CHUKA UNIVERSITY

PROPOSED MAIN LIBRARY COMPLEX (PHASE 2) AT CHUKA UNIVERSITY

VOLUME THREE

TECHNICAL SPECIFICATIONS

AND

BILLS OF QUANTITIES

FOR

GENERAL ELECTRICAL INSTALLATION WORKS

Tender Number: CU / OPNT / 08 / 2021-2022.

POSTAL ADDRESS	TELEPHONE
Chuka University P. O. Box 109 - 60400 CHUKA	020 2310512 / 8 0715505 858 0731620 266

Email: info@chuka.ac.ke

November, 2021

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CHUKA UNIVERSITY.

CONTRACT FOR PROPOSED CHUKA UNIVERSITY LIBRARY BLOCK ELECTRICAL INSTALLATIONS

SPECIAL NOTES FOR ALL TENDERERS:

1. These notes shall form part of these specifications and conditions.

2. The tenderer is required to check the number of pages in this document and should any be found to be missing or the figures indistinct, he must inform the Engineers at once and have the same rectified. Should the tenderer be in doubt about the precise meaning of any item, word or figures, or for any reason whatsoever observe any apparent omission of words or figures, he must inform the Engineer in order that the correct meaning may be decided upon before the date for the submission of the tenders.

3. No liability whatsoever will be admitted nor claim allowed in respect of errors in the completed tender due to mistakes in this document which should have been rectified in the manner described above.

4. The tenderer shall not alter or otherwise qualify the text of this specification. Any alteration or qualification made without authority will be ignored and the text of the specification as printed will be adhered to.

5. The tenderer shall be deemed to have made allowances in his unit prices generally to cover items of preliminaries or additions to Prime cost Sums or other items, if those have not been priced against the respective items.

6. The tenderer's price shall include all government taxes including duties, V.A.T. etc. No claims whatsoever will be allowed in respect of duties, VAT e.t.c if the tenderer fails to include them in his unit prices. It is also to be noted that VAT will be included in the unit rates and NOT worked out as a percentage of the total.

7. In no case will any expenses incurred by the tenderer in preparation of this tender be reimbursed.

8. The copyright of this specification is vested in the Engineers and no part thereof may be reproduced without their express permission, given in writing.

9. The specifications must be priced in Kenya Currency i.e. Shillings and Cents.

10. All the tenderers must make a declaration that they have not and will not make any payment to any person which can be perceived as an inducement to enable them to win this tender.

Signed (As in Tender)..... Date/Stamp.....

FORM OF TENDER

INSTRUCTIONS TO TENDERERS

i) The Tenderer must prepare this Form of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address.

ii) Allitalicized text is to help Tenderer in preparing this form.

iii) Tenderer must complete and sign CERTIFICATE OF INDEPENDENT TENDER DETERMINATION and the SELF DECLARATION OF THE TENDERER attached to this Form of Tender.

iv) The Form of Tender shall include the following Forms duly completed and signed by the Tenderer.

- *Tenderer's Eligibility- Confidential Business Questionnaire*
- *Certificate of Independent Tender Determination*
- *Self-Declaration of the Tenderer*

Date of thisTender submission: *[insert date (as day, month and year) of Tender submission]* **Request for Tender No.:** *[insert identification]* **Name and description of Tender** *[Insert as per ITT)* **Alternative No.:** *[insert identification No if this is a Tender for an alternative]*

To: *[insert complete name of Procuring Entity]*

Dear Sirs,

1. 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 and complete the Works and remedy any defects therein for the sum[1] of Kenya Shillings [*[Amount in figures]* _____Kenya Shillings *[amount in words]*_____

The above amount includes foreign currency[2] amount (s) of [*state figure or a percentage and currency*] [figures]_____[words] _____
_____

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

3. We agree to adhereby this tender until_____*[Insert date],* and it shall remain binding upon us and may be accepted at any time before that date.

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

5. We, the under signed, further declare that:

i) No reservations: We have examined and have no reservations to the tender document, including Addenda issuedinaccordance with ITT 28;

ii) Eligibility: We meet the eligibility requirements and have no conflict of interest in accordance with ITT 3 and 4;

[1] *This sum should be carried forward from the Summary of the Bills of Quantities.*
[2] *The percentage quoted above should not include provisional sums, and not more than two foreign currencies are allowed.*

iii) Tender - Securing Declaration: We have not been suspended nor declared ineligible by the Procuring Entity based on execution of a Tender-Securing or Proposal-Securing Declaration in the Procuring Entity's Country in accordance with ITT 19.8;

iv) Conformity: We offer to execute in conformity with the tendering documents and in accordance with the implementation and completion specified in the construction schedule, the following Works: *[insert a brief description of the Works];*

v) Tender Price: The total price of our Tender, excluding any discounts offered in item 1 above is: *[Insert one of the options below as appropriate]*

vi Option 1, incase of one lot: Total priceis: *[insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies*]; or

Option2, in case of multiple lots:

(a) Total price of each lot [*insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies*]; and

(b) Total price of all lots (sum of all lots) [*insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies*];

vii) Discounts: The discounts offered and the methodology for their application are:

viii) The discounts offered are: [*Specify in detail each discount offered.*]

ix) The exact method of calculations to determine the net price after application of discounts is shown below: [*Specify in detail the method that shall be used to apply the discounts*];

x) Tender Validity Period: Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

xi) Performance Security: If our Tender is accepted, we commit to obtaina Performance Security in accordance with the Tendering document;

xii) One Tender Per Tender: Weare not submitting any other Tender(s) as an individual Tender, and we are not participating in any other Tender(s) as a Joint Venture member or as a sub-contractor, and meet the requirements of ITT 3.4, other than alternative Tenders submitted in accordance with ITT 13.3;

xiii) Suspension and Debarment: We, along with any of our subcontractors, suppliers, Engineer, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Public Procurement Regulatory Authority or any other entity of the Government of Kenya, or any international organization.

xiv) State-owned enterprise or institution: [*select the appropriate option and delete the other*] [*We are not a state- owned enterprise or institution*]/[*We are a state-owned enterprise or institution but meet the requirements of ITT3.8*];

xv) Commissions, gratuities, fees: We have paid, or will pay the following commissions, gratuities, or fees with respect to the tender process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity].*

Name of Recipient	**Address**	**Reason**	**Amount**

(If none has been paid or is to be paid, indicate "none.")

xvi) Binding Contract: We understand that this Tender, together with your written acceptance there of included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;

xvii) Not Bound to Accept: We understand that you are not bound to accept the lowest evaluated cost Tender, the Most Advantageous Tender or any other Tender that you may receive;

xviii) Fraud and Corruption: We here by certify that we have taken steps to ensure that no personacting for us or on our behalf engages in any type of Fraud and Corruption; and

xix) Collusive practices: We hereby certify and confirm that the tender is genuine, non-collusive and made with the intention of accepting the contract if awarded. To this effect we have signed the "Certificate of Independent Tender Determination" attached below.

xx) We undertake to adhere by the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal, copy available from_____(*specify website*) during the procurement process and the execution of any resulting contract.

xxi) We, the Tenderer, have completed fully and signed the following Forms as part of our Tender:

a) Tenderer's Eligibility; Confidential Business Questionnaire - to establish we are no tin any conflict to interest.

(b) Certificate of Independent Tender Determination - to declare that we completed the tender without colluding with other tenderers.

(a) Self-Declarationo f the Tenderer - to declare that we will, if awarded a contract, not engage in any form of fraud and corruption.

(d) Declaration and commitment to the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal.

Further, we confirm that we have read and understood the full content and scope of fraud and corruption as informed in **"Appendix 1 - Fraud and Corruption**" attached to the Form of Tender.

Name of the Tenderer: *[*insert complete name of person signing the Tender*]

Name of the person duly authorized to sign the Tender on behalf of the Tenderer: **[*insert complete name of person duly authorized to sign the Tender*]

Title of the person signing the Tender: [*insert complete title of the person signing the Tender*]

Signature of the person named above: [*insert signature of person whose name and capacity are shown above*]

Date signed [*insert date of signing*] day of [*insert month*], [*insert year*]

Datesigned_____dayof_____,_____

Notes
** In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer.*
***Person signing the Tender shall have the power of attorney given by the Tenderer to be attached with the Tender.*

SECTION II - THE CONDITIONS OF CONTRACT AND CONTRACT

SECTION VIII - GENERAL CONDITIONS OF CONTRACT (GCC)

[Name of Procuring Entity] Chuka University

[Name of Contract] Proposed Main Library (Phase 2)

[Architect Name and Address]

General Conditions of Contract

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1. GENERALPROVISIONS

1.1 Definitions

In this Contract, except where context otherwise requires, the following terms shall be interpreted as indicated below. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

"Accepted Contract Amount" means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.

"Base Date" means a date 30 day prior to the submission of tenders.

"Bill of Quantities" means the priced and completed Bill of Quantities forming part of the tender.

"Completion Date" meansthedateofcompletionoftheWorksascertifiedbytheEngineer.

"Contract Price" means the price defined in the contract and there after as adjusted in accordance with the provisions of the Contract.

"Contract" means the agreement entered into between the Procuring Entity 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.

"Contractor's Documents" means the calculations, computer programs and other software, progress reports, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.

"Contractor's Equipment" means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor's Equipment excludes Temporary Works, Procuring Entity's Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

"Contractor'sPersonnel" means the Contractor's Representative and all personnel whom the Contractor utilizes on Site, who may include the staff, labor and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Works.

"Contractor's Representative" means the person named by the Contractor in the Contractor appointed from time to timeby the Contractor who acts on behalf of the Contractor.

"Contractor" means the person(s) named as contractor in the Form of Tender accepted by the Procuring Entity.

"Cost" means expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.

"Day" means a calendar day and **"year"** means 365 days.

"Dayworks" means Work inputs subject to payment on a time basis for labour and the associated materials and plant.

“Defect” means any part of the Works not completed in accordance with the Contract.

“Defects Liability Certificate” means the certificate issued by Architect upon correction of defects by the Contractor.

“Defects Liability Period” means the period named in the Special Conditions of Contract and calculated from the Completion Date, within which the contractor is liable for any defects that may develop in the handed over works.

“Defects Notification Period” means the period for notifying defects in the Works oraSection(asthecasemaybe) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], whichextendsoverthedaysstated intheSpecialConditionsofContract.

“Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Procuring Entity in accordance with the Contract.

“Final Payment Certificate” means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].

“Final Statement” means the statement defined in Sub-Clause 14.11 [ApplicationforFinalPaymentCertificate].

“Force Majeure” is defined in Clause19 [Force Majeure].

“Foreign Currency” means a currency of another country (not Kenya) in which part (or all) of the Contract Price is payable, but not the Local Currency.

“Goods” means Contractor's Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.

“Interim Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.

“Laws” means all national legislation, statutes, ordinances, and regulations and by-laws of any legally constituted public authority.

“Letter of Acceptance” means the letter of formal acceptance of a tender, signed by Procuring Entity, including any annexed memoranda comprising agreements between and signed by both Parties.

“Local Currency” means the currency of Kenya.

“Materials” means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

“Notice of Dissatisfaction” means the notice given by either Party to the other under Sub-Clause 20.3 indicating its dissatisfaction and intention to commence arbitration.

“Special Conditions of Contract” means the pages completed by the Procuring Entity entitled Special Conditions of Contract which constitute Part A of the Special Conditions.

“Party” means the Procuring Entity or the Contractor, as the context requires.

“Payment Certificate” means a payment certificate issued under Clause 14 [Contract Price and Payment].

“Performance Certificate” means the certificate issued under Sub-Clause 11.9 [Performance Certificate].

“Performance Security” means the security (or securities, if any) under Sub-Clause 4.2 [Performance Security].

“Permanent Works” means the permanent works to be executed by the Contractor under the Contract.

“Plant” means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Procuring Entity and relating to the construction or operation of the Works.

“Procuring Entity's Equipment” means the apparatus, machinery and vehicles (if any) made available by the

Procuring Entity for the use of the Contract or in the execution of the Works, as stated in the Specification; but does not include Plant which has not been taken over by the Procuring Entity.

"Procuring Entity's Personnel" means the Engineer, the Engineer, the assistants and all other staff, labor and other employees of the Architect and of the Procuring Entity; and any other personnel notified to the Contractor, by the Procuring Entity or the Engineer, as Procuring Entity's Personnel.

"Procuring Entity" means the Entity named in the Special Conditions of Contract.

"Engineer" is the person named in the Appendix to Conditions of Contract (or any other competent person appointed by the Procuring Entity and notified to the Contractor, to act in replacement of the Engineer) 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.

"Engineer" means the person appointed by the Procuring Entity to act as the Architect for the purposes of the Contract and named in the Special Conditions of Contract, or other person appointed from time to time by the Procuring Entity and notified to the Contractor

"Provisional Sum" means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].

"Retention Money" means the accumulated retention moneys which the Procuring Entity retains under Sub-Clause 14.3 [Application for Interim Payment Certificates] and pays under Sub-Clause 14.9 [Payment of Retention Money].

"Schedules" means the document(s) entitled schedules, completed by the Contractor and submitted with the Form of Tender, as included in the Contract.

"Section" means a part of the Works specified in the Special Conditions of Contract as a Section (if any)

"Site Investigation Reports" are those reports that may be included in the tendering documents which a ref actual and interpretative about the surface and sub-surface condition sat the Site.

"Site" means the places where the Permanent Works are to be executed, including storage and working areas, and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

"Specification" means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

"Start Date" or "Commencement 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).

"Statement" means a statement submitted by the Contractor as part of an application, under Clause 14 [Contract Price and Payment], for a payment certificate.

"Subcontractor" means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works.

"Taking-Over Certificate" means a certificate issued under Clause 10 [Procuring Entity's Taking Over].

"Temporary Works" means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

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

"Tender" means the Form of Tender and all other documents which the Contractor submitted with the Form of Tender, as included in the Contract.

"Tests after Completion" means the tests (if any) which are specified in the Contract and which are carried out in

accordance with the Specification after the Works or a Section (as the case may be) are taken over by the Procuring Entity.

"Testson Completion" means the tests which are specified in the Contractor agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Procuring Entity.

"Time for Completion" means the time for completing the Works or a Section (as the case may be) as stated in the Special Conditions of Contract (with any extension calculated from the Commencement Date.

"Unforeseeable" means not reasonably foreseeable by an experienced contractor by the Base Date.

"Variation" means any change to the Works, which is instructed or approved as a variation under Clause 13 [Variations and Adjustments].

