable and shall be well tamped into the ground. The surface of the blinding layer shall be spade finished and the specified cover of concrete under the reinforcement shall be provided above the blinding layer.

5. The area on which any concrete is to be placed must be made and maintained free from standing water during concreting operations, unless otherwise approved. Running water crossing or entering such areas must be brought under control before concreting proceeds. No pumping that may adversely affect the concrete being placed shall be done while placing, or within twenty-four hours of placing the concrete.

6. The arrangements for placing concrete are to be such that in all cases the materials may be conveniently handled and placed in the required position without re-handling or segregation. All concrete must be placed in position as rapidly as possible and in any case before it has taken an initial set.

7. For members involving 'vertical' placing of the concrete (e.g. walls) each lift shall be deposited in layers extending for the full width between end shuttering and of such depth that each layer can be easily and effectively integrated with the layer below by the means of compaction being employed. The layers shall be placed horizontally. Forms for walls, columns and other thin section of significant height shall be provided with openings or other devices that will permit the concrete to be placed in a manner that will prevent segregation.

8. For members involving 'horizontal' placing of the concrete (e.g. deck slabs) the concrete shall be placed along the line of the starting point in such quantities as will allow the member to be cast to its full depth along the full width between side shuttering and then along its entire front, parallel to the starting line.

9. Concrete in reinforced concrete work shall be deposited in small quantities in a plastic state with a water cement ratio such as to give the specified strength. The depositing of concrete in individual
members shall be continued without stoppage up to an approved
prearranged construction joint or until the member is completed and
shall be finished off in such a manner that the junction of member
shall be monolithic.

10. All members shall be concreted at such a rate as will eliminate any
Possibility of fresh batches of concrete being deposited immediately
adjacent to batches which have commenced to set. Mass concreting
shall be carried out in sections previously ordered or approved by
the engineer and shall proceed continuously in each section until
completed and no interval shall be allowed to lapse while the work
is in progress.

1711 PLACING OF CONCRETE UNDER WATER

1. Concrete may only be placed under water where indicated on the
drawings or with the prior approval of the engineer who shall likewise
approve the method to be used and the precautions necessary to
prevent loss of material.

2. The concrete quality shall be Class 25(20) or as specified on the
drawings. The quantity of cement in any concrete placed under water
shall, at the Contractor's expense, be increased by 20% above the
cement content, first batch which shall have the cement content
increased by 40%. If possible rounded aggregates with the addition of
approved plasticiser with high percentage of fines should be used to
obtain plastic mix. The slump of the concrete should be not less than
25mm.

3. The formation shall be cleaned by the diver and all silt removed by
aerial or other approved methods. Care should be also taken to ensure
that no silt or laitance is trapped in the corners.

4. Just before placement of the concrete, reinforcement shall be
cleaned by the diver by air lift, or other approved methods of all silt,
trapped debris, etc.

5. A tremie shall consist of a watertight tube having a diameter of not
less than 200mm with a hopper at the top. The tube shall be equipped
with a device that will prevent water from entering the tube whilst
charging the tube with concrete. The tremie shall be supported so as
to permit free movement of the discharge end over the entire top
surface of the work and to permit rapid lowering when necessary to
retard or stop the flow of concrete.

6. The tremie shall be filled by a method that will prevent washing of the
concrete. The lower ends of the tremie pipes shall always be kept
before the surface of the wet concrete already deposited and shall
contain sufficient concrete to prevent any water entry. Where a
batch is dumped into the hopper, the flow of concrete shall be
induced by slightly raising the discharge end, always keeping it in the deposited concrete.

7. The flow shall be continuous until the work is completed and the resulting concrete shall be monolithic and homogeneous. The raising speed of the cast concrete surface shall be at least 300mm/hour. Maximum distance between tremies, when concreting extensive areas, shall be 4m.

8. No concrete shall be allowed to fall through water at any time. Concrete shall be placed evenly over the whole area enclosed by the shuttering and must not be raked over, only the minimum of screeding being allowed once the concrete has been placed.

1712 COMPACTION OF CONCRETE

1. After the concrete has been placed in position it shall be compacted in such a manner as to produce a dense uniform mass. Compaction of all reinforced concrete work shall be by mechanical vibrators. Elsewhere it may be effected by either hand or mechanical tools. All compacting tools must be approved by the Engineer before being used in the works.

2. Where vibrators are used, they shall be of the rotary out-of-balance type or the electromagnetic type and shall operate at a frequency of not less than 8000 cycles per minute. The vibrators shall be disposed in such a manner, that the whole of the mass treatment shall be adequately compacted at a speed commensurate with the supply of concrete from the mixers. Vibration shall continue until all air has been expelled. At least two vibrators shall be available at the site of a structure in which more than 20m³ of concrete is to be placed.

3. The concrete shall be worked up against whatever surface it adjoins and compacted to such a degree, that it reaches its maximum density as a homogenous mass, free from air and water holes, and penetrates to all corners of the moulds and shuttering and completely surrounds the reinforcement. Care shall be taken to ensure that neither hand punners nor mechanical vibrators or shock come into contact with the formwork, reinforcement, nor any embedded fittings and to prevent the operation of compaction from transmitting any harmful vibrations or shocks to concrete which has not yet hardened sufficiently.

4. The use of external vibrators for compacting concrete will be permitted when the concrete is inaccessible for adequate compaction, provided the forms are constructed sufficiently rigid to resist displacement or damage from external vibration.

1713 CURING OF CONCRETE

1. Concrete shall be protected during the first stage of hardening from loss of moisture and from the development of temperature
differentials within the concrete sufficient to cause cracking. The methods used for curing shall not cause damage of any kind to the concrete.

2. Curing shall begin as soon as surface of the concrete has hardened sufficiently. The concrete shall be kept continuously wet by the application of water for a minimum period of 7 days after the concrete has been placed. Cotton mats, rugs, carpets or each or sand blankets may be used as a curing medium to retain the moisture during the curing period.

3. The entire surface of the concrete shall be kept damp by applying water with a nozzle preferably in form of a mist so as to not damage the surface until the surface is covered with the curing medium. The moisture from the nozzle shall not be applied under pressure directly upon the concrete and shall be allowed to accumulate on the concrete in a quantity sufficient to cause or wash the surface.

4. Where the concrete to be cured is enclosed by shuttering, the shuttering shall be covered with clean sacks or hessian which must be kept continuously in a wet condition. When the shuttering is removed, the damp hessian or sacks shall be hung directly around the concrete member and kept continuously wet by spraying with dean water. On no account must the surrounding sacks, hessian, etc. be allowed to dry during the curing period.

5. Surfaces of newly placed concrete to be cured by the membrane method shall be kept moisture wet until curing the compound is applied, which shall not be done until all patching or surface finishing has been complete. The water shall be applied with a nozzle as described above.

6. The curing compound shall be delivered to the work in ready mixed from. At the time of use the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. The compound shall not be diluted or altered in any manner. The curing compound shall be applied to the exposed surface at a uniform rate of 0.3 litres/m².

7. Curing compound used on the surface exposed to the sky shall contain sufficient finely divided aluminium in suspension to produce a complete coverage at the rate recommended by the manufacturer.

8. Curing compounds shall become stable and impervious to evaporation of water from the concrete surface within 60 minutes of application. The material shall not react chemically with the concrete and shall not crack, peel or disintegrate within three weeks after application. Should the film of curing compound be damaged from any cause, the damaged portions shall be repaired immediately with additional compound.
9. If instructed by the Engineer, the Contractor shall, in addition to the curing provisions set out above, provide a suitable form of shading to prevent the rays of the sun reaching the Concrete for at least the first four days of the curing period.

10. No separate payment will be made for complying with the provisions of this clause except for the specified curing compounds. The costs involved shall be included in the rate for concrete.

11. Layers shall not be placed so that they form feather edges, nor shall they be placed on a previous layer which has taken its initial set in order to comply with this requirement a layer may be started before completion of the preceding layer.

12. Great care shall be taken to avoid disturbing partially set concrete in any way. The Contractor shall not permit his workmen to walk over it and shall so arrange his operations that the partially set concrete is not subjected to unnecessary loads, shocks or vibrations from plant and labour operating in the immediate vicinity.

13. Should any unforeseen occurrence result in a stoppage of concreting for such time as might allow the concrete already placed to begin to set before the next batches can be compacted into place, the Contractor shall immediately insert at his own cost, a proper end-shutter to form a tongue and groove construction joint, as specified, normal to the work at that point, which will ensure that the section already cast is formed completely in accordance with this specification. Any additional reinforcement required as a result of the joint shall be provided by Contractor at his own expense.

14. Before concreting is resumed after such an interruption, the contractor shall cut out and remove all damaged or uncompacted feather edges or any other undesirable features and shall leave a clean, sound surface against which fresh concrete may be placed.

15. All foundation bolts, fittings, etc. are to be either built into the works as concreting proceeds by supporting them from the formwork in their correct position, or grouted into recesses cast in the work as specified or as approved by the Engineer. Recesses to accommodate such items shall be cast against properly constructed formwork and in no circumstances shall they be formed by cutting out green concrete. Similarly, no fittings shall be positioned in the works by securing to partially set concrete.

16. No vehicle will be allowed on any span until after the concrete in the span has attained a compressive strength of not less than twice the design strength and loads of any character having a total weight in excess of 2 tons will not be permitted on any span, until the concrete in the span has attained a compressive strengths of at least 210kg/cm².
17. Concreting may be continued during showers of a light drizzling nature, provided the run-off from elsewhere is intercepted. In the likelihood of a heavy rainfall developing, the Engineer may permit concreting to continue only if adequate protection is provided and the water/cement ratio adjusted to offset the additional moisture in the aggregates.

18. After concrete in any part of the area has been placed, the selected curing process shall be commenced as soon as possible. If any interval occurs between completion of placing and start of curing, the concrete shall be closely covered during the interval with polythene sheeting to prevent loss of moisture.

1714 FINISHES ON UNFORMED SURFACES

1. Horizontal or nearly horizontal surfaces which are not cast against formwork shall be finished to the class shown on the drawings and defined hereunder.

2. **Class UF 1 finish**

   All surfaces on which no higher class of finish is called for on the drawings or instructed by the Engineer shall be given a UF 1 finish. The concrete shall be leveled and screed to produce a uniform plain surface. Surplus concrete being stuck off by the straight edge immediately after compassion.

3. **Class UF 2 finish**

   This is a floated finish for roof or floor slabs and other surfaces where a hard trowelled surface is not required. The surface shall first be treated as a Class UF 1 finish and after the concrete has hardened sufficiently, it shall be floated by hand or machine sufficient only to produce a uniform surface free from screed marks.

4. **Class UF3 finish**

   This is a hard trowelled surfaced for use where weather resistance or Appearance is important, or which is subject to high velocity water flow. The surface shall be floated as for a UF2 finish, but to the tolerance stated below. When the moisture film has disappeared and the concrete has hardened sufficiently to prevent laitance from being worked to the surface, it shall be steel-trowelled under firm pressure to produce a dense, smooth uniform surface, free from trowel marks.

4. Surface tolerance for unformed concrete shall be as shown on table 1714-1. Where dimensional tolerance are given on the drawing they shall take precedence.
TABLE 1714-1 SURFACE TOLERANCE (mm)

<table>
<thead>
<tr>
<th></th>
<th>Sudden change of level in surface</th>
<th>Gradual change of surface as measured by 3m straight edge</th>
<th>Difference in level between 3m straight edge and the specified surface level</th>
</tr>
</thead>
<tbody>
<tr>
<td>UF1</td>
<td>Not applicable</td>
<td>10mm</td>
<td>+20-10mm</td>
</tr>
<tr>
<td>UF2</td>
<td>Nil</td>
<td>10mm</td>
<td>+20-10mm</td>
</tr>
<tr>
<td>UF3</td>
<td>Nil</td>
<td>5mm</td>
<td>12.5 of –7.5mm</td>
</tr>
</tbody>
</table>

**1715 CEMENT MORTAR**

1. Mortar shall be composed of fine aggregate complying with Clause 1703c and ordinary Portland cement complying with KS 02-21. The mix proportions shall be as stated on the drawings or if not stated, shall be one part of cement to two parts of fine aggregate by weight.

2. Small quantities of mortar may be hand mixed but for amounts over 0.5m³ a mechanical mixer shall be used. Mixing shall be done in an approved mixer, the amount of water added being just sufficient to give consistency and workability desired for the use to which the mortar is to be put, but in any case the water/cement ratio shall not be more than 0.5.

3. Where hand mixing of mortar is permitted the dry sand and cement shall first be mixed together by running over with a clean shovel or trowel on a clean steel platform or other approved surface until a mixture of uniform colour has been obtained. Water shall be added, a little at a time, the mixture being turned over after each addition until a homogenous paste has been obtained. This process shall be repeated until the required consistency has been obtained.

4. Cement mortar shall be made in suitable small quantities only as and when required and any mortar which has begun to set or which has been mixed more than 30 minutes before placing shall be rejected.

**1716 CONCRETE FOR SECONDARY PURPOSES**

1. Non structural concrete shall be composed of ordinary Portland cement complying with KS 02-21 and aggregates complying with KS 02-95 including all-in aggregate thin the grading limits of table 3 of KS 02-95. The weight of mixed cement mixed with 0.3m³ of combined or all-in aggregate shall not be less than 50kg. The maximum aggregate size shall be 40mm nominal.

2. The concrete shall be mixed by machine or by hand to uniform colour and consistency before placing. The quantity of water used shall not exceed that required to produce a concrete with sufficient workability to be placed and compacted where required.
3. No fines concrete is intended for use where a porous concrete is required. The mix shall consist of ordinary Portland cement complying with KS 02-21 and aggregate complying with KS 02-95. The aggregate size shall be 40mm to 10mm only. The weight of cement mixed with 0.3m³ of aggregate shall not be less than 50kg. The quantity of water shall not exceed that required to produce a smooth cement paste which will coat evenly the whole of the aggregate.

1717 CONSTRUCTION JOINTS

1. Whenever concrete is to be bonded to other concrete which has hardened, the surface of contact between the Sections shall be deemed a construction joint. All joints in all classes of work shall be conveniently rebated to form a key by inserting a tongue and groove against which concrete can be properly compacted.

