



REPUBLIC OF KENYA

## MINISTRY OF ENVIRONMENT AND FORESTRY

### KENYA METEOROLOGICAL DEPARTMENT

PROPOSED REHABILITATION OF ACCESS ROAD, PARKING,  
STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT  
KENYA METEOROLOGICAL DEPARTMENT, NAIROBI.

#### CIVIL WORKS TENDER DOCUMENT

W.P. ITEM NO. D110/NB/NB/2001 JOB NO. 10686D  
TENDER NO: MOE&F/KMD/OT/007/2020-2021

CLIENT

THE PRINCIPAL SECRETARY,  
MINISTRY OF ENVIRONMENT AND FORESTRY,  
P. O. BOX 30126-00100,  
NAIROBI.

PROJECT MANAGER

WORKS SECRETARY  
M.O.T. I. PW. H&UD  
STATE DEPARTEMNT OF PUBLIC WORKS  
P.O. BOX 30743-00100  
NAIROBI

CIVIL/STRUCTURAL ENGINEER

CHIEF ENGINEER (STRUCTURAL)  
M.O.T. I. PW. H&UD  
STATE DEPARTEMNT OF PUBLIC WORKS  
P.O. BOX 30743-00100  
NAIROBI

QUANTITY SURVEYOR

CHIEF QUANTITY SURVEYOR  
M.O.T. I. PW.H&UD  
STATE DEPARTEMNT OF PUBLIC WORKS  
P.O. BOX 30743-00100  
NAIROBI

MAY, 2021



PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM  
WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA  
METEOROLOGICAL DEPARTMENT, NAIROBI.

**CIVIL WORKS**

CONTENTS

A. CONTENTS PAGE	(i)
B. SIGNATURE AND SPECIAL NOTE PAGE	(ii)
C. STANDARD TENDER DOCUMENTS FOR PROCUREMENT OF WORKS	STD/1-STD/126
D. PARTICULAR PRELIMINARIES	PP/1 TO PP/10
E. GENERAL PRELIMINARIES	GP/1 TO GP/13
F. CIVIL WORKS	CIV 1 to CIV 17
G. GRAND SUMMARY	GS/1



REPUBLIC OF KENYA

PROPOSED REHABILITATION OF ACCESS ROAD, PARKING,  
STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT  
KENYA METEOROLOGICAL DEPARTMENT, NAIROBI.

CIVIL WORKS

Supplied as part of the Contract PROPOSED CIVIL WORKS AT KENYA  
METEOROLOGICAL DEPARTMENT, NAIROBI.

(Civil Works)

Issued by: -

Chief Engineer (Structural),  
State Department of Public Works,  
O Box 30743-00100,  
NAIROBI.

The contract for the above-mentioned works entered into this ..... day of ..... 20.....by the undersigned refers to these Bills of Quantities and the Ministry of Works General Specification dated March, 1976 (together with any amendments issued thereto) shall be read and construed as part of the said contract.

.....  
THE CONTRACTOR

.....  
THE PRINCIPAL SECRETARY  
MINISTRY OF ENVIRONMENT  
AND FORESTRY

Date: .....

Date: .....

SPECIAL NOTES

The Contractor is required to check the numbers of the pages of these Bills of Quantities and should he find any missing or in duplicate or figures indistinct he must inform the **Principal Secretary, Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development, State Department of Public Works, Head Office, Works Building, Ngong Road, Nairobi** at once and have the same rectified.

Should the Contractor be in doubt about the precise meaning of any item or figure for any reason whatsoever, he must inform the **Principal Secretary, Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development, State Department of Public Works, Head Office, Works Building, Ngong Road, Nairobi** in order that the correct meaning may be decided before the date for submission of tenders.

No liability will be admitted nor claim allowed in respect of errors in the Contractor's Tender due to mistakes in the Specifications which should have been rectified in the manner described above.

SIGNATURE PAGE AND NOTES

REPUBLIC OF KENYA



STANDARD TENDER DOCUMENT

FOR

PROCUREMENT OF WORKS  
(BUILDING AND ASSOCIATED  
CIVIL ENGINEERING WORKS)

(REVISED OCTOBER 2015)

## TABLE OF CONTENTS

	<u>PAGE</u>
INTRODUCTION	STD/3
SECTION I: INVITATION TO TENDER	STD/4
SECTION II: INSTRUCTIONS TO TENDERERS	STD/4 – STD/19
SECTION III: CONDITIONS OF CONTRACT	STD/22- STD/43
SECTION IV: APPENDIX TO CONDITIONS OF CONTRACT	STD/44-STD/46
SECTION V: SPECIFICATIONS	STD/47
SECTION VI: STANDARD FORMS	STD/48-STD/66
SECTION VII: SPECIAL SPECIFICATIONS	STD/67-STD/78
SECTION VIII: MATERIALS SPECIFICATIONS	STD/79-STD/135
SECTION IX: LIST OF DRAWINGS	STD/136-STD/137
SECTION X: BILLS OF QUANTITIES	STD/138-STD/143

## INTRODUCTION

1.1 This standard tender document for procurement of works has been prepared for use by procuring entities in Kenya in the procurement of works (i.e. Buildings and associated Civil Engineering Works).

1.2 The following guidelines should be observed when using the document:-  
(a) Specific details should be furnished in the Invitation to tender and in the special conditions of contract (where applicable). The tender document issued to tenderers should not have blank spaces or options.

The instructions to tenderers and the General Conditions of Contract should remain unchanged. Any necessary amendments to these parts should be made through Appendix to instructions to tenderers and special conditions of contract respectively.

1.3 Information contained in the invitation to tender shall conform to the data and information in the tender documents to enable prospective tenderers to decide whether or not to participate in the tender and shall indicate any important tender requirements

The invitation to tender shall be as an advertisement in accordance with the regulations or a letter of invitation addressed to tenderers who have been pre-qualified following a request for prequalification.

The cover of the document shall be modified to include:-

Tender number.  
Tender name.  
Name of procuring entity.  
Delete name and address of PPOA.

## SECTION I

### INVITATION FOR TENDERS

Tender reference No. MOE&F/KMD/OT/007/2020-2021

Tender Name: *Proposed Rehabilitation of Access Road, Parking, Storm Water Drainage and Associated Civil Works at Kenya Meteorological Department, Nairobi.*

Date: 22/06/2021

1. The Ministry of Environment and Forestry invites sealed tender documents from eligible interested bidders for the Proposed rehabilitation of access road, parking, storm water drainage and associated civil works at KMD Headquarters
2. Interested eligible candidates may obtain tender documents from **Ministry of Environment and Forestry, Ragati Road, NHIF Building, 11<sup>th</sup> floor, Supply Chain Management Office room 1104** during normal working hours (8.00 am to 5.00pm, Monday-Friday, with exemption of public holidays) upon payment of non-refundable fee of Ksh 1000 payable in cash or Bankers cheque to the **Principal Secretary Ministry of Environment and Forestry** or download the document free of charge from Ministry website: [www.environment.go.ke](http://www.environment.go.ke), [www.meteo.go.ke](http://www.meteo.go.ke) or <http://supplier.treasury.go.ke> and [www.tenders.go.ke](http://www.tenders.go.ke). In case the documents are downloaded, bidders must inform the Ministry of Environment and Forestry, Supply Chain Management Services immediately for recording purpose.
3. Prices quoted should be net inclusive of all taxes, must be in Kenya Shillings and should remain valid for 120 days.
4. Complete tender documents (Original and a copy) enclosed in plain sealed outer envelope clearly marked with tender name and tender number should be deposited in the Tender Box located at Ministry Environment and Forestry, Ragati Road, NHIF Building, 11<sup>th</sup> floor and be addressed to the Principal Secretary, Ministry of Environment and Forestry, P.O. Box 30126-00100 Nairobi, Kenya, so as to be received on or before **Tuesday, 6<sup>th</sup> July, 2021 at 10.00 a.m. East African time.**
5. Tenders must be accompanied by a **duly filled tender securing declaration form.**
6. **Mandatory site visit will be on Tuesday, 29<sup>th</sup> June, 2021 from 09:00 A.M to 02.00 PM**
7. Tenders will be opened immediately thereafter at **Ministry of Environment and Forestry boardroom, Ragati Road, NHIF Building, 12<sup>th</sup> floor** in the presence of candidates or their representatives who choose to attend.
8. Large documents that cannot fit in the tender box shall be received and registered at Supply Chain Management services office, Ministry of Environment and Forestry, Ragati Road, NHIF Building, 11<sup>th</sup> floor, Room 1102.
9. The Ministry of Environment and Forestry reserves the right to reject or accept in whole or in part any tender without obligation to give reasons for the decision.

---

For (*Accounting Officer/Procuring Entity*)

SECTION II

INSTRUCTIONS TO TENDERERS

TABLE OF CONTENTS PAGE

CLAUSE		PAGE
1.	General .....	STD/6-STD/8
2.	Tender Documents.....	STD/8-STD/9
3.	Preparation of Tenders .....	STD/9-STD/12
4.	Submission of Tenders .....	STD/12-STD/13
5.	Tender Opening and Evaluation .....	STD/13-STD/15
6.	Award of Contract .....	STD/15-STD/17



## INSTRUCTIONS TO TENDERERS.

1. 1. General/Eligibility/Qualifications/Joint venture/Cost of tendering
  - 1.1 The Employer as defined in the Appendix to Conditions of Contract invites tenders for Works Contract as described in the tender documents. The successful tenderer will be expected to complete the Works by the Intended Completion Date specified in the tender documents.
  - 1.2 All tenderers shall provide the Qualification Information, a statement that the tenderer (including all members of a joint venture and subcontractors) is not associated, or has not been associated in the past, directly or indirectly, with the Consultant or any other entity that has prepared the design, specifications, and other documents for the project or being proposed as Project Manager for the Contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the Works, and any of its affiliates, shall not be eligible to tender.
  - 1.3 All tenderers shall provide in the Form of Tender and Qualification Information, a preliminary description of the proposed work method and schedule, including drawings and charts, as necessary.
  - 1.4 In the event that pre-qualification of potential tenderers has been undertaken, only tenders from pre-qualified tenderers will be considered for award of Contract. These qualified tenderers should submit with their tenders any information updating their original pre-qualification applications or, alternatively, confirm in their tenders that the originally submitted pre-qualification information remains essentially correct as of the date of tender submission.
  - 1.5 Where no pre-qualification of potential tenderers has been done, all tenderers shall include the following information and documents with their tenders , unless otherwise stated:
    - copies of original documents defining the constitution or legal status, place of registration, and principal place of business; written power of attorney of the signatory of the tender to commit the tenderer:
    - total monetary value of construction work performed for each of the last five years:
    - experience in works of a similar nature and size for each of the last five years, and details of work under way or contractually committed; and names and addresses of clients who may be contacted for further information on these contracts;
    - major items of construction equipment proposed to carry out the Contract and an undertaking that they will be available for the Contract.

qualifications and experience of key site management and technical personnel proposed for the Contract and an undertaking that they shall be available for the Contract.

reports on the financial standing of the tenderer, such as profit and loss statements and auditor's reports for the past five years;

evidence of adequacy of working capital for this Contract (access to line(s) of credit and availability of other financial resources);

authority to seek references from the tenderer's bankers;

information regarding any litigation, current or during the last five years, in which the tenderer is involved, the parties concerned and disputed amount; and

proposals for subcontracting components of the Works amounting to more than 10 percent of the Contract Price.

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

the tender shall include all the information listed in clause 1.5 above for each joint venture partner;

the tender shall be signed so as to be legally binding on all partners;

all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;

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

The execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.

1.7 To qualify for award of the Contract, tenderers shall meet the following minimum qualifying criteria;

annual volume of construction work whose value is equal to the estimated annual cash flow for the Contract;

experience as main contractor in the construction of at least one project whose nature and complexity is equivalent to the Works over the last 10 years (to comply with this requirement, works cited should be at least 70 percent complete);

proposals for the timely acquisition (own, lease, hire, etc.) of the essential equipment listed as required for the Works;

a Contract manager with at least five years' experience in works of an equivalent nature and volume, including no less than three years as Manager; and

Liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the Contract, of no less than 4 months of the estimated payment flow under this Contract.

- 1.8 The figures for each of the partners of a joint venture shall be added together to determine the tenderer's compliance with the minimum qualifying criteria of clause 1.7 (a) and (e); however, for a joint venture to qualify, each of its partners must meet at least 25 percent of minimum criteria 1.7 (a), (b) and (e) for an individual tenderer, and the partner in charge at least 40 percent of those minimum criteria. Failure to comply with this requirement will result in rejection of the joint venture's tender. Subcontractors' experience and resources will not be taken into account in determining the tenderer's compliance with the qualifying criteria, unless otherwise stated.
- 1.9 Each tenderer shall submit only one tender, either individually or as a partner in a joint venture. A tenderer who submits or participates in more than one tender (other than as a subcontractor or in cases of alternatives that have been permitted or requested) will cause all the proposals with the tenderer's participation to be disqualified.
- 1.10 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.
- 1.11 The tenderer, at the tenderer's own responsibility and risk, is encouraged to visit and examine the Site of the Works and its surroundings, and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the tenderer's own expense.
- 1.12 The procuring entity's employees, committee members, board members and their relative (spouse and children) are not eligible to participate in the tender.
- 1.13 The price to be charged for the tender document shall not exceed Kshs.5,000/=
- 1.14 The procuring entity shall allow the tenderer to review the tender document free of charge before purchase.

## Tender Documents

- 2.1 The complete set of tender documents comprises the documents listed below and any addenda issued in accordance with Clause 2.4.

These Instructions to Tenderers  
Form of Tender and Qualification Information  
Conditions of Contract  
Appendix to Conditions of Contract  
Specifications  
Drawings  
Bills of Quantities  
Forms of Securities

- 2.2 The tenderer shall examine all Instructions, Forms to be filled and Specifications in the tender documents. Failure to furnish all information required by the tender documents, or submission of a tender not substantially responsive to the tendering documents in every respect will be at the tenderer's risk and may result in rejection of his tender.
- 2.3 A prospective tenderer making an inquiry relating to the tender documents may notify the Employer in writing or by cable, telex or facsimile at the address indicated in the letter of invitation to tender. The Employer will only respond to requests for clarification received earlier than seven days prior to the deadline for submission of tenders. Copies of the Employer's response will be circulated to all persons issued with tendering documents, including a description of the inquiry, but without identifying its source.
- 2.4 Before the deadline for submission of tenders, the Employer may modify the tendering documents by issuing addenda. Any addendum thus issued shall be part of the tendering documents and shall be communicated in writing or by cable, telex or facsimile to all tenderers. Prospective tenderers shall acknowledge receipt of each addendum in writing to the Employer.
- 2.5 To give prospective tenderers reasonable time in which to take an addendum into account in preparing their tenders, the Employer shall extend, as necessary, the deadline for submission of tenders, in accordance with Clause 4.2 here below.