"Works" means the items the Procuring Entity requires the Contractor to undertake as defined in the Appendix to Conditions of Contract. **"Works" may** also mean the Permanent Works and the Temporary Works, or either of them as appropriate.

1.2 Interpretation

In the Contract, except where the context requires otherwise:

a) Words indicating one gender include all genders;
b) words indicating the singular also include the plural and words indicating the plural also include the singular;
c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing;
d) "written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record; and

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

1.3 Communications

1.3.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

a) In writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Special Conditions of Contract; and
b) delivered, sentor transmitted to the addressf or the recipient's communications as stated in the Special Conditions of Contract. However:

i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the addressfromwhichtherequestwasissued.

1.3.2 Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Architect or the other Party, as the case may be.

1.4 Law and Language

1.4.1 The Contract shall be governed by the laws of **Kenya.**

1.4.2 The ruling language ofthe Contract shall be **English.**

1.5 Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

a) The Contract Agreement,
b) The Letter of Acceptance,
c) The Special Conditions – Part A,
d) the Special Conditions – Part B
e) the General Conditions of Contract
f) the Form of Tender,
g) the Specifications and Bills of Quantities
h) the Drawings, and
i) the Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Architect shall issue any necessary clarification or instruction.

1.6 Contract Agreement

The Parties shall enter into a Contract Agreement within 14 days after the Contractor receives the Contract Agreement, unless the Special Conditions establish otherwise. The Contract Agreement shall be based upon the formannexed to the Special Conditions. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Procuring Entity.

1.7 Assignment

The Contractor shall not assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, the contractor:

a) May as sign the whole or any part with the prior consent of the Procuring Entity, and
b) may, as security in favor of a bank or financial institution, assign its right to moneys due, or to become due, under the Contract.

1.8 Care and Supply of Documents

1.8.1 The Specifications and Drawings shall be in the custody and care of the Procuring Entity.Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawings and Bills of Quantities shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.

1.8.2 Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over bythe Procuring Entity. Unless otherwise stated in the Contract, the Contractor shall supply to the Architect two copies of each of the Contractor's Documents.

1.8.3 The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract.The Procuring Entity's Personnel shall have the right of access to all these documents at all reasonable times.

1.8.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, theParty shall promptly give notice to the other Party of such error or defect.

1.9 Timely provision of Drawings or Instructions

1.9.1 The Contractor shall give notice to the Architect whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and the nature and amount of the delay or disruption likely to be suffered if it is late.

1.9.2 If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Architect to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) payment of any other associated costs accrued, which shall be included in the Contract Price.

1.9.3 After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

1.9.4 However, if and to the extent that the Architect failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, or costs accrued.

1.10 Procuring Entity's Use of Contractor's Documents

1.10.1 Asagreed between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

1.10.2 The Contractor shall be deemed (by signing the Contract) to give to the Procuring Entity a non-terminable transferable non-exclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall:

a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,
b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and
c) in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

1.10.3 The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Procuring Entityf or purposes other than those permitted under Sub-Clause 1.10.2.

1.11 Contractor's Use of Procuring Entity's Documents

As agreed between the Parties, the Procuring Entity shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Procuring Entity. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not, without the Procuring Entity's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

1.12 Confidential Details

1.12.1 The Contractor's and the Procuring Entity's Personnel shall ensure confidentiality at all times. The confidentiality shall survive termination or completion of the contract. They shall disclose all such confidential and other information as may be reasonably required in order to verify compliance with the Contract and allow its proper implementation.

1.12.2 The Contractor's and the Procuring Entity's Personnel shall also treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

1.13 Compliance with Laws

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Special Conditions of Contract:

a) The Procuring Entity shall have obtained (or shall obtain) the planning, zoning, building permitor similar permission for the Permanent Works, and any other permissions described in the Specifications as having been (or to be) obtained by the Procuring Entity; and the Procuring Entity shall indemnify and hold the Contractor harmless against and from the consequences of any failure to do so; and

b) the Contractor shall give all notices, pay all taxes, duties and fees, and obtain all permits, licenses and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Procuring Entity harmless against and from the consequences of any failure to do so, unless the Contractor is impeded to accomplish these actions and shows evidence of its diligence.

1.14 Joint and Several Liability

If the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons:

a) These persons shall be deemed to be jointly and severally liable to the Procuring Entity for the performance of the Contract;
b) these persons shall notify the Procuring Entity of their leader who shall have authority to bind the Contractor and each of these persons; and
c) the Contractor shall not alter its composition or legal status without the prior consent of the Procuring Entity.

1.15 Inspections and Audit by the Procuring Entity

Pursuant to paragraph 2.2(e). of Appendix B to the General Conditions, the Contractor shall permit and shall cause its subcontractors and sub-consultants to permit, the Public Procurement Regulatory Authority, Procuring Entity and/or persons appointed or designated by the Government of Kenya to inspect the Site and/or the accounts and records relating to the procurement process, selection and/or contract execution, and to have such accounts and records audited by auditors appointed by the Procuring Entity if requested by the Procuring Entity. The Contractor's and its Subcontractors' and sub-consultants' attention is drawn to Sub-Clause 15.6 (Fraud and Corruption) which provides, inter alia, that acts intended to materially impede the exercise ofthe Procuring Entity's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of in eligibility pursuant to the Procuring Entity's prevailing sanctions procedures).

2 THE PROCURING ENTITY

2.1 Right of Access to the Site

2.1.1 The Procuring Entity shall give the Contractor right of access to, and possession of, all parts of the Site within thetime (or times) stated in the **Special Conditions of Contract.** The right and possession may not be exclusive to the Contractor. If, under the Contract, the Procuring Entity is required to give (to the Contractor) possession ofanyfoundation, structure, plant or means of access, the Procuring Entity shall do so in the time and manner stated in the Specification. However, the Procuring Entity may withhold any such right or possession until the Performance Security has been received.

2.1.2 If no such time is stated in the Special Conditions of Contract, the Procuring Entity shall give the Contractor right of access to, and possession of, the Site within such times as required to enable the Contractor to proceed without disruption in accordance with the programme submitted under Sub-Clause 8.3 [Programme].

2.1.3 If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Procuring Entity to give any such right or possession within such time, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:
a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
b) payment of any such Cost-plus profit, which shall be included in the Contract Price.

2.1.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

2.1.5 However, if and to the extent that the Procuring Entity's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost or profit.

2.2 Permits, Licenses or Approvals

2.2.1 The Procuring Entity shall provide, at the request of the Contractor, such reasonable assistance as to allow the Contractor to obtain properly:

a) Copies of the Laws of Kenya which are relevant to the Contract but are not readily available, and
b) any permits, licenses or approvals required by the Laws of Kenya:

i) which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws],
ii) for the delivery of Goods, including clearance through customs, and
iii) for the export of Contractor's Equipment when it is removed from the Site.

2.3 Procuring Entity'sPersonnel

The Procuring Entity shall be responsible for ensuring that the Procuring Entity's Personnel and the Procuring Entity's other contractor son the Site:

a) co-operate with the Contractor's efforts under Sub-Clause 4.6 [Co-operation], and

b) take action ssimilar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) ofSub-Clause 4.8 [Safety Procedures] and under Sub-Clause 4.18 [Protection of the Environment].

2.4 Procuring Entity's Financial Arrangements

The Procuring Entity shall make and maintain all necessary financial arrangements which will enable the Procuring Entity to pay the Contract Price punctually (as estimated at that time) in accordance with Clause14 [Contract Price and Payment].

3. THE ENGINEER

3.1 Architect Duties and Authority

3.1.1 The Procuring Entity shall appoint the Architect who shall carry out the duties as signed to him in the Contract. The Architect staff shall include suitably qualified Assistants and other professionals who are competent to carry out these duties. The Architect Name and Address shall be provided in the **Special Conditions of Contract.**

3.1.2 The Architect shall have no authority to amend the Contract.

3.1.3 The Architect May exercise the authority attributable to the Architect as specified in or necessarily to be implied from the Contract. If the Architectis required to obtain the approval of the Procuring Entity before exercising a specified authority, the requirements shall be as stated in the S**pecial Conditions of Contract**. The Procuring Entity shall promptly inform the Contractor of any change to the authority attributed to the Engineer.

3.1.4 However, whenever the Architect exercises a specified authority for which the Procuring Entity's approvalis required, then (for the purposes of the Contract) the contractor shall require the Architect toprovideevidence of such approval before complying with the instruction.

3.1.5 Except as otherwise stated in these Conditions:

a) Whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Architect shallbedeemedtoactfortheProcuring Entity;
b) the Architect has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract;
c) any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Architect (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliances; and
d) anyact by the Architect in response to a Contractor's request shall be notified in writing to the Contractor within 14 days of receipt.

3.1.6 The following provisions shall apply:

The Architect shall obtain the specific approval of the Procuring Entity before taking action under the-following Sub-Clauses of these Conditions:

a) Sub-Clause 4.12: agreeing or determining an extension of time and/or additional cost.

b) Sub-Clause 13.1: instructing a Variation, except;

i) In an emergency situation as determined by the Engineer, or

ii) If such a Variation would increase the Accepted Contract Amount by less than the percentage specified in the **Special Conditions of Contract.**

c) Sub-Clause 13.3: Approving a proposal for Variation submitted by the Contractor in accordance with Sub Clause 13.1 or 13.2.

d) Sub-Clause13.4: Specifying the amount payable in each of the applicable three currencies.

3.1.7 Not withstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibility under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forth with comply, despite the absence of approval of the Procuring Entity, with any such instruction of the Engineer. The Architect shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13 and shall notify the Contractor accordingly, with a copy to the Procuring Entity.

3.2 Delegation by the Engineer

3.2.1 The Architect may from time to time assign duties and delegate authority to assistants and may also revoke such assignment or delegation. These assistants may include a resident Engineer, and/or independent inspectors appointed to inspect and/ or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties. However, unless otherwise agreed by both Parties, the Architect shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [Determinations].

3.2.2 Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorized to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:

a) Any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not prejudice the right of the Architect to reject the work, Plant or Materials;

b) If the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3 Instructions of the Engineer

3.3.1 The Architect may issue to the Contractor (at anytime) instructions and additional or modified Drawings which may benecessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instructions from the Engineer, or from an assistant to whom the appropriate authority has been delegated under Clause 3.2.1.

3.3.2 The Contractor shall comply with the instructions given by the Architect or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing. If the Architec tor a delegated assistant:

a) Gives an oral instruction,

b) receives a written confirmation of the instruction, from (or on behalf of) the Contractor, within two working days after giving the instruction, and

c) does not reply by issuing a written rejection and/or instruction within two working days after receiving the confirmation,

Then the confirmation shall constitute the written instruction of the Architect or delegated assistant (as the case may be).

3.4 Replacement of the Engineer

IftheProcuring Entity intends to replace the Engineer, the Procuring Entity shall, in not less than 21 days before theintendeddateofreplacement, give notice to the Contractor of the name, address and relevant experience of the intended person to replace the Engineer.

3.5 Determinations

3.5.1 Whenever these Conditions provide that the Architect shall proceed in accordance with this Sub-Clause3.5 to agreeor determine any matter, the Architect shall consult with each Party in an endeavor to reach agreement. If agreement is not achieved, the Architect shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

3.5.1 The Architect shall give notice to both Parties of each agree mentor determination, with supporting particulars, within 30 days from the receipt of the corresponding claim or request except when otherwise specified. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [Claims, Disputes and Arbitration].

4 THE CONTRACTOR

4.1 Contractor's General Obligations

4.1.1 The Contractor shall design (to the extent specified in the Contract), execute and complete the Works in accordance with the Contract and with the Architect instructions, ands hall remedy any defects in the Works.

4.1.2 The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design, execution, completion and remedying of defects.

4.1.3 All equipment, material, and services to be incorporated in or required for the Works shall have their origin in any eligible source country.

4.1.4 The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the designor specification of the Permanent Works.

4.1.5 The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.

4.1.6 If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Special Conditions:

a) The Contractor shall submit to the Architect the Contractor's Documents for this part in accordance with the procedures specified in the Contract;

b) these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [Law and Language], and shall include additional information required by the Architect to add to the Drawings for co-ordination of each Party's designs;

c) the Contractor shall be responsible for this part and it shall, when the Works are completed, befit for such purposes for which the part is intended as are specified in the Contract; and

d) prior to the commencement of the Tests on Completion, the Contractor shall submit to the Architectthe "as-built" documents and, if applicable, operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Procuring Entity to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections] until these documents and manuals have been submitted to the Engineer.

4.2 Performance Security

4.2.1 The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount stated in the **Special Conditions of Contract** and denominated in the currency (ies) of the Contract or in a freely convertible currency acceptable to the Procuring Entity. If an amount is not stated in the Special Conditions of Contract, this Sub-Clause shall not apply.

4.2.2 The Contractor shall deliver the Performance Security to the Procuring Entity within 30 days after receiving the Notification of Award and shall send a copy to the Engineer. The Performance Security shall be issued by a reputable bank selected by the Contractor and shall be in the form annexed to the Special Conditions, as stipulated by the Procuring Entity in the Special Conditions of Contract, or in another form approved by the Procuring Entity.

4.2.3 The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executedand completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 30 days prior to the expiry date, the Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.

4.2.4 The Procuring Entity shall not make a claim under the Performance Security, except for amounts to which the Procuring Entity is entitled under the Contract.

4.2.5 The Procuring Entity shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Procuring Entity was not entitled to make the claim.

4.2.6 The Procuring Entity shall return the Performance Security to the Contractor within 14 days after receiving a copyof the Taking-Over Certificate.

4.2.7 Without limitation to the provisions of the rest of this Sub-Clause, whenever the Architect determines an addition or a reduction to the Contract Price as a result of a change in cost and/ or legislation, or as a result of a Variation, amounting to more than 25 percent of the portion of the Contract Price payable in a specific currency, the Contractor shall at the Architect request promptly increase, or may decrease, as the case may be, the value of the Performance Security in that currency by an equal percentage.

4.3 Contractor's Representative

4.3.1 The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract. The Contractor's Representative's Name and Address shall be provided in the **Special Conditions of Contract.**

4.3.2 Unless the Contractor's Representative **is named in the Contract**, the Contractor shall, prior to the Commencement Date, submit to the Architect for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is with held or subsequently revoked in terms of Sub-Clause 6.9 [Contractor's Personnel], or if the appointed person fails to act as Contractor's Representative, the Contractor shall similarly submit the name and particulars of an other suitable person for such appointment.

4.3.3 The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint are placement.

4.3.4 The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the Site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Architect prior consent, and the Architect shall be notified accordingly.