2. Where construction joints are shown on the drawings, the Contractor shall form such joints in those positions. The location of joints which the Contractor requires to make for the purpose of construction shall be subject to the agreement of the Engineer. Construction joints shall be in vertical or horizontal planes except in sloping slabs, where they shall be normal to the exposed surface or elsewhere, where the drawings require a different arrangement.

3. Construction joints shall be so arranged as to reduce to a minimum the effects of shrinkage in the concrete after placing, and shall be placed in the most advantageous positions with regard to stresses in the structures and the desirability of staggering joints. Generally, construction joints shall be located at points, where shear or tensile stresses are at minimum.

4. Feather edges of concrete at joints shall be avoided and any feather edges which may have formed, where reinforcing bars project through a joint, shall be cut back until sound concrete has been reached.

5. The intersections of horizontal or near horizontal joints and exposed faces of concrete shall appear as straight lines produced by use of a guide strip fixed to the formwork at the top of the concrete lift, or by other means acceptable to the Engineer.

6. Construction joints formed as free surfaces shall not exceed a slope of 20% from the horizontal.

7. The surface of the fresh concrete in horizontal or near horizontal joints shall be thoroughly cleaned and roughened by means of high pressure water and air jets when the concrete is hard enough to withstand the treatment without the leaching of cement. The surface of vertical or near vertical joints shall be similarly treated if circumstances permit the removal of formwork at a suitable time.
8. Where concrete has become too hard for the above treatment to be successful, the surface whether formed or free is to be thoroughly scrabbled by mechanical means or wet sand blasted and then washed with clean water. The indentations produced by scrabbling shall be not less than 10mm deep and shall not extend closer than 40mm to a finished face.

9. If instructed by the Engineer the surface of the concrete shall be thoroughly brushed with a thin layer of mortar composed of one part of cement to two parts of sand by weight and complying with clause 1704 b.

10. The mortar shall be kept just ahead of the fresh concrete being placed and the fresh layer of concrete shall be thoroughly and systematically vibrated to full depth to ensure complete bond with the adjacent layer.

11. No mortar or concrete may be placed in position on or against a construction joint until the joint has been inspected and passed by the Engineer.

1718 EXPANSION JOINTS

1. The size of the gap shall be compatible with the mean temperature at the time of the installation, which shall be carried out earliest possible in the morning with the expected ambient temperature of structure in region of +20°C.

2. In order to attain this temperature it may be necessary to spray structure with fine mist of water. The final arrangement to determining the temperature shall be made with the engineer on site.

3. The position of bolts cast into concrete and holes drilled in plates shall be accurately determined. The mixing application and curing of all proprietary materials shall comply with the manufacturer’s requirements.

4. During placing and hardening of concrete or mortar under expansion joint components relative movement shall be prevented between them and the supports to which they are being fixed. When one haft of the joint is being set other half shall be completely free from longitudinal restraint.

5. Screw threads shall be kept clean and free from rust. Ramps shall be provided and maintained to protect all expansion joints from vehicular loading. Vehicles shall cross the joints only over the ramps until Engineer permits their removal.
1719 **EXPANDED RUBBER SEALANTS**

1. The materials shall comply in all respects with the ASTM Specification D471 and D2628. The size of the sealant shall be determined from following parameters.
   
   a) Greatest size of the opening 0.9BN.
   
   b) Smallest size of the opening 0.55BN.
   
   c) Smallest working opening 0.35BN where BN = Breadth of unstressed sealant

2. The sealants shall be installed strictly with the manufacturer’s instructions with the particular attention to the anchorages. The sealants may have to be precompressed by external means such as clamps before installation.

3. The installation shall be carried out early in the morning with the ambient temperature of the structure being 20°C.

4. The surfaces of the steelwork in contact with sealant shall be free of all organic and inorganic debris and impurities.

5. The amount of pre-compression shall be agreed with the Engineer on site.

6. Unit measurement of sealant shall be linear meter. The rates shall include for supply, transportation, installation anchor bolts, fixings sealing and all expenses, taxes (except VAT), duties and profits and all other items necessary for satisfactory incorporation in works.

1720 **JOINT SEALING COMPOUND**

1. Poured joint sealing compound shall consist of hot or cold poured material as agreed with the Engineer on site.

2. Hot poured compound shall comply with the requirements of B.S. 2499. Two-component cold poured compound shall comply with the requirements of U.S. Federal Specification SS-S-170 and test certificates prepared in an approved laboratory shall be supplied by the Contractor to show that it complies with the following requirements.

   **Test** | **Requirements**
   --- | ---
   Cone penetrating-150g for 5 seconds at less than 5mm 25°C. Standard grease cone. | Penetration to be not more than 27.5mm.
   Flow on a plane inclined at 75° to 20mm. Horizontal, 5 hours at 60°C | Flow not to exceed
   Bond 25mm wide joint extended specimen in 3 to 12.5mm per hour at 3 cydes of | Not more than one Develop
a crack, separation or other extension and compression opening more than 6mm deep.

3. In addition to the materials complying with US Specification SS-170, the Engineer may approved the use of the alternative materials provided these meet the other requirements of this clause relating to cold poured joint sealing compounds.

4. The treatment of the surfaces to receive sealant shall be carried out strictly with the suppliers’ instructions.

5. The pouring of the sealant shall be carried out at mean temperature of 20 ° -22°C, unless otherwise agreed with the Engineer on site. The measurement of the sealant shall be linear meter.

6. The rates shall include for supply, transportation, installation anchor bolts and fixings, sealing, and all expenses, taxes, duties and profits and all other necessary items for satisfactory incorporation in works.

1721 JOINT FILLER

1. Joint filler shall be either
   a) Flexcell, as manufactured by Expandite Limited
   b) Korkpak, as manufactured by Services Limited
   c) Or similar approved material

2. Joint filler shall be maintained in position during construction by use of a suitable adhesive as recommended by the manufacturer or by approved mechanical means.

1722 CEMENT GROUT

1. Cement grout shall consist of neat cement mixed with sufficient water to produce a freely running mixture. Normally this will comprise one part by volume of cement to one and a half parts by volume of water. In situations where it is possible and desirable in the opinion of the Engineer, to mix fine sand with grout, the proportions of sand to cement will be determined by the Engineer. The grout shall be used whilst fresh and within half an hour of mixing,

2. Any concrete area to be in contact with grout shall be cleaned of all loose or foreign material that would In any way prevent bond between the mortar and the concrete surfaces and shall be kept thoroughly moistened with water for a period of not less than 24 hours immediately prior to placing the grout.
3. The grout shall completely fill and shall be tightly packed into recesses, holes, etc. After placing, all surfaces of grout shall be cured by the water method for a period of not less than 3 days. **1723 FORMWORK FOR STRUCTURES**

1. Formwork shall include all temporary forms required for forming the concrete together with all temporary construction required for the support. All formwork shall be so constructed that there shall be no loss of material from the concrete and shall be of sum quality and strength as will ensure rigidity throughout the placing, compaction and setting of the concrete. After hardening, the concrete shall be in the position and of the shape, dimensions and surface as described in the contract.

2. False work or centering shall be founded upon a solid footing safe against undermining and protected from softening. Falsework which cannot be founded on satisfactory footing shall be supported on piling which shall be spaced, driven and removed in a manner approved by the Engineer.

3. The design of the forms shall also take into account the effect of vibration of concrete as it is paced. They shall be built mortar tight and of sufficient rigidity to prevent distortion due to the pressure of concrete and other loads incidental to the construction operations and so as to prevent warping and the opening of joints due to shrinkages of the timber.

4. The form shall be so constructed that they shall be capable of being removed without shock, vibration or damage to the concrete. All forms for beams and similar members shall be designed and constructed so that the sides may be removed without disturbing the bottom boards or supports thereof. The supporting struts shall be adjusted and securely fixed in position by approved means.

5. Struts and props shall be fitted with double hardwood wedges or other approved devices, so that the moulds may be adjusted as required and eased gradually after casting the concrete. Wedges shall be 'Spiked’ into position, and any adjusting device locked before the concrete is cast.

6. All forms for the outside surfaces shall be constructed with stiff wales at right angles to the studs and all form clamps shall extend through and fasten such wales. When removable bolts are used they shall be greased with water dissoluble grease to allow for easy withdrawal. No form of fixing passing through the concrete shall be used in concrete slabs.

7. Form clamps, bolts and anchors shall be used to fasten forms. The use of wire ties to hold forms in position during placing of concrete will not be permitted. Bolts or damps shall be positive in action and shall be of sufficient strength and number to prevent spreading or springing of the
forms. They shall be of such type that they can be entirely removed or cut back 25mm or more below the finished surface of the concrete leaving no metal within 25mm of the concrete surface. The cavities shall be filled with grout and the surface left sound, smooth, even and uniform in colour.

8. Where reinforcement passes through the faces of a construction joint the stopping off board shall be drilled so, that the bars can pass through, or the board shall be made in sections with a half round indentation in the joint faces for each bar, so that when placed, the board is a neat and accurate fit and no grout leaks from the concrete through the bar holes or joints.

9. Where holes are to be provided in formwork for weep holes and the like, they shall be neatly trimmed off to fit the pipe and caulked with an approved material to form a waste-tight joint.

10. Formwork for columns and small concrete sections, or where directed by the Engineer, shall be fitted with trap doors through which saw dust, shaving and other debris can be removed.

11. All formwork for new lifts of concrete shall be tightly and accurately fitted against the concrete already cast to ensure that the surface of the new work will be quite flush and in line with that of the old one.

12. All surfaces of the formwork which come into contact with the wet concrete shall be treated with an approved non-staining mould oil or similar oil. Any material which will adhere to or discolour concrete shall not be used. The Contractor shall ensure that the oil will be kept from contact with the reinforcement or embedded fittings.

13. All forms shall be set and maintained true to the line designated until the concrete is sufficiently hardened. Forms shall remain in place for periods which shall be as specified in table 1724-1. When forms appear to be unsatisfactory in any way, either before or during the placing of concrete, the Engineer shall order the work stopped until the defects have been corrected.

14. Formworks shall be provided for concrete surfaces at slopes of 30 degrees to the horizontal or steeper. Surfaces at slopes less than 20 degrees may be formed by screeding. Surfaces at slopes between 20 degrees and 30 degrees shall generally be formed unless the Contractor can demonstrate to the satisfaction of the Engineer that such slopes can be screeded with the use of special screed boards to hold the concrete in place during vibration.

15. Horizontal or inclined formwork to the upper surface of concrete shall be adequately secured against uplift due to pressure of fresh concrete. Formwork to voids within the body of concrete shall also be tied down or otherwise secured against floating.

16 All timber used for forms, false work and centering shall be sound wood, well seasoned and free from loose knots, shakes, large
cracks, warping and other defects. Before use on the work, it shall be properly stacked and protected from injury from any source. Any timber which becomes badly warped cracked, prior to the placing of concrete shall be rejected.

17. Where steel shuttering is to be used, it shall be of approved manufacture and panels shall fit tightly and accurately to form a true surface and joints, which will not allow the escape of liquid from the concrete. All rivets and bolt heads must be countersunk on the inside face and finished flush, so as to leave no mark on the resulting concrete surface. The provisions for timber shuttering specified above shall also apply to steel shuttering where applicable.

18. All formwork shall be approved by the Engineer before concrete is placed within it. The Contractor shall, if required by the Engineer, provide the later with copies of his calculations, of the strength and stability of the formwork or false work, but not withstanding the Engineer's approval of these calculations, nothing will relieve the Contractor of his responsibility for safety or adequacy of the formwork.

19. Formwork shall be measured by the square metre of formwork actually on contact with the finished face of the concrete. No deduction shall be made in the measurement for openings, pipes, ducts and the like, provided that the area of each is less than 0.05 square metres. Unless otherwise stated, if the volume or area of concrete has not been deducted when measuring the concrete in accordance with clause 320, formwork to form or box out the void shall not be measured. Formwork less than 300mm high to edges of slabs shall be measured by the linear metre.

20. Formwork required for blinding concrete, to form construction joints and hear keys for future concrete and other construction surfaces, shall not be measured and the costs shall be included in the rates for other work.

21. Formwork to contraction and expansion joints shall be measured by the square metre on one face only. The rates shall include for the costs stated below and for forming recesses for sealant and channels for grout.

22. The rates for formwork shall include for the cost of submission of details, providing and transporting all materials for formwork and falsework, erection including provision of supports, fillets and chamfers 75mm and less in width, bolts, ties, fixings, cutting to waste, drilling or notching the formwork for reinforcement where required.

1724 REMOVING OF FORMWORK

1. In the determination of the time for the removal of forms, falsework and hosing, consideration shall be given to the location and character of the structure, the weather and other conditions...
influencing the setting of the concrete and the admixture used in the mix.

2. No formwork shall be removed without the prior approval of the Engineer and in no case shall shuttering of props be removed before the periods mentioned in table -1 have elapsed after placing the concrete. Compliance with these requirements shall not relieve the Contractor of his obligation to delay the removal of the forms, if the concrete has not set sufficiently hard.

**TABLE 1724-1 MINIMUM PERIOD FOR FORMWORK REMOVAL**

<table>
<thead>
<tr>
<th>POSITION OF FORMWORK</th>
<th>MINIMUM PERIOD FOR TEM. OVER 10 DEG.C.</th>
<th>STRENGTH TO BE ATTAINED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical or near vertical faces of mass concrete</td>
<td>24 hours</td>
<td>0.2C</td>
</tr>
<tr>
<td>Vertical or near vertical faces of reinforced walls, beams and columns</td>
<td>48 hours</td>
<td>0.3C</td>
</tr>
<tr>
<td>Underside of arches, beams and slab formwork only</td>
<td>4 days</td>
<td>0.5C</td>
</tr>
<tr>
<td>Supports to underside of arches, beams and slabs</td>
<td>21 days</td>
<td>0.75C</td>
</tr>
<tr>
<td>Arched linings in tunnels and underground works</td>
<td>24 hours</td>
<td>4N/mm²</td>
</tr>
</tbody>
</table>

Note: C is the nominal strength for the class of concrete used.