### **Preparation of Tenders**

3.1 All documents relating to the tender and any correspondence shall be in English language.

3.2 The tender submitted by the tenderer shall comprise the following:

These Instructions to Tenderers, Form of Tender, Conditions of Contract, Appendix to Conditions of Contract and Specifications;

Tender Security;

Priced Bill of Quantities ;

Qualification Information Form and Documents;

Alternative offers where invited; and

Any other materials required to be completed and submitted by the tenderers.

3.3 The tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items for which no rate or price is entered by the tenderer will not be paid for when executed and shall be deemed covered by the other rates and prices in the Bill of Quantities. All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause relevant to the Contract, as of 30 days prior to the deadline for submission of tenders, shall be included in the tender price submitted by the tenderer.

- 3.4 The rates and prices quoted by the tenderer shall only be subject to adjustment during the performance of the Contract if provided for in the Appendix to Conditions of Contract and provisions made in the Conditions of Contract.
- 3.5 The unit rates and prices shall be in Kenya Shillings.
- 3.6 Tenders shall remain valid for a period of sixty (60) days from the date of submission. However in exceptional circumstances, the Employer may request that the tenderers extend the period of validity for a specified additional period. The request and the tenderers' responses shall be made in writing. A tenderer may refuse the request without forfeiting the Tender Security. A tenderer agreeing to the request will not be required or permitted to otherwise modify the tender, but will be required to extend the validity of Tender Security for the period of the extension, and in compliance with Clause 3.7 - 3.11 in all respects.
- 3.7 The tenderer shall furnish, as part of the tender, a Tender Security in the amount and form specified in the appendix to invitation to tenderers.
- 3.8 The format of the Tender Security should be in accordance with the form of Tender Security included in Section G - Standard forms or any other form acceptable to the Employer. Tender Security shall be valid for 30 days beyond the validity of the tender.
- 3.9 Any tender not accompanied by an acceptable Tender Security shall be rejected. The Tender Security of a joint venture must define as "Tenderer" all joint venture partners and list them in the following manner: a joint venture consisting of ".....", ".....", and ".....".
- 3.10 The Tender Securities of unsuccessful tenderers will be returned within 28 days of the end of the tender validity period specified in Clause 3.6.
- 3.11 The Tender Security of the successful tenderer will be discharged when the tenderer has signed the Contract Agreement and furnished the required Performance Security.
- 3.12 The Tender Security may be forfeited
- if the tenderer withdraws the tender after tender opening during the period of tender validity;
  - if the tenderer does not accept the correction of the tender price, pursuant to Clause 5.7;
  - in the case of a successful tenderer, if the tenderer fails within the specified time limit to
    - sign the Agreement, or
    - furnish the required Performance Security.

- 3.13 Tenderers shall submit offers that comply with the requirements of the tendering documents, including the basic technical design as indicated in the Drawings and Specifications. Alternatives will not be considered, unless specifically allowed in the invitation to tender. If so allowed, tenderers wishing to offer technical alternatives to the requirements of the tendering documents must also submit a tender that complies with the requirements of the tendering documents, including the basic technical design as indicated in the Drawings and Specifications. In addition to submitting the basic tender, the tenderer shall provide all information necessary for a complete evaluation of the alternative, including design calculations, technical specifications, breakdown of prices, proposed construction methods and other relevant details. Only the technical alternatives, if any, of the lowest evaluated tender conforming to the basic technical requirements shall be considered.
- 3.14 The tenderer shall prepare one original of the documents comprising the tender documents as described in Clause 3.2 of these Instructions to Tenderers, bound with the volume containing the Form of Tender, and clearly marked "ORIGINAL". In addition, the tenderer shall submit copies of the tender, in the number specified in the invitation to tender, and clearly marked as "COPIES". In the event of discrepancy between them, the original shall prevail.
- 3.15 The original and all copies of the tender 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, pursuant to Clause 1.5 (a) or 1.6 (b), as the case may be. All pages of the tender where alterations or additions have been made shall be initialed by the person or persons signing the tender.
- 3.16 Clarification of tenders shall be requested by the tenderer to be received by the procuring entity not later than 7 days prior to the deadline for submission of tenders.
- 3.17 The procuring entity shall reply to any clarifications sought by the tenderer within 3 days of receiving the request to enable the tenderer to make timely submission of its tender.

### Submission of Tenders

- 4.1 The tenderer shall seal the original and all copies of the tender in two inner envelopes and one outer envelope, duly marking the inner envelopes as "ORIGINAL" and "COPIES" as appropriate. The inner and outer envelopes shall:
- be addressed to the Employer at the address provided in the invitation to tender;
  - bear the name and identification number of the Contract as defined in the invitation to tender; and
  - Provide a warning not to open before the specified time and date for tender opening.
- 4.2 Tenders shall be delivered to the Employer at the address specified above not later than the time and date specified in the invitation to tender. However, the Employer may extend the deadline for submission of tenders by issuing an amendment in

accordance with Sub-Clause 2.5 in which case all rights and obligations of the Employer and the tenderers previously subject to the original deadline will then be subject to the new deadline.

- 4.3 Any tender received after the deadline prescribed in clause 4.2 will be returned to the tenderer un-opened.
- 4.4 Tenderers may modify or withdraw their tenders by giving notice in writing before the deadline prescribed in clause 4.2. Each tenderer's modification or withdrawal notice shall be prepared, sealed, marked, and delivered in accordance with clause 3.13 and 4.1, with the outer and inner envelopes additionally marked "MODIFICATION" and "WITHDRAWAL", as appropriate. No tender may be modified after the deadline for submission of tenders.
- 4.5 Withdrawal of a tender between the deadline for submission of tenders and the expiration of the period of tender validity specified in the invitation to tender or as extended pursuant to Clause 3.6 may result in the forfeiture of the Tender Security pursuant to Clause 3.11.
- 4.6 Tenderers may only offer discounts to, or otherwise modify the prices of their tenders by submitting tender modifications in accordance with Clause 4.4 or be included in the original tender submission.

#### Tender Opening and Evaluation

- 5.1 The tenders will be opened by the Employer, including modifications made pursuant to Clause 4.4, in the presence of the tenderers' representatives who choose to attend at the time and in the place specified in the invitation to tender. Envelopes marked "WITHDRAWAL" shall be opened and read out first. Tenderers' and Employer's representatives who are present during the opening shall sign a register evidencing their attendance.
- 5.2 The tenderers' names, the tender prices, the total amount of each tender and of any alternative tender (if alternatives have been requested or permitted), any discounts, tender modifications and withdrawals, the presence or absence of Tender Security, and such other details as may be considered appropriate, will be announced by the Employer at the opening. Minutes of the tender opening, including the information disclosed to those present will be prepared by the Employer.
- 5.3 Information relating to the examination, clarification, evaluation, and comparison of tenders and recommendations for the award of Contract shall not be disclosed to tenderers or any other persons not officially concerned with such process until the award to the successful tenderer has been announced. Any effort by a tenderer to influence the Employer's officials, processing of tenders or award decisions may result in the rejection of his tender.
- 5.4 To assist in the examination, evaluation, and comparison of tenders, the Employer at his discretion, may ask any tenderer for clarification of the tender, including breakdowns of unit rates. The request for clarification and the response shall be in writing or by cable, telex or facsimile 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 arithmetic errors discovered in the evaluation of the tenders in accordance with Clause 5.7.

- 5.5 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender (a) meets the eligibility criteria defined in Clause 1.7;(b) has been properly signed; (c) is accompanied by the required securities; and (d) is substantially responsive to the requirements of the tendering documents. A substantially responsive tender is one which conforms to all the terms, conditions and specifications of the tendering documents, without material deviation or reservation. A material deviation or reservation is one (a) which

affects in any substantial way the scope, quality, or performance of the works; (b) which limits in any substantial way, inconsistent with the tendering documents, the Employer's rights or the tenderer's obligations under the Contract; or (c) whose rectification would affect unfairly the competitive position of other tenderers presenting substantially responsive tenders.

- 5.6 If a tender is not substantially responsive, it will be rejected, and may not subsequently be made responsive by correction or withdrawal of the nonconforming deviation or reservation.
- 5.7 Tenders determined to be substantially responsive will be checked for any arithmetic errors. Errors will be corrected as follows:

where there is a discrepancy between the amount in figures and the amount in words, the amount in words will prevail; and

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 the adjustment will be made to the entry containing that error.

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 Bill of Quantities, the amount as stated in the Form of Tender shall prevail.

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)

The Error Correction Factor shall be applied to all Builders' Work (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.

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 3.11.



- 5.8 The Employer will evaluate and compare only the tenders determined to be substantially responsive in accordance with Clause 5.5.
- 5.9 In evaluating the tenders, the Employer will determine for each tender the evaluated tender price by adjusting the tender price as follows:
- making any correction for errors pursuant to clause 5.7;
  - Excluding provisional sums and the provision, if any, for contingencies in the Bill of Quantities, but including Dayworks where priced competitively.
  - making an appropriate adjustment for any other acceptable variations, deviations, or alternative offers submitted in accordance with clause 3.12; and
  - making appropriate adjustments to reflect discounts or other price modifications offered in accordance with clause 4.6
- 5.10 The Employer reserves the right to accept or reject any variation, deviation, or alternative offer. Variations, deviations, and alternative offers and other factors which are in excess of the requirements of the tender documents or otherwise result in unsolicited benefits for the Employer will not be taken into account in tender evaluation.
- 5.11 The tenderer shall not influence the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. Any effort by the Tenderer to influence the Employer or his employees in his decision on tender evaluation, tender comparison or Contract award may result in the rejection of the tender.
- 5.12 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**

- 6.1 Subject to Clause 6.2, the award of the Contract will be made to the tenderer whose tender has been determined to be substantially responsive to the tendering documents and who has offered the lowest evaluated tender price, provided that such tenderer has been determined to be (a) eligible in accordance with the provision of Clauses 1.2, and (b) qualified in accordance with the provisions of clause 1.7 and 1.8.
- 6.2 Notwithstanding clause 6.1 above, the Employer reserves the right to accept or reject any tender, and to cancel the tendering process and reject all tenders, at any time prior to the award of Contract, without thereby incurring any liability to the affected tenderer or tenderers or any obligation to inform the affected tenderer or tenderers of the grounds for the action.
- 6.3 The tenderer whose tender has been accepted will be notified of the award prior to expiration of the tender validity period in writing or by cable, telex or facsimile. This

notification (hereinafter and in all Contract documents called the “Letter of Acceptance”) will state the sum (hereinafter and in all Contract documents called the “Contract Price”) that the Employer will pay the Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract. At the same time the other tenderers shall be informed that their tenders have not been successful.

The contract shall be formed on the parties signing the contract.

- 6.4 The Agreement will incorporate all agreements between the Employer and the successful tenderer. Within 14 days of receipt the successful tenderer will sign the Agreement and return it to the Employer.
- 6.5 Within 21 days after receipt of the Letter of Acceptance, the successful tenderer shall deliver to the Employer a Performance Security in the amount stipulated in the Appendix to Conditions of Contract and in the form stipulated in the Tender documents. The Performance Security shall be in the amount and specified form
- 6.6 Failure of the successful tenderer to comply with the requirements of clause 6.5 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Tender Security.
- 6.7 Upon the furnishing by the successful tenderer of the Performance Security, the Employer will promptly notify the other tenderers that their tenders have been unsuccessful.
- 6.8 Preference where allowed in the evaluation of tenders shall not be allowed for contracts not exceeding one year (12 months)
- 6.9 The tender evaluation committee shall evaluate the tender within 30 days of the validity period from the date of opening the tender.
- 6.10 The parties to the contract shall have it signed within 30 days from the date of notification of contract award unless there is an administrative review request.
- 6.11 Contract price variations shall not be allowed for contracts not exceeding one year (12 months)
- 6.12 Where contract price variation is allowed, the variation shall not exceed 15% of the original contract price.
- 6.13 Price variation request shall be processed by the procuring entity within 30 days of receiving the request.
- 6.14 The procuring entity may at any time terminate procurement proceedings before contract award and shall not be liable to any person for the termination.
- 6.15 The procuring entity shall give prompt notice of the termination to the tenderers and on request give its reasons for termination within 14 days of receiving the request from any tenderer.

- 6.16 A tenderer who gives false information in the tender document about its qualification or who refuses to enter into a contract after notification of contract award shall be considered for debarment from participating in future public procurement.

#### **Corrupt and Fraudulent practices**

- 7.1 The procuring entity requires that tenderers observe the highest standards of ethics during procurement process and execution of contracts. A tenderer shall sign a declaration that he has not and will not be involved in corrupt and fraudulent practices.

**TENDER**

**EVALUATION CRITERIA**

## TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in **4 stages**, namely:

- Preliminary examination;
- Technical evaluation;
- Financial Evaluation; and
- Recommendation for Award.

### STAGE 1: PRELIMINARY EXAMINATION

This stage of evaluation shall involve examination of the pre-qualification conditions 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 provision of the following: -

ITEM	MANDATORY REQUIREMENT (MR)
MR1	Certified copy of Certificate of Incorporation / Registration from the Registrar of Companies / Businesses;
MR2	Certified copy of CR12 issued not earlier than 6 months from tender opening date;
MR3	Current Category of Registration with National Construction Authority (NCA) in the Road Works; <b>(NCA 7 and above)</b> ,
MR4	Current Class of Practicing Licenses with NCA;
MR5	Dully filled, Signed and Stamped Form of Tender;
MR6	Certified Valid copy of Single Business Permit;
MR7	Copy of Valid Tax Compliance Certificate;
MR8	Dully filled, Signed and Stamped Confidential Business Questionnaire;
MR9	Submission of Original and 1 Copy of tender document;
MR10	Written and signed power of attorney authorizing the person signing the tender document to do so
MR11	Serialization and pagination of all pages sequentially
MR12	Should attach a works programme, safety Management, Mobilization plan and methodology of works to proof that it can complete the above works within 24 weeks contract period if awarded.
MR13	Mandatory site visit form signed and stamped by authorized personnel
MR14	Declaration that the firm has not been debarred from participating in public procurement proceedings <b>(Must be commissioned by a commissioner of Oaths)</b> .
MR15	Declaration that the firm is not guilty of any violation of fair employment laws and practices <b>(Must be commissioned by a commissioner of Oaths)</b> .
MR16	Copy of valid certificate on Access to Government Procurement Opportunities (AGPO) from the National Treasury.
MR17	Duly filled Tender securing declaration form <b>(Attached)</b>

#### Note:

The employer/procuring entity may seek further clarification/confirmation if necessary to confirm authenticity/compliance of any condition of the tender. Further, in case of a discrepancy between the amounts stated in the appendix to instruction to tenderers and the one stated in the advertisement or invitation letter, the bid security shall be taken as the amount in the advertisement/ letter of invitation.