4.3.5 The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer].

4.3.6 The Contractor's Representative may delegate any powers, functions and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Architect has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.

4.3.7 The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause1.4

[Law and Language]. If the Contractor's Representative's delegates are not fluent in the said language, the Contractor shall make competent interpreter savailable during all working hours in a number deemed sufficient by the Engineer.

4.4 Sub-contractors

4.4.1 The Contractor shall not subcontract the whole of the Works. The contractor may however subcontract the works as provided in Clause 34.2.

4.4.2 The Contractor shall be responsible for the acts or defaults of any Subcontractor, his agents or employees, as if theyweret heacts or defaults of the Contractor. Unless otherwise stated in the Special Conditions:

a) The Contractor shall not be required to obtain consent to suppliers solely of Materials, or to a subcontract for which the Subcontractor is named in the Contract;
b) The prior consent of the Procuring Entity shall be obtained to other proposed Subcontractors;
c) the Contractor shall give the Procuring Entity not less than 14 days' notice of the intended date of the commencement of each Subcontractor's work, and of the commencement of such work on the Site; and
d) each subcontract shall include provisions which would entitle the Procuring Entity to require the subcontract to be assigned to the Procuring Entity under Sub-Clause 4.5 [Assignment of Benefit of Subcontract] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [Termination by Procuring Entity].

4.4.3 The Contractor shall ensure that the requirements imposed on the Contractor by Sub-Clause 1.12 [Confidential Details] apply equally to each Subcontractor.

4.4.4 Wher epracticable, the Contractor shall give fair and reasonable opportunity for contractors from Kenya to be appointed as Subcontractors.

4.5 Assignment of Benefit of Subcontract

If a Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Procuring Entity, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Procuring Entity for the work carried out by the Subcontractor after the assignment takes effect.

4.6 Co-operation

4.6.1 The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

a) The Procuring Entity's Personnel,
b) Any other contractors employed by the Procuring Entity, and
c) The personnel of any legally constituted public authorities, who may be employed in the execution on or near the Site of any work not included in the Contract.

4.6.2 Any such instruction shall constitute a Variation if and to the extent that it cause sthe Contractor to suffer delays and/ortoincur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment, Temporary Works or access arrangements which are the responsibility of the Contractor.

4.6.3 If, under the Contract, the Procuring Entity is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Architect in the time and manner stated in the Specification.

4.7 Setting Out of the Works

4.7.1 The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contractor notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Works.

4.7.2 The Procuring Entity shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used.

4.7.3 If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an errorin these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/ or Cost, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
b) payment of any such costs accrued, which shall be included in the Contract Price.

4.7.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to thise.

4.8 Safety Procedures

The Contractor shall:
a) Comply with all applicable safety regulations,
b) Takec are for the safety of all persons entitled to be on the Site,
c) Use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [Procuring Entity's Taking Over], and
e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

4.9 Quality Assurance

4.9.1 The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract.The system shall be in accordance with the details stated in the Contract. The Architect shall be entitledto audit any aspect of the system.

4.9.2 Details of all procedures and compliance documents shall be submitted to the Architectf or information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor itself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10 Site Data

4.10.1 The Procuring Entity shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Procuring Entity's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Procuring Entity shall similarly make available to the Contractor all such data which come into the Procuring Entity's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

4.10.2 To the extent which was practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation):

a) The form and nature of the Site, including sub-surface conditions,
b) the hydrological and climatic conditions,
c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects,
d) the Laws, procedures and labour practices of Kenya, and
e) the Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

4.11 Sufficiency of the Accepted Contract Amount

4.11.1 TheContractor shall be deemed to:

a) Have satisfied itself as to the correctness and sufficiency of the Accepted Contract Amount, and

b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [Site Data].

4.11.2 Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

4.12 Unforeseeable Physical Conditions

4.12.1 In this Sub-Clause, "physical conditions" means natural physical conditions and man-made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

4.12.2 If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Architect as soon as practicable.

4.12.3 This notice shal ldescribe the physical conditions, so that they can be inspected by the Architect and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instructions which the Architect may give. If an instruction constitutes a Variation, Clause 13 [Variations and Adjustments] shall apply.

4.12.4 If and to the extent that the Contractor encounters physical conditions which are Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to notice under Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) payment of any such Cost, which shall be included in the Contract Price.

4.12.5 Upon receiving such notice and inspecting and/or investigating these physical conditions, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

4.12.6 However, before additional Cost is finally agreed or determined under sub-paragraph (ii), the Architect may also review whether other physical conditions in similar parts of the Works (if any) were more favorable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favorable conditions were encountered, the Architect may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under sub-paragraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

4.12.7 The Architect shall take account of any evidence of the physical conditions foreseen by the Contractorwhen submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor'sinterpretationofanysuchevidence.

4.13 Rights of Way and Facilities

Unless otherwise specified in the Contract the Procuring Entity shall provide effective access to and possession of the Site including special and/or temporary rights-of-way which are necessary for the Works. The Contractor shall obtain, at his risk and cost, any additional rights of way or facilities out side the Site

which he may require for the purposes of the Works.

4.14 Avoidance of Interference

4.14.1 The Contractor shall not interfere unnecessarily or improperly with:

a) The convenience of the public, or

b) The access to and use and occupation of all roads and foot paths, irrespective of whether they are public or in the possession of the Procuring Entity or of others.

4.14.2 The Contractor shall indemnify and hold the Procuring Entity harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15 Access Route

4.15.1 The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site at Base Date. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes.

4.15.2 Except as otherwise stated in these Conditions:

a) The Contractor shall (as be tween the Parties) be responsible for any maintenance which may be required for his use of access routes;

b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions;

c) the Procuring Entity shall not be responsible for any claims which may arise from the use or otherwise of any access route;

d) the Procuring Entity does not guarantee the suitability or a vailability of particular access routes; and

e) Costs due to non-suitability or non-availability, for the use required by the Contractor, of access routes shall be borne by the Contractor.

4.16 Transport of Goods

Unless otherwise stated in the Special Conditions:

a) the Contractor shall give the Architect not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;

b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and

c) the Contractor shall indemnify and hold the Procuring Entity harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from thetransport of Goods and shall negotiate and pay all claims arising from their transport.

4.17 Contractor's Equipment

The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

4.18 Protection of the Environment

4.18.1 The contractor shall comply with the applicable environmental laws, regulations and policies.

4.18.2 The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

4.18.3 The Contractors Hall ensure that emissions, surfaced is charges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws.

4.19 Electricity, Water and Gas

4.19.1 The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require for his construction activities and to the extent defined in the Specifications, for the tests.

4.19.2 The Contractor shall be entitled to use for the purposes of the Works such supplies of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specifications.The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed.

4.19.3 The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Architect in accordance with Sub-Clause 2.5 [Procuring Entity's Claims] and Sub-Clause 3.5 [Determinations]. The Contractor shall pay these amounts to the Procuring Entity.

4.20 Procuring Entity's Equipment and Free-Issue Materials

4.20.1 The Procuring Entity shall make the Procuring Entity's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:

a) The Procuring Entitys hall be responsible for the Procuring Entity's Equipment, except that

b) the Contractor shall be responsible for each item of Procuring Entity's Equipment whilst any of the Contractor's Personnel is operating it, driving it, directing it or in possession or control of it.

4.20.1 The appropriate quantities and the amounts due (at such stated prices) for the use of Procuring Entity's Equipment shall be agreed or determined by the Architect in accordance with Sub-Clause 2.5 [Procuring Entity's Claims] and Sub-Clause3.5 [Determinations]. The Contractor shall pay these amounts to the Procuring Entity.

4.20.2 The Procuring Entity shall supply, free of charge, the “free-issue materials” (if any) in accordance with the details stated in the Specification. The Procuring Entity shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them and shall promptly give notice to the Architect of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Procuring Entity shall immediately rectify the notified shortage, defector default.

4.20.3 After this visual inspection, the free-issue materials shall come under the care, custody and control of the Contractor. The Contractor's obligations of inspection, care, custody and control shall not relieve the Procuring Entity of liability for any shortage, defect or default not apparent from a visual inspection.

4.21 Progress Reports

4.21.1 Unless otherwise stated in the Special Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Architect in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

4.21.2 Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works. Each report shall include:

a) charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [NominatedSubcontractors]),

b) photographs showing the status of manufacture and of progress on the Site;

c) for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:

   i) commencement of manufacture,

   ii) Contractor's inspections,

   iii) tests, and

iv) shipment and arrival at the Site;

d) the details described in Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment];

e) copies of quality assurance documents, test results and certificates of Materials;

f) list of notices given under Sub-Clause 2.5 [Procuring Entity's Claims] and notices given under Sub- Clause 20.1 [Contractor's Claims];

g) safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and

h) comparison so factual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22 Security of the Site

Unless otherwise stated in the Special Conditions:

a) The Contractor shall be responsible for keeping unauthorized persons off the Site, and

b) authorized persons shall be limited to the Contractor's Personnel and the Procuring Entity's Personnel; and to any other personnel notified to the Contractor, by the Procuring Entity or the Engineer, as authorized personnel of the Procuring Entity's other contractors on the Site.

4.23 Contractor's Operations on Site

4.23.1 The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Architect as additional working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacentl and.

4.23.2 During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

4.23.3 Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from that part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfil obligations under the Contract.

4.24 Fossils

4.24.1 All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Procuring Entity. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

4.24.2 The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) payment of any such Cost, which shall be included in the Contract Price.
After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

5. NOMINATED SUBCONTRACTORS

5.1 Definition of "nominated Subcontractor"

In this Contract, "nominated Subcontractor" means a Subcontractor:

a) Who is nominated by the Procuring Entity, or

b) Contractor has nominated as a Subcontractor subject to Sub-Clause 5.2 [Objection to Notification].

5.2 Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Procuring Entity as soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Procuring Entity agrees in writing to indemnify the Contractor against and from the consequences of the matter:

a) there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength;

b) the nominated Subcontractor does not accept to indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and employees; or

c) the nominated Subcontractor does not accept to enter into a subcontract which specifies that, for the subcontracted work (including design, if any), the nominated Subcontractor shall:

   i) undertake to the Contractor such obligations and liabilities as will enable the Contractor to discharge hisobligations and liabilities under the Contract;

   ii) indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfil these liabilities, and

   iii) be paid only if and when the Contractor has received from the Procuring Entity payments for sums due under the Subcontract referred to under Sub-Clause 5.3 [Payment to nominated Subcontractors].

5.3 Payments to nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts shown on the nominated Subcontractor's invoices approved by the Contractor which the Architect certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with sub-paragraph (b) of Sub-Clause 13.5 [Provisional Sums], except as stated in Sub-Clause 5.4 [Evidence of Payments].

5.4 Evidence of Payments

5.4.1 Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Architect may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

(a) Submits this reasonable evidence to the Engineer, or

(b) i) Satisfies the Architect in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and

   ii) Submits to the Architect reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement, then the Procuring Entity may (at his sole discretion) pay, directto the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above.The Contractor shall then repay, to the Procuring Entity, the amount which the nominated Subcontractor was directly paid by the Procuring Entity.

6. STAFF AND LABOR

6.1 Engagement of Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, feeding, transport, and, when appropriate, housing. The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within Kenya.

6.2 Rates of Wages and Conditions of Labor

6.2.1 The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by Procuring Entity's whose trade or industry is similar

to that of theContractor.

6.2.2 The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in Kenya in respect of such of their salaries, wages, allowances and any benefits as are subject to tax under the Laws of Kenya for the time being in force, and the Contractor shall perform such duties in regard to such deductions there of as may be imposed on him by such Laws.

6.3 Persons in the Service of Procuring Entity

The Contractor shall not recruit, or attempt to recruit, staff and labour from amongst the Procuring Entity's Personnel.

6.4 Lab or Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, employment of children, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights. The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work.

6.5 Working Hours

Nowork shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the **Special Conditions of Contract**, unless:

a) Otherwise stated in the Contract,
b) The Architect gives consent, or
c) The work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Engineer, provided that work done outside the normal working hours shall be considered and paid for as overtime.

6.6 Facilities for Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities on site for the Contractor's Personnel. The Contractor shall also provide facilities for the Procuring Entity's Personnel as stated in the Specifications. The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.7 Health and Safety

6.7.1 The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with loca lhealth authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Procuring Entity's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

6.7.2 The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide what ever is required by this person to exercise this responsibility and authority.

6.7.3 The Contractor shall send, to the Engineer, details of any accident as soon as practicable after itsoccurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Architect may reasonably require.

6.7.4 The Contractor shall conduct an awareness programme on HIV and other sexually transmitted diseases via an approved service provider and shall undertake such other measures taken to reduce the risk of the transfer of these diseases between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals.

6.8 Contractor's Superintendence

6.8.1 Throughout the execution of the Works, and as long thereafter as is necessary to fulfil the Contractor's obligations, the Contractor shall provide all necessary super intendence to plan, arrange, direct, manage,

inspect and test the work.

6.8.2 Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and Language]) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

6.9 Contractor's Personnel

6.9.1 The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Contractors Key personnel shall be named in the Special Conditions of Contract. The Architect may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative if applicable, who:

a) Persists in any misconduct or lack of care,
b) Carries out duties in competently or negligently,
c) fails to conform with any provisions of the Contract,
d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment, or
e) based on reasonable evidence, is determined to have engaged in Fraud and Corruption during the execution ofthe Works.

6.9.2 If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

6.10 Records of Contractor's Personnel and Equipment

The Contractor shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

6.11 Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, and to preserve peace and protection of persons and property on and near the Site.

6.12 Foreign Personnel

6.12.1 The Contractor shall not employ foreign personnel unless the contractor demonstrates that there are no Kenyans with the required skills.

6.12.2 The Contractor shall be responsible for the return of any foreign personnel to the place where they were recruited or to their domicile. In the event of the death in Kenya of any of these personnel or members of their families, the Contractor shall similarly be responsible for making the appropriate arrangements for their return or burial.

6.13 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Sitea n adequate supply of drinking and other water for the use of the Contractor's Personnel.

6.14 Measures against Insect and Pest Nuisance

The Contractor shall a tall times take the necessary precautions to protect the Contractor's Personnel employed on the Site from insect and pest nuisance, and to reduce the danger to their health. The Contractor shall comply with all the regulations of the local health authorities, including use of appropriate insecticide.

6.15 Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Laws of Kenya, onsite, import, sell, give, barter or otherwise dispose of any alcoholic liquor or drugs, or permit or allow importation, sale, gift, barter or disposal there of by Contractor's Personnel.