3. When shuttering is removed after 3 days it will be necessary to ensure that the exposed surfaces of the concrete are kept thoroughly wetted for the period of curing specified in this section.

4. Forms shall be removed in such a manner as will not injure the concrete. The formwork shall be removed by gradual easing without jarring and only under competent supervision. Before removal of the shuttering, the concrete shall be examined and removal shall only be proceeded with, if the concrete has attained sufficient strength to sustain all the loads to which it will be subjected.

5. The Contractor shall be responsible for any injury or damage to the work caused by or arising out of the removal of formwork and props and any advice, permission or approval given by the engineer relative to the removal of formwork and props shall not relieve the Contractor of this responsibility. Any work showing sign of damage through premature removal of shuttering or through premature loading shall be entirely reconstructed at the Contractor’s expense.

6. Where props are to be left in position under slabs and beams, the formwork shall have been made in such a fashion, that it can be
removed without disturbing the props in any way. Otherwise it must be left in position for the full period that the props are left in position.

7. False work supporting any span of a continuous or rigid frame structure shall not be released before the period specified for the concrete placed in that span. The same shall apply for the adjacent portions of each adjoining span over a distance of at least half the length of the span where false work is to be released.

8. The shuttering for a part of a structure supported by concrete placed subsequently to that in, or on the shuttering, shall not be removed until the supporting concrete has matured, and such shuttering shall be prominently marked with a warning against premature removal.

9. The structure shall not be assumed to be capable of carrying its full load until 28 days have elapsed from completing the placing of the concrete.

10. All false work materials shall be completely removed. False work piling shall be removed to at least 0.5m below the surface of the original ground or original stream bed.

1725 FINISHES ON FORMED SURFACES

1. **Class F 1 finish**

   This finish is for surfaces against which backfill or further concrete will be placed. Formwork may be sawn boards, sheet metal or any other suitable material, which will prevent the loss of fine material from the concrete being placed.

2. **Class F 2 finish**

   This finish is for surfaces which are permanently exposed to view, but where the highest standard of finish is not required. Forms to provide Class F2 finish shall be faced with wrought thickness tongued and grooved boards with Square edges arranged in a uniform pattern and close jointed or with suitable sheet material.

   The thickness of boards or sheets shall be such that there shall be no visible deflection under the pressure exerted by the concrete placed against them. Joints between boards or panels shall be horizontal and vertical, unless otherwise directed. This finish shall be such as to require no general filling of surface pitting, but fins, surface discoloration and other minor defects shall be remedied by methods agreed by the Engineer.

3. **Class F 3 finish**

   This finish is for surfaces which will be in contact with water flowing at high velocity, and for surfaces prominently exposed to view where good appearance is of special importance. To achieve this finish, which shall be free of board marks, the formwork shall be faced with plywood,
complying with BS 1088 or equivalent material in large sheets. The sheets shall be arranged in an approved uniform pattern. Whenever possible, joints between sheets shall be arranged to coincide with architectural features or changes in direction of the surface.

4. All parts of formwork concrete surface shall be in the positions shown on the drawings within the tolerances set out in table 1725-1. In cases where the drawings call for tolerances other than those given in the table the drawings shall rule.

**TABLE 1725-1 TOLERANCES**

<table>
<thead>
<tr>
<th>Class of finish</th>
<th>Sudden change in the surface</th>
<th>Gradual change of the surface measured by 3m straight edge</th>
<th>Concrete face displacement from correct position</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>10</td>
<td>10 TO +25</td>
<td>+25 TO −10</td>
</tr>
<tr>
<td>F2</td>
<td>5</td>
<td>10</td>
<td>+ or −15</td>
</tr>
<tr>
<td>F3</td>
<td>2</td>
<td>5</td>
<td>+ or 110</td>
</tr>
</tbody>
</table>

5. Where precast have been set to a specified tolerance, further adjustments shall be made as necessary to produce a satisfactory straight or curved line. When the Engineer has approved the alignment, the Contractor shall fix the units so that there is no possibility of further movement.

**1726 REMEDIAL WORK TO DEFECTIVE SURFACES**

1. If on stripping any formwork the concrete surface is found to be defective in any way the contract shall make no attempt to
remedy such defects prior to the Engineer's inspection and the receipt of any instructions which the Engineer may give. Defective surface shall not be made good by plastering.

2. Areas of honeycombing which the Engineer agrees may be repaired shall be cut back to sound concrete or to 75mm, whichever is the greater distance. In the case of reinforced concrete the area shall be cut back to at least 25mm clear distance behind the reinforcement or to 75mm, whichever is the greater distance. The cavity shall have sides at right angles to the face of the concrete. After cleaning out with water and compressed air, a thin layer of cement grout shall be brushed on to the concrete surfaces in the cavity and it shall then be filled immediately with concrete of the same class as the main body but with aggregate larger than 20mm nominal size removed. A form shall be used against the cavity provided with a lip to enable concrete to be placed. The form shall be filled to a point above the top edge of the cavity. After seven days the lip shall be broken off and the surface ground smooth.

3. Surface irregularities which are outside the limits of tolerance set out in table 1725-1 shall be ground down in the manner and to the extent instructed by the Engineer.

4. Defects other than those mentioned above shall be dealt with as instructed by the Engineer.

1727 REINFORCEMENT FOR CONCRETE

1. Reinforcement which shall comply with the following Kenya Standards, covers and deformed bar reinforcement and steel fabric to be cast into concrete in any part of the Works but does not include pre-stressing tendons or any other embedded steel.

- KS 02 -22 for hot rolled plain bar
- KS 02 -105 for hard drawn mild steel wire
- KS 02 -573 for cold worked steel bar
- KS 02 -574 for steel mesh fabric

2. All reinforcement shall be from an approved manufacturer and, if required by the Engineer, the Contractor shall submit a test certificate from the manufacturer.

3. All reinforced for use in the works shall be tested for compliance with the Appropriate Kenya Standard in a laboratory acceptable to the Engineer and two Copies of each test certificate shall be supplied to the Engineer. The frequency of Testing shall be as set out in the Kenya Standard.
BENDING AND FIXING REINFORCEMENT

1. Unless otherwise shown on the drawings, bending and cutting shall comply with BS4466.

2. The Contractor shall satisfy himself as to the accuracy of any bar bending schedules supplied and shall be responsible for cuffing, bending and fixing the reinforcement in accordance with the drawings.

3. Bars shall be bent cold by the application of slow steady pressure. At temperatures below 15 degrees centigrade the rate of bending shall be reduced, if necessary to prevent fracture of the steel.

4. After bending, bars shall be securely tied together in bundles or groups and legibly labelled as set out in BS 4466.

5. Reinforcement shall be thoroughly cleaned and all dirt, scale, loose rust, oil and other contaminants removed before it is placed in the works.

6. Reinforcement shall be securely fixed in position within a dimensional tolerance of 20mm. In any direction parallel to a concrete face and within a tolerance of 5mm at right angles to a face, provided that the cover is not thereby decreased below the minimum shown on the drawings, or if not shown, shall be not less than 25mm or the diameter of the bar, whichever is the greater. Cover on distribution steel shall not be less than 15mm or the diameter of the bar, whichever is the greater.

7. Unless otherwise agreed by the Engineer, all intersecting bars shall either be tied together with 1.6 mm diameter soft annealed iron wire and the ends of the wire turned into the body of the concrete, or shall be secured with a wire clip of a type agreed by the Engineer.

8. Spacer blocks shall be used for ensuring that the correct cover is maintained on the reinforcement. Blocks shall be as small as practicable and of a shape agreed by the Engineer. They shall be made of mortar mixed in the proportions of one part of cement to two parts of sand. Wires cast into the block for tying in to the reinforcement shall be .6mm diameter soft annealed iron.

   Alternatively another type of spacer block may be used subject to the Engineer’s agreement.

9. Reinforcement shall be rigidly fixed so that no movement can occur during concrete placing. Any fixings made to the formwork shall not be within the space to be occupied by the concrete being currently placed.

10. No splices shall be made in the reinforcement except where shown on the drawings or agreed by the Engineer. Splice lengths shall be as shown on the drawings.
11. Reinforcement shall not be welded except where required by the contract or agreed by the Engineer. If welding is employed, the procedures shall be as set out in BS 2640 for gas welding or BS 5135 for metal arc welding. Full strength butt welds shall only be used for steel complying with BS 4449, and if used on high yield deformed bars complying with BS 4449 the permissible stresses in the vicinity of the weld shall be reduced to those applicable to the plain bars complying with that specification.

12. Bars complying with BS 4461 or other high tensile bars shall not be bent after being placed in the works.

13. Before concrete is placed in any section of the works, which includes reinforcement, the reinforcement shall be completely clean and free from all contamination, including concrete, which may have been deposited on it from previous operations.

14. The Contractor shall ensure that reinforcement left exposed in the works shall not suffer distortion, displacement or other damage. When it is necessary to bend protruding reinforcement aside temporarily, the radius of the bend shall not be less than four times the bar diameter for mild steel bars of six times the bar diameter for high yield bars. Such bends shall be carefully straightened before placing concrete continues without leaving residual kinks or damaging the concrete round them. In no circumstances will heating and bending of high yield bars be permitted.

15. Reinforcement shall be measured in kilogrammes for each of the following ranges of diameters:

   (a) of diameter equal to or less than 16mm
   (b) of diameter greater than 16mm

16. Steel fabric reinforcement shall be measured by the square metre and shall be the calculated area excluding for laps.

17. Steel plain and deformed bar reinforcement shall be measured by the Kg and shall be the calculated weight of the steel required splice lengths shown on the drawings. No allowance shall be made in the measurement for rolling margin or cutting waste. The density of steel shall be taken as 7850 kilogrammes per cubic metre.

18. The rates for reinforcement shall include for the cost of providing, cutting to length, splice lengths additional to those shown on the drawings, laps, bending, hooking, waste incurred by cutting, cleaning, spacer, blocks, provision and fixing of chairs or other types of supports, welding, fixing the reinforcement in position including the provision of wire or other materials for supporting and tying the reinforcement in place, bending reinforcement aside temporarily and straightening, placing and compacting concrete around reinforcement and for complying with the requirements of this clause.

1729 MEASUREMENT AND PAYMENT FOR CONCRETE

1. Concrete shall be measured by the cubic metre of each class calculated from the dimensions given on the drawings or as
instructed by the Engineer. No deduction shall be made in the measurement for:

a) Bolt holes, pockets, box outs and cast in components provided that the volume of each is less than 0.10 m³

b) Fillets, drips, rebates, recesses, grooves, chamfers and the like each less than 0.005 m² in cross-sectional area.

2. The rate for concrete shall include for the cost of:

a) Provision and transport of cement aggregates and water

b) Admixtures and workability agents including submission of details unless Specified.

c) Batching, mixing, transporting, placing, compacting and curing

d) Laying to sloping surfaces not exceeding 15 degrees from the horizontal and to falls.

e) Formwork to binding concrete

f) Placing and compacting against excavated surfaces, where required, including any additional concrete to fill overbreak or working space.

g) Complying with the requirements of this specification.

3. Blinding concrete shall be measured by the square metre calculated as the product to the width of the foundation as shown on the drawings and the length of the foundation. No deduction shall be made for openings, provided that the area of each is less than 0.05m².

18. 0 SEWERS, DRAINS AND MANHOLES

18.01 EXCAVATION FOR PIPE LINES, SEWERS AND MANHOLES

The ground shall be excavated to the lines and depths shown on the Drawings or to such other lines and depths as the Engineer may direct. Excavations taken out to greater depth than is necessary shall be filled in to the required level with concrete of the appropriate class as specified for the pipe bed at the Contractors own cost. Trenches shall be of sufficient widths to enable the pipes to be properly laid and jointed. Special care shall be taken to provide a solid and even bed for the barrels of the pipes and, where a concrete bed is not specified, the floor of the trench shall be properly shaped to receive the sockets.

Excavations will be considered to be from ground level at the centre line of the pipe measured to the invert level of the pipe. The Contractor must allow in his prices for all extra excavation required to allow for thickness of pipes and concrete beds.
18.02 SUPPORTS FOR PITS, TRENCHES AND OTHER EXCAVATIONS

The sides of pits, trenches and other excavations shall where necessary be adequately supported to the satisfaction of the Engineer by timber or by other approved means, and all such excavations shall be of sizes sufficient to enable the pipes and concrete to be laid accurately, and proper refilling and compaction to be carried out.

The Contractor shall take all precautions necessary for the safety of adjoining structures and buildings by shoring, opening in short lengths or otherwise, during the time the trenches are open.

Where directed by the Engineer, the supports shall be left in trenches or other excavations, and such supports so left will be measured and paid for at the prices entered in the Bills of Quantities except where in the opinion of the Engineer the necessity for leaving the supports in has arisen from carelessness or neglect on the part of the Contractor.

18.03 ROCK CUTTING IN TRENCHES FOR PIPES

Where solid rock is met with in trenches, it shall be cut out to a depth of 100mm below the intended level of the bottom of the pipes, and replaced with 100mm of concrete of the appropriate class specified elsewhere. In measuring such rock excavation the Contractor will be allowed width of 300mm more than the external diameter of the pipes to a level of 100mm below the bottom of the pipes. The price inserted in the Bills of Quantities shall be held to cover all expenses in connection with excavation of the rock and disposing off surplus material as directed by the Engineer.

18.04 WATER IN TRENCHES FOR THE PIPE LINES AND SEWERS

Trenches shall be kept free from water until, in the opinion of the Engineer, any concrete or other works therein are sufficiently set, and the Contractor shall construct any sumps or temporary drains that the Engineer may deem necessary.

18.05 PUTRESCENT MATTER

The Contractor shall include in his excavation prices for the removal of all filth or putrescent matter met with in the excavation of the Works to suitable places to be provided by the Contractor clear of the works, and on no account shall it be so replaced as to allow its gaining admission into the pipes, laid or un-laid. Such material shall be replaced as required by surplus excavated soil.