**The tenderers who do not satisfy any of the above requirements shall be considered Non-Responsive and their tenders will not be evaluated further**



## STAGE 2: TECHNICAL EVALUATION

---

### A) Assessment for eligibility

The tender document shall be examined based on clause 2.2 of the Instruction 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 Instruction to Tenderers and adequacy of resources to effectively carry out the subject contract. The tenderers shall be required to fill the Standard Forms provided for the purposes of providing the required information. The tenderers may also attach the required information if they so desire.*

*The award of points for the STANDARD FORMS considered in this section shall be as shown below*

<u>PARAMETER</u>	<u>MAXIMUM POINTS</u>
(i) Key personnel -----	20
(ii) Contract Completed in the last Five (5) years -----	20
(iii) Schedules of on-going projects -----	3
(iv) Schedules of contractors equipment -----	20
(v) Audited Financial Report for the last 3 years -----	15
(vi) Evidence of Financial Resources -----	15
(vii) Name, Address and Telephone of Banks (Contractor to provide) 2	
(viii) Litigation History -----	5
<b>TOTAL</b>	<b><u>100</u></b>

The detailed scoring plan shall be as shown in table 1 below: -

**TABLE 1: Assessment for Eligibility (Main Contractor)**

Item	Description	Point Scored	Max. Point	
i	<b>Key Personnel (Attach evidence)</b>		20	
	<b>Director of the firm ((Building and Civil Engineering Construction Related Field)</b>			
	<ul style="list-style-type: none"> <li>• Holder of degree in relevant Engineering field ..... 4</li> <li>• Holder of diploma in relevant Engineering field ----- 3</li> <li>• Holder of certificate in relevant Engineering field----- 2</li> <li>• Holder of trade test certificate in relevant Engineering field ..... 1</li> <li>• No relevant certificate ----- 0</li> </ul>	<b>4</b>		
	<b>At least 1No. degree/higher diploma holder of key personnel in relevant Engineering field (Building and Civil Engineering Construction Related Field)</b>			<b>6</b>
	<ul style="list-style-type: none"> <li>• With over 10 years relevant experience ----- 6</li> <li>• With over 5 years relevant experience----- 4</li> <li>• With under 5 years relevant experience ----- 3</li> <li>• No relevant certificate ----- 0</li> </ul>			
i	<b>At least 1No Diploma holder of key personnel in relevant Engineering field (Building and Civil Engineering Construction Related Field)</b>		<b>5</b>	
	<ul style="list-style-type: none"> <li>• With over 10 years relevant experience----- 5</li> <li>• With over 5 years relevant experience ----- 3</li> <li>• With under 5 years relevant experience ----- 1</li> <li>• No relevant certificate ----- 0</li> </ul>			
ii	<b>At least 2No Certificate/artisan (trade test certificate in relevant Engineering field) – (Building and Civil Engineering Construction Related Field)</b>		<b>5</b>	
	<ul style="list-style-type: none"> <li>• Artisan with over 10 years relevant experience ..... 2.5</li> <li>• Artisan with under 10 years relevant experience ----- 1</li> <li>• Non skilled worker with over 10 years relevant experience ..... 1</li> <li>• No relevant certificate ----- 0</li> </ul>			
ii	<b>Contract completed in the last five (5) years (Max of 5No. Projects)- Provide Evidence (Attach Award letter, Contract Agreement and Completion Certificate)</b>		<b>20</b>	
	<ul style="list-style-type: none"> <li>• Project of similar nature, complexity or magnitude ----- 4</li> <li>• Project of similar nature but of lower value than the one in consideration ----- 2</li> <li>• No completed project of similar nature ----- 0</li> </ul>			



	<b>On-going projects – Provide Evidence (Award letter and Contract Agreement)</b> <ul style="list-style-type: none"> <li>No Project of similar nature, complexity and magnitude - (Attach Proof)----- 3  Three and below Projects of similar, nature complexity and magnitude -----2  Four and above Projects of similar nature, complexity and magnitude ----- 1</li> </ul>			<b>3</b>
	<b>Schedule of contractors equipment and transport (proof or evidence of ownership/Lease)</b> <b>a) Relevant Transport (pickups, lorries, trucks- at least 2 no.))</b> <ul style="list-style-type: none"> <li>Means of transport (Vehicles) ----- 10</li> <li>No means of transport ----- 0</li> </ul>		10	<b>20</b>
	<b>b) Relevant Tools and Equipment (Excavators, Concrete mixer, poker vibrator, roller, tipper – at least 5 no.)</b> Has relevant equipment for work being tendered ----- 10 <ul style="list-style-type: none"> <li>No relevant equipment for work being tendered ----- 0</li> </ul> <b>Financial report</b>		10	
<b>v</b>	a)Attach Audited financial report (last three (3) years)- 2020,2019,2020 (Signed and Stamped by Auditors) ----- 3 b) Average Annual Turnover <ul style="list-style-type: none"> <li>Average Annual Turn-over equal to or greater than the cost of the project ----- 12  Average Annual Turn-over above 50% but below 100% of the cost of the project ----- 6  Average Annual Turn-over below 50% of the cost of the project ----- 3</li> <li>No audited Financial Statements attached----- 0</li> </ul>			<b>15</b>
	<b>b)Evidence of Financial Resources (cash in hand, lines of credit, over draft facility etc )- Bank/Creditors/Letters dated not earlier than July 2020)</b> Has financial resources to finance the projected <b>monthly cash flow*</b> for three months -----15 Has financial resources equal to the projected <b>monthly cash flow*</b> -----10 Has financial resources less the projected <b>monthly cash flow*</b> ----- 5 <ul style="list-style-type: none"> <li>Has not indicated sources of financial resources ----- 0</li> </ul>			<b>15</b>
<b>vi</b>	<b>Bank Details</b> <ul style="list-style-type: none"> <li>Attached ----- 2</li> <li>Not Attached----- 0</li> </ul> <b>Litigation History/Affidavit signed and Stamped by an Attorney/ Commissioner for Oaths</b> <ul style="list-style-type: none"> <li>Attached ----- 5</li> <li>Not attached----- 0</li> </ul>			<b>2</b>
	<b>TOTAL</b>			<b>100</b>
<b>Any bidder who scores 70 points and above shall be considered for further evaluation</b> <i>*Monthly Cash Flow = Tender Sum/Contract Period</i>				

## **STAGE 3: FINANCIAL EVALUATION**

---

Upon completion of the technical evaluation a detailed financial evaluation shall follow. The financial evaluation shall proceed in the manner described in the Public Procurement and Asset Disposal Act (2015).

The evaluation shall be in **three stages**

Comparison of Rates for major components of Works; and  
Consistency of the Rates.

### **A) Comparison of Rates for major components of Works**

The evaluation committee will compare the rates for major components of works and make note. The committee may require clarifications on major differences by a tenderer and may write to tenderer to confirm the rates.

### **B) 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 III

### CONDITIONS OF CONTRACT

#### Table of Contents

1	Definitions .....	STD/19-STD/20
2	Interpretation.....	STD/20-STD/21
3	Language and Law .....	STD/21
4	Project Manager's Decisions.....	STD/21
5	Delegation.....	STD/21
6	Communications .....	STD/22
7	Sub Contracting .....	STD/22
8	Other Contractors .....	STD/22
9	Personnel .....	STD/22
10	Works.....	STD/22
11	Safety and temporary works .....	STD/22
12	Discoveries .....	STD/23
13	Work Programme .....	STD/3
14	Possession of site .....	STD/23
15	Access to site .....	STD/23
16	Instructions .....	STD/23
17	Extension or Acceleration of completion date .....	STD/23
18	Management Meetings .....	STD/24
19	Early Warning .....	STD/24
20	Defects .....	STD/24
21	Bills of Quantities .....	STD/25
22	Variations .....	STD/25
23	Payment certificates, currency of payments and Advance Payments .....	STD/26-STD/27
24	Compensation events .....	STD/27-STD/29
25	Price Adjustment .....	STD/29-STD/30
26	Retention .....	STD/30
27	Liquidated Damages.....	STD/30
28	Securities .....	STD/30

29	Day Works .....	STD/31
30	Liability and Insurance .....	STD/31-STD/32
31	Completion and taking over .....	STD/32
32	Final Account .....	STD/32
33	Termination .....	STD/32-STD/33
34	Payment upon termination .....	STD/33-STD/34
35	Release from performance .....	STD/34
36	Corrupt gifts and payments of commission	STD/34
37	Settlement of Disputes .....	STD/34-STD/36

# CONDITIONS OF CONTRACT

## Definitions

1.1 In this Contract, except where context otherwise requires, the following terms shall be interpreted as indicated;

“**Bill of Quantities**” means the priced and completed Bill of Quantities forming part of the tender.

“**Compensation Events**” are those defined in Clause 24 hereunder.

“**The Completion Date**” means the date of completion of the Works as certified by the Project Manager, in accordance with Clause 31.

“**The Contract**” means the agreement entered into between the Employer and the Contractor as recorded in the Agreement Form and signed by the parties including all attachments and appendices thereto and all documents incorporated by reference therein to execute, complete, and maintain the Works,

“**The Contractor**” refers to the person or corporate body whose tender to carry out the Works has been accepted by the Employer.

“**The Contractor’s Tender**” is the completed tendering document submitted by the Contractor to the Employer.

“**The Contract Price**” is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

“**Days**” are calendar days; “**Months**” are calendar months.

“**A Defect**” is any part of the Works not completed in accordance with the Contract.

“**The Defects Liability Certificate**” is the certificate issued by Project Manager upon correction of defects by the Contractor.

“**The Defects Liability Period**” is the period named in the Contract Data and calculated from the Completion Date.

“**Drawings**” include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

“**Dayworks**” are Work inputs subject to payment on a time basis for labour and the associated materials and plant.

“**Employer**”, or the “**Procuring entity**” as defined in the Public Procurement Regulations (i.e. Central or Local Government administration, Universities, Public Institutions and Corporations, etc) is the party who employs the Contractor to carry out the Works.

“Equipment” is the Contractor’s machinery and vehicles brought temporarily to the Site for the execution of the Works.

“The Intended Completion Date” is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.

“Materials” are all supplies, including consumables, used by the Contractor for incorporation in the Works.

“Plant” is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.

“Project Manager” is the person named in the Appendix to Conditions of Contract (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract and shall be an “Architect” or a “Quantity Surveyor” registered under the Architects and Quantity Surveyors Act Cap 525 or an “Engineer” registered under Engineers Registration Act Cap 530.

“Site” is the area defined as such in the Appendix to Condition of Contract.

“Site Investigation Reports” are those reports that may be included in the tendering documents which are factual and interpretative about the surface and subsurface conditions at the Site.

“Specifications” means the Specifications of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

“Start Date” is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with the Site possession date(s).

“A Subcontractor” is a person or corporate body who has a Contract with the Contractor to carry out a part of the Work in the Contract, which includes Work on the Site.

“Temporary works” are works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

“A Variation” is an instruction given by the Project Manager which varies the Works.

“The Works” are what the Contract requires the Contractor to construct, install, and turnover to the Employer, as defined in the Appendix to Conditions of Contract.

2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning in English Language unless specifically defined. The Project Manager will provide instructions clarifying queries about these Conditions of Contract.

- 2.2 If sectional completion is specified in the Appendix to Conditions of Contract, reference in the Conditions of Contract to the Works, the Completion Date and the Intended Completion Date apply to any section of the Works (other than references to the Intended Completion Date for the whole of the Works).
- 2.3 The following documents shall constitute the Contract documents and shall be interpreted in the following order of priority;

Agreement,

Letter of Acceptance,

Contractor's Tender,

Appendix to Conditions of Contract,

Conditions of Contract,

Specifications,

Drawings,

Bill of Quantities,

Any other documents listed in the Appendix to Conditions of Contract as forming part of the Contract.

Immediately after the execution of the Contract, the Project Manager shall furnish both the Employer and the Contractor with two copies each of all the Contract documents. Further, as and when necessary the Project Manager shall furnish the Contractor [always with a copy to the Employer] with three [3] copies of such further drawings or details or descriptive schedules as are reasonably necessary either to explain or amplify the Contract drawings or to enable the Contractor to carry out and complete the Works in accordance with these Conditions.

### Language and Law

- 3.1 Language of the Contract and the law governing the Contract shall be English language and the Laws of Kenya respectively unless otherwise stated.

### Project Manager's Decisions

- 4.1 Except where otherwise specifically stated, the Project Manager will decide contractual matters between the Employer and the Contractor in the role representing the Employer.

## 5 Delegation

- 5.1 The Project Manager may delegate any of his duties and responsibilities to others after notifying the Contractor.

## 6 Communications

- 6.1 Communication between parties shall be effective only when in writing. A notice shall be effective only when it is delivered.

## 7 Subcontracting

- 7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.

## 8 Other Contractors

- 8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities etc. as listed in the Appendix to Conditions of Contract and also with the Employer, as per the directions of the Project Manager. The Contractor shall also provide facilities and services for them. The Employer may modify the said List of Other Contractors etc., and shall notify the Contractor of any such modification.

## 9 Personnel

- 9.1 The Contractor shall employ the key personnel named in the Qualification Information, to carry out the functions stated in the said Information or other personnel approved by the Project Manager. The Project Manager will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Qualification Information. If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the Work in the Contract.

## 10 Works

- 10.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings. The Works may commence on the Start Date and shall be carried out in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

## 11 Safety and Temporary Works

- 11.1 The Contractor shall be responsible for the design of temporary works. However before erecting the same, he shall submit his designs including specifications and drawings to the Project Manager and to any other relevant third parties for their approval. No erection of temporary works shall be done until such approvals are obtained.
- 11.2 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary works and all drawings prepared by the Contractor for the execution of the temporary or permanent Works, shall be subject to prior approval by the Project Manager before they can be used.



11.3 The Contractor shall be responsible for the safety of all activities on the Site.

#### Discoveries

12.1 Anything of historical or other interest or of significant value unexpectedly discovered on Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

#### Work Program

13.1 Within the time stated in the Appendix to Conditions of Contract, the Contractor shall submit to the Project Manager for approval a program showing the general methods, arrangements, order, and timing for all the activities in the Works. An update of the program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining Work, including any changes to the sequence of the activities.