6.16 Prohibition of Forced or Compulsory Labour

The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements.

6.17 Prohibition of Harmful Child Labor

The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where the relevant labour laws of Kenya have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.

6.18 Employment Records of Workers

The Contractor shall keep complete and accurate records of the employment of labour at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and submitted to the Engineer. These records shall be included in the details to be submitted by the Contractor under Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment].

6.19 Workers' Organizations

The Contractor shall comply with the relevant labor laws that recognize workers' rights to form and to join workers' organizations of their choosing without interference.

6.20 Non-Discrimination and Equal Opportunity

The Contractor shall base the labour employment on the principle of equal opportunity and fair treatment and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employ mentor retirement, and discipline.

7. PLANT, MATERIALS AND WORKMANSHIP

7.1 Manner of Execution

The Contractor shall carry out the manufacture/assemble of plant, the production and manufacture of Materials, and all other execution of the Works:

a) In the manner (if any) specified in the Contract,

b) in a proper workman like and careful manner, in accordance with recognized good practice, and

c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2 Samples

The Contractor shall submit the following samples of Materials, and relevant information, to the Architect for consent prior to using the Material sin or for the Works:

a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and

b) additional samples instructed by the Architect as a Variation.

Each sample shall be labeled as to origin and intended use in the Works.

7.3 Inspection

7.3.1 The Procuring Entity's Personnel shall at all reasonable times:

a) Have full access to all parts of the Site and to all places from which natural Materials are being obtained, and

b) during production, manufacture and construction (at the Site and elsewhere), be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

7.3.2 The Contractor shall give the Procuring Entity's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment. No such activity shall relieve the Contractor from any obligation or responsibility.

7.3.3 The Contractor shall give notice to the Architect whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Architect shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Architect does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and there after reinstate and make good, all at the Contractor's cost.

7.4 Testing

7.4.1 This Sub-Clause shall apply to all tests specified in the Contract.

7.4.2 Except as otherwise specified in the Contract, the Contractor shall provide all apparatus, assistance, documents and other information, electricity, equipment, fuel, consumables, instruments, labor, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and placef ort he specified testing of any Plant, Materials and other parts of the Works.

7.4.3 The Architect may, under Clause 13 [Variations and Adjustments], vary the location or details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional tests show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, not withstanding other provisions of the Contract.

7.4.4 The Architect shall give the Contractor not less than 24 hours' notice of the Architect intention to attend the tests. If the Architect does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer, and the tests shall then be deemed to have been made in the Architect presence.

7.4.5 If the Contractor suffers delay and/ or incurs Cost from complying with these instructions or as a result of a delay for which the Procuring Entity is responsible, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) payment of any such Cost-plus profit, which shall be included in the Contract Price.

7.4.6 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

7.4.7 The Contractor shall promptly forward to the Architect duly certified reports of the tests. When thespecified tests have be enpassed, the Architect shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Architect has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5 Rejection

7.5.1 If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Architect may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

7.5.2 If the Architect requires this Plant, Materials or workmanship to be retested, the tests shall be repeated under the same terms and conditions. If the rejection and retesting cause the Procuring Entity to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay these costs to the Procuring Entity.

7.6 Remedial Work

7.6.1 Not withstanding any previous test or certification, the Architect may instruct the Contractorto:

a) Remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,

b) remove and re-execute any other work which is not in accordance with the Contract, and

c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseen able event or otherwise.

7.6.2 The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under sub-paragraph (c).

7.6.3 If the Contractor fails to comply with the instruction, the Procuring Entity shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay to the Procuring Entity all costs arising from this failure.

7.6.4 If the contractor repeatedly delivers defective work, the Procuring Entity may consider termination in accordance with Clause 15.

7.7 Ownership of Plant and Materials

Except as otherwise provided in the Contract, each item of Plant and Materials shall become the property of the Procuring Entity at whichever is the earlier of the following times, free from liens and other encumbrances:

a) When it is in corporated in the Works;

b) when the Contractor is paid the corresponding value of the Plant and Materials under Sub-Clause 8.10 [Payment for Plant and Materials in Event of Suspension].

7.8 Royalties

Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payments for:

a) Natural materials obtained from outside the Site, and

b) thedisposal of material from demolitions and excavations and of other surplus material (whether natural orman-made), except to the extent that disposal are as within the Site are specified in the Contract.

8. COMMENCEMENT, DELAYS AND SUSPENSION

8.1 Commencement of Works

8.1.1 Except as otherwise specified in the Special Conditions of Contract, the Commencement Date shall be the date at which the following precedent condition shave all been fulfilled and the Architect notification recording the agreement of both Parties on such fulfilment and instructing to commence the Work is received by the Contractor:

a) Signature of the Contract Agreement by both Parties, and if required, approval of the Contract by relevant authorities of Kenya;

b) except if otherwise specified in the Special Conditions of Contract, effective access to and possession of the Site given to the Contractor together with such permission(s) under (a) of Sub-Clause 1.13 [Compliance with Laws] as required for the commencement of the Works.

c) Receipt by the Contractor of the Advance Payment under Sub-Clause 14.2 [Advance Payment] provided that the corresponding bank guarantee has been delivered by the Contractor.

8.1.2 If the said Architect instruction is not received by the Contractor within 180 days from his receipt of the Letter of Acceptance, the Contractor shall be entitled to terminate the Contract under Sub-Clause1 6.2 [Terminationby Contractor].

8.1.3 The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date and shal lthen proceed with the Works with due expedition and without delay.

8.2 Time for Completion

The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for the Works or Section (as the case may be), including:

a) Achieving the passing of the Testson Completion, and

b) completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [Taking Over of the Works and Sections].

8.3 Programme

8.3.1 The Contractor shall submit a detailed time programme to the Architect within1 4 days after receiving the notice under Sub-Clause 8.1 [Commencement of Works]. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

a) The order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing,

b) each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]),

c) the sequence and timing of inspections and tests specified in the Contract, and

d) a supporting report which includes:

i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and

ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

8.3.2 Unless the Engineer, within 14 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Procuring Entity's Personnel shall be entitled to rely upon the programme when planning their activities.

8.3.3 The Contractor shall promptly give notice to the Architect of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price or delay the execution of the Works.

8.3.4 If, at anytime, the Architect gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contractor to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Architect in accordance with this Sub-Clause.

8.4 Extension of Time for Completion

8.4.1 The Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to an extension of the Time for Completion if and to the extent that completion for the purposes of Sub-Clause 10.1 [Taking Over of the Works and Sections] is or will be delayed by any of the following causes:

a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [Variation Procedure]) or other substantial change in the quantity of an item of work included in the Contract,

b) a cause of delay giving an entitlement to extension of time under a Sub-Clause of these Conditions,

c) exceptionally adverse climatic conditions,

d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or

e) any delay, impediment or prevention caused by or attributable to the Procuring Entity, the Procuring Entity's Personnel, or the Procuring Entity's other contractors.

8.4.2 If the Contractor considers itself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Architect in accordance with Sub-Clause 20.1 [Contractor's Claims]. When determining each extension of time under Sub-Clause 20.1, the Architec tshall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5 Delays Caused by Authorities

If the following conditions apply, namely:

a) The Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in Kenya,

b) These authorities delay or disrupt the Contractor's work, and

c) the delay or disruption was Unforeseeable, then this delay or disruption will be considered as a cause of delay under sub-paragraph (b) of Sub-Clause 8.4 [Extension of Time for Completion].

8.6 Rate of Progress

8.6.1 If, at anytime:

a) Actual progress is too slow to complete within the Time for Completion, and/or

b) Progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [Programme], other than as a result of a cause listed in Sub-Clause 8.4 [Extension of Time for Completion], then the Architect may instruct the Contractor to submit, under Sub-Clause 8.3 [Programme], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

8.6.2 Unless the Architect notifies otherwise, the Contractor shall adopt these revised methods, which mayrequire increases in the working hours and/or in the numbers of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Procuring Entity to incur additional costs, the Contractor shall subject to notice under Sub-Clause 2.5 [Procuring Entity's Claims] pay these costs to the Procuring Entity, in addition to delay damages (if any) under Sub-Clause 8.7 below.

8.6.3 Additional costs of revised methods including acceleration measures, instructed by the Architect to reduce delays resulting from causes listed under Sub-Clause 8.4 [Extension of Time for Completion] shall be paid by the Procuring Entity, without generating, however, any other additional payment benefit to the Contractor.

8.7 Delay Damages

8.7.1 If the Contractor fails to comply with Sub-Clause 8.2 [Time for Completion], the Contractor shall subject to notice under Sub-Clause 2.5 [Procuring Entity's Claims] pay delay damages to the Procuring Entity for this default. These delay damages shall be the sum stated in the **Special Conditions of Contract**, which shall be paid for everyday which shall elapse between the relevant Time for Completion and the date stated in the taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Special Conditions of Contract.

8.7.2 These delay damages shall be the only damages due from the Contractor for such default, other than in the event of termination under Sub-Clause 15.2 [Termination by Procuring Entity] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

8.8 Suspension of Work

8.8.1 The Architect may at anytime instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works a gainst any deterioration, loss or damage.

8.8.2 The Architect may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clauses 8.9, 8.10 and 8.11 shall not apply.

8.9 Consequences of Suspension

8.9.1 If the Contractor suffers delay and/or incurs Cost from complying with the Architect instructions under Sub-Clause 8.8 [Suspension of Work] and/or from resuming the work, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) Payment of any such Cost, which shall be included in the Contract Price.

8.9.2 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause3.5 [Determinations] to agree or determine these matters.

8.9.3 The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's faulty design, workmanship or materials, or of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [Suspension of Work].

8.10 Payment for Plant and Materials in Event of Suspension

The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/ or Materials which have not been delivered to Site, if:

a) The work on Plant or delivery of Plant and/ or Materials has been suspended for more than 30 days, and

b) the Contractor has marked the Plant and/or Materials as the Procuring Entity's property in accordance with the Architect instructions.

8.11 ProlongedSuspension

If the suspension under Sub-Clause 8.8 [Suspension of Work] has continued for more than 84 days, the Contractor may request the Architect permission to proceed. If the Architect does not give permission within 30 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [Variations and Adjustments] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [Termination by Contractor].

8.12 Resumption of Work

After the permission or instruction to proceed is given, the Contractor and the Architect shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension after receivingf rom the Architec tan instruction to this effect under Clause 13 [Variations and Adjustments].

9. TESTS ON COMPLETION

9.1 Contractor's Obligations

9.1.1 The Contractor shall carry out the Tests on Completion in accordance with this Clause and Sub-Clause 7.4 [Testing], after providing the documents in accordance with sub-paragraph (d) of Sub-Clause 4.1 [Contractor's General Obligations].

9.1.2 The Contractor shall give to the Architect not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Architect shall instruct.

9.1.3 In considering the results of the Tests on Completion, the Architect shall make allowances for the effect of any use of the Works by the Procuring Entity on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certified report of the resultsof these Tests to the Engineer.

9.2 Delayed Tests

9.2.1 If the Tests on Completion are being unduly delayed by the Procuring Entity, Sub-Clause 7.4 [Testing] (fifth paragraph) and/ or Sub-Clause 10.3 [Interference with Tests on Completion] shall be applicable.

9.2.2 If the Tests on Completion are being unduly delayed by the Contractor, the Architect may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Testson such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.

9.2.3 If the Contractor fails to carryout the Tests on Completion within the period of 21 days, the Procuring Entity's Personnel may proceed with the Test sat the risk and cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted asaccurate.

9.3 Retesting of related works

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [Rejection] shall apply, and the Architect or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

9.4 Failure to Pass Tests on Completion

9.4.1 If the Works, or a Section, fail to pass the Tests on Completion repeated under Sub-Clause 9.3 [Retesting],

the Architect shall be entitled to:

a) Order further repetition of Tests on Completion under Sub-Clause 9.3; or

b) if the failure deprives the Procuring Entity of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Procuring Entity shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause1 1.4 [Failure to Remedy Defects].

10. PROCURING ENTITY'S TAKING OVER

10.1 Taking Over of the Works and Sections

10.1.1 Except as stated in Sub-Clause 9.4 [Failure to Pass Tests on Completion], the Works shall be taken over by the Procuring Entity when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [Time for Completion] and except as allowed in sub-paragraph (a) below, and (ii) a Taking-Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.

10.1.2 The Contractor may apply by notice to the Architect for a Taking-Over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contract or may similarly apply for a Taking-Over Certificate for each Section.

10.1.3 The Architect shall, within 30 days after receiving the Contractor's application:

a) Issue the Taking-Over Certificate to the Contract or, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor out standing work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or

b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice undert his Sub-Clause.

10.1.4 If the Architect fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 30 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on thel ast day of that period.

10.2 Taking Over of Parts of the Works

10.2.1 The Architect may, at the sole discretion of the Procuring Entity, issue a Taking-Over Certificate for any part of the Permanent Works.

10.2.2 The Procuring Entity shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Architect has issued a Taking-Over Certificate for this part. However, if the Procuring Entity does use any part of the Works before the Taking-Over Certificate is issued:

a) The part which is used shall be deemed to have been taken over as from the date on which it is used,

b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Procuring Entity, and

c) if requested by the Contractor, the Architect shall issue a Taking-Over Certificate for this part.

10.2.3 After the Architect has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earliest opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period.

10.2.4 If the Contractor incurs Cost as a result of the Procuring Entity taking over and/or using a part of the Works, other than such use as is specified in the Contractor agreed by the Contractor, the Contractor shall (i) give notice to the Architect and (ii) be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to payment of any such accrued costs, which shall be included in the Contract Price. After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this accrued cost.

10.2.5 If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages there after for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or

Section (as the case may be) as a whole. The Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub-Clause 8.7 [Delay Damages] and shall not affect the maximum amount of these damages.

10.3 Interference with Tests on Completion

10.3.1 If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Procuring Entity is responsible, the Procuring Entity shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

10.3.2 The Architect shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Architect shall require the Tests on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

10.3.3 If the Contractor suffers delay and/or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) payment of any such accrued costs, which shall be included in the Contract Price.

10.3.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

10.4 Surfaces Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

11. DEFECTS LIABILITY

11.1 Completion of Outstanding Work and Remedying Defects

11.1.1 In order that the Works and Contractor's Documents, and each Section, shall be in the condition required by the Contract (fairwear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable there after, the Contractor shall:

a) complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer, and

b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Procuring Entity on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

11.1.2 If a defect appears or damage occurs, the Contractor shall be notified accordingly by the Engineer.

11.2 Cost of Remedying Defects

11.2.1 All work referred to in sub-paragraph (b) of Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:

a) Any design for which the Contractor is responsible,

b) Plant, Materials or workmanship not being in accordance with the Contract, or

c) Failure by the Contractor to comply with any other obligation.