18.06 SIGHT RAILS

Before trenches are excavated sight rails shall be provided and erected by the Contractor at convenient intervals not exceeding the distance between those manholes for whichever an invert level is given in the Drawings or 50 metres whichever is the less. Rails shall be of substantial construction and shall be painted in alternate contrasting colours in such a manner as to indicate clearly the lines and levels, and, for use in conjunction with them, suitable boning rods shall be provided by the Contractor. The posts shall be firmly planted on either side of the trench. The Contractor will be held responsible for any errors, which may occur in the execution of the Works through sight
rails being disturbed, faulty setting out there from, or from any other cause whatsoever and shall make good at his own expense.

The sight rails shall be fixed with the upper edge an integral height in metres above the level of the invert of the pipe being laid.

18.07 INSPECTION OF TRENCHES

Before any pipes are laid in a trench the trench shall be inspected and passed as satisfactory by the Engineer.

18.08 CLEANING OF PIPES

Before being laid in the trench, each pipe and fitting shall be inspected and any dirt or foreign matter inside the pipe or fitting shall be removed. Spigots and sockets shall also be examined for cleanliness to ensure proper joints.

18.09 PIPE LAYING

In any length of drain, laying shall always be carried out from the lower end of the length to the higher. In case of spigot and socket pipes the socket shall always be at the upper end of the pipe. Pipes shall be laid true to line and grade or as directed by the Engineer. In order to prevent stones or soil from entering the pipe suitable cover or plug shall be provided which is to be used for covering the mouth of the last laid pipe at all times while pipe laying is not proceeding.

18.10 JOINTING OF P.V.C. PIPES - GLUED JOINTS

The following procedures must be strictly followed:-

- The spigot end shall be chamfered and cut square.
- Clean spigot and socket with wet cloth and let dry.
- Un-grease spigot and socket with acetone.
- Mark length of joint on spigot.
- Apply first a relatively thick layer of glue onto spigot, then a thin layer into socket.
- Push home the joint to the mark quickly and give at once a 90 degrees twist.
- Remove pressed out cement.
- Do not disturb the joint for five minutes whilst the glue is hardening.
- It is essential that the glue used is the correct type, i.e. it shall be purchased from the same factory which delivers the pipes.

18.11 JOINTING OF P.V.C. PIPES - RUBBER RING JOINTS

The joints can be either tye tyton type which incorporates only one rubber ring or loose couplets, in any case the fittings used shall be purchased from the same factory which delivers the pipes. Jointing procedure is:-

The end of pipes shall be cut square and shall be chamfered.

Coupler rubber ring and pipe end shall be cleaned and dry.
The rubber ring(s) shall be placed in the groove(s) or other socket (coupler).

Rubber ring(s) and end of pipe shall be lubricated with a lubricant delivered by the pipe manufacturer.

Mark clearly on the pipe ends the distance from the edge of the coupler to centre of coupler. Push home pipe end to within a few millimetres from centre of coupler.

18.12 PROTECTION OF PIPES

The concrete used for bedding, haunching and surrounding the pipes shall be concrete class 15 (20) unless otherwise ordered by the Engineer.

All concrete pipes will normally be laid with one of the alternative means of protective concrete hereinafter specified.

In all cases where concrete protection is adopted, a concrete mat at least 75mm thick shall first be laid on the bottom of the trench and shall be allowed to set before pipe laying is commenced. Individual pipes shall be firmly supported on bricks or pre-cast concrete blocks or wedges placed immediately behind the socket and in such a manner that each pipe is accurately positioned in both line and level. After the pipe joints have been made and the pipelines satisfactorily tested the remainder of the bedding concrete (and haunching and surrounding concrete where required) shall be placed.

In cases where pipes are not required to be laid on a concrete bed the Contractor shall ensure that each pipe is supported throughout its length by the bottom quarter of the barrel and is bedded on a firm foundation of sand which does not contain any hard lumps.

Joint holes are to be formed in the sand to enable joints to be made and inspected as they are to be as short as practicable.

In all cases the concrete protection shall be thoroughly worked around the undersides of the pipes, and into the joint holes, if any, and shall be thoroughly compacted during the operation of placing and in the case of pipes 450mm or more in diameter, the concreting operations shall be so organized that the vertical faces of the concrete shall bear upon the sides of the excavations, the trench supports being withdrawn as required to achieve this or additional concrete shall be placed between the concrete protection and the sides of the excavation.

Where concrete raft protection is required, the pipe shall be completely surrounded (minimum 150mm) with hand compacted sand up to the prescribed level. The raft shall then be cast and the next 0.5 metres backfilling shall be carried out with sand spread in 150mm layers each layer being well compacted by hand.

18.13 TEMPORARY SEALING OF DRAINS

During progress of the Works, all open ends of drains to be temporarily sealed off with hardwood plugs.
18.15 PIPES PASSING THROUGH WALLS

A lintel or arch to be provided through walls to allow 50mm clearance around pipes unless otherwise shown.

Foundation concrete to be lowered where necessary to allow drains to pass over and be adequately supported.

18.16 uP.V.C. UNDERGROUND DRAIN PIPES

uP.V.C. underground drain pipes and fittings shall be golden brown colour underground pipes and shall comply either with ISO/DIS 4435 'Unplasticised P.V.C. pipes and fittings' for buried drains or with B. S. 4660 or B. S. 5481 and to be obtained complete with coupling rings and relevant sealing compound from an approved manufacturer and laid and jointed strictly in accordance with the manufacturer's printed instructions.

18.17 BACKFILLING OF TRENCHES

Trenches shall be backfilled with suitable excavated material but not before the work has been measured and approved by the Engineer. For pipes which are not surrounded with concrete, the first layer of filling material shall be free from stones and shall not be thrown directly onto the pipes, but shall be placed and packed with care under and round them. All filling shall be deposited and compacted in layers, not exceeding 225mm loose depth, to a dry density not less than that of the adjoining soil.

18.18 BACKFILLING OF MANHOLES

Backfilling around manhole walls will not be started earlier than 3 days after the building or making of the wall nor sooner than 14 days over the cover slabs of manholes, after these are cast.

18.19 CONNECTIONS OF EXISTING SEWERS AND DRAINS

Where shown on the Drawings, existing sewers and drains shall be properly extended, connected and jointed to new sewers, culverts, drains or channels. All such connections shall be made during the construction of the main sewer, drain or other work and a record of their positions kept for future use or reference. Where pipe connections are made to a sewer, culvert, stone pitched or lined channel, the pipes shall be well and tightly built into the concrete or masonry work and be so placed as to discharge in the direction of flow of the main sewer, drain or channel and with the end of the pipe carefully cut to the necessary angle. Where the connections are between pipe sewers or drains, special connection pipes as shown on the Drawings shall be supplied and be truly laid and properly jointed.

18.20 MANHOLES AND INSPECTION CHAMBERS

Manholes and inspection chambers shall be constructed in accordance with the Drawings and in the positions shown on the Drawings or as directed by the Engineer.

Benching to manhole floors shall have a minimum fall of 1 in 12 from the manhole walls and shall be finished tangentially vertical to the bore of the channels, providing a gross
channel depth not less than the channel diameter. The intersection of the channel sides and the benching shall be finished in a sharp curve not greater than 30mm in diameter.

The benching shall be formed of concrete, as specified, floated to a hard smooth surface with a coat of cement-sand mortar (1:1).

If required half channel pipes, bends and junctions shall be laid and bedded in cement-sand mortar (1:3) to the required lines and levels, and both sides of the channel pipes shall be benched up with concrete of the appropriate class and finished smooth to the slopes and levels as shown on the drawings or directed by the Engineer. The ends of all pipes shall be neatly built in and finished flush with cement-sand mortar (1:3).

Walls of manholes and access shafts shall be constructed of concrete block work as specified elsewhere and in accordance with the Drawings.

Walls shall be rendered internally for the full height with a cement-sand mortar (1:3) of at least 12mm thickness and finished with a completely smooth surface.

Cast iron manhole covers and frames as specified shall be provided and the frames shall be bedded in cement-sand mortar (1:3) and so set that the tops of the covers shall be flush at all points with the surrounding surface of the footway, verge or carriageway, as the case may be. Any slight adjustment of the cover level which may be necessary to accomplish this shall be affected by topping the side walls with concrete integral with the slab.

Manhole covers and frames: bed and point frames in cement-sand mortar 1:3. Apply two coats of bitumen paint internally and externally. Bed covers in grease-sand mixture to make them airtight.

The manholes shall be covered by high density coated cast iron (where there is a road atop) and medium density coated cast iron covers.

Reinforced concrete manholes shall have 50mm thick concrete blinding. 1000 gauge polythene sheeting, 225mm thick reinforced concrete over slab, concrete benching trowelled smooth with main and branch channels formed in the same.

Step irons shall be laid at 225mm vertical centers for manholes over 1.20m Deep. All sizes shown on the drawings are internal sizes.

All manholes when completed shall be watertight and to the satisfaction of the Engineer.

18.21 PRECAST CONCRETE MANHOLES AND INSPECTION CHAMBERS

Precast concrete manholes and inspection chambers as specified elsewhere in this Specification shall be supplied and laid in accordance with Clause 4.28 and the Drawings.
18.22 GULLERY CONNECTIONS

Connection from gullies to sewers and surface water drains or -ditches shall consist of concrete pipes and fittings as specified elsewhere in this Specification jointed with cement-sand mortar (1:3). All pipes, bends and junctions shall be laid to the lines and levels shown in the Drawings or as directed by the Engineer.

18.23 GULLIES

Gullies complete with gratings and with Roding eyes where necessary shall be supplied and laid in accordance with the drawings. Where directed by the Engineer, pre-cast concrete gullies shall be laid on and surrounded with 100mm of concrete of the appropriate class specified elsewhere the concrete surround to be brought up to the underside of the frame or flush with the top surface as the case may be. Masonry gullies shall be constructed from 225mm building stone and rendered internally.

18.24 TEMPORARY STOPPERS

Junction pipes which are laid but not immediately connected to gullies shall be fitted with temporary stoppers or seats, and the position of all such junctions shall be clearly defined by means of stakes or training wires property marked and labeled.

18.25 PROVISION FOR FUTURE CONNECTION TO MANHOLES

Inlet pipes of the required diameters shall be built into the walls of manholes and elsewhere for future use and shall be of the diameters shown on the Drawings. The external ends of all such connections shall be sealed off with temporary stoppers, or otherwise sealed off as approved by the Engineer.

18.26 GRANULAR BEDDING TO' PIPES

Immediately following excavations of the trench, pipes shall be laid and jointed except when shown otherwise on the Drawings on pipe bedding material as specified elsewhere in this Specification. Brick or other hard material shall not be placed under the pipes for temporary support.

After jointing of the pipes the bedding shall be brought up equally on both sides of the pipe, first to the level of the centre of the pipeline and then up to height 225mm above the top of the pipe barrel. The bedding material shall be carefully compacted for the full width of the trench with hand tools. Pipes shall be laid so that each one is in contact with the bed throughout the length of its barrel, bedding material being scooped away at each socket in the case of socketed pipes so that the socket does not bear on the bed.

18.27 INVERT BLOCK DRAINS

Pre-cast concrete invert blocks and side slabs shall be formed of concrete of the appropriate class specified elsewhere to the dimensions shown on the Drawings. Each course of side slabs required in the Bills of Quantities shall be interpreted as one complete row of side slabs to one side of the channel concerned.
Invert block drains shall be constructed in the positions and to the levels and dimensions shown on the Drawings and laid to true line and even fall.

Invert blocks and side slabs shall be laid on a 75mm minimum thickness of compacted murram and be neatly jointed with cement-sand-mortar (1:3) as the work proceeds.

18.28 **AIR TEST**

All branches and openings in the length of drain under test shall first be sealed with approved expanding plugs and appropriate lids in the case of access fittings. After sealing, an air pressure of 100mm of water as measured on a manometer tube shall be applied. The drop in pressure after pumping has ceased shall not exceed 25mm of water in five minutes. Should the rate of pressure drop exceed that specified, a smoke test shall be applied for the purpose of locating the fault. Any failure of the drains to withstand these tests and any defect which may be found while they are under test must be made good to the satisfaction of the Engineer and at the Contractor's expense, and the test repeated. Upon the successful completion of the test, the pipes shall be backfilled in accordance with this Specification.

18.29 **WATER TEST**

All branches and openings in the lengths of drain under test shall first be sealed with approved expanding plugs and appropriate lids in the case of access fittings. The pipes shall be filled with water in such a matter as will give rise to no shock and prevent any accumulation of air in the sewer. When all air has been expelled and the pipes saturated, the pressure in the drains shall be raised by means of a force pump or standpipe so that the length under test is subjected to a hydrostatic pressure of at least 1.2 metres head of water. The drop in pressure after pumping has ceased shall not exceed 25mm head of water in 10 minutes. Should the rate of pressure drop exceed that specified, the Contractor shall thereupon, at his own expense, search for and rectify any weakness or defect in the pipes and fittings under test to the satisfaction of the Engineer. The pipes shall then be subjected to the specified water pressure again and re-tested and repaired until a satisfactory test is obtained. The Contractor shall allow for supplying all water required for such tests and shall make provision for its disposal after use.

18.30 **TESTING OF MANHOLES**

Manholes shall be tested by filling to the adjacent ground level with clean water. After allowing a 60 minutes period of initial absorption, no measurable subsidence in the water level shall occur during the next 30 minutes. The Contractor shall correct any leaks in the manhole at his own expense.

The Contractor shall, at his own expense, provide the water and everything necessary for the carrying out of the manhole test.

18.31 **PROTECTION OF WORK**

The drains are to be laid to suit the general progress of the Works and at such times and in such a manner as to be adequately protected against damage and deterioration.
The whole of the work is to be maintained and handed over in a sound clean condition on completion of the Contract.

18.32  **SOAK PITS**

Where the collected surface water is to be discharged to a soak pit, the suitability of the natural ground to receive and dispose of the water without causing damage or nuisance to neighbouring property shall be demonstrated to the satisfaction of the territorial authority.

If required, field testing of soakage can be carried out as follows:

a)  Bore test holes of 100mm to 150mm diameter to the depth of the proposed soak pit. If groundwater is encountered in the bore test hole then this depth shall be taken as the depth of the soak pit.

b)  Fill the hole with water and maintain full for at least 4 hours (unless the soakage is so great that the hole completely drains in a short time).

c)  Fill the hole with water to within 750mm of ground level, and record the drop in water level against time, at intervals of no greater than 30 minutes, until the hole is almost empty, or over 4 hours, whichever is the shortest.

d)  Plot the drop in water level against time on a graph, and the soakage rate in mm/hr is determined from the minimum slope of the curve. If there is a marked decrease in soakage rate as the hole becomes nearly empty, the lower rates may be discarded and the value closer to the average can be adopted.