The Contractor shall submit to the Project Manager for approval an updated program at intervals no longer than the period stated in the Appendix to Conditions of Contract. If the Contractor does not submit an updated program within this period, the Project Manager may withhold the amount stated in the said Appendix from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue program has been submitted. The Project Manager's approval of the program shall not alter the Contractor's obligations. The Contractor may revise the program and submit it to the Project Manager again at any time. A revised program shall show the effect of Variations and Compensation Events.

#### 14. Possession of Site

14.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Appendix to Conditions of Contract, the Employer will be deemed to have delayed the start of the relevant activities, and this will be a Compensation Event.

#### 15. Access to Site

15.1 The Contractor shall allow the Project Manager and any other person authorized by the Project Manager, access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

#### 16. Instructions

16.1 The Contractor shall carry out all instructions of the Project Manager which are in accordance with the Contract.

#### 17. Extension or Acceleration of Completion Date

17.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a variation is issued which makes it impossible for completion to be

achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining Work, which would cause the Contractor to incur additional cost. The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager in writing for a decision upon the effect of a Compensation Event or variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay caused by such failure shall not be considered in assessing the new (extended) Completion Date.

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

## 18. Management Meetings

- 18.1 A Contract management meeting shall be held monthly and attended by the Project Manager and the Contractor. Its business shall be to review the plans for the remaining Work and to deal with matters raised in accordance with the early warning procedure. The Project Manager shall record the minutes of management meetings and provide copies of the same to those attending the meeting and the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

## 19. Early Warning

- 19.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the Work increase the Contract Price or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.
- 19.2 The Contractor shall cooperate with the Project Manager in making and considering proposals on how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the Work and in carrying out any resulting instructions of the Project Manager.

## 20. Defects

- 20.1 The Project Manager shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a defect and to uncover and test any Work that the Project Manager considers may have a defect. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor, However, if there is no defect found, the cost of uncovering and making good shall be treated as a variation and added to the Contract Price.
- 20.2 The Project Manager shall give notice to the Contractor of any defects before the end of the Defects Liability Period, which begins at Completion, and is defined in the Appendix to Conditions of Contract. The Defects Liability Period shall be extended for as long as defects remain to be corrected.

- 20.3 Every time notice of a defect is given, the Contractor shall correct the notified defect within the length of time specified by the Project Manager's notice. If the Contractor has not corrected a defect within the time specified in the Project Manager's notice, the Project Manager will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

## 21. Bills Of Quantities

- 21.1 The Bills of Quantities shall contain items for the construction, installation, testing and commissioning of the Work to be done by the Contractor. The Contractor will be paid for the quantity of the Work done at the rate in the Bills of Quantities for each item.
- 21.2 If the final quantity of the Work done differs from the quantity in the Bills of Quantities for the particular item by more than 25 percent and provided the change exceeds 1 percent of the Initial Contract price, the Project Manager shall adjust the rate to allow for the change.
- 21.3 If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bills of Quantities.

## 22. Variations

- 22.1 All variations shall be included in updated programs produced by the Contractor.
- 22.2 The Contractor shall provide the Project Manager with a quotation for carrying out the variations when requested to do so. The Project Manager shall assess the quotation, which shall be given within seven days of the request or within any longer period as may be stated by the Project Manager and before the Variation is ordered.
- 22.3 If the work in the variation corresponds with an item description in the Bills of Quantities and if in the opinion of the Project Manager, the quantity of work is not above the limit stated in Clause 21.2 or the timing of its execution does not cause the cost per unit of quantity to change, the rate in the Bills of Quantities shall be used to calculate the value of the variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the variation does not correspond with items in the Bills of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of Work.
- 22.4 If the Contractor's quotation is unreasonable, the Project Manager may order the variation and make a change to the Contract price, which shall be based on the Project Manager's own forecast of the effects of the variation on the Contractor's costs.
- 22.5 If the Project Manager decides that the urgency of varying the Work would prevent a quotation being given and considered without delaying the Work, no quotation shall be given and the variation shall be treated as a Compensation Event.
- 22.6 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

- 22.7 When the Program is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast.

### 23. Payment Certificates, Currency of Payments and Advance Payments

- 23.1 The Contractor shall submit to the Project Manager monthly applications for payment giving sufficient details of the Work done and materials on Site and the amounts which the Contractor considers himself to be entitled to. The Project Manager shall check the monthly application and certify the amount to be paid to the Contractor within 14 days. The value of Work executed and payable shall be determined by the Project Manager.
- 23.2 The value of Work executed shall comprise the value of the quantities of the items in the Bills of Quantities completed; materials delivered on Site, variations and compensation events. Such materials shall become the property of the Employer once the Employer has paid the Contractor for their value. Thereafter, they shall not be removed from Site without the Project Manager's instructions except for use upon the Works.
- 23.3 Payments shall be adjusted for deductions for retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 30 days of the date of issue of each certificate. If the Employer makes a late payment, the Contractor shall be paid simple interest on the late payment in the next payment. Interest shall be calculated on the basis of number of days delayed at a rate three percentage points above the Central Bank of Kenya's average rate for base lending prevailing as of the first day the payment becomes overdue.
- 23.4 If an amount certified is increased in a later certificate or as a result of an award by an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 23.5 Items of the Works for which no rate or price has been entered in will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.
- 23.6 The Contract Price shall be stated in Kenya Shillings. All payments to the Contractor shall be made in Kenya Shillings and foreign currency in the proportion indicated in the tender, or agreed prior to the execution of the Contract Agreement and indicated therein. The rate of exchange for the calculation of the amount of foreign currency payment shall be the rate of exchange indicated in the Appendix to Conditions of Contract. 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 Project Manager shall be notified promptly by the Contractor of an changes in the expected foreign currency requirements of the Contractor during the execution of the Works as indicated in the

Schedule 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.

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

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.

No advance payment may be made before the Contractor has submitted proof of the establishment of deposit or 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.

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:

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

Where:

- R = the amount to be reimbursed
- A = the amount of the advance which has been granted
- X<sup>1</sup> = 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<sup>11</sup> = 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%.

with each reimbursement the counterpart of the directly liable guarantee may be reduced accordingly.

### Compensation Events

24.1 The following issues shall constitute Compensation Events:

The Employer does not give access to a part of the Site by the Site Possession Date stated in the Appendix to Conditions of Contract.

The Employer modifies the List of Other Contractors, etc., in a way that affects the Work of the Contractor under the Contract.

The Project Manager orders a delay or does not issue drawings, specifications or instructions required for execution of the Works on time.

The Project Manager instructs the Contractor to uncover or to carry out additional tests upon the Work, which is then found to have no defects.

The Project Manager unreasonably does not approve a subcontract to be let.

Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to tenderers (including the Site investigation reports), from information available publicly and from a visual inspection of the Site.

The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer or additional work required for safety or other reasons.

Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.

The effects on the Contractor of any of the Employer's risks.

The Project Manager unreasonably delays issuing a Certificate of Completion.

Other compensation events described in the Contract or determined by the Project Manager shall apply.

- 24.2 If a compensation event would cause additional cost or would prevent the Work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.
- 24.3 As soon as information demonstrating the effect of each compensation event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager will assume that the Contractor will react competently and promptly to the event.
- 24.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor not having given early warning or not having co-operated with the Project Manager.
- 24.5 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the Appendix to Conditions of Contract.

- 24.6 The Contractor shall give written notice to the Project Manager of his intention to make a claim within thirty days after the event giving rise to the claim has first arisen. The claim shall be submitted within thirty days thereafter.

Provided always that should the event giving rise to the claim of continuing effect, the Contractor shall submit an interim claim within the said thirty days and a final claim within thirty days of the end of the event giving rise to the claim.

## 25. Price Adjustment

- 25.1 The Project Manager shall adjust the Contract Price if taxes, duties and other levies are changed between the date 30 days before the submission of tenders for the Contract and the date of Completion. The adjustment shall be the change in the amount of tax payable by the Contractor.
- 25.2 The Contract Price shall be deemed to be based on exchange rates current at the date of tender submission in calculating the cost to the Contractor of materials to be specifically imported (by express provisions in the Contract Bills of Quantities or Specifications) for permanent incorporation in the Works. Unless otherwise stated in the Contract, if at any time during the period of the Contract exchange rates shall be varied and this shall affect the cost to the Contractor of such materials, then the Project Manager shall assess the net difference in the cost of such materials. Any amount from time to time so assessed shall be added to or deducted from the Contract Price, as the case may be.
- 25.3 Unless otherwise stated in the Contract, the Contract Price shall be deemed to have been calculated in the manner set out below and in sub-clauses 25.4 and 25.5 and shall be subject to adjustment in the events specified there under;

The prices contained in the Contract Bills of Quantities shall be deemed to be based upon the rates of wages and other emoluments and expenses as determined by the Joint Building Council of Kenya (J.B.C.) and set out in the schedule of basic rates issued 30 days before the date for submission of tenders. A copy of the schedule used by the Contractor in his pricing shall be attached in the Appendix to Conditions of Contract.

Upon J.B.C. determining that any of the said rates of wages or other emoluments and expenses are increased or decreased, then the Contract Price shall be increased or decreased by the amount assessed by the Project Manager based upon the difference, expressed as a percentage, between the rate set out in the schedule of basic rates issued 30 days before the date for submission of tenders and the rate published by the J.B.C. and applied to the quantum of labour incorporated within the amount of Work remaining to be executed at the date of publication of such increase or decrease.

No adjustment shall be made in respect of changes in the rates of wages and other emoluments and expenses which occur after the date of Completion except during such other period as may be granted as an extension of time under clause 17.0 of these Conditions.

- 25.4 The prices contained in the Contract Bills of Quantities shall be deemed to be based upon the basic prices of materials to be permanently incorporated in the Works as

determined by the J.B.C. and set out in the schedule of basic rates issued 30 days before the date for submission of tenders. A copy of the schedule used by the Contractor in his pricing shall be attached in the Appendix to Conditions of Contract.

- 25.5 Upon the J.B.C. determining that any of the said basic prices are increased or decreased then the Contract Price shall be increased or decreased by the amount to be assessed by the Project Manager based upon the difference between the price set out in the schedule of basic rates issued 30 days before the date for submission of tenders and the rate published by the J.B.C. and applied to the quantum of the relevant materials which have not been taken into account in arriving at the amount of any interim certificate under clause 23 of these Conditions issued before the date of publication of such increase or decrease.
- 25.6 No adjustment shall be made in respect of changes in basic prices of materials which occur after the date for Completion except during such other period as may be granted as an extension of time under clause 17.0 of these Conditions.
- 25.7 The provisions of sub-clause 25.1 to 25.2 herein shall not apply in respect of any materials included in the schedule of basic rates.

## 26. Retention

- 26.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the Appendix to Conditions of Contract until Completion of the whole of the Works. On Completion of the whole of the Works, half the total amount retained shall be repaid to the Contractor and the remaining half when the Defects Liability Period has passed and the Project Manager has certified that all defects notified to the Contractor before the end of this period have been corrected.

## 27. Liquidated Damages

- 27.1 The Contractor shall pay liquidated damages to the Employer at the rate stated in the Appendix to Conditions of Contract for each day that the actual Completion Date is later than the Intended Completion Date. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not alter the Contractor's liabilities.
- 27.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rate specified in Clause 23.30

## 28. Securities

- 28.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a reputable bank acceptable to the Employer, and denominated in Kenya Shillings. The Performance Security shall be valid until a date 30 days beyond the date of issue of the Certificate of Completion.



## 29. Dayworks

- 29.1 If applicable, the Dayworks rates in the Contractor's tender shall be used for small additional amounts of Work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
- 29.2 All work to be paid for as Dayworks shall be recorded by the Contractor on Forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the Work being done.
- 29.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

## 30. Liability and Insurance

- 30.1 From the Start Date until the Defects Correction Certificate has been issued, the following are the Employer's risks:

The risk of personal injury, death or loss of or damage to property (excluding the Works, Plant, Materials and Equipment), which are due to;

use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works, or

Negligence, breach of statutory duty or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.

The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in Employer's design, or due to war or radioactive contamination directly affecting the place where the Works are being executed.

- 30.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is the Employer's risk except loss or damage due to;

A defect which existed on or before the Completion Date.

an event occurring before the Completion Date, which was not itself the Employer's risk

The activities of the Contractor on the Site after the Completion Date.

- 30.3 From the Start Date until the Defects Correction Certificate has been issued, the risks of personal injury, death and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risk are Contractor's risks.

The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts stated in the Appendix to Conditions of Contract for the following events;

loss of or damage to the Works, Plant, and Materials;  
loss of or damage to Equipment;  
loss of or damage to property (except the Works, Plant, Materials, and  
Equipment) in connection with the Contract, and  
Personal injury or death.

- 30.4 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation required to rectify the loss or damage incurred.
- 30.5 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.
- 30.6 Alterations to the terms of insurance shall not be made without the approval of the Project Manager. Both parties shall comply with any conditions of insurance policies.

### 31. Completion and taking over

- 31.1 Upon deciding that the Works are complete, the Contractor shall issue a written request to the Project Manager to issue a Certificate of Completion of the Works. The Employer shall take over the Site and the Works within seven [7] days of the Project Manager's issuing a Certificate of Completion.

### 32. Final Account

- 32.1 The Contractor shall issue the Project Manager with a detailed account of the total amount that the Contractor considers payable to him by the Employer under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 30 days a schedule that states the scope of the corrections or additions that are necessary. If the final account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a Payment Certificate. The Employer shall pay the Contractor the amount due in the Final Certificate within 60 days.

### 33. Termination

- 33.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. These

Fundamental breaches of Contract shall include, but shall not be limited to, the following;

the Contractor stops work for 30 days when no stoppage of work is shown on the current program and the stoppage has not been authorized by the Project Manager;

the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days;

the Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation;

a payment certified by the Project Manager is not paid by the Employer to the Contractor within 30 days (for Interim Certificate) or 60 days (for Final Certificate) of issue.

the Project Manager gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;

The Contractor does not maintain a security, which is required.

- 33.2 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under Clause 33.1 above, the Project Manager shall decide whether the breach is fundamental or not.
- 33.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.
- 33.4 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible. The Project Manager shall immediately thereafter arrange for a meeting for the purpose of taking record of the Works executed and materials, goods, equipment and temporary buildings on Site.

#### **34. Payment Upon Termination**

- 34.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the Work done and materials ordered and delivered to Site up to the date of the issue of the certificate. Additional liquidated damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable by the Contractor.
- 34.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the Work done, materials ordered, the reasonable cost of removal of equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works.
- 34.3 The Employer may employ and pay other persons to carry out and complete the Works and to rectify any defects and may enter upon the Works and use all materials on the Site, plant, equipment and temporary works.
- 34.4 The Contractor shall, during the execution or after the completion of the Works under this clause remove from the Site as and when required, within such reasonable time as the Project Manager may in writing specify, any temporary buildings, plant, machinery, appliances, goods or materials belonging to or hired by him, and in default

the Employer may (without being responsible for any loss or damage) remove and sell any such property of the Contractor, holding the proceeds less all costs incurred to the credit of the Contractor.