11.2.2 If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Procuring Entity, and Sub-Clause 13.3 [Variation Procedure] shall apply.

11.3 Extension of Defects Notification Period

11.3.1 The Procuring Entity shall be entitled subject to Sub-Clause 2.5 [Procuring Entity's Claims] to an extension

of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a defect or by reason of damage attributable to the Contractor. However, a Defects Notification Period shall not be extended by more than two years.

11.3.2 If delivery and/ or erection of Plant and/ or Materials was suspended under Sub-Clause 8.8 [Suspension of Work] or Sub-Clause 16.1 [Contractor's Entitlement to Suspend Work], the Contractor's obligations under this Clause shall not appl yto any defectsor damage occurring more than two years after the Defects Notification Period for the Plant and/ or Materials would otherwise have expired.

11.4 Failure to Remedy Defects

11.4.1 If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by the Engineer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

11.4.2 If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2[Costo f Remedying Defects], the Procuring Entity may (at his option):

(a) Carry out the work itself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work; and the Contractor shall subject to Sub-Clause 2.5 [Procuring Entity's Claims] pay to the Procuring Entity the costs reasonably incurred by the Procuring Entity in remedying the defect or damage;

(b) Requirethe Architect to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [Determinations]; or

(c) if the defect or damage deprives the Procuring Entity of substantially the whole benefit of the Works or any major part of the Works, terminate the Contractas a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contractor otherwise, the Procuring Entity shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5 Removal of Defective Work

If the defector damage cannot be remedied expeditiously on the Site and the Procuring Entity gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6 Further Tests

11.6.1 If the work of remedying of any defector damage may affect the performance of the Works, the Architect may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 14 days after the defect or damage is remedied.

11.6.2 These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [Cost of Remedying Defects], for the cost of the remedial work.

11.7 Right of Access

Unti lthe Completion Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Procuring Entity's reasonable security restrictions.

11.8 Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defecton parts of the works that have already accepted, under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Cost of the search plus profit shall be agreed or determined by the Architect in accordance with Sub-Clause 3.5 [Determinations] and shall be included in the Contract Price.

11.9 Completion Certificate

11.9.1 Performance of the Contractor's obligations shall not be considered to have been completed until the Architect has issued the Completion Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.

11.9.2 The Architect shall issue the Completion Certificate within 30days after the latest of the expiry dates of the Defects Liability Period, or as soon there after as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Completionn Certificate shall be issued to the Procuring Entity.

11.9.3 Only the Completion Certificate shall be deemed to constitute acceptance of the Works.

11.10 Unfulfilled Obligations

After the Completion Certificate has been issued, each Party shall remain liable for the fulfilment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

11.11 Clearance of Site

11.11.1 Upon receiving the Completion Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.

11.11.2 If all these items have not been removed within 30 days after receipt by the Contractor of the Completion Certificate, the Procuring Entity may sell or otherwise dispose of any remaining items. The Procuring Entity shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

11.11.3 Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Procuring Entity's costs, the Contractor shall pay the outstanding balance to the Procuring Entity.

12. MEASUREMENT AN DEVALUATION

12.1 Works to be Measured

12.1.1 The Works shall be measured, and valued for payment, in accordance with this Clause. The Contractorshall show in each application under Sub-Clauses 14.3 [Application for Interim Payment Certificates], 14.10 [Statement on Completion] and 14.11 [Application for Final Payment Certificate] the quantities and other particulars detailing the amounts which he considers to be entitled under the Contract.

12.1.2 Whenever the Architect requires any part of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:

a) promptly either attend or send another qualified representative to assist the Architect in making the measurement, and
b) supply any particulars requested by the Engineer.

12.1.3 If the Contractor fails to attend or send a representative, the measurement made by the Architect shall be accepted as accurate.

12.1.4 Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records, these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agreet her ecords with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.

12.1.5 If the Contractor examines and disagrees the records, and/ or does not sign them as agreed, then the Contractor shall give notice to the Architect of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Architect shall review the records and either confirm or vary them and certify the paymentofthe undisputed part. If the Contractor does not so give notice to the Architect within 14 days after being requested to examine the records, they shall be accepted as accurate.

12.2 Method of Measurement

Except as otherwise stated in the Contract:

a) Measurement shall be made of the net actual quantity of each item of the Permanent Works, and
b) the method of measurement shall be in accordance with the Bill of Quantities or other applicable

Schedules.

12.3 Evaluation

12.3.1 Except as otherwise stated in the Contract, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of workd one by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 and 12.2 and the appropriate rate or price for the item.

12.3.2 For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Contractor, if there is no such item, specified for similar work.

12.3.3 Any item of work included in the Bill of Quantities for which no rate or price was specified shall be considered as included in other rates and prices in the Bill of Quantities and will not be paid for separately.

12.3.4 However, for a new item of work, a new rate or price shall be appropriate for such item of work if:

a) The work is instructed under Clause13 [Variations and Adjustments],

b) no rate or price is specified in the Contract for this item, and

c) no specified rate or price is appropriate because the item of work is not of similar character, or is not executed under similar conditions, as any item in the Contract.

12.3.5 Each new rate or price shall be derived from any relevant rates or prices in the Contract. If no rates or prices are relevant for the new item of work, it shall be derived from the reasonable Cost of executing such work, prevailing market rates, together with profit, taking account of any other relevant matters.

12.3.6 Until such time as an appropriate rate or price is agreed or determined, the Architect shall determine a provisional rate or price for the purposes of Interim Payment Certificates as soon as the concerned work commences.

12.3.7 Where the contract price is different from the corrected tender price, in order to ensure the contractor is not paid less or more relative to the contract price (*which would be the tender price*), payment valuation certificates and variation orders on omissions and additions valued based on rates in the Bill of Quantities or schedule of rates in the Tender, will be adjusted by a plus or minus percentage. The percentage already worked out during tender evaluation is worked out as follows: *(corrected tender price– tender price)/ tender price X 100*.

12.4 Omissions

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

a) The Contractor will incur (or has incurred) cost which, if the work had not been omitted, wouldhavebeen deemed to be covered by a sum forming part of the Accepted Contract Amount;

b) The omission of the work will result (or has resulted) in this sum not forming part of the Contract Price; and

c) this cost is not deemed to be included in the evaluation of any substituted work; then the Contractor shall give notice to the Architect accordingly, with supporting particulars. Upon receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine this cost, which shall be included in the Contract Price.

13. VARIATIONS AND ADJUSTMENTS

13.1 Right to Vary

13.1.1 Variations may be initiated by the Architect at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal. No Variation instructed by the Architect under this Clause shall in any way vitiate or in validate the Contract.

13.1.2 The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Architect stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, or (ii) such Variation triggers a substantial change in the sequence or progress of the Works. Upon receiving this notice, the Architect shall cancel, confirm or vary the instruction.

13.1.3 Each Variation may include:

a) changes to the quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation),

b) changes to the quality and otherc haracteristics of any item of work,
c) changes to the levels, positions and/ or dimensions of any part of the Works,
d) omission of any work unless it is to be carried out by others,
e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, or
f) changes to the sequence or timing of the execution of the Works.

13.1.4 The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Architect instructs after obtaining approval of the Procuring Entity.

13.2. Variation Order Procedure

13.2.1 Priortoany Variation Order under Sub-Clause 13.1.4 the Architect shall notify the Contractor of the nature and form of such variation. As soon as possible after having received such notice, the Contractor shall submit to the Engineer:

a) A description of work, if any, to be performed and a programme for its execution, and
b) the Contractor's proposals for any necessary modifications to the Programme according to Sub-Clause 8.3 or to any of the Contractor's obligations under the Contract, and
c) the Contractor's proposals for adjustment to the Contract Price.

Following the receipt of the Contractor's submission the Architect shall, after due consultation with the Employer and the Contractor, decide as soon as possible whether or not the variation shall be carried out. If the Architect decides that the variation shall be carried out, he shall issue a Variation Order clearly identified as such in accordance with the Contractor's submission or as modified by agreement.

If the Architect and the Contractor are unable to agree the adjustment of the Contract Price, the provisions of Sub-Clause 13.2.2 shall apply.

13.2.2 Disagreement on Adjustment of the Contract Price

If the Contractor and the Architecture unable to agree on the adjustment of the Contract Price, the adjustment shall be determined in accordance with the rates specified in the Bills of Quantities or Schedule of Daywork Prices. If the rates contained in the Bills of Quantities or Dayworks Prices are not directly applicable to the specific work in question, suitable rates shall be established by the Architect reflecting the level of pricing in the Dayworks Prices. Where rates are not contained in the said Prices, the amount shall be such as is in all the circumstances reasonable, reflecting a market price. Due account shall be taken of any over-or under-recovery of overheads by the Contractor in consequence of the variation. The Contractor shall also be entitled to be paid:

a) The cost of any partial execution of the Work srendered useless by any such variation,
b) Thecostof making necessary alterations to Plant already manufactured or in the course of manufacture or of any work done that has to be altered in consequence of such a variation,
c) any additional costs incurred by the Contractor by the disruption of the progress of the Works as detailed in the Programme, and
d) the net effect of the Contractor's financec osts, including interest, caused by the variation.

The Architect shall on this basis determine the rates or prices to enable on-account payment to be included in certificates of payment.

13.2.3 Contractor to Proceed

On receipt of a Variation Order, the Contractor shall forth with proceed to carry out the variation and be bound to these Conditions in so doing as if such variation was stated in the Contract. The work shall not be delayed pending the granting of an extension of the Time for Completion or an adjustment to the Contract Price under Sub-Clause31.3.

13.3 Value Engineering

13.3.1 TheContractor may, at anytime, submit to the Architect written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the Procuring Entity of executing, maintaining or operating the Works, (iii) improve the efficiency or value to the Procuring Entity of the completed Works, or
(iv) otherwise be of benefit to the Procuring Entity.

13.3.2 The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [Variation Procedure].

13.2.3 If a proposal, which is approved by the Engineer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties:

a) The Contractor shall design this part,

b) sub-paragraphs (a) to (d) of Sub-Clause 4.1 [Contractor's General Obligations] shall apply, and

c) if this change results in a reduction in the contract value of this part, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine a fee, which shall be included in the Contract Price. This fee shall behalf (50%) of the difference between the following amounts:

i) such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.8 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost], and

ii) the reduction (if any) in the value to the Procuring Entity of the varied works, taking account of any improvement in quality, anticipated life or operational efficiencies.

13.3.4 However, if the amount established in item 13.2.3 (c) (i) is less than amount established in item 13.2.3 (c (ii), there shall not be a fee. However, if the if the amount established in item 13.2.3 (c) (i) is more than amount established in item 13.2.3 (c (ii), it shall result in a price variation to the Procuring Entity.

13.4 Variation Procedure for Value Engineering proposal

13.4.1 If the Architect requests a proposal, prior to instructing a Variation, the Contractor shall respond in writinga s soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:

a) A description of the proposed work to be performed and a programme for its execution,

b) the Contractor's proposal for any necessary modifications to the programme according to Sub-Clause 8.3 [Programme] and to the Time for Completion, and

c) the Contractor's proposal for evaluation of the Variation.

13.4.2 The Architect shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [Value Project Engineering] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst a waiting a response.

13.4.3 Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Architect to the Contractor, who shall acknowledge receipt.

13.4.4 Each Variation shall be evaluated in accordance with Clause 12 [Measurement and Evaluation], unless the Architect instructs or approves otherwise in accordance with this Clause.

13.5 Paymentin Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency, then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work, and to the proportions of various currencies specified for payment of the Contract Price.

13.6 Provisional Sums

13.6.1 Each Provisional Sum shall only be used, in whole or inpart, in accordance with the Architect instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include onlysuch amounts, for the work, supplies or services to which the Provisional Sum relates, as the Architect shall have instructed. For each Provisional Sum, the Architect May instruct:

a) Work to be executed (including Plant, Materialso r services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [Variation Procedure]; and/or

b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [Nominated Subcontractors]) or otherwise; and for which there shall be included in the Contract Price:

i) The actual amounts paid (or due to be paid) by the Contractor, and

ii) a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in **the Special Conditions of Contract** shall be applied.

13.6.2 The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

13.7 Dayworks

13.7.1 For work of a minor or incidental nature, the Architect may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause shall not apply.

13.7.2 Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

13.7.3 Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall delive reach day to the Architect accurate statements induplicate which shall include the following details of the resources used in executing the previous day's work:

a) The names, occupations and time of Contractor's Personnel,
b) the identification, type and time of Contractor's Equipment and Temporary Works, and
c) the quantities and types of Plant and Materials used.

13.7.4 One copy of each statement will, if correct, or when agreed, be signed by the Architect and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [Application for Interim Payment Certificates].

13.8 Adjustments for Changes in Legislation

13.8.1 The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of Kenya (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.

13.8.2 If the Contractor suffers (or will suffer) delay and/or incurs (or will incur) additional Cost as a result of these changes in the Laws or in such interpretations, made after the Base Date, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
b) payment of any such Cost, which shall be included in the Contract Price.

13.8.3 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

13.8.4 Not withstanding the foregoing, the Contractor shall not be entitled to an extension of time if the relevant delay has already been taken into account in the determination of a previous extension of time and such Cost shall not be separately paid if the same shall already have been taken into account in the indexing of any inputs to the table of adjustment data in accordance with the provisions of Sub-Clause 13.8 [Adjustments for Changes in Cost].

13.9 Adjustments for Changes in Cost

13.9.1 In this Sub-Clause, “table of adjustment data” means the completed table of adjustment data for local and foreign currencies included in the Schedules. If there is no such table of adjustment data, this Sub-Clause shall not apply.

13.9.2 If this Sub-Clause applies, the amounts payable to the Contractor shall be adjusted for rises or falls in the cost of labor, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included a mounts to cover the contingency of other rises and falls in costs.

13.9.3 The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

Price Adjustment Formula

Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC.** If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type specified below applies:

P = A + B Im/Io
where:

P is the adjustment factor for the portion of the Contract Price payable.
A and **B** a recoefficients **specified in the SCC,** representing then on adjustable and adjustable portions, respectively, of the Contract Price payable and
I m is the index prevailing at the end of the month being invoiced and **Io**c is the index prevailing 30 days before Bid opening for inputs payable.

NOTE: The sum of the two coefficients A and B should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulae for all currencies, since coefficient A, for the non-adjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency are added to the Contract Price.