Soak pits must be located at least 10 metres away from any waterways in saturated soil conditions.

A well-sized soak pit should last for about 3 to 5 years without maintenance. To extend the life of a soak pit, care should be taken to ensure that the effluent has been clarified and/or filtered well before they are discharged into the pit. This prevents an excessive build-up of solids.

The soak pit should be kept away from high-traffic areas so that the soil above and around it is not compacted. When the performance of the soak pit deteriorates, the material inside the soak pit can be excavated and refilled. To allow for future access, a removable (preferably concrete) lid should be used to seal the pit until it needs to be maintained. Particles and biomass will eventually clog the pit and it will need to be cleaned or moved. As long as the soak pit is not used for raw sewage, and as long as the previous collection and storage/treatment technology is functioning well, health concerns are minimal. The technology is located underground and thus, humans and animals should have no contact with the effluent.

It is important however, that the soak pit is located a safe distance from a drinking water source (ideally at least 30 m). Particles and biomass will eventually clog the pit and it will need to be cleaned or moved.
18.33 Septic Tanks

Septic tanks shall receive all wastewater (black and grey water), from toilets, baths, showers, wash basins, sinks and washing machines. Water that must be excluded includes run-off water from roofs, yards, foundation drains, and other sources not considered to be wastewater.

LOCATION - Septic tanks and sewage holding tanks shall be located so as to be readily accessible for the pumping out of liquid sewage and sludge.

Septic tank covers shall always be accessible. Where manholes are more than 300mm below final grade, an extension collar shall be provided over each opening. Extension collars shall not be brought flush with the ground surface unless the cover can be locked to prevent tampering. Driveways or other facilities shall not be constructed above septic tanks unless specially designed and reinforced to safely carry the load imposed.

Tanks must be watertight, constructed of durable material not subject to corrosion, decay, frost damage, or cracking

Tanks shall have inlet and outlet baffles, sanitary tees or other devices to prevent the passage of floating solids and to minimize disturbance of settled sludge and floating scum by sewage entering and leaving the tank

There shall be a minimum drop in elevation of 60mm between the inverts of the inlet and outlet pipes.
SECTION G

LIST OF DRAWINGS
**DRAWINGS**

**Note:** The list of contract drawings is as follows:

01- LAYOUT FOR CIVIL WORKS.
02- PROFILES
03- CIVIL WORKS STANDARD SECTIONS
04- CIVIL WORKS STANDARD SECTIONS
SECTION H

BILL OF QUANTITIES
BILL OF QUANTITIES

1.0 Preamble to Bill of Quantities

a) The Bill of Quantities shall form part of the Contract Documents and is to be read in conjunction with the Instructions to Tenderers, Conditions of Contract, Specifications and Drawings.

b) The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.

c) The Quantities set forth in the Bill of Quantities are estimated and provisional, representing substantially the work to be carried out, and are given to provide a common basis for tendering and comparing of Tenders. 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 fulfillment of his obligation under the Contract.

d) The prices and rates inserted in the Bills of Quantities will be used for valuing work executed, and the Engineer will measure the whole of the works executed in accordance with this Contract.

e) A price or rate shall be entered in ink against every item in the Bill of Quantities with the exception of items, which already have provisional sums, affixed thereto. The Tenderers 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. Tenderers who fail to comply will be disqualified.

f) Provisional sums (including Dayworks) in the Bill 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 of the Conditions of Contract.

g) The price and rates entered in the Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional plant to be used, labour, insurance, supervision,
compliance, testing, materials, erection, maintenance or works, overheads and profits, taxes (including VAT) 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.

h) Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:

1) Where there is a discrepancy between amount in words and figures, the amount in words will govern; and

2) Where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer, there is an obviously gross misplacement of the decimal point in the unit price, in which event the total amount as quoted will govern and the unit rate will be corrected.

3) If a Tenderer does not accept the correction of errors as outlined above, his Tender will be rejected.

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

j) “Authorized” “Directed” or “Approved” shall mean the authority, direction or approval of the Engineer.

k) 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 or the requirements of the plans and specifications will not be paid for, unless ordered in writing by the Engineer.

l) (a) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 150 brake horse power (112 kilowatt) with a single, rear-mounted, hydraulic ripper. Boulders of more than 0.2m³ occurring in soft material shall be classified as hard material.

(b) Soft material shall be all material other than hard material.

m) Standing Time
Standing time for the plant and crew shall be applicable only to delays resulting from the causes under direct control of the Engineer.
(a) Delays to plant and crew arising from the constructional variations, exceptional weather conditions will not be considered applicable to the standing time claims.

(b) Delays to plant and crew arising from the constructional sequence adopted by the contractor, irrespective whether such as constructional sequence has been approved by the Engineer shall not form a basis for the claims of whatsoever nature.

(c) Delays to plant and crew arising from constructional methods adopted by the contractor, misinterpretation of the results given by the contract documents, wrong assumptions arrived at from the information given by the contract documents, mistakes in the information or in phrasing of items in the tender documents shall not form any basis for claims of whatsoever nature.

(d) Delays to plant and crew arising from the fulfillment of the requirements stipulated in the Special Specifications and General Notes shall not form a basis for the claim of whatsoever nature.

(e) Delays to plant and crew arising from use of the unsuitable or faulty plant, delays to plant and crew arising from the Engineers rejection of the plant or equipment as defined under Clause 4 of the Special Specifications, shall not form a basis for claims of whatsoever nature.

The stipulations under (a), (b), (c), (d), and (e), shall refer where applicable to all Bills contained in the tender documents.

2.0 The objectives of the Bills of Quantities are:

(a) to provide sufficient information on the quantities of Works to be performed to enable tenders to be prepared efficiently and accurately; and

(b) When a Contract has been entered into, to provide a priced Bills of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works are itemized in the Bills of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bills of Quantities is as simple and brief as possible.

3.0 The Bills of Quantities is divided generally into the following sections:

(a) Preliminaries.
The preliminaries indicate the inclusiveness of the unit prices, and state the methods of measurement which have been adopted in the
preparation of the Bills of Quantities and which are to be used for the measurement of any part of the Works.

The number of preliminary items to be priced by the tenderer is limited to tangible items such as site office and other temporary works, otherwise items such as security for the Works which are primarily part of the Contractor’s obligations are included in the Contractor’s rates.

(b) **Work Items**

(i) The items in the Bills of Quantities are grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing or any other special characteristics may give rise to different methods of construction or phasing of the Works or considerations of cost. General items common to all parts of the Works have been grouped as a separate section in the Bills of Quantities.

(ii) The brief description of the items in the Bill of Quantities should in no way modify or supersede the detailed descriptions given in the Contract drawings, Conditions of Contract and Specifications.

(iii) Quantities are computed net from the Drawings, unless directed otherwise in the Contract, and no allowance has been made for bulking, shrinkage or waste. Quantities have been rounded up or down where appropriate.

(iv) The following units of measurement and abbreviations apply:

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<tr>
<td>lump sum</td>
<td>sum</td>
<td>Square millimeter</td>
<td>SMM</td>
</tr>
<tr>
<td>Linear meter</td>
<td>Lm</td>
<td>Week</td>
<td>wk</td>
</tr>
<tr>
<td>Metric ton</td>
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<tr>
<td>(1,000 kg)</td>
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</table>

(v) The commencing surface should be identified in the description of each item for Work involving excavation, boring or drilling, for which the commencing surface is not also the original surface. The excavated surface should be identified in the description of each item for Work involving excavation for which the excavated surface is not also the final surface. The depths of Work shall be measured from the commencing surface to the excavated surface, as defined.
(vi) The tenderers should note that they **must quote for both options (i.e. Option 1 and Option 2)** and failure to do so will automatically disqualify the tenderer. The Employer may adopt either of the options and the tenderer should take this into consideration when quoting.

(c) Day work Schedule

A Day work Schedule should be included if the probability of unforeseen work, outside the items included in the Bills of Quantities is relatively high. To facilitate checking by the Employer of the realism of rates quoted by the tenderers, the Day work Schedule should normally comprise:

- A list of the various classes of labour, and materials for which basic Day work rates or prices are to be inserted by the tenderer, together with a statement of the conditions under which the Contractor will be paid for Work executed on a Day work basis; and

- A percentage to be entered by the tenderer against each basic Day work Subtotal for labour, materials and plant representing the Contractor’s profit, overheads, supervision and other charges.

(d) Provisional Quantities and Provisional Sums

i. Provisional Sums to cover specialized works normally carried out by Nominated Sub Contractors in the Bills of Quantities as specialized Works have been included in a section of the main Bill of Quantities to be priced by the Main Contractor.

The Main Contractor should be required to indicate the names(s) of the specialized firms he proposes to engage to carry out the specialized Works as his approved domestic sub-contractors. Only Provisional Sums to covert specialized Works by statutory authorities should be included in the Bill of Quantities.

ii. The Provisional Sums included in the Bills of Quantities will be expended in whole or in part at the discretion of the Engineer after full consultation with the Employer.

(e) Summary

The Summary should contain a tabulation of the separate parts of the Bill of Quantities carried forward, with Provisional Sums for Day works, Physical (quantity) contingencies, and price contingencies (upward price adjustment) where applicable and 16% VAT.
GENERAL PRELIMINARIES
## A. PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES

Prices will be inserted against items of Preliminaries in the Contractor’s priced Bills of Quantities and Specification.

The Contractor shall be deemed to have included in his prices or rates for the various items in the Bills of Quantities or Specification for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract.

## B. ABBREVIATIONS

Throughout these Bills, units of measurement and terms are abbreviated and shall be interpreted as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>C.M.</td>
<td>Shall mean cubic metre</td>
</tr>
<tr>
<td>S.M.</td>
<td>Shall mean square metre</td>
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<tr>
<td>L.M.</td>
<td>Shall mean linear metre</td>
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<tr>
<td>MM</td>
<td>Shall mean Millimetre</td>
</tr>
<tr>
<td>Kg.</td>
<td>Shall mean Kilogramme</td>
</tr>
<tr>
<td>No.</td>
<td>Shall mean Number</td>
</tr>
<tr>
<td>Prs.</td>
<td>Shall mean Pairs</td>
</tr>
<tr>
<td>B.S.</td>
<td>Shall mean the British Standard Specification</td>
</tr>
<tr>
<td></td>
<td>Published by the British Standards Institution, 2 Park Street, London W.I., England.</td>
</tr>
<tr>
<td>Ditto</td>
<td>Shall mean the whole of the preceding description except as qualified in the description in which it occurs.</td>
</tr>
<tr>
<td>m.s.</td>
<td>Shall mean measured separately.</td>
</tr>
<tr>
<td>a.b.d</td>
<td>Shall mean as before described.</td>
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</table>

**Carried to collection**
### PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-PHASE 2- CIVIL WORKS

**BILL NO. 1: GENERAL PRELIMINARIES**

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#### A. EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT

*Attendance*; Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:

Attendance on nominated Sub-Contractors shall be given as an item in each case shall be deemed to include: allowing use of standing scaffolding, mess rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary; providing space for office accommodation and for storage of plant and materials; providing light and water for their work; clearing away rubbish; unloading checking and hoisting; providing electric power and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub-Contractors' work and being responsible for the accuracy of the same.

*Fix Only*:

"Fix Only" shall mean take delivery at nearest railway station (Unless otherwise stated), pay all demurrage charges, load and transport to site where necessary, unload, store, unpack, assemble as necessary, distribute to position, hoist and fix only.

#### B. EMPLOYER

The "Employer" is KENYA SCHOOL OF GOVERNMENT

The term "Employer" and "Government" wherever used in the contract document shall be synonymous.

#### C. PROJECT MANAGER

The term "P.M." wherever used in these Bills of Quantities shall be deemed to imply the Project Manager as defined in Condition 1 of the Conditions of Contract or such person or persons as may be duly authorised to represent him on behalf of the Government.

#### D. ARCHITECT

The term "Architect" shall be deemed to mean "The Project Manager," as defined above whose address unless otherwise notified is Ministry of Public Works, P. O. Box 30743, NAIROBI.

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### E. QUANTITY SURVEYOR

The term "Quantity Surveyor" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is Ministry of Public Works, P. O. Box 30743, NAIROBI.

### A. ELECTRICAL ENGINEER

The term "Electrical Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is Ministry of Public Works, P. O. Box 30743, NAIROBI.

### B. MECHANICAL ENGINEER

The term "Mechanical Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is Ministry of Public Works, P. O. Box 30743, NAIROBI.

### C. STRUCTURAL/CIVIL ENGINEER

The term "Structural/Civil Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is Ministry of Public Works, P. O. Box 30743, NAIROBI.

### D. FORM OF CONTRACT

The Form of Contract shall be as stipulated in the Republic of Kenya’s Standard Tender Document for Procurement of Building Works (2006 Edition) included herein. The Conditions of Contract are also included herein **Conditions of Contract**. These are numbered from 1 to 37 as set out in pages 17 to 36 of these tender documents. Particulars of insertions to be made in the Appendix to the Contract Agreement will be found in the Particular Preliminaries part of these Bills of Quantities.

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**E. BOND.**

The Contractor shall find and submit on the Form of Tender an **approved Bank** and who will be willing to be bound to the Government in and amount equal to five per cent (5%) of the Contract amount for the due performances of the Contract up to the date of completion as certified by the PROJECT MANAGER and who will when and if called upon, sign a Bond to that effect on the relevant standard form included herein. (without the addition of any limitations) on the same day as the Contract Agreement is signed, by the Government, the Contractor shall furnish within seven days another Surety to the approval of the Government.

**A. PLANT, TOOLS AND VEHICLES**

Allow for providing all scaffolding, plant, tools and vehicles required for the worksexcept in so far as may be stated otherwise herein and except for such items specifically and only required for the use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.

**B. TRANSPORT.**

Allow for transport of workmen, materials, etc., to and from the site at such hours and by such routes as may be permitted by the competent authorities.