Until after completion of the Works under this clause the Employer shall not be bound by any other provision of this Contract to make any payment to the Contractor, but upon such completion as aforesaid and the verification within a reasonable time of the accounts therefore the Project Manager shall certify the amount of expenses properly incurred by the Employer and, if such amount added to the money paid to the Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Contract the difference shall be a debt payable to the Employer by the Contractor; and if the said amount added to the said money be less than the said total amount, the difference shall be a debt payable by the Employer to the Contractor.

### 35. Release from Performance

- 35.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop Work as quickly as possible after receiving this certificate and shall be paid for all Work carried out before receiving it.

### Corrupt gifts and payments of

**commission** The Contractor shall not;

Offer or give or agree to give to any person in the service of the

Employer any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for the Employer or for showing or forbearing to show favour

or disfavor to any person in relation to this or any other contract for the Employer.

Enter into this or any other contract with the Employer in connection with which commission has been paid or agreed to be paid by him or on his behalf or to his knowledge, unless before the Contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Employer.

Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the provisions of the Public Procurement Regulations issued under The Exchequer and Audit Act Cap 412 of the Laws of Kenya.

### Settlement Of Disputes

- 37.1 In case any dispute or difference shall arise between the Employer or the Project Manager on his behalf and the Contractor, either during the progress or after the completion or termination of the Works, such dispute shall be notified in writing by either party to the other with a request to submit it to arbitration and to concur in the appointment of an Arbitrator within thirty days of the notice. The dispute shall be

referred to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the Chairman or Vice Chairman of any of the following professional institutions;

Architectural Association of Kenya

Institute of Quantity Surveyors of Kenya

Association of Consulting Engineers of Kenya

Chartered Institute of Arbitrators (Kenya Branch)

Institution of Engineers of Kenya

On the request of the applying party. The institution written to first by the aggrieved party shall take precedence over all other institutions.

- 37.2 The arbitration may be on the construction of this Contract or on any matter or thing of whatsoever nature arising there under or in connection therewith, including any matter or thing left by this Contract to the discretion of the Project Manager, or the withholding by the Project Manager of any certificate to which the Contractor may claim to be entitled to or the measurement and valuation referred to in clause 23.0 of these conditions, or the rights and liabilities of the parties subsequent to the termination of Contract.
- 37.3 Provided that no arbitration proceedings shall be commenced on any dispute or difference where notice of a dispute or difference has not been given by the applying party within ninety days of the occurrence or discovery of the matter or issue giving rise to the dispute.
- 37.4 Notwithstanding the issue of a notice as stated above, the arbitration of such a dispute or difference shall not commence unless an attempt has in the first instance been made by the parties to settle such dispute or difference amicably with or without the assistance of third parties. Proof of such attempt shall be required.
- 37.5 Notwithstanding anything stated herein the following matters may be referred to arbitration before the practical completion of the Works or abandonment of the Works or termination of the Contract by either party:
- 37.5.1 The appointment of a replacement Project Manager  
Upon the said person ceasing to act.
- 37.5.2 Whether or not the issue of an instruction by the Project Manager is empowered by these Conditions.
- 37.5.3 Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
- 37.5.4 Any dispute or difference arising in respect of war risks or war damage.

- 37.6 All other matters shall only be referred to arbitration after the completion or alleged completion of the Works or termination or alleged termination of the Contract, unless the Employer and the Contractor agree otherwise in writing.
- 37.7 The Arbitrator shall, without prejudice to the generality of his powers, have powers to direct such measurements, computations, tests or valuations as may in his opinion be desirable in order to determine the rights of the parties and assess and award any sums which ought to have been the subject of or included in any certificate.
- 37.8 The Arbitrator shall, without prejudice to the generality of his powers, have powers to open up, review and revise any certificate, opinion, decision, requirement or notice and to determine all matters in dispute which shall be submitted to him in the same manner as if no such certificate, opinion, decision requirement or notice had been given.
- 37.9 The award of such Arbitrator shall be final and binding upon the parties.

SECTION IV - APPENDIX TO CONDITIONS OF CONTRACT

THE EMPLOYER IS

Name: **MINISTRY OF ENVIRONMENT AND FORESTRY**

Address: **P. O. BOX 30126-00100,**

Name of Authorized Representative: **THE PRINCIPAL SECRETARY**

Telephone:

Facsimile:

The Project Manager is

Name: **WORKS SECRETARY, STATE DEPARTMENT OF PUBLIC WORKS**

Address: **P. O BOX 30743-00100 NAIROBI.**

Telephone:

Facsimile:

The name (and identification number) of the Contract is ***PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METEOROLOGICAL DEPARTMENT, NAIROBI.***

W.P. ITEM NO. D110/NB/NB/2001 JOB NO. 10686D

The Works consist of ***PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METEOROLOGICAL DEPARTMENT, NAIROBI.***

The Start Date shall be **AGREED WITH THE PROJECT MANAGER.**

The Intended Completion Date for the whole of the Works shall be **24 WEEKS FROM DATE OF POSSESSION.**

The following documents also form part of the Contract:  
**AS LISTED IN CLAUSE 2.3 OF CONDITIONS OF CONTRACT.**

The Contractor shall submit a revised program for the Works within   7   days of delivery of the Letter of Acceptance.

The Site Possession Date shall be **AGREED WITH THE PROJECT MANAGER.**

The Site is located at Ngong RD Dagoretti Corner Nairobi County

The Defects Liability period is            365            days.

Other Contractors, utilities etc., to be engaged by the Employer on the Site Include those for the execution of;

Electrical Works  
Mechanical Works

The minimum cover for insurance of the Works and of Plant and Materials in respect of the Contractor's faulty design is:

The minimum cover for loss or damage to Equipment is **Kshs 400,000.00**

The minimum for insurance of other property is **Kshs 600,000.00**

The minimum cover for personal injury or death insurance

For the Contractor's employees is **Kshs 500,000.00**

And for other people is **Kshs500,000.00**

NONE (ONLY AS LISTED IN CLAUSE 24 OF THE CONDITIONS OF CONTRACT.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The period between Program updates is **7** days.

The amount to be withheld for late submission of an updated Program is **WHOLE CERTIFICATE**

The proportion of payments retained is **10%** percent. The Limit of Retention is **10%** percent.

The Price Adjustment Clause **SHALL NOT** apply

The liquidated damages for the whole of the Works is **Kshs. 20,000.00**\_(per week or part thereof)

The Performance Security shall be for the following minimum amounts equivalent as a percentage of the Contract Price-----**5%**----- percent (%)

The Completion Period for the Works is **\_24** (Weeks]

The rate of exchange for calculation of foreign currency payments is **NOT APPLICABLE**



The schedule of basic rates used in pricing by the Contractor is as attached [*Contractor to attach*].PRICE INCREASE WILL BE BASED ON JBC INDECES

Advance Payment **SHALL NOT BE** granted.

Prices for V.A.T. should be given WITHIN THE RATES

Copies of tender documents: only one copy will be required.

## SECTION V - SPECIFICATIONS

### Notes for preparing Specifications

- 1.0 Specifications must be drafted to present a clear and precise statement of the required standards of materials, and workmanship for tenderers to respond realistically and competitively to the requirements of the Employer and ensure responsiveness of tenders. The Specifications should require that all materials, plant, and other supplies to be permanently incorporated in the Works be new, unused, of the most recent or current models, and incorporating all recent improvements in design and materials unless provided otherwise in the Contract. Where the Contractor is responsible for the design of any part of the permanent Works, the extent of his obligations must be stated.
- 2.0 Specifications from previous similar projects are useful and may not be necessary to re-write specifications for every Works Contract.
- 3.0 There are considerable advantages in standardizing **General Specifications** for repetitive Works in recognized public sectors, such as highways, urban housing, irrigation and water supply. The General Specifications should cover all classes of workmanship, materials and equipment commonly involved in constructions, although not necessarily to be used in a particular works contract. Deletions or addenda should then adapt the General Specifications to the particular Works.
- 4.0 Care must be taken in drafting Specifications to ensure they are not restrictive. In the Specifications of standards for materials, plant and workmanship, existing Kenya Standards should be used as much as possible, otherwise recognized international standards may also be used.
- 5.0 The Employer should decide whether technical solutions to specified parts of the Works are to be permitted. Alternatives are appropriate in cases where obvious (and potentially less costly) alternatives are possible to the technical solutions indicated in tender documents for certain elements of the Works, taking into consideration the comparative specialized advantage of potential tenderers.

The Employer should provide a description of the selected parts of the Works with appropriate reference to Drawings, Specifications, Bills of Quantities, and Design or Performance criteria, stating that the alternative solutions shall be at least structurally and functionally equivalent to the basic design parameters and Specifications.

Such alternative solutions shall be accompanied by all information necessary for a complete evaluation by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, proposed construction methodology, and other relevant details. Technical alternatives permitted in this manner shall be considered by the Employer each on its own merits and independently of whether the tenderer has priced the item as described in the Employer's design included with the tender documents.



## SECTION VIII – STANDARD FORMS

- (i) Form of Invitation for Tenders
- (ii) Form of Tender
- Letter of Acceptance
- (iv) Form of Agreement
- (v) Form of Tender Security
- (vi) Performance Bank Guarantee
- Bank Guarantee for Advance Payment
- Qualification Information
- Tender Questionnaire
- Confidential Business Questionnaire
- (x) Statement of Foreign Currency Requirement
- Details of Sub-Contractors

# FORM OF INVITATION FOR TENDERS

\_\_\_\_\_ [date]

To: \_\_\_\_\_ [name of Contractor]

\_\_\_\_\_ [address]

\_\_\_\_\_

\_\_\_\_\_

Dear Sirs:

Reference: \_\_\_\_\_ [Contract Name]

You have been pre-qualified to tender for the above project.

We hereby invite you and other pre-qualified tenderers to submit a tender for the execution and completion of the above Contract.

A complete set of tender documents may be purchased by you from \_\_\_\_

\_\_\_\_\_ [mailing address, cable/telex/facsimile numbers]. Upon

payment of a non-refundable fee of Kshs \_\_\_\_\_

All tenders must be accompanied by \_\_\_\_\_ number of copies of the same and a security in the form and amount specified in the tendering documents, and must be delivered to

\_\_\_\_\_ [address and location]

at or before \_\_\_\_\_ (time and date). Tenders will be opened immediately thereafter, in the presence of tenderers' representatives who choose to attend.

Please confirm receipt of this letter immediately in writing by cable/facsimile or telex.

Yours faithfully,

\_\_\_\_\_ Authorized Signature

\_\_\_\_\_ Name and Title

# FORM OF TENDER

TO:..... [Name of Employer)  
\_\_\_\_\_ [Date] \_\_\_\_\_ [Name of Contract]

Dear Sir,

In accordance with the Conditions of Contract, Specifications, Drawings 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]

We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Project Manager'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 until 120 days after tender opening \_\_\_\_\_ [Insert date], and it shall remain binding upon us and may be accepted at any time before that date.

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.

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 Employer]  
of \_\_\_\_\_ [Address of Employer]

Witness; Name \_\_\_\_\_

Address \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

**LETTER OF ACCEPTANCE [letterhead paper of the Employer]**

\_\_\_\_\_ [date]

To: \_\_\_\_\_  
[name of the Contractor]

\_\_\_\_\_  
[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][Kenya Shillings \_\_\_\_\_ (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 .....

Name and Title of Signatory .....

Attachment : Agreement

# FORM OF AGREEMENT

THIS AGREEMENT, made the \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_  
between \_\_\_\_\_ of [or whose registered office is situated  
at] \_\_\_\_\_  
(hereinafter called “the Employer”) of the one part AND \_\_\_\_\_ of  
[or whose registered office is situated at] \_\_\_\_\_  
(hereinafter called “the Contractor”) of the other part.

WHEREAS THE Employer is desirous that the Contractor executes

\_\_\_\_\_ *(name and identification number of Contract)* (hereinafter called “the Works”) located  
at \_\_\_\_\_ *[Place/location of the Works]* and the Employer has accepted the tender  
submitted by the Contractor for the execution and completion of such Works and the remedying of any  
defects therein for the Contract Price of Kshs \_\_\_\_\_ *[Amount in figures]*, Kenya  
Shillings \_\_\_\_\_ *[Amount in words]*.

NOW THIS AGREEMENT WITNESSETH as follows:

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

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

- Letter of Acceptance
- Form of Tender
- Conditions of Contract Part I
- Conditions of Contract Part II and Appendix to  
Conditions of Contract
- Specifications
- Drawings
- Priced Bills of Quantities

In consideration of the payments to be made by the Employer to the Contractor as hereinafter  
mentioned, the Contractor hereby 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.

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 the 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 \_\_\_\_\_

Binding Signature of Contractor \_\_\_\_\_

In the presence of (i) Name \_\_\_\_\_

Address \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Signature \_\_\_\_\_

FORM OF TENDER SECURITY

WHEREAS .....(hereinafter called “the Tenderer”) has submitted his tender dated ..... for the construction of .....  
..... (name of Contract)

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:

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

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

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

\_\_\_\_\_  
[date]

\_\_\_\_\_  
[signature of the Bank]

\_\_\_\_\_  
[witness]

\_\_\_\_\_  
[seal]

PERFORMANCE BANK GUARANTEE

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 of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR \_\_\_\_\_

Name of Bank \_\_\_\_\_

Address \_\_\_\_\_

Date \_\_\_\_\_

**BANK GUARANTEE FOR ADVANCE PAYMENT**

To: \_\_\_\_\_ [name of Employer] \_\_\_\_\_ (Date)  
\_\_\_\_\_ [address of Employer]

Gentlemen,

Ref: \_\_\_\_\_ [name of Contract]

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

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

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

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

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

Yours faithfully,

Signature and Seal \_\_\_\_\_

Name of the Bank or financial institution \_\_\_\_\_

Address \_\_\_\_\_

Date \_\_\_\_\_

Witness: Name: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# QUALIFICATION INFORMATION

## Individual Tenderers or Individual Members of Joint Ventures

1.1 Constitution or legal status of tenderer (attach copy or Incorporation Certificate);  
Place of registration: \_\_\_\_\_

Principal place of business \_\_\_\_\_

Power of attorney of signatory of tender \_\_\_\_\_

1.2 Total annual volume of construction work performed in the last five years

Year	Volume	
	Currency	Value

1.3 Work performed as Main Contractor on works of a similar nature and volume over the last five years. Also list details of work under way or committed, including expected completion date.