13.9.4 The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, itshall be determined by the Engineer. Forth is purpose, reference shall be made to the values of the indices at stated dates (quoted in the fourth and fifth columns respectively of the table) for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.

13.9.5 Incases where the "currency of index" is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the Central Bank of Kenya, of this relevant currency on the above date for which the index is required to be applicable.

13.9.6 Until such time as each current cost index is available, the Architect shall determine a provisional index for the issue of Interim Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.

13.9.7 If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices there after shall be made using either (i) each index or price applicableo n the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price, whichever is more favorable to the Procuring Entity.

13.9.8 The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or in applicable, as a result of Variations.

14. CONTRACT PRICE AND PAYMENT

14.1 The Contract Price

14.1.1 Unless otherwise stated in the Special Conditions:

a) The value of the payment certificate shall be agreed or determined under Sub-Clause 12.3 [Evaluation] and be subject to adjustments in accordance with the Contract;
b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation];
c) any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:

i) of the Works which the Contractor is required to execute, or

ii) for the purposes of Clause12 [Measurement and Evaluation]; and

d) the Contractor shall submit to the Engineer, within 30 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Architect may take account of the break down when preparing Payment Certificates but shall not be bound by it.

14.1.2 Notwithstanding the provisions of subparagraph (b), Contractor's Equipment, including essential spare parts there for, imported by the Contractor for the sole purpose of executing the Contract shall not be exempt from the payment of import duties and taxes upon importation.

14.2 Advance Payment

14.2.1 The Procuring Entity shall make an advance payment, as an interest-free loan for mobilization and cashflow support, when the Contractor submits a guarantee in accordance with this Clause. The total advance payment, the number and timing of instalments (if more than one), and the applicable currencies and proportions, shall be as stated in the **Special Conditions of Contract.**

14.2.2 Unless and until the Procuring Entity receives this guarantee, or if the total advance payment is not stated in the Special Conditions of Contract, this Sub-Clause shall not apply.

14.2.3 The Architect shall deliver to the Procuring Entity and to the Contractor an Interim Payment Certificate for the advance payment or its first instalment after receiving a Statement (under Sub-Clause 14.3 [Application for Interim Payment Certificates]) and after the Procuring Entity receives (i) the Performance Security in accordance with Sub-Clause 4.2 [Performance Security] and (ii) a guarantee in amounts and currencies equal to the a dvance payment. This guarantee shall be issued by a reputable bank or financial institutions elected by the Contractor and shall be in the form annexed to the Special Conditions or in another form approved by the Procuring Entity.

14.2.4 The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount shall be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 30 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

14.2.5 Unless stated otherwise in **the Special Conditions of Contract**, the advance payment shall be repaid through percentage deductions from the interim payments determined by the Architect in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates], as follows:

a) Deductions shall commence in the next interim Payment Certificate following that in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds 30 percent (30%) of the Accepted Contract Amount less Provisional Sums; and

b) deductions shall be made at the amortization rate stated in the **Special Conditions of Contract** of the amount of each Interim Payment Certificate (excluding the advance payment and deductions for its repayments as well as deductions for retention money) in the currencies and proportions of the advance payment until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the time when 90 percent (90%) of the Accepted Contract Amount less Provisional Sums has been certified for payment.

14.2.6 If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [Termination by Procuring Entity], Clause 16 [Suspension and Termination by Contractor] or Clause 19 [Force Majeure] (as thec ase may be), the whole of the balance then outstanding shall immediately become due and in case of termination under Clause 15 [Termination by Procuring Entity], except for Sub-Clause 14.2.7 [Procuring Entity's Entitlement to Termination for Convenience], payable by the Contractor to the Procuring Entity.

14.3 Application for Interim Payment Certificates

14.3.1 The Contractor shall submit a Statement (in number of copies indicated in the **Special Conditions of Contract**) to the Architect after the end of each month, in aform approved by the Engineer, showing in detail

the amounts to which the Contractor considers itself to be entitled, together with supporting documents which shall include there porton the progress during this month in accordance with Sub-Clause4.21 [Progress Reports].

14.3.2 The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

a) the estimated contract value of the Works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);

b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause 13.8 [Adjustments for Changes in Cost];

c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in **the Special Conditions of Contract** to the total of the above amounts, until the amount so retained by the Procuring Entity reaches the limit of Retention Money (if any) stated **in the Special Conditions of Contract**;

d) any amounts to be added for the advance payment and (if more than one instalment) and to be deducted for its repayments in accordance with Sub-Clause 14.2 [Advance Payment];

e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [Plant and Materials intended for the Works];

f) any other additions or deductions which may have become due under the Contractor otherwise, including those under Clause 20 [Claims, Disputes and Arbitration]; and

g) the deduction of amounts certified in all previous Payment Certificates.

14.4 Schedule of Payments

14.4.1 I fthe Contract includes a schedule of payments specifying the instalments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

a) The instalments quoted in this schedule of payments shall be the estimated contract values for the purposes of sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates];

b) Sub-Clause 14.5 [Plant and Materials intended for the Works] shall not apply; and

c) If these instalments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less or more than that on which this schedule of payments was based, then the Architect may proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine revised instalments, which shall take account of the extent to which progress is less or more than that on which the instalments were previously based.

14.4.2 If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

14.5 Plant and Materials intended for the Works

14.5.1 If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates].

14.5.2 If the lists referred to in sub-paragraphs (b)(i) or (c)(i) below are not included in the Schedules, this Sub-Clause shall not apply.

14.5.3 The Architect shall determine and certify each addition if the following conditions a resatisfied:

a) The Contractor has:
   i) kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection, and
   (ii) submitted statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence;

   and either:

b) the relevant Plant and Materials:
   i) are those listed in the Schedules for payment when shipped,
   ii) have been shipped to Kenya, enroute to the Site, in accordance with the Contract; and
   iii) are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Architect together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Procuring Entity in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause14.2 [Advance Payment] and shall be valid until the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration; or

c) the relevant Plant and Materials:
   i) are those listed in the Schedules for payment when delivered to the Site, and
   ii) have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration and appear to be in accordance with the Contract.

14.5.4 The additional amount to be certified shall be the equivalent of eighty percent (80%) of the Architect determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

14.5.5 The currencies for this additional amount shall be the same as those in which payment will become due when the contract value is included under sub-paragraph (a) of Sub-Clause 14.3 [Application for Interim Payment Certificates]. At that time, the Payment Certificate shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6 Issue of Interim Payment Certificates

14.6.1 No amount will be certified or paid until the Procuring Entity has received and approved the Performance Security. Thereafter, the Architect shall, within 30 days after receiving a Statement and supporting documents, deliver to the Procuring Entity and to the Contractor an Interim Payment Certificate which shall state the amount which the Architect fairly determines to be due, with all supporting particulars for any reduction or withholding made by the Architect on the Statemen tif any.

14.6.2 However, prior to issuing the Taking-Over Certificate for the Works, the Architect shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated **in the Special Conditions of Contract**. In this event, the Architect shall give notice to the Contractor accordingly.

14.6.3 An Interim Payment Certificate shall not be withheld for any other reason, although:
a) if anything supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed; and/or
b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

4.6.4 The Architect may in any Payment Certificate make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Architect acceptance, approval, consent or satisfaction.

14.7 Payment

14.7.1 The Procuring Entity shall pay to the Contractor:
a) The advance payment shall be paid within 60 days after signing of the contract by both parties or within 60 days after receiving the documents in accordance with Sub-Clause 4.2 [Performance Security] and Sub- Clause 14.2 [Advance Payment], which ever is later;
b) The amount certified in each Interim Payment Certificate within 60 days after the Architect Issues Interim Payment Certificate; and
c) the amount certified in the Final Payment Certificate within 60 days after the Procuring Entity Issues

Interim Payment Certificate; or after determination of any disputed amount shown in the Final Statement in accordance with Sub-Clause 16.2 [Terminationby Contractor].

14.7.2 Payment of the amount due in each currency shall be made into the bank account, nominated by the Contractor, in the payment country (forth is currency) specified in the Contract.

14.8 Delayed Payment

14.8.1 If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [Payment], the Contractor shall be entitled to receive financing charges (simple interest) monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [Payment], irrespective (in the case of its sub-paragraph (b) of the date on which any Interim Payment Certificate isissued.

14.8.2 These financing charges shall be calculated at the annual rate of three percentage points above the mean rate of the Central Bank in Kenya of the currency of payment, or if not available, the inter bank offered rate, and shall be paid in such currency.

14.8.3 The Contractor shall be entitled to this payment without formal notice and certification, and without prejudice to any other right or remedy.

14.9 Payment of Retention Money

14.9.1 When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Architect for payment to the Contractor. If a Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall behalf (50%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

14.9.2 Promptly after the latest of the expiry dates of the Defects Liability Periods, the outstanding balance of the Retention Money shall be certified by the Architect for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall behalf (50%) of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

14.9.3 However, if any work remains to be executed under Clause 11 [Defects Liability], the Architects hall be entitled to withhold certification of the estimated cost of this work until it has been executed.

14.9.4 When calculating these proportions, no account shall be taken of any adjustments under Sub-Clause 13.7 [Adjustments for Changes in Legislation] and Sub-Clause13.8 [Adjustments for Changes in Cost].

14.9.5 Unless otherwise stated in the Special Conditions, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment by the Engineer, the Contractor shall be entitled to substitute a Retention Money Security guarantee, in the form annexed to the Special Conditions or in another form approved by the Procuring Entity and issued by a reputable bank or financial institution selected by the Contractor, for the second half of the Retention Money.

14.9.6 The Procuring Entity shall return the Retention Money Security guarantee to the Contractor within 14 days after receiving a copy of the Completion Certificate.

14.10 Statement at Completion

14.10.1 Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Architect three copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [Application for Interim Payment Certificates], showing:

a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works,
b) any further sums which the Contractor considers to be due, and
c) an estimate of any other amounts which the Contractor considers will become due to him under the

Contract. Estimated amounts shall be shown separately in this Statement at completion.

14.10.2 The Architect shall then certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates].

14.11 Application for Final Payment Certificate

14.11.1 Within 60 days after receiving the Completion Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with supporting documents showing in detail in a form approved by the Engineer:

a) The value of all work done in accordance with the Contract, and
b) Any further sums which the Contractor considers to be due to him under the Contractor otherwise.

14.11.2 If the Architect disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Architect may reasonably require within 30 days from receipt of said draft and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Architect the final statement as agreed. This agreed statement is referred to in these Conditions as the “Final Statement”.

14.11.3 However, if, following discussions between the Architect and the Contractor and any changes to the draft final statement which are agreed, it be comes evident that a dispute exists, the Architect shall deliver to the Procuring Entity (with a copy to the Contractor) an Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [Obtaining Dispute Board's Decision] or Sub-Clause 20.5 [Amicable Settlement], the Contractor shall then prepare and submit to the Procuring Entity (with a copy to the Engineer) a Final Statement.

14.12 Discharge

When submitting the Final Statement, the Contractor shall submit a discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the out standing balance of this total, in which event the discharge shall be effective on such date.

14.13 Issue of Final Payment Certificate

14.13.1 Within 30days after receiving the Final Statement and discharge in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Architect shall deliver, to the Procuring Entity and to the Contractor, the Final Payment Certificate which shall state:

a) The amount which he fairly determines is finally due, and
b) After giving credit to the Procuring Entity for all amounts previously paid by the Procuring Entity and for all sums to which the Procuring Entity is entitled, the balance (if any) due from the Procuring Entity to the Contractor or from the Contractor to the Procuring Entity, as the case may be.

14.13.2 If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [Application for Final Payment Certificate] and Sub-Clause 14.12 [Discharge], the Architect shall request theContractor to do so. If the Contractor fails to submit an application within a period of 30 days, the Architect shall issue the Final Payment Certificate for such amount as he fairly determines to be due.

14.14 Cessation of Procuring Entity's Liability

14.14.1 The Procuring Entity shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

a) in the Final Statement and also,
b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [Statement at Completion].

14.14.2 However, this Sub-Clause shall not limit the Procuring Entity's liability under his in demnification obligations, or the Procuring Entity's liability in any case of fraud, deliberate default or reckless misconduct

by the Procuring Entity.

14.15 Currencies of Payment

The Contract Price shall be paid in the currency or currencies named in the Schedule of Payment Currencies. If more than one currency is so named, payments shall be made as follows:

a) If the Accepted Contract Amount was expressed in Local Currency only:
   i) the proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Schedule of Payment Currencies, except as otherwise agreed by both Parties;
   ii) payments and deductions under Sub-Clause 13.5 [Provisional Sums] and Sub-Clause 13.7 [Adjustments for Changes in Legislation] shall be made in the applicable currencies and proportions; and
   iii) otherpaymentsanddeductions under sub-paragraphs (a) to (d) of Sub-Clause 14.3 [Application for Interim Payment Certificates] shall be made in the currencies and proportions specified in sub-paragraph (a) (i) above;
b) payment of the damages specified in the Special Conditions of Contract, shall be made in the currencies and proportions specified in the Schedule of Payment Currencies;
c) other payments to the Procuring Entity by the Contractor shall be made in the currency in which the sum was expended by the Procuring Entity, or in such currency as may be agreed by both Parties;
d) if any amount payable by the Contractor to the Procuring Entity in a particular currency exceeds the sum payable by the Procuring Entity to the Contractor in that currency, the Procuring Entity may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
e) if no rates of exchange are stated in the Schedule of Payment Currencies, they shall be those prevailing on the Base Date and determined by the Central Bank of Kenya.

15. TERMINATION BY PROCURING ENTITY

15.1 Notice to correct any defects or failures

If the Contractor fails to carry out any obligation under the Contract, the Architect may by notice require the Contractor to make good the failure and to remedy it within 30 days.

15.2 Termination by Procuring Entity

15.2.1 The Procuring Entity shall be entitled to terminate the Contract if the Contractor breaches the contract based on following circumstances which shall include but not limited to:

a) fails to comply with Sub-Clause 4.2 [Performance Security] or with a notice under Sub-Clause 15.1 [Notice to Correct],
b) abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract,
c) without reasonable excuse fails:
   i) to proceed with the Works in accordance with Clause 8 [Commencement, Delays and Suspension], or
   ii) to comply with a notice issued under Sub-Clause 7.5 [Rejection] or Sub-Clause 7.6 [Remedial Work], within 30 days after receiving it,
d) subcontracts the major part or whole of the Works or assigns the Contract without the consent of the Procuring Entity,
e) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of theseacts or events, or
f) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an induce mentor reward:

i) for doing or for bearing to do any action in relation to the Contract, or
ii) for showing or for bearing to show favor or disfavor to any person in relation to the Contract, or
iii) if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such induce mentor reward as is described in this sub-paragraph (f). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination, or

g) If the contract or repeatedly fails to remedy delivers defective work,

h) based on reasonable evidence, has engaged in Fraud and Corruption as defined in paragraph 2.2 of the Appendix B to these General Conditions, incompeting for or in executing the Contract.