**C. MATERIALS AND WORKMANSHIP.**

All materials and workmanship used in the execution of the work shall be of the best quality and description unless otherwise stated. The Contractor shall order all materialsto be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are onsite when required for use in the works. The Bills of Quantities shall not be used for the purpose of ordering materials.

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**Carried to collection**
**D. SIGN FOR MATERIALS SUPPLIED.**

The Contractor will be required to sign a receipt for all articles and materials supplied by the PROJECT MANAGER at the time of taking deliver thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacements of any such loss or damage with articles and/or materials which will be supplied by the PROJECT MANAGER at the current market prices including Customs Duty and V.A.T., all at the Contractor's own cost and expense, to the satisfaction of the PROJECT MANAGER.

**E. STORAGE OF MATERIALS**

The Contractor shall provide at his own risk and cost where directed on the site weather proof lock-up sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the PROJECT MANAGER. Nominated Sub-Contractors are to be made liable for the cost of any storage accommodation provided especially for their use.

**A. SAMPLES**

The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete test cubes required for the works that may be called for by the PROJECT MANAGER for his approval until such samples are approved by the PROJECT MANAGER and the PROJECT MANAGER, may reject any materials or workmanship not in his opinion to be up to approved samples. The PROJECT MANAGER shall arrange for the testing of such materials as he may at his discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the PROJECT MANAGER. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by the Ministry of Public Works.

The procedure for submitting samples of materials for testing and the method of marking for identification shall be as laid down by the PROJECT MANAGER. The Contractor shall allow in his tender for such samples and tests except those in connection with nominated sub-contractors' work.
B. GOVERNMENT ACTS REGARDING WORKPEOPLE ETC.

Allow for complying with all Government Acts, Orders and Regulations in connection with the employment of Labour and other matters related to the execution of the works. In particular the Contractor's attention is drawn to the provisions of the Factory Act 1950 and his tender must include for all costs arising or resulting from compliance with any Act, Order or Regulation relating to Insurances, pensions and holidays for workpeople or so the safety, health and welfare of the workpeople. The Contractor must make himself fully acquainted with current Acts and Regulations, including Police Regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc. It is most important that the Contractor, before tendering, shall obtain from the relevant Authority the fullest information regarding all such regulations and/or restrictions which may affect the organisation of the works, supply and control of labour, etc., and allow accordingly in his tender.

No claim in respect of want of knowledge in this connection will be entertained.

C. SECURITY OF WORKS ETC.

The Contractor shall be entirely responsible for the security of all the works stores, materials, plant, personnel, etc., both his own and sub-contractors' and must provide all necessary watching, lighting and other precautions as necessary to ensure security against theft, loss or damage and the protection of the public.

A. PUBLIC AND PRIVATE ROADS.

Maintain as required throughout the execution of the works and make good any damage to public or private roads arising from or consequent upon the execution of the works to the satisfaction of the local and other competent authority and the PROJECT MANAGER.

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**PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-PHASE 2- CIVIL WORKS**

**BILL NO. 1: GENERAL PRELIMINARIES**

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<td>B.</td>
<td>EXISTING PROPERTY.</td>
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<td>The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services and he will be held responsible for and shall make good all such damage arising from the execution of this contract at his own expense to the satisfaction of the PROJECT MANAGER</td>
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<td>C.</td>
<td>VISIT SITE AND EXAMINE DRAWINGS.</td>
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<td>The Contractor is recommended to examine the drawings and visit the site the location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which, may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.</td>
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<td>D.</td>
<td>ACCESS TO SITE AND TEMPORARY ROADS.</td>
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<td>Means of access to the Site shall be agreed with the PROJECT MANAGER prior to commencement of the work and Contractor must allow for building any necessary temporary access roads for the transport of the materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossings, bridges, or any other means of gaining access to the Site. Upon completion of the works, the Contractor shall remove such temporary access roads; temporary culverts, bridges, etc., and make good and reinstate all works and surfaces disturbed to the satisfaction of the PROJECT MANAGER</td>
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<tr>
<td>E.</td>
<td>AREA TO BE OCCUPIED BY THE CONTRACTOR</td>
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<td></td>
<td>The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops, etc., shall be defined on site by the PROJECT MANAGER</td>
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</table>
The Contractor shall provide, erect and maintain where directed on site and afterwards dismantle the site office of the type noted in the Particular Preliminaries, complete with Furniture. He shall also provide a strong metal trunk complete with strong hasp and staple fastening and two keys. He shall provide, erect and maintain a lock-up type water or bucket closet for the sole use of the PROJECT MANAGER including making temporary connections to the drain where applicable to the satisfaction of Government and Medical Officer of Health and shall provide services of cleaner and pay all conservancy charges and keep both office and closet in a clean and sanitary condition from commencement to the completion of the works and dismantle and make good disturbed surfaces. The office and closet shall be completed before the Contractor is permitted to commence the works. The Contractor shall make available on the Site as and when required by the "PROJECT MANAGER" a modern and accurate level together with levelling staff, ranging rods and 50 metre metallic or linen tape.

**WATER AND ELECTRICITY SUPPLY FOR THE WORKS**

The Contractor shall provide at his own risk and cost all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangements for connection to the nearest suitable water main and for metering the water used. He must also provide temporary tanks and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the PROJECT MANAGER. The Contractor shall pay all charges in connection herewith. No guarantee is given or implied that sufficient water will be available from mains and the Contractor must make his own arrangements for augmenting this supply at his own cost. Nominated Sub-contractors are to be made liable for the cost of any water or electric current used and for any installation provided especially for.

**SANITATION OF THE WORKS**

The Sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Government and/or Local Authorities, Labour Department and the PROJECT MANAGER.

*Carried to collection*
### PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-
### PHASE 2· CIVIL WORKS

**BILL NO. 1: GENERAL PRELIMINARIES**

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**D. SUPERVISION AND WORKING HOURS**

The works shall be executed under the direction and to the entire satisfaction in all respects of the PROJECT MANAGER who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and sub-Contractors or other places where work is being prepared for the contract.

**E. PROVISIONAL SUMS.**

The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(i) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.

**A. PRIME COST (OR P.C.) SUMS.**

The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the Standard Method of Measurement. Persons or firms nominated by the PROJECT MANAGER to execute work or to provide and fix materials or goods are described herein as Nominated Sub-Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.

**B. PROGRESS CHART.**

The Contractor shall provide within two weeks of Possession of Site and in agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Sub-Contractors; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on Site. Progress to be recorded and chart to be amended as necessary as the work proceeds.

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PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-
PHASE 2- CIVIL WORKS
BILL NO. 1: GENERAL PRELIMINARIES

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<tr>
<td>C.</td>
<td>ADJUSTMENT OF P.C. SUMS.</td>
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In the final account all P.C. Sums shall be deducted and the amount properly expended upon the PROJECT MANAGER'S order in respect of each of them added to the Contract sum. The Contractor shall produce to the PROJECT MANAGER such quotations, invoices or bills, properly receipted, as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" (as previously described) following P.C. Sums shall be adjusted pro-rata to the physical extent of the work executed (not pro-rata to the amount paid) and this shall apply even though the Contractor's priced Bill shows a percentage in the rate column in respect of them. Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in these Bill of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a Nominated Sub-Contractor.

A. ADJUSTMENT OF PROVISIONAL SUMS.

In the final account all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such work shall be valued, but should any part of the work be executed by a Nominated Sub-Contractor, the value of such work or articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.

B. NOMINATED SUB-CONTRACTORS

When any work is ordered by the PROJECT MANAGER to be executed by nominated sub-contractors, the Contractor shall enter into sub-contracts and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractors any or all of the facilities described in these Preliminaries. The Contractor should price for these with the nominated Sub-contract Contractor's work concerned in the P.C. Sums under the description "add for Attendance".

Carried to collection
C. DIRECT CONTRACTS

Notwithstanding the foregoing conditions, the Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum in the priced Bills of Quantities will be adjusted as described for P.C. Sums is allowed.

D. ATTENDANCE UPON OTHER TRADESMEN, ETC.

The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Contract every facility for carrying out their work and also for use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these Bills.

A. INSURANCE

The Contractor shall insure as required in Conditions No. 30 of the Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the PROJECT MANAGER either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing Insurance Clauses have been complied with in all respects. Thereafter the PROJECT MANAGER shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce the receipted premium renewals for the PROJECT MANAGER's inspection.
PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-
PHASE 2- CIVIL WORKS
BILL NO. 1: GENERAL PRELIMINARIES

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B. **PROVISIONAL WORK**

All work described as "Provisional" in these Bills of Quantities is subject to remeasurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract shall left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the PROJECT MANAGER. Immediately the work is ready for measuring, the Contractor shall give notice to the PROJECT MANAGER. If the Contractor makes default in these respects he shall if the PROJECT MANAGER so directs uncover the work to enable all measurements to be taken and afterwards reinstate at his own expense.

C. **ALTERATIONS TO BILLS, PRICING, ETC.**

Any unauthorised alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted.

D. **BLASTING OPERATIONS**

Blasting will only be allowed with the express permission of the PROJECT MANAGER in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being, and any special regulations laid down by the PROJECT MANAGER governing the use and storage of explosives.

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PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-PHASE 2-CIVIL WORKS
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<tbody>
<tr>
<td>A.</td>
<td>MATERIALS ARISING FROM EXCAVATIONS</td>
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<td></td>
<td>Materials of any kind obtained from the excavations shall be the property of the Government. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the PROJECT MANAGER. Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.</td>
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<tr>
<td>B.</td>
<td>PROTECTION OF THE WORKS.</td>
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<td></td>
<td>Provide protection of the whole of the works contained in the Bills of Quantities, including casing, casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which may nevertheless have been done at completion free of cost to the Government.</td>
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<tr>
<td>C.</td>
<td>REMOVAL OF RUBBISH ETC.</td>
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<td></td>
<td>Removal of rubbish and debris from the Buildings and site as it accumulates and at the completion of the works and remove all plant, scaffolding and unused materials at completion.</td>
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<td>D.</td>
<td>WORKS TO BE DELIVERED UP CLEAN</td>
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<td></td>
<td>Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupation to the approval of the PROJECT MANAGER.</td>
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Carried to collection
PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-
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BILL NO. 1: GENERAL PRELIMINARIES

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<td>A.</td>
<td><strong>GENERAL SPECIFICATION.</strong></td>
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<td>For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads and Public Works and Housing General Specification dated 1976 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.</td>
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<tr>
<td>B.</td>
<td><strong>TRAINING LEVY</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>The Contractor's attention is drawn to legal notice No. 237 of October, 1971, which requires payment by the Contractor of a Training Levy at the rate of 1/4 % of the Contract sum on all contracts of more than Kshs. 50,000.00 in value.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.</td>
<td><strong>MATERIALS ON SITE</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>All materials for incorporation in the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the PROJECT MANAGER. This includes the materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.</td>
<td></td>
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<tr>
<td>D.</td>
<td><strong>HOARDING</strong></td>
<td></td>
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<tr>
<td></td>
<td>The Contractor shall enclose the site or part of the works under construction with a hoarding 2400 mm high consisting of iron sheets on 100 x 50 mm timber posts firmly secured at 1800 mm centres with two 75 x 50 mm timber rails approximately three hundred and fifty metres. The Contractor is in addition required to take all precautions necessary for the safe custody of the works, materials, plant, public and Employer’s property on the site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E.</td>
<td><strong>CONTRACTOR'S SUPERINTENDENCE/SITE AGENT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor shall constantly keep on the works a literate English speaking Agent or Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the Project Manager and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1-PHASE 2- CIVIL WORKS

#### BILL NO. 1: GENERAL PRELIMINARIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>KSHS</th>
<th>CTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>COLLECTION</strong></td>
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<td>Brought Forward From Page GP/1</td>
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<td>Brought Forward From Page GP/2</td>
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<td>Brought Forward From Page GP/5</td>
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<td>Brought Forward From Page GP/6</td>
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<td>Brought Forward From Page GP/7</td>
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<td>Brought Forward From Page GP/8</td>
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<td>Brought Forward From Page GP/9</td>
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<td>Brought Forward From Page GP/10</td>
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<td>Brought Forward From Page GP/11</td>
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<td>Brought Forward From Page GP/12</td>
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<td>Brought Forward From Page GP/13</td>
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<td></td>
<td>Brought Forward From Page GP/14</td>
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</tbody>
</table>

**TOTAL FOR GENERAL PRELIMINARIES CARRIED TO GRAND SUMMARY**
PARTICULAR PRELIMINARIES
PRINCIPAL PRELIMINARIES

PRICING ITEMS OF PRELIMINARIES

Prices **SHALL BE INSERTED** against items of “preliminaries” in the tenderer’s priced Bills of Quantities. The Contractor shall be deemed to have included in his prices or rates for the various items in the Bills of Quantities or Specification for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract. The contractor is advised to read and understand all preliminary items.

DESCRIPTION OF THE WORKS

The works to be carried out under this contract involves: Construction of Aqua-culture Mini Processing Plant, Overhead Water Storage, Incinerators, External works, Civil works and the associated Electrical & Mechanical Works.

MEASUREMENTS

In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT MANAGER in accordance with Clause 22 of the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with Clause 22 of the said Conditions.
PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2- CIVIL WORKS

BILL NO 1: PARTICULAR PRELIMINARIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
</table>

**D LOCATION OF SITE**

The site is located within the …………………………………………… ……………… County. The Contractor is advised to visit the site, to familiarize with the nature and position of the site. No claims arising from the Contractor’s failure to do so will be entertained.

**A CLEARING AWAY**

The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate and upon completion of the works, remove and clear away all plant, equipment, rubbish, unused materials and stains and leave in a clean and tidy state to the reasonable satisfaction of the Project Manager.

The whole of the works shall be delivered up clean, complete and in perfect condition in every respect to the satisfaction of the PROJECT MANAGER.

**B CLAIMS**

It shall be a condition of this contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and/or expenses due to any of the contract conditions, or by any other reason whatsoever, he shall present such claim or intent to claim notice to the PROJECT MANAGER within the contract period. No claims shall be entertained upon the expiry of the said contract period.