Project name	Name of client and contact person	Type of work performed and year of completion	Value of performed and	Contract

1.4 Major items of Contractor's Equipment proposed for carrying out the Works. List all information requested below.

Item of Equipment	Description, Make and age (years)	Condition (new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
(etc .)			

- 1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract. Attach biographical data.

Position	Name	Years of experience (general)	Years of experience in proposed position
Project Manager			
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
(etc.)			

- 1.6 Financial reports for the last five years: balance sheets, profit and loss statements, auditor's reports, etc. List below and attach copies.

\_\_\_\_\_

\_\_\_\_\_

- 1.7 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of supportive documents.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- 1.8 Name, address and telephone, telex and facsimile numbers of banks that may provide reference if contacted by the Employer.

\_\_\_\_\_

\_\_\_\_\_

- 1.9 Statement of compliance with the requirements of Clause 1.2 of the Instructions to Tenderers.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- 1.10 Proposed program (work method and schedule) for the whole of the Works.

## 2 Joint Ventures

- 2.4 The information listed in 1.1 – 1.10 above shall be provided for each partner of the joint venture.

- 2.5 The information required in 1.11 above shall be provided for the joint venture.

- 2.6 Attach the power of attorney of the signatory(ies) of the tender authorizing signature of the tender on behalf of the joint venture
- 2.7 Attach the Agreement among all partners of the joint venture ( and which is legally binding on all partners), which shows that:

all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;

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; and

the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge.



TENDER QUESTIONNAIRE

Please fill in block letters.

Full names of tenderer

.....

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

.....

Telephone number (s) of tenderer

.....

Telex address of tenderer

.....

Name of tenderer's representative to be contacted on matters of the tender during the tender period

.....

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

.....

.....

\_\_\_\_\_  
Signature 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: K. pound.....

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:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details</i>	<i>Shares</i>
1.	.....			
2.	.....			
3.	.....			

*Part 2(c) – Registered Company:*

Private or public.....

State the nominal and issued capital of the Company-

Nominal Kshs.....

Issued Kshs.....

Give details of all directors as follows:

Name in full . Nationality. Citizenship Details\*. Shares.

1.....

2.....

3.....

4.....

*Part 2(d) – Interest in the Firm:*

Is there any person / persons in .....(Name of Employer) who has interest in this firm?  
Yes/No.....(Delete as necessary)

I certify that the information given above is correct.

.....  
(Title) (Signature)

(Date)

Attach proof of citizenship

STATEMENT OF FOREIGN CURRENCY REQUIREMENTS

(See Clause 23] 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 21 of the Conditions of Contract, which is attached hereto, the following percentage:

(Figures)..... (Words)..... of the Contract Sum, (Less Fluctuations) 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 Fluctuations.

\_\_\_\_\_  
(Signature of Tenderer)

DETAILS OF SUB-CONTRACTORS

If the Tenderer wishes to sublet any portions of the Works under any heading, he must give below details of the sub-contractors he intends to employ for each portion.

Failure to comply with this requirement may invalidate the tender.

(1) Portion of Works to be sublet: .....

[i] Full name of Sub-contractor  
and address of head office: .....

.....

Sub-contractor's experience  
of similar works carried out  
in the last 3 years with  
Contract value: .....

.....

.....

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

Full name of sub-contractor  
and address of head office: .....

.....

.....

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

.....

\_\_\_\_\_  
[Signature of Tenderer)

\_\_\_\_\_  
Date

LETTER OF NOTIFICATION OF AWARD

Address of Procuring Entity

\_\_\_\_\_  
\_\_\_\_\_

To: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

RE: Tender No. \_\_\_\_\_

Tender Name \_\_\_\_\_

This is to notify that the contract/s stated below under the above mentioned tender have been awarded to you.

\_\_\_\_\_  
\_\_\_\_\_

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

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

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

(FULL PARTICULARS) \_\_\_\_\_  
\_\_\_\_\_

SIGNED FOR ACCOUNTING OFFICER

**TENDER SECURING DECLARATION FORM**

[The Tenderer shall complete this Form in accordance with the instructions indicated]

Date: [insert date (as day, month and year) of Proposal Submission] Tender No. [insert number of bidding process]

To: [insert complete name of Client]

I, the undersigned, declare that:

I understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

I accept that we will automatically be suspended from being eligible for bidding in any contract with the Client for the period of time of **2years** starting on [insert date], if I am in breach of my obligation(s) under the bid conditions, because I –

have withdrawn my Bid during the period of bid validity specified in the Information to Consultants; or

having been notified of the acceptance of my Bid by the Client during the period of bid validity, fail or refuse to execute the Contract, if required, or

I understand that this Bid Securing Declaration shall expire if I am not the Successful Bidder, upon the earlier of:

My receipt of a copy of your notification of the name of the successful Bidder; or

thirty days after the expiration of validity of my Tender.

Signed: [.....)

Dated on ..... day of ..... , ..... [insert date of signing]

# SPECIAL SPECIFICATIONS



## SECTION I

### GENERAL

#### DESCRIPTION OF WORKS

##### Scope

Access road and parking  
Storm Water Drainage  
Associated Civil Works

##### Location

The works are located at **Ngong RD Dagoretti Corner Nairobi County**  
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.

The site can be approached by road via Mombasa Voi Road.  
**The Resident Engineer's House.**

The contract does not allow for Resident Engineer's office

##### 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.

##### Site Office

There is a provision for in this contract. The contractor to construct it as per the specifications

##### 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.

#### THE MANAGEMENT OF THE CONTRACT

The Chief Engineer (Structural), State Department of Public Works, will be responsible for the contract management and site supervision.

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

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. Re-instatement 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.

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.

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.

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.

#### **04 PROGRAMMES FOR EXECUTION OF THE WORKS**

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

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.

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.

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.

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.

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.

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.

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, sum 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.

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.

### TEMPORARY WORKS

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.

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.

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

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.

### 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.

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.

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.

The Site Agent to be a Registered Engineer.

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.

### NOTICE OF OPERATIONS

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.

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.

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.

### SETTING OUT

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.

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.

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

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 or levels of the Contractor's basic setting out.

### HEALTH, SAFETY ON SITE AND WELFARE

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.

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.

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.

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.

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.

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.

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.

**Welfare facilities:**

The Contractor SHALL NOT provide welfare facilities.

**PRIVATELY OWNED AND PUBLIC UTILITY SERVICES**

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.

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.

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 of services.

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.

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.

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.

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.

## EXISTING ROADS AND ACCESSES

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.

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.

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.

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.

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.

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

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.

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.

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.



The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1<sup>st</sup> 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 11<sup>th</sup> September 2003 operational from 1<sup>st</sup> 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 complied with.

This item SHALL be priced at the Grand Summary page.

## WATER SUPPLY

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.

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.

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.

## LIGHTING, POWER AND TELEPHONE

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.

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.

## WORKING AREA

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.



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.

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

### CO-ORDINATION OF THE WORKS

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.

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.

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.

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.

### COPIES OF ORDERS AND TEST CERTIFICATES

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 work.

The Contractor shall deposit with the Engineer samples of materials and manufactured articles including the manufacturer's specification, when and where appropriate.

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.

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.

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.

#### **PROGRESS PHOTOGRAPHS AND RECORD DRAWINGS**

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

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

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

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

#### **SURVEY EQUIPMENT FOR THE ENGINEER**

The Contract has no provision for the supply of survey equipment

The Contractor will provide two experienced chainmen for the assistance of the Engineer in checking the setting out of the works.

#### **MAINTENANCE AND INSURANCE OF BUILDINGS**

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.

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.

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.

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.

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.

□ → ~~□~~ □                      □ □                      □ □                      □ □                      □ □                      □ □

he 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.

### SIGNBOARDS

The Contractor to provide Signboards for the project.

### SITE MEETINGS

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

# MATERIALS SPECIFICATIONS

# CONCRETE WORKS

## 1702. DEFINITIONS

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

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.

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.

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

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

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.

'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.

'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.

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.

## 1703 a CEMENT

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.

The weight of magnesium oxide in the cement shall not exceed 5% and the content of total sulphur expressed as SO<sub>3</sub>, shall not exceed 3.5%.

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

TABLE 1703 b-1

Type of Cement	Strength at 3 days N/mm <sup>2</sup>	Strength at 7 days N/mm <sup>2</sup>	Strength at 28 days N/mm <sup>2</sup>
Ordinary Portland Cement Rapid	17.5	6.5	38.0
Rapid Hardening Cement	23.0	31.0	46.0

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.

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

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.

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.

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.

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.



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.

#### 1703 b FINE AGGREGATE

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.

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.

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.

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.

Sulphate soluble in a 10 per cent solution by weight of hydrochloric acid shall not exceed 0.4 per cent by weight expressed as  $SO_3$ , Subject also to the further restriction given on total sulphate content in Clause 1703 d.

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

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.

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.

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%.

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.

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:

TABLE 1703 c-1

AIR CONTENT	<3%	3%-4%	4%-5%	5%-6%
Additional Cement per m <sup>3</sup> concrete (kg)	0	30	56	104

When an air entraining agent is used, the air content shall in no case exceed 6% by volume in the freshly mixed concrete.

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.

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%.

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

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.

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

Test Size	Percentage by weight passing			
	Normal size of single-size aggregate			
	40mm	20mm	15mm	10mm
40mm	85-100	100	-	-
20mm	0-20	80-100	100	-
15mm	-	-	85-100	100
10mm	-	0-20	0-45	100
5mm	-	0-5	0-10	0-20
2.5mm	-	0-2	0-2	0-5

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 1703 d-2

Test Service	Percentage by weight passing		
	Normal size of Graded Aggregate		
	40mm to 5mm	20mm-5mm	15mm-5mm
40mm	95-100	100	-
20mm	30-70	95-100	100
15mm	-	-	90-100
5mm	0-5	0-10	0-10

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

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

Soundness: After 5 cycles of the test in AASHTO T104 the aggregate shall not show a weight loss of more than 12 per cent.

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.

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.

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 50kN.

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.

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%.

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 ion 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.

Sulphate soluble in a 10 per cent solution by weight of hydrochloric acid shall not exceed 0.4 per cent by weight expressed as SO<sub>3</sub>, provided that the total sulphate content expressed as SO<sub>3</sub> 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.

TESTING OF AGGREGATE

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.

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.

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

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.

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.

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.

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.

1703 f. STORAGE OF AGGREGATES

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

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.

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

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

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

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

1704 a CLASSIFICATION OF CONCRETE MIXES

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.

□ ~~→~~ □                      □                      □                      □                      □  
concrete Mix by proportion or prescribed mix.

□ ~~→~~ □                      □                      □                      □                      □  
uaranteed strength concrete or designed mix.

The class of concrete is denoted by a number for characteristic strength in  $N/mm^2$ . 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  $30 N/mm^2$  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.

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.

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

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.

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.

The maximum cement content shall not exceed  $500\text{kg/m}^3$  or as otherwise described in the contract or directed by the Engineer. Cement contents in excess of  $500\text{kg/m}^3$  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  $400\text{kg/m}^3$  or more, measures to reduce temperature, such as selection of the cement type with slower release of heat of hydration may be considered.

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 ( $\text{kg/m}^3$ )**

Exposure	Nominal maximum size of aggregate (mm)								
	Plain concrete			Reinforced concrete			Prestressed concrete		
	40	20	10	40	20	10	40	20	10
Moderate	220	250	300	260	290	340	300	300	340
Intermediate	240	280	330	290	320	370	310	330	370
Severe	270	310	360	320	400	410	320	400	410

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.

- 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.

1704 c GUARANTEED STRENGTH CONCRETE (DESIGN MIXES)

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.

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

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

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.

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

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.

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

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.

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.

$\bar{f}_{cm}$        $\bar{f}_{cm}$        $\bar{f}_{cm}$        $\bar{f}_{cm}$        $\bar{f}_{cm}$

he 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.

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**

Class of concrete	Nominal Strength (N/mm <sup>2</sup> )	Maximum nominal size aggregate (mm)	Maximum water/cement ratio		Trial mixes Target Mean Strength (N/mm <sup>2</sup> )	Early works test cubes	
			A	B		Any one cube (N/mm <sup>2</sup> )	Ave. of any group of 4 cubes (N/mm <sup>2</sup> )
10/75	10	75	0.60	0.55	13.5	8.5	13.3
15/75	15	75	0.60	0.50	21.5	12.8	20.0
15/40	15	40	0.60	0.50	21.5	12.8	20.0
15/20	15	20	0.57	0.50	21.5	12.8	20.0
20/40	20	40	0.55	0.48	31.5	17.0	27.5
20/20	20	20	0.53	0.48	31.5	17.0	27.5
20/10	20	10	0.50	0.48	31.5	17.0	27.5
25/40	25	40	0.52	0.48	36.5	21.3	32.5
25/20	25	20	0.50	0.46	36.5	21.3	32.5
25/10	25	10	0.48	0.46	36.5	21.3	32.5
30/40	30	40	0.50	0.46	41.5	25.5	37.5
30/20	30	20	0.48	0.45	41.5	25.5	37.5
30/10	30	10	0.47	0.45	41.5	25.5	37.5
40/20	40	20	0.46	0.43	51.5	34.0	47.5
40/10	40	10	0.45	0.43	51.5	34.0	47.5

Note: Under water/cement ratio, column A applies to moderate and intermediate Exposure, and column B applies to severe exposure.

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

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.

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.

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.

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.

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  $1500\text{kg/m}^3$ . 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.

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.

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 1m<sup>3</sup> ORDINARILY STRUCTURAL CONCRETE

Grade of Concrete	Normal max. Size of aggregate (mm)						
		40		20		10	
	Limits to slump (mm)	50-100	100-150	25-75	75-125	15-25	25-50
10	Cement(kg)	210	230	240	260	-	-
	Total Aggr(kg)	1900	1850	1850	1800	-	-
	Sand (%)	30-40	30-45	35-45	35-50		
15	Cement(kg)	250	270	280	310	-	-
	Total Aggr(kg)	1850	1800	1800	1750	-	-
	Sand (%)	30-40	35-45	35-45	35-50		
20	Cement(kg)	300	320	320	350	360	410
	Total Aggr(kg)	1850	1750	1800	1750	1750	1650
	Coarse Sand (%)	35	40	40	45	50	55
	Medium sand(%)	30	35	35	40	45	50
	Fine Sand (%)	30	30	30	35	40	45
25	Cement(kg)	340	360	360	390	400	450
	Total Aggr(kg)	1800	1750	1750	1700	1700	1600
	Coarse Sand (%)	35	40	40	45	50	55
	Medium sand(%)	30	35	35	40	45	50
	Fine Sand (%)	30	30	30	35	40	45
30	Cement(kg)	370	390	400	430	460	510
	Total Aggr(kg)	1750	1700	1700	1650	1650	1550
	Coarse Sand (%)	35	40	40	50	50	55
	Medium sand(%)	30	35	35	40	45	50
	Fine Sand (%)	30	30	30	35	40	45

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.