15.2.2 In any of these events or circumstances, the Procuring Entity may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in the case of sub-paragraph (e) or (f) or (g) or (h), the Procuring Entity may by notice terminate the Contract immediately.

15.2.3 The Procuring Entity's election to terminate the Contract shall not prejudice any other rights of the Procuring Entity, under the Contractor otherwise.

15.2.4 The Contractor shall then leave the Site and deliver any required Goods, all Contractor's Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for the assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

15.2.5 After termination, the Procuring Entity may complete the Works and/ or arrange for any other entities to do so. The Procuring Entity and these entities may then use any Goods, Contractor's Documents and other design documents made by or on behalf of the Contractor.

15.2.6 The Procuring Entity shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal, at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due to the Procuring Entity, these items may be sold by the Procuring Entity in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

15.3 Valuation at Date of Termination

Assoon as practicable after a notice of termination under Sub-Clause 15.2 [Termination by Procuring Entity] has taken effect, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine the value of the Works, Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

15.4 Payment after Termination

After a notice of termination under Sub-Clause 15.2 [Termination by Procuring Entity] has taken effect, the Procuring Entity may:

a) Proceed in accordance with Sub-Clause 2.5 [Procurin Entity's Claims],

b) withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Procuring Entity, have been established, and/ or

c) recover from the Contractor any losses and damages incurred by the Procuring Entity and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3 [Valuation at Date of Termination]. After recovering any such losses, damages and extra costs, the Procuring Entity shall pay any balance to the Contractor.

15.5 Procuring Entity's Entitlement to Termination for Convenience

The Procuring Entity shall be entitled to terminate the Contract, at any time at the Procuring Entity's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 30 days after the later of the dates on which the Contractor receives this notice or the Procuring Entity returns the Performance Security. The Procuring Entity shall not terminate the Contract under this Sub-Clausein order to execute the Works itself or to arrange for the Works to be executed by another contractor or to avoid a termination of the Contract by the Contractor under Clause 16.2 [Termination by Contractor]. After this termination, the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment] and shall be paid in accordance with Sub-Clause 16.4 [Payment on Termination].

15.6 Fraud and Corruption

The Contractor shall ensure compliance with the Kenya Government's Anti-Corruption Laws and its prevailing sanctions.

15.7 Corrupt gifts and payments of commission

15.7.1 The Contractor shall not;

a) Offer or give or agree to give to any person in the service of the Procuring Entity any gift or consideration of any kind as an inducement or reward for doing or for bearing to door for having done or for borne to do any act in relation to the obtaining or execution of this or any other Contract for the Procuring Entity or for showing or for bearing to show favor or disfavor to any person in relation to this or any other contract for the Procuring Entity.

b) Enter into this or any other contract with the Procuring Entity 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 there of have been disclosed in writing to the Procuring Entity.

15.7.2 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 and Asset Disposal Act (2015) and the Anti-Corruption and Economic Crimes Act (2003) of the Laws of Kenya.

16. SUSPENSION AND TERMINATION BY CONTRACTOR

16.1 Contractor's Entitlement to Suspend Work

16.1.1 If the Architect fails to certify in accordance with Sub-Clause 14.6 [Issue of Interim Payment Certificates] or Sub-Clause 14.7 [Payment],or not receiving instructions that would enable the contractor to proceed with the works in accordance with the program, the Contractor may, after giving not less than 30 days' notice to the Procuring Entity, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may bea nd as described in the notice.

16.1.2 The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [Delayed Payment] and to termination under Sub-Clause 16.2 [Terminationby Contractor].

16.1.3 If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

16.1.4 If the Contractor suffers delay and/ori ncurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Sub-Clause, the Contractor shall give notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
b) payment of any such Cost-plus profit, which shall be included in the Contract Price.

16.2 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

16.3 Termination by Contractor

16.3.1 The Contractor shall be entitled to terminate the Contract if:

a) the Architect fails, within 60 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate,
b) the Contractor does not receive the amount due under an Interim Payment Certificate within 90 days after the expiry of the time stated in Sub-Clause1 4.7 [Payment] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [Procuring Entity's Claims]),
c) the Procuring Entity substantially fails to perform his obligations under the Contract in such manner as to materially and adversely affect the economic balance of the Contract and/or the ability of the Contractor to perform the Contract,
d) a prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [Prolonged Suspension], or
e) the Procuring Entity becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a

receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events.

f) the Contractor does not receive the Architect instruction recording the agreement of both Parties on the fulfilment of the conditions for the Commencement of Works under Sub-Clause 8.1 [Commencement of Works].

16.3.2 In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Procuring Entity, terminate the Contract. However, in the case of sub-paragraph (f) or (g), the Contractor may by notice terminate the Contract immediately.

16.3.3 The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contractor otherwise.

16.4 Cessation of Work and Removal of Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [Procuring Entity's Entitlement to Termination for Convenience], Sub-Clause 16.2 [Termination by Contractor] or Sub-Clause 19.6 [Optional Termination, Payment and Release] has taken effect, the Contractor shall promptly:

a) cease all further work, except for such work as may have been instructed by the Architect for the protection of life or property or for the safety of the Works,

b) hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment, and

c) remove all other Goods from the Site, except as necessary for safety, and leave the Site.

16.5 PaymentonTermination

After a notice of termination under Sub-Clause 16.2 [Termination by Contractor] has taken effect, the Procuring Entity shall promptly:

a) Return the Performance Security to the Contractor,

b) pay the Contractor in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release], and

c) pay to the Contractor the amount of any loss or damage sustained by the Contractor as a result of this termination.

17. RISK AND RESPONSIBILITY

17.1 Indemnities

17.1.1 The Contractor shall indemnify and hold harmless the Procuring Entity, the Procuring Entity's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

a) Bodily injury, sickness, disease or death, of any person what so ever arising outo for in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, willful actor breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, or any of their respective agents, and

b) damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless and to the extent that any such damage or loss is attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

17.1.2 The Procuring Entity shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, willful act or breach of the Contract by the Procuring Entity, the Procuring Entity's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in sub-paragraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [Insurance Against Injury to Persons and Damage to Property], unless and to the extent that any such damage or loss is attributable to any negligence, willful actor breach of the Contract by the contractor, the contractor's Personnel, their respective agents, or anyone directly or indirectly employed by any of them.

17.2 Contractor's Care of the Works

17.2.1 The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the Taking-Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [Taking Over of the Works and Sections]) for the Works, when responsibility for the care of the Works shall pass to the Procuring Entity. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall then pass to the Procuring Entity.

17.2.2 After responsibility has accordingly passed to the Procuring Entity, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.

17.2.3 If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contractorisresponsiblefor their care, from any cause not listed in Sub-Clause 17.3 [Procuring Entity's Risks], the Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

17.2.4 The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3 Procuring Entity's Risks

The risks referred to in Sub-Clause 17.4 [Consequences of Procuring Entity's Risks] below, in so far as they directly affect the execution of the Works in Kenya, are:

a) War hostilities (whether war be declared or not),
b) rebellion, riot, commotion or disorder, terrorism, sabotage by persons other than the Contractor's Personnel,
c) explosive materials, ionizing gradiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such explosives, radiation or radio-activity,
d) pressure waves caused by aircraft or other aerial devices traveling at sonic or supersonic speeds,
e) use or occupation by the Procuring Entity of any part of the Permanent Works, except as may be specified in the Contract,
f) design of any part of the Works by the Procuring Entity's Personnel or by others for whom the Procuring Entity is responsible, and
g) any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventive precautions.

17.4 Consequences of Procuring Entity's Risks

17.4.1 If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Architect and shall rectify this loss or damage to the extent required by the Engineer.

17.4.2 If the Contractor suffers delay and/ or incurs Cost from rectifying this loss or damage, the Contractor shall give a further notice to the Architect and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

(a) An extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of TimeforCompletion], and
(b) paymentofany such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (e)and (g) of Sub-Clause 17.3 [Procuring Entity's Risks], Accrued Costs shall be payable.

17.4.3 After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

17.5 Intellectual and Industrial Property Rights

17.5.1 In this Sub-Clause, “infringement” shall refer to an infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and “claim” shall refer to a claim (or proceedings pursuing a claim) alleging an infringement.

17.5.2 Whenever a Party does not give notice to the other Party of any claim within 30 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

17.5.3 The Procuring Entity shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

a) An un avoidable result of the Contractor's compliance with the Contract, or
b) A result of any Works be ingused by the Procuring Entity:
   i) for a purpose other than that indicated by, or reasonably to be inferred from, the Contract, or
   ii) in conjunction with anything not supplied by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.

17.5.4 The Contractor shall indemnify and hold the Procuring Entity harmless again stand from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.

17.5.5 IfaPartyisentitledtobeindemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

17.5.6 For operation and maintenance of any plan to requipment installed, the contractor shall grant a non-exclusive and non-transferable license to the Procuring Entity under the patent, utility models ,or other intellectual rights owned by the contractor or a third party from whom the contract or has received the rights to grant sub-licenses and shall also grant to the Procuring Entity a non-exclusive and non-transferable rights (without the rights to sub-license) to use the know how and other technical information disclosed to the contract or under the contract. Nothing contained here-in shall be construed as transferring ownership of any patent, utility model, trademark, design, copy right, know-how or other intellectual rights from the contractor or any other third party to the Procuring Entity.

17.6 Limitation of Liability

17.6.1 Neither Party shall be liable to the other Party for loss of use of anyW orks, loss of profit, loss of any contractor for any in director consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than as specifically provided in Sub-Clause 8.7 [Delay Damages]; Sub-Clause 11.2 [Cost of Remedying Defects]; Sub-Clause 15.4 [Payment after Termination]; Sub-Clause 16.4 [Payment on Termination]; Sub-Clause 17.1 [Indemnities]; Sub-Clause 17.4(b) [Consequences of Procuring Entity's Risks] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights].

17.6.2 The total liability of the Contractor to the Procuring Entity, under or in connection with the Contract other than under Sub-Clause 4.19 [Electricity, Water and Gas], Sub-Clause 4.20 [Procuring Entity's Equipment and Free- Issue Materials], Sub-Clause 17.1 [Indemnities] and Sub-Clause 17.5 [Intellectual and Industrial Property Rights], shall not exceed the sum resulting from the application of a multiplier (less or greater than one) to the Accepted Contract Amount, as stated in **the Special Conditions of Contract**, or (if such multiplier or other sum is not so stated) the Accepted Contract Amount.

17.6.3 This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

17.7 Use of Procuring Entity's Accommodation/Facilities

17.7.1 The Contractor shall take full responsibility for the care of the Procuring Entity provided accommodation and facilities, if any, as detailed in the Specification, from the respective dates of hand-over to the Contractor until cessation of occupation (where hand-over or cessation of occupation may take place after the date stated in the Taking-Over Certificate for the Works).

17.7.2 If any loss or damage happens to any of the above items while the Contractor is responsible for their care arising from any cause whatsoever other than those for which the Procuring Entity is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Engineer.

18. INSURANCE

18.1 General Requirements for Insurances

18.1.1 In this Clause, “insuring Party” means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

18.1.2 Wherever the Contractor is the insuring Party, each insurance shall be effected with insurers and in terms approved by the Procuring Entity. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

18.1.3 Wherever the Procuring Entity is the insuring Party, each insurance shall be effected with insurers and in terms acceptable to the Contractor. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

18.1.4 If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Procuring Entity shall act for Procuring Entity's Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

18.1.5 Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

18.1.6 The relevant insuring Party shall, within the respective periods stated in **the Special Conditions of Contract** (calculated from the Commencement Date), submit to the other Party:

a) Evidence that the insurances described in this Clause have been affected, and
b) copies of the policies for the insurances described in Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment] and Sub-Clause 18.3 [Insurance against Injury to Persons and Damage to Property].

18.1.7 When each premium is paid, the insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.

18.1.8 Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.

18.1.9 Neither Party shall make any material alteration to the terms of any insurance without the prior approval of the other Party. If an insurer makes (or at tempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.

18.1.10 If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contractor fails to provide satisfactory evidence and copies of policies in accordance with this Sub- Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

18.1.11 Nothing in this Clause limits the obligations, liabilities or responsibilities of the Contractor or the Procuring Entity, under the other terms of the Contractor otherwise. Any amounts not insured or not recovered from the insurers shall be borne by the Contractor and/or the Procuring Entity.

18.1.12 Procuring Entity in accordance with these obligations, liabilitieso r responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

18.1.13 Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [Procuring Entity's Claims] or Sub- Clause 20.1 [Contractor's Claims], as applicable.

18.1.14 The Contractor shall be entitled to place all insurance relating to the Contract (including, but not limited to

the insurance referred to Clause 18) with insurers from any eligible source country.

18.2 Insurance for Works and Contractor's Equipment

18.2.1 The insuring Party shall insure the Works, Plant, Material sand Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [General Requirements for Insurances], until the date of issue of the Taking-Over Certificate for the Works.

18.2.2 The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [Defects Liability]).

18.2.3 The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

18.2.4 Unless otherwise stated in the Special Conditions, insurances under this Sub-Clause:

a) Shal lbe effected and maintained by the Contractor as insuring Party,

b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated to the Party actually bearing the costs of rectifying the loss or damage,

c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [Procuring Entity's Risks],

d) shall also cover, to the extent specifically required in the tendering documents of the Contract, loss or damage to a part of the Works which is attributable to the use or occupation by the Procuring Entity of another part of the Works, and loss or damage from the risks listed in sub-paragraphs (c), (g) and (h)of Sub-Clause 17.3 [Procuring Entity's Risks], excluding (in each case) risks which are not insurable at commercially reasonable terms, with deductibles per occurrence of not more than the amount stated **in the Special Conditions** of Contract (if an amount is not so stated,t his sub-paragraph (d) shall not apply), and

e) may however exclude loss of, damage to, and reinstatement of:

   i) a part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below),

   ii) apart of the Works which is lost or damaged inorder to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship,

   iii) apart of the Works which has been taken over by the Procuring Entity, except to the extent that the Contractor is liable for the loss or damage, and

   iv) Goods while they are not in Kenya, subject to Sub-Clause 14.5 [Plant and Materials intended for the Works].