**C PAYMENTS**

The tenderer’s attention is drawn to the fact that the GOVERNMENT SHALL NOT MAKE ADVANCE PAYMENTS

Carried to Collection
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>PREVENTION OF ACCIDENT, DAMAGE OR LOSS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor is notified that these works are to be carried out on a restricted site where the client is going on with other normal activities. The Contractor is instructed to take reasonable care in the execution of the works as to prevent accidents, damage or loss and disruption of normal activities being carried out by the Client. The Contractor shall allow in his rates any expense he deems necessary by taking such care within the site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>BID SECURITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The contractor shall provide a bid security duly signed, sealed and stamped from an approved Institution in an approved format of required amount.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>WORKING CONDITIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor shall allow in his rates for any interference that he may encounter in the course of execution of the works for the Client may in some cases ask the Contractor not to proceed with the works until some activities within the site are completed, as the facility will be operating as usual during the course of the contract.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>SIGNBOARD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allow for providing, erecting, maintaining throughout the course of the Contract and afterwards clearing away a signboard as designed, specified and approved by the Project Manager.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## BILL NO 1: PARTICULAR PRELIMINARIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C</strong></td>
<td>LABOUR CAMPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor shall not be allowed to house labour on site. Allow for transporting workers to and from the site during the tenure of the contract.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>MATERIALS FROM DEMOLITIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any materials arising from demolitions and not re-used shall become the property of the government. The Contractor shall allow in his rates the cost of transporting the demolished materials to the District Works Office Nairobi.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>PRICING RATES</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The tenderer shall include for all costs in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>SECURITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Contractor shall allow for providing adequate security for the works and the workers in the course of execution of this contract. No claim will be entertained from the Contractor for not maintaining adequate security for both the works and workers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carried to Collection
B **URGENCY OF THE WORKS**

The Contractor is notified that these “works are urgent” and should be completed within the period stated in these Particular Preliminaries. The Contractor shall allow in his rates for any costs he deems that he/she may incur by having to complete the works within the stipulated contract period.

C **PAYMENT FOR MATERIALS ON SITE**

All materials for incorporation in the works must be stored on site before payment is effected, unless specifically exempted by the PROJECT MANAGER. This is to include materials of the Contractor, nominated sub-Contractors and nominated suppliers.

D **EXISTING SERVICES**

Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the area and he/she shall make whatever provisions may be required by the authorities concerned for the support, maintenance and protection of such services.
### BILL NO 1: PARTICULAR PRELIMINARIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>PERFORMANCE BOND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A bond of 5 % of the contract sum will be required. No payment on account for the works executed will be made to the contractor until he has submitted the Performance Bond to the Project Manager duly signed, sealed and stamped from an approved Bank in the approved format.</td>
<td></td>
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<tr>
<td>B</td>
<td>TENDER DOCUMENTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tender documents are as listed in Clause 2.1 of the Instruction to Tenderer’s Page 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>DELIVERY OF TENDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tenders and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents or as indicated in the advertisement. Tenders will be opened at the time specified in the letter accompanying these Tender Documents or as indicated in the advertisement. Tenders delivered/received later than the above time will not be opened.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Carried to collection
### Proposed Construction of Gate and Gate House at the Kenya School of Government, Lower Kabete-Nairobi, W.P Item D103.NB/1301-JOB No. 0275Z1, Phase 2 - Civil Works

**Bill No 1: Particular Preliminaries**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong></td>
<td>VALUE ADDED TAX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Contractor’s attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1st September, 1993 which requires payment of VAT on all contracts. The tenderer is advised that in accordance with Government public notice No. 35 & 36 Dated 11th September 2003 operational from 1st October 2003, withholding VAT will be levied against the contract sum by the Employer and remitted to the Commissioner of VAT through all interim certificates. The contractor should therefore include this tax in the Grand Summary page as indicated herein.

### Project Management and Contract Administration Expenses

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Allow a sum of <strong>Kenya Shillings 500,000</strong> only for the training of the Ministry of Public Works Technical staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Allow a percentage sum for the contractors administrative costs and profits for the above........%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Allow a sum of <strong>Kenya Shillings.......</strong> Only for the clerk of works expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>Allow a percentage sum for the contractors administrative costs and profits for the above........%</td>
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</tr>
</tbody>
</table>

Carried to collection
### Proposed Construction of Gate and Gate House at the Kenya School of Government, Lower Kabete-Nairobi, W.P Item D103.NB/1301-JOB NO. 0275Z1, Phase 2 - Civil Works

**Bill No 1: Particular Preliminaries**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><strong>Mobile Phone Airtime and Subsistence Allowance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Allow a provisional Sum of Kenya Shilling <strong>50,000</strong> for the provision of Airtime to the Project Management team for the duration of the contract.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Allow a percentage sum for the contractors administrative costs and profits for the above....%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Allow a provisional sum of Kenya Shillings <strong>300,000</strong>. For Ministry of Public Works Subsitence Allowance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Allow a percentage sum for the contractors administrative costs and profits for the above......%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Stationery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Allow a provisional Sum of Kenya Shilling <strong>200,000</strong> only for supply and delivery of the Projects Managers Stationery and computers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Allow a percentage sum for the contractors administrative costs and profits for the above......%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Carried to collection**
### PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z1, PHASE 2- CIVIL WORKS

**BILL NO 1: PARTICULAR PRELIMINARIES**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIRE OF PROJECT VEHICLE</td>
</tr>
<tr>
<td></td>
<td>Transport</td>
</tr>
</tbody>
</table>

The contractor shall provide for site trips only a vehicle of type Urvan to comfortably seat Twenty Nine persons including maintaining licences and insurances, competent driver: all to the satisfaction of the Project Manager.

The vehicle shall be provided specifically for and during site visits by the Ministry of Public Works Technical team. The vehicle shall be in perfect conditions for the entire duration of the trip i.e. from Ministry of Public Works Head Office to ............................................................... County (Site) and back to Ministry of Public Works Head Office including Local running.

The driver shall be at the sole direction of the Project Manager for the entire duration of the trip, until released by him /her.

Reimbursement to the contractor for providing the transport services will be based per trip to the site and back during the currency of the contract at a rate as herebelow *(Contractor to insert rate - Item A)* inserted. Reimbursement to the contractor for providing driver, servicing, fuels, oils, Lubricants and tyres will similarly be based per trip at a rate herebelow *(Contractor to insert rate - Item B)* inserted.

Allow for providing a vehicle as above described including maintaining licences and comprehensive insurance

(One day)

Allow for providing driver, maintenance, fuels, lubricants spares and tyres (One day)

<table>
<thead>
<tr>
<th>NO. TRIPS</th>
<th>10</th>
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</thead>
</table>

**Carried to Collection**
### PARTICULARS OF INSERTIONS TO BE MADE IN APPENDIX TO CONTRACT AGREEMENT

The following are the insertions to be made in the appendix to the Contract Agreement:

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period of Final Measurement</strong></td>
<td>3 Months from Practical Completion</td>
<td></td>
</tr>
<tr>
<td><strong>Defects Liability Period</strong></td>
<td>6 Months from Practical Completion</td>
<td></td>
</tr>
<tr>
<td><strong>Date for Possession</strong></td>
<td>To be agreed with the Project Manager</td>
<td></td>
</tr>
<tr>
<td><strong>Date for Completion</strong></td>
<td>8 weeks from date of Possession</td>
<td></td>
</tr>
<tr>
<td><strong>Liquidated and Ascertained Damages</strong></td>
<td>at a rate of Kshs 200,000 Per week or part thereof</td>
<td></td>
</tr>
<tr>
<td><strong>Period of Iterim Certificates</strong></td>
<td>Monthly</td>
<td></td>
</tr>
<tr>
<td><strong>Period of Honouring Certificates</strong></td>
<td>30 Days</td>
<td></td>
</tr>
<tr>
<td><strong>Percentage of Certified Value Retained</strong></td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td><strong>Limit of Retention Fund</strong></td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

*Carried to Collection*
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
</table>

**COLLECTION**

- Brought forward from page PP/1
- Brought forward from page PP/2
- Brought forward from page PP/3
- Brought forward from page PP/4
- Brought forward from page PP/5
- Brought forward from page PP/6
- Brought forward from page PP/7
- Brought forward from page PP/8
- Brought forward from page PP/9
CIVIL WORKS
## PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z 1,

### PHASE 2- CIVIL WORKS

<table>
<thead>
<tr>
<th>ITEM NO</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.01</td>
<td>BILL NO 02: ACCESS ROAD, PARKING AND FOOTPATHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.01</td>
<td>Site Clearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.01</td>
<td>Tree girth less than 300mm</td>
<td>NO</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.02</td>
<td>Ditto; greater than 300mm but less than 450mm.</td>
<td>NO</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.03</td>
<td>Ditto; greater than 450mm but less than 600mm.</td>
<td>NO</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.04</td>
<td>Ditto; greater than 600mm.</td>
<td>NO</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.05</td>
<td>Grab up tree stamps and roots and dispose away from site</td>
<td>NO</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.06</td>
<td>Excavations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.06</td>
<td>Scarify the existing bituminous pavement to spoil, average depth 50mm</td>
<td>CM</td>
<td>33.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.07</td>
<td>Excavate, trim and clean pot holes, failed and damaged areas of the carriageway and edges including carting away to spoil the excavated materials</td>
<td>CM</td>
<td>45.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.08</td>
<td>Excavate oversite to remove vegetable soil average depth 200mm deep wheel and spread on site n.e. 100m as directed by the PM</td>
<td>SM</td>
<td>3,075</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.09</td>
<td>Excavate for driveway and drainage areas to formation level, average depth 0.5m and heap some selected material on site.</td>
<td>CM</td>
<td>1,750.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>Use selected excavated material to make up levels, average thickness 100mm.</td>
<td>CM</td>
<td>215.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.11</td>
<td>Extra over excavation in rock class II</td>
<td>CM</td>
<td>30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.12</td>
<td>Cart away excavated material.</td>
<td>CM</td>
<td>1,435.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.13</td>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.14</td>
<td>Trim and compact formation to correct levels, cross-falls, and longitudinal falls</td>
<td>SM</td>
<td>3,075.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.15</td>
<td>Provide murram or approved equivalent, lay and compact 150mm thick as road sub-base to 98% BS</td>
<td>SM</td>
<td>3,075.0</td>
<td></td>
<td></td>
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<tr>
<td>1.16</td>
<td>Apply approved herbicide to the trimmed surfaces.</td>
<td>SM</td>
<td>3,075.0</td>
<td></td>
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</tr>
<tr>
<td>1.17</td>
<td>Provide, lay and compact 200mm thick handpacked stones as road base to M.O.W. General Specifications.</td>
<td>CM</td>
<td>896.0</td>
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**TOTAL CARRIED TO COLLECTION PAGE CIV/3**
## Phase 2: Civil Works

<table>
<thead>
<tr>
<th>Item</th>
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<th>Unit</th>
<th>Qty</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.18</td>
<td>Supply, spread and compact 50mm quarry dust blinding to receive paving blocks</td>
<td>SM</td>
<td>2,899.0</td>
<td></td>
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<tr>
<td>1.90</td>
<td>Supply, lay and compact 60mm thick medium duty concrete paving blocks</td>
<td>SM</td>
<td>2,899.0</td>
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<tr>
<td>1.20</td>
<td>Clean and prepare surfaces of the road, provide, heat and spray MC-30 cutback bitumen prime coat at a rate of spray of 1.2 litre/m2</td>
<td>ltrs</td>
<td>6,619</td>
<td></td>
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<tr>
<td>1.21</td>
<td>Provide, heat and spray 80/100 straight run bitumen as binder for the 1st seal on carriageway at the rate of 1.0-1.4 litres/m2</td>
<td>ltrs</td>
<td>6,619</td>
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<tr>
<td>1.22</td>
<td>Prepare surfaces, provide, mix, lay and compact 6/10 Surface dressing layer as wearing course on blinded and primed layer of hand packed stones.</td>
<td>m²</td>
<td>5,516</td>
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### Road Kerbs Only

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1.23</td>
<td>Excavate for kerb stone depth not exceeding 200mm, backfill and cart away the excavated material.</td>
<td>LM</td>
<td>322.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.24</td>
<td>Prepare and pour 350x100mm concrete class 20, mix 1:2:4 to excavated place as bedding and haunching respectively for the kerb stone.</td>
<td>LM</td>
<td>322.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.25</td>
<td>Provide all material and fix sawn timber form work to edges of haunching to the kerb stones, 75mm- 150mm girth</td>
<td>LM</td>
<td>644.0</td>
<td></td>
<td></td>
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<tr>
<td>1.26</td>
<td>Provide, lay and joint along the edge of the road and parking 125x250mm pre-cast concrete kerb all to detail (50) 5332A.</td>
<td>LM</td>
<td>322.0</td>
<td></td>
<td></td>
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<tr>
<td>1.27</td>
<td>Ditto; but curved to varying radii.</td>
<td>LM</td>
<td>45.0</td>
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### Road Kerbs and Channel

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<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1.28</td>
<td>Excavate depth not exceeding 200mm, backfill and cart away the excavated material.</td>
<td>LM</td>
<td>946.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.29</td>
<td>Prepare and pour 350x100mm and 125x100mm concrete class 15/20, mix 1:3:6 to excavated place as bedding and haunching respectively for the kerb stone.</td>
<td>LM</td>
<td>946.0</td>
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<tr>
<td>1.30</td>
<td>Provide all material and fix sawn timber form work to edges of haunching to the kerb stones, 75mm- 150mm girth</td>
<td>LM</td>
<td>1,892.0</td>
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</table>