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.

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%.

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.

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.

**1704 e      QUALITY CONTROL OF CONCRETE**

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.

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.

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**

Volume of concrete at risk	Sample from one batch selected at random and at intervals such that each sample represents an average volume of not more than:
30m <sup>3</sup>	10 m <sup>3</sup> or 10 batches – Highly stressed structural course
60 m <sup>3</sup>	20 m <sup>3</sup> or 20 batches – Normal structural concrete
150 m <sup>3</sup>	50 m <sup>3</sup> or 50 batches – Mass concrete

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

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.

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.

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.

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.

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 early 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.

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:

□ ~~→~~  $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □

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'.

□ ~~→~~  $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □                       $\bar{A}$  □

each individual test result is greater than 85% of the specified characteristic strength.

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/mm<sup>2</sup> for grade 15 or 7.5N/mm<sup>2</sup> for grade 20 or above.

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.

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.

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.

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.

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 READY MIXED CONCRETE**

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.

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.

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.

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 manufacturer's guaranteed capacity of the drum, and the speed of the rotation of mixing drum or blades.

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.

## **1706 MEASURING MATERIALS FOR CONCRETE**

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

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.

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.

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.

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 KS 02-1238.

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

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.

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.

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.

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.

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.

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.

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**

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 0.25m<sup>3</sup> may be mixed by hand methods in accordance with provisions under Clause 1708.

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.

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 30degr.C

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.

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.

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.

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<sup>3</sup> . .

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.

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.

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  $100\text{kg/m}^3$ .

Concrete shall be mixed in such quantities that any batch can be placed in the works within 30 minutes. The retamping 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.

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

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  $0.25\text{ m}^3$ .

The mixing shall be done on a clean watertight, non-absorbent platform approved 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.

Mixing shall be carried out until the whole batch has been turned at least three times dry and three times wet.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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.

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.

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.

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.

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

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.

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.

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

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.

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.

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.

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

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.

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 20m<sup>3</sup> of concrete is to be placed.

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

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.

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.

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.

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.

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.

The curing compound shall be delivered to the work in ready mixed form. 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/m<sup>2</sup>.

The 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.

The 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.

STD/103

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.

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.

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.

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.

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.

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.

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.

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  $210\text{kg/cm}^2$ .

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

Horizontal or nearly horizontal surfaces which are not cast against formwork shall be finished to the class shown on the drawings and defined hereunder.

#### **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 compaction.

#### **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.

#### **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.

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)

	Sudden change of level in surface	Gradual change of surface as measured by 3m straight edge	Difference in level between 3m straight edge and the specified surface level
UF 1	Not applicable	10mm	+20-10mm
UF 2	Nil	10mm	+20-10mm
UF 3	Nil	5mm	12.5 of -7.5mm

**1715 CEMENT MORTAR**

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

Small quantities of mortar may be hand mixed but for amounts over 0.5m<sup>3</sup> 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.

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.

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**

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 0.3m<sup>3</sup> of combined or all-in aggregate shall not be less than 50kg. The maximum aggregate size shall be 40mm nominal.

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.

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 0.3m<sup>3</sup> 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

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.

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

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.

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.

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.

Construction joints formed as free surfaces shall not exceed a slope of 20% from the horizontal.

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.

Where concrete has become too hard for the above treatment to be successful, the surface whether formed or free is to be thoroughly scabbled by mechanical means or wet sand blasted and then washed with clean water. The indentations produced by scabbling shall be not less than 10mm deep and shall not extend closer than 40mm to a finished face.

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.

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.

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

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.

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.

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.

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 half of the joint is being set other half shall be completely free from longitudinal restraint.

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

The materials shall comply in an respects with the ASTM Specification D471 and D2628. The size of the sealant shall be determined from following parameters.

Greatest size of the opening 0.9BN.

Smallest size of the opening 0.55BN.

Smallest working opening 0.35BN where BN = Breadth of unstressed sealant

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.

The installation shall be carried out early in the morning with the ambient temperature of the structure being 20°C.

The surfaces of the steelwork in contact with sealant shall be free of all organic and inorganic debris and impurities.

The amount of pre-compression shall be agreed with the Engineer on site.

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

Poured joint sealing compound shall consist of hot or cold poured material as agreed with the Engineer on site.

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.

<u>Test</u>	<u>Requirements</u>
Cone penetrating-150g for 5 seconds at 5mm 25°C. Standard grease cone.	Penetration to be not less than Not more than 27.5mm.
Flow on a plane inclined at 75° to Horizontal, 5 hours at 60°c	Flow not to exceed 20mm.
Bond 25mm wide joint extended to 12.5mm per hour at 3 cycles of other extension and compression	Not more than one specimen in 3 Develop a crack, separation or opening more than 6mm deep.

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.

The treatment of the surfaces to receive sealant shall be carried out strictly with the suppliers' instructions.

The pouring of the sealant shall be carried out at mean temperature of 20<sup>o</sup> -22°C, unless otherwise agreed with the Engineer on site. The measurement of the sealant shall be linear meter.

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

Joint filler shall be either

- ~~+~~  lexcell, as manufactured by Expandite Limited
- ~~+~~  orkpak, as manufactured by Services Limited
- ~~+~~  or similar approved material

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

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,

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.

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

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.

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.

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.

STD/110

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.

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.

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.

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 dampers 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.

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.

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

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.

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.

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.

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.

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.

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.

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.

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.

All formwork shall be approved by the Engineer before concrete is placed within it. The Contractor shall, if required by the Engineer, provide the latter 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.

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.

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**

In the determination of the time for the removal of forms, falsework and husing, 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.

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**

POSITION OF FORMWORK	MINIMUM PERIOD FOR TEM. OVER 10 DEG.C.	STRENGTH TO BE ATTAINED
Vertical or near vertical faces of mass concrete	24 hours	0.2C
Vertical or near vertical faces of reinforced walls, beams and columns	48 hours	0.3C
Underside of arches, beams and slab formwork only	4 days	0.5C
Supports to underside of arches, beams and slabs	21 days	0.75C
Arched linings in tunnels and underground works	24 hours	4N/mm <sup>2</sup>

Note: C is the nominal strength for the class of concrete used.

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.

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.

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.

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.

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.

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.

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.

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**

### **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.

### **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.

### **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.

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**

Class of finish	Tolerance in mm		
	Sudden change in the surface	Gradual change of the surface measured by 3m straight edge	Concrete face displacement from correct position
F1	10	10 TO +25	+25 TO -10
F2	5	10	+ or -15
F3	2	5	+ or 110

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.

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.

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.

Defects other than those mentioned above shall be dealt with as instructed by the Engineer.

## 1727 REINFORCEMENT FOR CONCRETE

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

127

All reinforcement shall be from an approved manufacturer and, if required by the Engineer, the Contractor shall submit a test certificate from the manufacturer.

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.

## 1728 BENDING AND FIXING REINFORCEMENT

Unless otherwise shown on the drawings, bending and cutting shall comply with BS 4466.

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.

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.

Reinforcement shall be thoroughly cleaned and all dirt, scale, loose rust, oil and other contaminants removed before it is placed in the works.

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.

Unless otherwise agreed by the Engineer, all intersecting bars shall either be tied together with 1.6mm 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.

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.

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.

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.

Bars complying with BS 4461 or other high tensile bars shall not be bent after being placed in the works.

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.

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.

Reinforcement shall be measured in kilogrammes for each of the following ranges of diameters:

of diameter equal to or less than 16mm  
of diameter greater than 16mm

Steel fabric reinforcement shall be measured by the square metre and shall be the calculated area excluding for laps.

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

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:

Bolt holes, pockets, box outs and cast in components provided that the volume of each is less than 0.10 m<sup>3</sup>

Fillets, drips, rebates, recesses, grooves, chamfers and the like each less than  $0.005 \text{ m}^2$  in cross-sectional area.

The rate for concrete shall include for the cost of:

Provision and transport of cement aggregates and water

Admixtures and workability agents including submission of details unless Specified.

Batching, mixing, transporting, placing, compacting and curing

Laying to sloping surfaces not exceeding 15 degrees from the horizontal and to falls.

Formwork to binding concrete

Placing and compacting against excavated surfaces, where required, including any additional concrete to fill overbreak or working space.

Complying with the requirements of this specification.

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  $0.05 \text{ m}^2$ .



## LIST OF DRAWINGS

## DRAWINGS

Note:-The list of contract drawings is as follows:

# BILLS OF QUANTITIES

## BILL OF QUANTITIES

1.0 Preamble to Bill of Quantities

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.

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.

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.

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.

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.

Provisional sums (including Day works) 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.

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.

Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:

Where there is a discrepancy between amount in words and figures, the amount in words will govern; and

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.

If a Tenderer does not accept the correction of errors as outlined above, his Tender will be rejected.

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).

“Authorized” “Directed” or “Approved” shall mean the authority, direction or approval of the Engineer.

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

(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 0.2m<sup>3</sup> occurring in soft material shall be classified as hard material

(b) Soft material shall be all material other than hard material.

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.

Delays to plant and crew arising from the constructional variations, exceptional weather conditions will not be considered applicable to the standing time claims.

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.

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.

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:

to provide sufficient information on the quantities of Works to be performed to enable tenders to be prepared efficiently and accurately; and

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:

**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.

**Work Items**

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.

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.

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:

<i>Unit</i>	<i>Abbreviation</i>	<i>Unit</i>	<i>Abbreviation</i>
cubic meter	m <sup>3</sup> or cu m	Millimeter	mm
hectare	ha	Month	mon
hour	h	Number	nr

kilogram	kg	Square meter	SM
lump sum	sum	Square millimeter	SMM
Linear meter	Lm	Week	wk
Metric ton (1,000 kg)	t		

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.

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.

### 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:

- →  $\bar{A}$  □  $\bar{A}$  □  $\bar{A}$  □
- 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
- →  $\bar{A}$  □  $\bar{A}$  □  $\bar{A}$  □
- 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.

### Provisional Quantities and Provisional Sums

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.

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.

### 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) applicable and VAT.

where



**PARTICULAR PRELIMINARIES**

ITEM	DESCRIPTION	Kshs.	Cts
	<p><b>PRICING ITEMS OF PRELIMINARIES</b></p> <p>Prices <b>SHALL BE INSERTED</b> 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.</p> <p><b>DESCRIPTION OF THE WORKS</b></p> <p>The works to be carried out under this contract involves <b>REHABILITATION OF ACCESS ROAD, PARKING STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS</b></p> <p><b>MEASUREMENTS</b></p> <p>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 <b>PROJECT MANAGER</b> 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.</p> <p><b>LOCATION OF SITE</b></p> <p>The site is located <b>AT NGONG ROAD DAGORETTI CORNER NAIROBI COUNTY</b>. 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.</p>		
	<p><b>Carried to Collection</b></p>		

Item	DESCRIPTION	Kshs.	Cts
	<p><b>CLEARING AWAY</b>  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.</p> <p>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.</p> <p><b>CLAIMS</b>  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.</p> <p><b>PAYMENTS</b>  The tenderer's attention is drawn to the fact that the GOVERNMENT SHALL NOT MAKE ADVANCE PAYMENTS</p> <p><b>PREVENTION OF ACCIDENT, DAMAGE OR LOSS</b> 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.</p> <p><b>BID SECURITY</b>  The contractor shall provide a bid security duly signed, sealed and stamped from an approved Institution in an approved format of required amount.</p>		
	<b>Carried to Collection</b>		

Item	DESCRIPTION	Kshs.	Cts
	<p><b>WORKING CONDITIONS</b></p> <p>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.</p> <p><b>SIGNBOARD</b></p> <p>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.</p> <p><b>LABOUR CAMPS</b></p> <p>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.</p> <p><b>MATERIALS FROM DEMOLITIONS</b></p> <p>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 Provincial Works Office Nairobi.</p> <p><b>PRICING RATES</b></p> <p>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.</p>		
	<b>Carried to Collection</b>		

Item	DESCRIPTION	Kshs.	Cts
	<p><b>SECURITY</b> 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.</p> <p><b>URGENCY OF THE WORKS</b> 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.</p> <p><b>PAYMENT FOR MATERIALS ON SITE</b> 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.</p> <p><b>EXISTING SERVICES</b> 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.</p>		
	<b>Carried to Collection</b>		

Item	DESCRIPTION	Kshs.	Cts
	<p><b>PERFORMANCE BOND</b> 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.</p> <p><b>TENDER DOCUMENTS</b> Tender documents are as listed in Clause 2.1 of the Instruction to Tenderer's Page 7</p> <p><b>C DELIVERY OF TENDER</b> 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.</p> <p>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.</p> <p><b>VALUE ADDED TAX</b> The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1<sup>st</sup> September, 1993 which requires payment of VAT on all contracts. The tenderer is advised that in accordance with Government public notice No. 35 &amp; 36 Dated 11<sup>th</sup> September 2003 operational from 1<sup>st</sup> 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.</p>		
	<b>Carried to Collection</b>		

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

Period of Final Measurement	3 Months from Practical Completion
Defects Liability Period	12 Months from Practical Completion
Date for Possession	To be agreed with the Project Manager
Date for Completion	24 weeks from date of Possession
Liquidated and Ascertained Damages	at a rate of Kshs 20,000 Per week or part thereof
Period of Interim Certificates	Monthly
Period of Honouring Certificates	90 Days
Percentage of Certified Value Retained	10%
Limit of Retention Fund	10%

Carried to Collection

Item	DESCRIPTION	Kshs.	Cts
	<b><u>PROJECT MANAGEMENT EXPENSES</u></b>		
	Allow a Provisional Sum of <b>Kshs 800,000.00</b> for the <b>supervision of works &amp; transport by the Engineer and staff.</b>	800,000	
	Allow a percentage sum for the contractors administrative costs and profits for the above .....%.		
	Allow a provisional Sum of <b>Kshs 50,000.00</b> only for <b>Project Management air time and training.</b>	50,000	
	Allow a percentage sum for the contractors administrative costs and profits for the above .....%.		
	Allow a provisional Sum of <b>Kshs 400,000.00</b> only for supply and delivery of the <b>Project Managers Stationery, Airtime and Equipment.</b>	400,000	
	Allow a percentage sum for the contractors administrative costs and profits for the above .....%.		
	Carried to Collection		

Item	DESCRIPTION	Kshs.	Cts
	<p><u>COLLECTION</u></p> <p>Brought forward from page PP/1</p> <p>Brought forward from page PP/2</p> <p>Brought forward from page PP/3</p> <p>Brought forward from page PP/4</p> <p>Brought forward from page PP/5</p> <p>Brought forward from page PP/6</p> <p>Brought forward from page PP/7</p>		
	<p>PARTICULAR PRELIMINARIES CARRIED TO GRAND SUMMARY PAGE</p>		



TEM	DESCRIPTION	KSHS	CTS
	<p style="text-align: center;"><b>GENERAL PRELIMINARIES</b></p> <p><b>PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES</b></p> <p>Prices will be inserted against items of Preliminaries in the Contractor's priced Bills of Quantities and Specification.</p> <p>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.</p> <p><b>ABBREVIATIONS</b></p> <p>Throughout these Bills, units of measurement and terms are abbreviated and shall be interpreted as follows:-</p> <p><i>C.M.</i>                Shall mean cubic metre</p> <p><i>S.M.</i>                Shall mean square metre</p> <p><i>L.M.</i>                Shall mean linear metre</p> <p><i>MM</i>                 Shall mean Millimetre</p> <p><i>Kg.</i>                 Shall mean Kilogramme</p> <p><i>No.</i>                 Shall mean Number</p> <p><i>Prs.</i>                Shall mean Pairs</p> <p><i>B.S.</i>                Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.I., England.</p> <p><i>Ditto</i> Shall mean the whole of the preceding description except as qualified in the description in which it occurs.</p> <p><i>m.s.</i>                Shall mean measured separately.</p> <p><i>a.b.d</i>                Shall mean as before described.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT</b></p> <p><i>Attendance</i> ; Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:-</p> <p>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.</p> <p><i>Fix Only</i>:-</p> <p>"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.</p> <p><b>EMPLOYER</b></p> <p>The "Employer" is <b>MINISTRY OF ENVIRONMENT AND FORESTRY - KENYA METEOROLOGICAL DEPARTMENT</b></p> <p>The term "Employer" and "Government" wherever used in the contract document shall be synonymous</p> <p><b>PROJECT MANAGER</b></p> <p>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.</p> <p><b>ARCHITECT</b></p> <p>The term "Architect" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is State Department of Public Works, P.O. Box 30743, NAIROBI.</p> <p><b>QUANTITY SURVEYOR</b></p> <p>The term "Quantity Surveyor" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is State Department of Public Works, P.O. Box 30743, NAIROBI.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
A.	<p><b>ELECTRICAL ENGINEER</b></p> <p>The term "Electrical Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is State Department of Public Works, P.O. Box 30743, NAIROBI.</p>		
B.	<p><b>MECHANICAL ENGINEER</b></p> <p>The term "Mechanical Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is State Department of Public Works, P.O. Box 30743, NAIROBI.</p> <p><b>CIVIL/STRUCTURAL ENGINEER</b></p> <p>The term "Structural Engineer" shall be deemed to mean "The Project Manager." as defined above whose address unless otherwise notified is State Department of Public Works, P.O. Box 30743, NAIROBI.</p> <p><b>FORM OF CONTRACT</b></p> <p>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 <b>Conditions of Contract</b> 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</p> <p><b>BOND.</b></p> <p>The Contractor shall find and submit on the Form of Tender an <b>approved Bank or Insurance Company</b> and who will be willing to be bound 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.</p>		
<i>Carried to collection</i>			

TEM	DESCRIPTION	KSHS	CTS
	<p><b>PLANT, TOOLS AND VEHICLES</b></p> <p>Allow for providing all scaffolding, plant, tools and vehicles required for the work except 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.</p> <p><b>TRANSPORT.</b></p> <p>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.</p> <p><b>MATERIALS AND WORKMANSHIP.</b></p> <p>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 materials to 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.</p> <p><b>SIGN FOR MATERIALS SUPPLIED.</b></p> <p>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</p> <p><b>STORAGE OF MATERIALS</b></p> <p>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.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>SAMPLES</b></p> <p>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.</p> <p>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.</p> <p><b>GOVERNMENT ACTS REGARDING WORKPEOPLE ETC.</b></p> <p>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 information regarding all such regulations and/or restrictions which may affect the organisation of No claim in respect of want of knowledge in this connection will be entertained.</p> <p><b>SECURITY OF WORKS ETC.</b></p> <p>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.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>PUBLIC AND PRIVATE ROADS.</b></p> <p>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</p> <p><b>EXISTING PROPERTY.</b></p> <p>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</p> <p><b>VISIT SITE AND EXAMINE DRAWINGS.</b></p> <p>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.</p> <p><b>ACCESS TO SITE AND TEMPORARY ROADS.</b></p> <p>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</p> <p><b>AREA TO BE OCCUPIED BY THE CONTRACTOR</b></p> <p>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</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>OFFICE ETC. FOR THE PROJECT MANAGER</b></p> <p>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.</p> <p><b>WATER AND ELECTRICITY SUPPLY FOR THE WORKS</b></p> <p>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 their own use.</p> <p><b>SANITATION OF THE WORKS</b></p> <p>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</p> <p><b>SUPERVISION AND WORKING HOURS</b></p> <p>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.</p> <p><b>PROVISIONAL SUMS.</b></p> <p>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.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>PRIME COST (OR P.C.) SUMS.</b></p> <p>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.</p> <p><b>PROGRESS CHART.</b></p> <p>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.</p> <p><b>ADJUSTMENT OF P.C. SUMS.</b></p> <p>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.</p> <p style="text-align: right;"><i>Carried to collection</i></p>		



TEM	DESCRIPTION	KSHS	CTS
	<p><b>ADJUSTMENT OF PROVISIONAL SUMS.</b></p> <p>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.</p> <p><b>B. NOMINATED SUB-CONTRACTORS</b></p> <p>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".</p> <p><b>DIRECT CONTRACTS</b></p> <p>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.</p> <p><b>ATTENDANCE UPON OTHER TRADESMEN, ETC.</b></p> <p>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.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>INSURANCE</b></p> <p>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.</p> <p><b>PROVISIONAL WORK</b></p> <p>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.</p> <p><b>ALTERATIONS TO BILLS, PRICING, ETC.</b></p> <p>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.</p> <p><b>BLASTING OPERATIONS</b></p> <p>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.</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>MATERIALS ARISING FROM EXCAVATIONS</b></p> <p>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.</p> <p><b>PROTECTION OF THE WORKS.</b></p> <p>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.</p> <p><b>REMOVAL OF RUBBISH ETC.</b></p> <p>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.</p> <p><b>WORKS TO BE DELIVERED UP CLEAN</b></p> <p>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</p>		
	<i>Carried to collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<p><b>GENERAL SPECIFICATION.</b></p> <p>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.</p> <p><b>TRAINING LEVY</b></p> <p>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.</p> <p><b>MATERIALS ON SITE</b></p> <p>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.</p> <p><b>HOARDING</b></p> <p>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 seven 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.</p> <p><b>CONTRACTOR'S SUPERINTENDENCE/SITE AGENT</b></p> <p>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.</p>		
	<i>Carried to Collection</i>		

TEM	DESCRIPTION	KSHS	CTS
	<u>COLLECTION</u>		
	Brought Forward From Page GP/1		
	Brought Forward From Page GP/2		
	Brought Forward From Page GP/3		
	Brought Forward From Page GP/4		
	Brought Forward From Page GP/5		
	Brought Forward From Page GP/6		
	Brought Forward From Page GP/7		
	Brought Forward From Page GP/8		
	Brought Forward From Page GP/9		
	Brought Forward From Page GP/10		
	Brought Forward From Page GP/11		
	Brought Forward From Page GP/12		
	TOTAL FOR GENERAL PRELIMINARIES CARRIED TO GRAND SUMMARY PAGE		

**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METROLOGICAL DEPARTMENT, NAIROBI.**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
<b><u>BILL NO 1: ROAD WORKS &amp; PARKING AREA</u></b>					
A	Strip existing tarmac to base course layer up to a depth not exceeding 100mm	SM	5723		
B	Fill up all depressed areas of base with approved hardcore	CM	600		
	Provide lay and compact 50mm thick sand or quarry dust bedding to receive heavy duty precast concrete paving blocks.	SM	5723		
D	Provide and lay 80mm thick heavy duty precast concrete paving blocks (minimum strength 49 N/mm <sup>2</sup> )	SM	5723		
E	Load and cart away all surplus excavated materials from site.	CM	572		
<b><u>KERBS AND CHANNELS</u></b>					
	Carefully remove existing 250 x 125mm Kerbs to allow laying of Shallow Invert Block Drains and Channels and stack them on site for re-use	LM	200		
G	Excavate trench for 250x125mm pre-cast concrete kerbs as per Drawing detail (50)5332 'A'.	CM	120		
	Provide and place 325x300 concrete bed and haunch in concrete (mix 1:3:6). Include for all necessary formwork as per Drawing detail (50)5332 'A'.	CM	67		
	Provide, lay and joint 250x125mm precast concrete kerbs in cement mortar as per Drawing detail (50)5332 'A'.	LM	687		
J	Excavate trench for 125x100mm pre-cast concrete channels as paving edging per Drawing detail (50) 5332 'C'	CM	10		
K	Provide and place 475x200 concrete bed and haunch. including all necessary formwork, to Drawing detail (50) 5332 'C' in concrete mix 1:3:6.	CM	65		
L	Provide, lay and joint in cement mortar pre-cast concrete 125x100 channels as paving edging as per Drawing detail (50)5332 'C'.	LM	400		
<b>TOTAL CARRIED TO COLLECTION PAGE CIV 4</b>					

**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METROLOGICAL DEPARTMENT, NAIROBI.**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Parking cont'd</u>				
	<u>CAR PARK MARKING</u>				
	Provide and apply three coats of approved reflective paint white in colour in strips of 100mm wide as directed by the Engineer to define parking bays.	LM	300		
B	Ditto but alternate black and white colours to kerbs	LM	687		
	<u>Pre-cast Concrete 600 X 600 X 50mm Paving Slabs</u>				
C	Excavations for the footpaths paving	SM	990		
D	Provide, lay and compact 100mm thick approved murrum bedding	SM	990		
E	Treat surface of formation with approved persistent herbicide	SM	990		
F	Provide lay and compact 50mm thick sand or quarry dust bedding to receive precast concrete paving slabs.	SM	990		
G	Provide, lay and joint in cement mortar 600x600x50 pre-cast concrete paving slabs on 50mm bed of sand	SM	990		
<b>TOTAL CARRIED TO COLLECTION PAGE CIV 4</b>					

**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METROLOGICAL DEPARTMENT, NAIROBI.**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<b><u>Storm Water Drain Along the Driveway &amp; Parking</u></b>				
	Excavate trench for 600x270mm 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.	CM	80		
	Ditto but not exceeding 1.5m, (av. depth 1.0m) ditto to detail (50) 5329 'B'.	CM	50		
C	Extra over for excavation in rock class II	CM	32		
D	Backfill and ram	CM	3		
E	Load and cart away surplus material.	CM	6		
	Provide, lay and compact 100mm approved murram bed and on sloping sides for the invert block drain width to detail (50) 5329 'B'.	SM	100		
G	Provide, lay and joint 600x270mm external dimensions pcc IBD to detail (50) 5329 'B'.	LM	50		
H	Extra over for 1x1 side slabs to detail.	LM	50		
I	Ditto but 2x2 side slabs ditto.	LM	50		
J	Ditto but 3x3 side slabs ditto.	LM	50		
	<b><u>MITRE DRAINS</u></b>				
K	Excavate for Miter drains depth not exceeding 300mm and cart away the excavated material.	CM	50		
L	Provide, lay and compact 100mm murram as bedding for the miter drains.	SM	100		
	Provide all materials and construct meter drains to detail (50)5353.	LM	40		
<b>TOTAL CARRIED TO COLLECTION PAGE CIV 4</b>					



**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METROLOGICAL DEPARTMENT, NAIROBI.**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<b><u>Drainage Continued</u></b>				
	<b><u>Pre-cast Concrete Pipe Culverts</u></b>				
A	Excavate in ordinary material for Pipe culverts depth n.e.1.5m	CM	60		
B	Trim and compact trench with 100mm thick murrum bedding	CM	3		
C	Provide 150mm thick concrete bedding to pipes in concrete class 'Q' (Mix 1:3:6)	CM	6		
D	Cut and fix forwork to walling of headwalls.	SM	400		
E	Cut and fix BRC A142 to headwalls including spacer blocks .	SM	420		
F	Prepare and cast class 20/20 , mix 1:2:4, concrete to headwalls , culvert surround and bedding.	CM	65		
G	Prepare and apply plaster to headwalls, sand cement mortar mix 1:3.	SM	320		
H	Provide, lay and joint 600mm diamentter Precast Concrete Ogee-Pipes	LM	36		
	<b>OUTFALL STORM DRAIN</b>				
I	Excavate, trim and shape existing storm water drain	CM	194		
J	Provide materials and stone pitch sides and bottom of the storm water drain as directed by engineer on site.	SM	504		
<b>TOTAL CARRIED TO COLLECTION PAGE CIV 4</b>					

**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METROLOGICAL DEPARTMENT, NAIROBI.**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<b><u>SUMMARY PAGE FOR CIVIL WORKS</u></b>				
	Carried forward from page CIV 1				
	Carried forward from page CIV 2				
	Carried forward from page CIV 3				
	Carried forward from page CIV 4				
	<b>TOTAL CARRIED TO SUMMARY PAGE</b>				

**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND ASSOCIATED CIVIL WORKS AT KENYA METROLOGICAL DEPARTMENT, NAIROBI.**

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<b><u>SUMMARY PAGE</u></b>				
	Civil Works (Carried forward from Page CIV 5)				
	Provisional Sum of Kenya Shillings Two Million for Contingencies				2,000,000.00
	Provisional Sum of Kenya Shillings One Million for Landscaping works				1,000,000.00
	<b>TOTAL CARRIED TO GRAND SUMMARY PAGE</b>				

**PROPOSED REHABILITATION OF ACCESS ROAD, PARKING, STORM WATER DRAINAGE AND AND ASSOCIATED CIVIL WORKS FOR MINISTRY OF ENVIRONMENT AND FORESTRY AT KENYA METEOROLOGICAL DEPARTMENT**

<b>GRAND SUMMARY</b>			
BILL NO.	DESCRIPTION	TENDERERS AMOUNT (Kshs)	OFFICIAL USE ONLY (Kshs)
	PARTICULAR PRELIMINARIES		
	GENERAL PRELIMINARIES		
	CIVIL WORKS		
	SUB-TOTAL		
	<b>TOTAL</b>		
	TOTAL CARRIED TO FORM OF TENDER		

Amount in words : .....

Tenderer's signature and stamp.....

Contractor's name : .....

Date : .....

Witness's name : .....

Signature.....

Address.....

Date : .....