**Total Carried to Collection Page CIV/3**
## PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z 1,

### PHASE 2- CIVIL WORKS

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<tr>
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<tr>
<td><strong>BILL NO 01: ACCESS ROAD, PARKING AND FOOTPATHS</strong></td>
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<tr>
<td>1.31</td>
<td>Provide, lay and joint along the edge of the road and parking 125x250mm pre-cast concrete kerb and 125x100, all to detail (50) 5332B.</td>
<td>LM</td>
<td>946.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.32</td>
<td>Ditto; but curved to varying radii.</td>
<td>LM</td>
<td>18.0</td>
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<tr>
<td><strong>ROAD MARKING</strong></td>
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<tr>
<td>1.33</td>
<td>Prepare and apply three coats of road marking refractory paint on driveways and road kerbs surfaces.</td>
<td>LM</td>
<td>3,345.0</td>
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<tr>
<td><strong>FOOT PATHS</strong></td>
<td></td>
<td></td>
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<tr>
<td>1.34</td>
<td>Excavate 150mm deep for footpaths to remove vegetable soil and cart away.</td>
<td>SM</td>
<td>465.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.35</td>
<td>Provide, lay and compact 100mm approved gravel filling and level ready to receive paving slabs.</td>
<td>SM</td>
<td>465.0</td>
<td></td>
<td></td>
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<tr>
<td>1.36</td>
<td>Provide, lay and joint in cement mortar (1:3) 600x600x50mm precast concrete paving slab on 50mm sand or stone dust blinding.</td>
<td>SM</td>
<td>465.0</td>
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<tr>
<td>1.37</td>
<td>Prepare and apply concrete 100mm wide and 150mm thick class 15/20-mix 1:3:6-to the edges of footpaths.</td>
<td>CM</td>
<td>6.0</td>
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<tr>
<td><strong>Landscaping</strong></td>
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<tr>
<td>1.38</td>
<td>Use selected material heaped on site, spread to slopes as directed, average depth 0.3m</td>
<td>CM</td>
<td>75.0</td>
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<td></td>
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<tr>
<td>1.39</td>
<td>Supply and plant kikuyu grass as directed, water it until it takes root.</td>
<td>SM</td>
<td>150.0</td>
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### TOTAL CARRIED TO COLLECTION PAGE CIV/3

### COLLECTION

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Brought forward from page 2
Brought forward from above

### TOTAL CARRIED TO SUMMARY PAGE CIV/11
### PHASE 2- CIVIL WORKS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>BILL NO. 2: STORM WATER DRAINAGE</th>
<th>UNIT</th>
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<th>RATE</th>
<th>AMOUNT</th>
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<tbody>
<tr>
<td>2.01</td>
<td><strong>300 DIAMETER INVERT BLOCK DRAIN</strong></td>
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<td></td>
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<tr>
<td></td>
<td>Excavate trench for 450x225mm external dim. pcc IBD n.e. 1.0m (av. depth 0.6m) incl. trimming sides to slopes and disposal of excess material to detail (50) 5329B.</td>
<td>CM</td>
<td>450.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.02</td>
<td>Ditto but not exceeding 1.5m, (av. depth 1.0m) ditto to detail (50) 5329 'B'.</td>
<td>CM</td>
<td>112.0</td>
<td></td>
<td></td>
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<tr>
<td>2.03</td>
<td>Extra over for excavation in rock class II</td>
<td>CM</td>
<td>10.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.04</td>
<td>Backfill and compact after constructing culvert and head walls</td>
<td>CM</td>
<td>125.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.05</td>
<td>Cart away excess material.</td>
<td>CM</td>
<td>437.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.06</td>
<td>Provide, lay and compact 100mm approved murram bed and on sloping sides for the invert block drain width to detail (50) 5329 'B'.</td>
<td>SM</td>
<td>645.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.07</td>
<td>Provide, lay and joint 450x225mm external dimensions pcc IBD to detail (50) 5329 'B'.</td>
<td>LM</td>
<td>563.0</td>
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<tr>
<td>2.08</td>
<td>Extra over for 1x1 side slabs to detail.</td>
<td>LM</td>
<td>30.0</td>
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<tr>
<td>2.09</td>
<td>Ditto but 2x2 side slabs ditto.</td>
<td>LM</td>
<td>20.0</td>
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<tr>
<td><strong>SHALLOW IBD-800mm WIDE</strong></td>
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<tr>
<td>2.10</td>
<td>Excavate for shallow IBDs, depth not exceeding 300mm and cart away the excavated material.</td>
<td>CM</td>
<td>18.0</td>
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<tr>
<td>2.11</td>
<td>Provide, lay and compact 100mm murram as bedding for the miter drains.</td>
<td>SM</td>
<td>18.0</td>
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<tr>
<td>2.12</td>
<td>Provide all materials and construct meter drains to detail (50)5353B</td>
<td>LM</td>
<td>60.0</td>
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<tr>
<td><strong>CULVERTS HEADWALLS AND CULVERT PIPES</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2.13</td>
<td>Excavate for headwalls and culvert pipe to depth n.e 1.2m,</td>
<td>CM</td>
<td>21.0</td>
<td></td>
<td></td>
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<tr>
<td>2.14</td>
<td>Backfill and compact after constructing culvert and head walls</td>
<td>CM</td>
<td>12.0</td>
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</table>

**TOTAL CARRIED TO COLLECTION PAGE CIV/7**
### Proposed Construction of Gate and Gate House at the Kenya School of Government, Lower Kabete-Nairobi, W.P Item D103.NB/1301-Job No. 0275Z 1, Phase 2 - Civil Works

<table>
<thead>
<tr>
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<th>RATE</th>
<th>AMOUNT</th>
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<tbody>
<tr>
<td>2.15</td>
<td><strong>Bill No. 3: Storm Water Drainage</strong></td>
<td></td>
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<tr>
<td>2.15</td>
<td>Cart away excess material.</td>
<td>CM</td>
<td>9.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.16</td>
<td>Prepare and pour plain concrete, mix 1:4:8 as bedding for bedding, culvert pipe and headwalls</td>
<td>SM</td>
<td>13.0</td>
<td></td>
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<tr>
<td>2.17</td>
<td>Cut and fix for work to vertical sids of headwalls.</td>
<td>SM</td>
<td>20.0</td>
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<tr>
<td>2.18</td>
<td>Cut and fix BRC A142 to headwalls including spacer blocks.</td>
<td>SM</td>
<td>10.0</td>
<td></td>
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<tr>
<td>2.19</td>
<td>Prepare and cast class 25/20, mix 1:1.5:3, concrete to headwalls, culvert surround and bedding.</td>
<td>CM</td>
<td>14.0</td>
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<tr>
<td>2.20</td>
<td>Prepare and apply plaster to headwalls, sand cement mortar mix 1:3.</td>
<td>SM</td>
<td>30.0</td>
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</tr>
<tr>
<td>2.21</td>
<td>Conc. pipe as culvert between headwalls to detail (50) 5310 'C'.</td>
<td>LM</td>
<td>10.0</td>
<td></td>
<td></td>
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<tr>
<td>2.22</td>
<td>Provide, lay and joint in trench; 300mm dia.</td>
<td>LM</td>
<td>8.0</td>
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<tr>
<td>2.23</td>
<td>Conc. pipe as culvert between headwalls to detail (50) 5310 'C'.</td>
<td>LM</td>
<td>18.0</td>
<td></td>
<td></td>
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</table>

### Piped Storm Water

*Excavate for storm water manholes specified as follows: 300x300x400mm deep internal dimensions, plaster with mortar mix 1:3 both internally and externally, channelled with 200mm diameter drains to right slopes, top covered with 350x350 grating comprising of 30x30x2mm angles with T12 bars @50mm c/c primer painted.*

<table>
<thead>
<tr>
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<tr>
<td>2.24</td>
<td></td>
<td>No</td>
<td>5.0</td>
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**Total Carried to Collection Page CIV/7**
## PHASE 2 - CIVIL WORKS

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<tbody>
<tr>
<td><strong>BILL NO. 3: STORM WATER DRAINAGE</strong></td>
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<tr>
<td>2.25</td>
<td>Excavate for storm water manholes specified as follows: 800x800x1000mm deep constructed in 200mm masonry walling internal dimensions, plaster with mortar mix 1:3 internally, channelled with 600mm diameter drains to right slopes, top covered with 700x700 grating comprising of double 50x50x3mm angles with T20 bars @75mm c/c primer painted.</td>
<td>No</td>
<td>2.0</td>
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<tr>
<td>2.26</td>
<td>Excavate a trench for a 200mm pvc storm drain pipe and dispose the excavated material.</td>
<td>CM</td>
<td>12.0</td>
<td></td>
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<tr>
<td>2.27</td>
<td>Provide and lay 200mm diameter pvc pipe as storm drains</td>
<td>LM</td>
<td>18.0</td>
<td></td>
<td></td>
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<tr>
<td>2.28</td>
<td>Ditto as sleeves</td>
<td>LM</td>
<td>30.0</td>
<td></td>
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<tr>
<td>2.29</td>
<td>Prepare and cast class 25/20, mix 1:1.5:3, concrete to headwalls, culvert surround and bedding.</td>
<td>CM</td>
<td>9.0</td>
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<tr>
<td><strong>STONE PITCHING</strong></td>
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<tr>
<td>2.30</td>
<td>Excavate to slope as directed</td>
<td>CM</td>
<td>21.0</td>
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</tr>
<tr>
<td>2.31</td>
<td>Stoneditch 150mm thick the cut and sloped surface as directed</td>
<td>SM</td>
<td>12.0</td>
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<tr>
<td><strong>MASS CONCRETE LINED OPEN STORM DRAIN</strong></td>
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<tr>
<td>2.32</td>
<td>Excavate a 1.5m wide trench storm drain, average depth 400mm and spread on site</td>
<td>CM</td>
<td>36.0</td>
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<tr>
<td>2.33</td>
<td>Prepare and pour 100mm thick mass concrete 15/20, mix 1:3:6 to the bottom and sloping sides of the drain</td>
<td>SM</td>
<td>196.0</td>
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<tr>
<td>2.34</td>
<td>Prepare and apply sand cement smooth render to concrete surface, mix 1:3</td>
<td>SM</td>
<td>196.0</td>
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<tr>
<td><strong>STORM WATER TESTING</strong></td>
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<tr>
<td>2.35</td>
<td>Allow for testing the whole of the storm water drainage system in the presence of the Engineer/Project Manager and make good any defects, re-test as necessary and leave the whole system perfect and to the satisfaction.</td>
<td>ITEM</td>
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</table>

| TOTAL CARRIED TO COLLECTION PAGE CIV/7 | | | | | |
### BILL NO. 2: STORM WATER DRAINAGE

**COLLECTION PAGE**

- Brought forward from page 4
- Brought forward from page 5
- Brought forward from page 6

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**TOTAL CARRIED TO SUMMARY PAGE CIV/11**
### PHASE 2 - CIVIL WORKS

<table>
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<tr>
<td>BILL NO. 3: BOUNDARY WALL</td>
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<tr>
<td>3.01</td>
<td>Excavate for masonry walling strip footing and column bases and heap on site for backfilling.</td>
<td>CM</td>
<td>20.0</td>
<td>3.02</td>
<td>Back fill after the construction of walling and ram.</td>
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<tr>
<td>Concrete Works</td>
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<tr>
<td>3.04</td>
<td>Prepare and place 50mm thick concrete class 15 , mix 1:3:6 as blinding to strip footing and column bases</td>
<td>SM</td>
<td>15.0</td>
<td>3.05</td>
<td>Prepare and place 200mm thick concrete class 20 , mix 1:2:4 to strip footing</td>
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<td>Form work</td>
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<tr>
<td>3.07</td>
<td>Provide all materials and construct sawn cypress timber form work to sides of columns.</td>
<td>SM</td>
<td>36.0</td>
<td>3.08</td>
<td>8mm diameter bars</td>
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<td>Reinforcement works</td>
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<tr>
<td>3.11</td>
<td>Provide all reinforcement, cut and install to strip footing , column bases and columns</td>
<td></td>
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<tr>
<td>3.12</td>
<td>Prepare and apply plaster mortar mix 1:3 sand cement ratio to both internal and external part of the wall and columns.</td>
<td>SM</td>
<td>125.0</td>
<td>3.13</td>
<td>Provide all materials and fix 450x450 coping to columns</td>
</tr>
</tbody>
</table>

**TOTAL CARRIED TO COLLECTION PAGE CIV/9**
# PROPOSED CONSTRUCTION OF GATE AND GATE HOUSE AT THE KENYA SCHOOL OF GOVERNMENT, LOWER KABETE-NAIROBI, W.P ITEM D103.NB/1301-JOB NO. 0275Z 1,
## PHASE 2- CIVIL WORKS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.15</td>
<td>BILL NO. 4: BOUNDARY WALL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GRILLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide all material, fabricate and install a grille in mild steel comprising of 50x50x2mm SHS and 25x25x1.5mm SHS to Architects details. Paint the grille with approved primer.</td>
<td>SM</td>
<td>146.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.16</td>
<td>Prepare and apply a gloss paint to metal surfaces</td>
<td>SM</td>
<td>146.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL CARRIED TO COLLECTION PAGE CIV/9**

| BILL NO. 4: BOUNDARY WALL | | | | |
| COLLECTION | | | |
| Brought forward from page 8 | | | |
| Brought forward from above | | | |

**TOTAL CARRIED TO SUMMARY PAGE CIV/11**
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>SUMMARY PAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACCESS ROADS, PARKING AND FOOTPATHS</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2.00</td>
<td>STORM WATER DRAINAGE</td>
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</tr>
<tr>
<td>3.00</td>
<td>BOUNDARY WALL</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CARRIED TO GRAND SUMMARY
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.01</td>
<td>BILL 05: PC SUMS</td>
<td>300,000</td>
<td>0</td>
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</tbody>
</table>

Provide a prime cost of Ksh 300,000 for automating the gate

PC SUMS CARRIED TO GRAND SUMMARY | 300,000 |
PROVISIONAL SUMS
### BILL NO 6: PROVISIONAL SUMS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>Kshs.</th>
<th>Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.01</td>
<td>Provide a sum of Ksh 1,500,000 as contingencies</td>
<td>1,500,000</td>
<td>0</td>
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</tbody>
</table>

**PROVISIONAL SUMS CARRIED TO GRAND SUMMARY**

|        | 1,500,000 |
GRAND SUMMARY
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>TENDERERS AMOUNT Kshs</th>
<th>OFFICIAL USE ONLY Kshs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GRAND SUMMARY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>PRELIMINARIES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>CIVIL WORKS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PC SUM</td>
<td>300,000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>PROVISIONAL SUMS</td>
<td>1,500,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TOTAL CARRIED TO FORM OF TENDER (VAT INCL)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>