18.2.5 If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Procuring Entity, with supporting particulars. The Procuring Entity shall then (i) be entitled subject to Sub-Clause 2.5 [Procuring Entity's Claims] to payment of an amount equivalent to such commercially reasonable terms asthe Contractor should have expected to have paid for such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [General Requirements for Insurances].

18.3 Insurance against Injury to Persons and Damage to Property

18.3.1 The insuring Party shall insure against each Party's liability for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 18.4 [Insurance for Contractor's Personnel]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

18.3.2 This insurance shall be for a limit per occurrence of not less than the amount stated in **the Special Conditions of Contract**, with no limit on the number of occurrences. If an amount is not stated in the **Special Conditions**

of Contract, this Sub-Clause shall not apply.

18.3.3 Unless otherwise stated in the Special Conditions, the insurances specified in this Sub-Clause:

a) Shall be effected and maintained by the Contractor as insuring Party,
b) shall be in the joint names of the Parties,
c) shall be extended to cover liability for all loss and damage to the Procuring Entity's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and
d) may however exclude liability to the extent that it arises from:
   i) the Procuring Entity's right to have the Permanent Works executed on, over, under, in or
   ii) through any land, and to occupy this land for the Permanent Works,
   iii) damage which is an unavoidable result of the Contractor's obligations to execute the
   iv) Works and remedy any defects, and
   v) a cause listed in Sub-Clause 17.3 [Procuring Entity's Risks], except to the extent that cover is available at commercially reasonable terms.

18.4 Insurance for Contractor's Personnel

18.4.1 The Contractor shall effect and maintain insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

18.4.2 The insurance shall cover the Procuring Entity and the Architect against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractoror any othe rof the Contractor's Personnel, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Procuring Entity or of the Procuring Entity's Personnel.

18.4.3 The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

19. FORCE MAJEURE

19.1 Definition of Force Majeure

19.1.1 In this Clause, “Force Majeure” means an exceptional event or circumstance:

a) Which is beyond a Party's control,
b) Which such Party could not reasonably have provided against before entering into the Contract,
c) which, having arisen, such Party could not reasonably have avoided or over come, and
d) which is not substantially attributable to the other Party.

19.1.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, s olong as conditions (a) to (d) above are satisfied:

a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war,
c) riot, commotion, disorder, strike or lock out by persons other than the Contractor's Personnel,
d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as maybeattributabletotheContractor'suseofsuchmunitions, explosives, radiation or radio-activity, and
e) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

19.2 Notice of Force Majeure

19.2.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

19.2.2 The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

19.2.3 Not withstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either

Party to make payments to the other Party under the Contract.

19.3 Duty to Minimize Delay

Each Party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure. A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

19.4 Consequences of Force Majeure

19.4.1 If the Contractor is prevented from performing his substantial obligations under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], and suffers delay and/ or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and

b) if the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 [Definition of Force Majeure] and, in sub-paragraphs (ii) to (iv), occurs in Kenya, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in Sub-Clause18.2 [Insurance for Works and Contractor's Equipment].

19.4.2 After receiving this notice, the Architect shall proceed in a ccordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

19.5 Force Majeure Affecting Subcontractor

If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

19.6 Optional Termination, Payment and Release

19.6.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 16.3 [Cessation of Work and Removal of Contractor's Equipment].

19.6.2 Upon such termination, the Architect shall determine the value of the work done and issue a Payment Certificate which shall include:

a) theamountspayableforanyworkcarriedoutforwhichapriceisstatedintheContract;

b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Procuring Entity when paid for by the Procuring Entity, and the Contractor shall place the same at the Procuring Entity'sdisposal;

c) other Cost or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;

d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and

e) the Cost of repatriation of the Contractor's staff and lab or employed wholly in connection with the Works at the date of termination.

19.7 Release from Performance

Not withstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfil its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Partyofsucheventorcircumstance:

a) The Parties shall be discharged from further performance, without prejudice to the rights of either Party

in respect of any previous breach of the Contract, and

b) The sum payable by the Procuring Entity to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [Optional Termination, Payment and Release] if the Contract had been terminated under Sub-Clause 19.6.

20. SETTLEMENT OF CLAIMS AND DISPUTES

20.1 Contractor's Claims

20.1.1 If the Contractor considers itself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give Notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 30 days after the Contractor became aware, or should have become aware, of the event or circumstance.

20.1.2 If the Contractor fails to give notice of a claim within such period of 30 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Procuring Entity shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

20.1.3 The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

20.1.4 TheContractorshallkeepsuch contemporary records as may be necessary to substantiate any claim, either on the Site or at an other location acceptable to the Engineer. Without admitting the Procuring Entity's liability, the Architect may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/ or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Architect to inspect all these records and shall (if instructed) submit copies to the Engineer.

20.1.5 Within 42days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Architect fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/ or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

a) This fully detailed claim shall be considered as interim;

b) The Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/ or amount claimed, and such further particulars as the Architect may reasonably require; and

c) The Contractor shall send a final claim within 30 days after the end of the effects resulting from the eventor circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

20.1.6 Within 42 days after receiving a Notice of a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Architect and approved by the Contractor, the Architect shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars but shall nevertheless give his response on the principles of the claim within the above defined time period.

20.1.7 Within the above defined period of 42 days, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

20.1.8 Each Payment Certificate shall include such additional payment for any claim as has been reasonably substantiated as due under the relevant provision of the Contract.Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

20.1.9 If the Architect does not respond within the time frame defined in this Clause, either Party may consider that the claim is rejected by the Architect and any of the Parties may refer the dispute for amicable settlement in accordance with Clause 20.3.

20.1.10 The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/ or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause 20.3.

20.2 Procuring Entity's Claims

20.2.1 If the Procuring Entity considers itself to be entitled to any payment under any Clause of these Conditionsor otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Procuring Entity or the Architect shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19 [Electricity, Water and Gas], under Sub-Clause 4.20 [Procuring Entity's Equipment and Free-Issue Materials], or for other services requested by the Contractor.

20.2.2 The notice shall be given as soon as practicable and no longer than 30 days afte rthe Procuring Entity became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

20.2.3 The particulars shall specify the Clause or other basis of the claim and shall include substantiation of the amount and/or extension to which the Procuring Entity considers itself to be entitled in connection with the Contract. The Architect shall then proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the amount (if any) which the Procuring Entity is entitled to be paid by the Contractor, and/ or (ii) the extension (if any) of the Defects Notification Period in accordance with Sub-Clause 11.3 [Extension of Defects Notification Period].

20.2.4 This amount may be included as a deduction in the Contract Price and Payment Certificates. The Procuring Entity shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

20.3 Amicable Settlement

Where a notice of a claim has been given, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, the Party giving a notice of a claim in accordance with Sub-Clause 20.1 above should move to commence arbitrationa fter 60 days from the day on which a notice of a claim was given, even if no attempt at an amicable settlement has been made.

20.4 Matters that may be referred to arbitration

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:

a) Whether or not the issue of an instruction by the Architect is empowered by these Conditions.
b) Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
c) Any dispute arising in respect risks arising from matters referred to in Clause 17.3 and Clause 19.
e) 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 Procuring Entity and the Contractor agree otherwise in writing.

20.5 Arbitration

20.5.1 Any claim or dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.3 shall be finally settled by arbitration.

20.5.2 No arbitration proceedings shall be commenced on any claim or dispute where notice of a claim or dispute 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.

20.5.3 Not withstanding the issue of a notice as stated above, the arbitration of such a claim or dispute shall not commence unless an attempt has in the first instance been made by the parties to settle such claim or dispute amicably with or without the assistance of third parties. Proof of such attempt shall be required.

20.5.4 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 a ward any sums which ought to have been the subject of or included in any certificate.

20.5.5 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 require mentor notice had been given.

20.5.6 The arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Architect from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.

20.5.7 Neither Party shall be limited in the proceedings before the arbitrators to the evidence, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction.

20.5.7 Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, and the Architect shall not be altered by reason of any arbitration being conducted during the progress of the Works.

20.5.8 Thetermsofthere muneration of each or all the members of Arbitration shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

20.6 Arbitration with National Contractors

20.6.1 If the Contractis with national contractors, arbitration proceedings will be conducted in accordance with the Arbitration Laws ofKenya. In case of any claim or dispute, such claim or 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, on the request of the applying party, by the Chairman or Vice Chairman of any of the following professional institutions;

i) Architectural Association of Kenya
ii) Institute of Quantity Surveyors of Kenya
iii) Association of Consulting Engineers of Kenya
iv) Chartered Institute of Arbitrators (Kenya Branch)
v) Institution of Engineers of Kenya

20.6.2 The institution written to first by the aggrieved party shall take precedence over all other institutions.

20.7 Arbitration with Foreign Contractors

20.7.1 Arbitration with foreign contractors shall be conducted in accordance with the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL); or with proceedings administered by the International Chamber of Commerce (ICC) and conducted under the ICC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules.

20.7.2 The place of arbitration shall be a location specified in the **SCC;** and the arbitration shall be conducted in the language for communications defined in Sub-Clause1.4 [Law and Language].

20.8 Alternative Arbitration Proceedings

Alternatively, the Parties may refer the matter to the Nairobi Centre for International Arbitration (NCIA) which offers a neutral venue for the conduct of national and international arbitration with commitment to providing institutional support to the arbitral process.

20.9 Failureto Comply with Arbitrator's Decision

20.9.1 The award of such Arbitrator shall be final and binding up on the parties.

20.9.2 In the even tthat a Party fails to comply with a final and binding Arbitrator's decision, then the other Party may, without prejudice to any other rights it may have, refer the matter to a competent court of law.

20.10 Contract operations to continue

Notwithstanding any reference to arbitration herein,

1.1.1 the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and

1.1.2 the Procuring Entity shall pay the Contractor any monies due the Contractor.

Section IX - Special Conditions of Contract

The following Special Conditions shall supplement the GCC. Whenever there is a conflict, the provisions here in shall prevail over those in the GCC.

Conditions	Sub-Clause	Data
Part A - Contract Data		
Procuring Entity's name and address	Heading	*Chuka University, P.O. BOX 109-60400, CHUKA*
Name and Reference No. of the Contract	Heading and 1.1	*CU/OPNT/07/2021-2022*
Engineers Name and address	Heading and 3.1.1	*Baseline Architects Limited* *P.O Box 39928 - 00623* *Nairobi*
Contractor's Representative's name	4.3.1	…… *[insert the name of the Contractor's Representative agreed by the Procuring Entity prior to Contract signature]*
Key Personnel names	16.9.1	…… *[insert the name of each Key Personnel agreed by the Procuring Entity prior to Contract signature]*
Time for Completion	1.1.	**260 Weeks from commencement date**
Defects Notification Period	1.1	**52 weeks from practical completion**
Sections	1.1	*N/A*
Electronic transmission systems	1.3	N/A
Time for the Parties entering into a Contract Agreement	1.6	Within 30days
Commencement Date	8.1.1	
Time for access to the Site	2.1.1	To be agreed during contract signing
Architect Duties and Authority	3.1.6 (b) (ii)	Any **Variations that increases** the contract sum shall require approval of the Procuring Entity.
Performance Security	4.2.1	The performance security will be in the form of a ***performance bond*** in the amount(s) of **Five (5) percent** of the Accepted Contract Amount and in the same currency(ies) of the Accepted Contract Amount.
Normal working hours	6.5	Shall be from 0800 hours to 1700 hours
Delay damages for the Works	8.7 & 14.15(b)	**Equivalent to running preliminaris of the contractor**
Maximum amount of delay damages	8.7.1	**1%** of the final Contract Price.
Provisional Sums	13.6. (b)(ii)	*[If there are Provisional Sums, insert a percentage for adjustment of Provisional Sums]* _____%
Adjustments for Changes in Cost	13.9	Period "n" applicable to the adjustment multiplier "Pn": __NA

Conditions	Sub-Clause	Data
Total advance payment	14.2.1	**Not Applicable**
Repayment amortization rate of advance payment	14.2.5 (b)	**Not Applicable**
Percentage of Retention	14.3.2 (c)	Ten (10) percent
Limit of Retention Money	14.3.2 (c)	Five (5) of the Accepted Contract Amount
Plant and Materials	14.5.3(b)(i)	**Not Applicable**
	14.5.3(c)(i)	Plant and Materials for payment when delivered to the Site All materials for the works.
Minimum Amount of Interim Payment Certificates	14.6.2	500,000.00 of the Accepted Contract Amount.
Publishing source of commercial interest rates for financial charges in case of delayed payment	14.8	Central Bank of Kenya Mean Lending rate per day of delayed payment. Period for honouring certificate is 60 days from date of certification.
Maximum total liability of the Contractor to the Procuring Entity	17.6.2	3 million
Periods for submission of insurance: a. evidence of insurance. b. relevant policies	18.1.6	 ___30__days ___30__days
Maximum amount of deductibles for insurance of the Procuring Entity's risks	18.2.4 (d)	100,000.00
Minimum amount of third-party insurance	18.3.2	3 million
The place of arbitration	20.7.2	***N/A***
Arbitration	20.5.1	***Delete the clause and substitute thus*** 'Any claim or dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.3 shall be finally settled by **Kenyan law court.**

SECTION X - CONTRACT FORMS

FORM NO. 5 - PERFORMANCE SECURITY (SAMPLE)

[Option 1 - Unconditional Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: *[insert name and Address of Procuring Entity]*

Date: _____*[Insert date of issue]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informedthat_____(hereinafter called "the Contractor") has entered into Contract No._____dated_____with (*name of Procuring Entity*)_____(the Procuring Entity as the Beneficiary), for the execution of _____(hereinafter called "the Contract").

2. Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

3. Atthe request of the Contractor, we as Guarantor, here by irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of_____(*in words*),[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand it self or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

4. This guarantee shall expire, no later than the……...Day of……,2...…[2], and any demand for payment under it must be received by us at the office indicated above on or before that date.

5. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months] [one year]*, inresponse tot he Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee." .....

[Name of Authorized Official, signature(s) and seals/stamps]

Note: *All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.*

[1] *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency of the Contract or a freely convertible currency acceptable to the Beneficiary.*

[2] *Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9. The Procuring Entity should note that in the event of an extension of this date for completion of the Contract, the Procuring Entity would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

FORM NO. 9 BENEFICIAL OWNERSHIP DISCLOSURE FORM

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form ("Form") is to be completed by the successful tenderer. In case of joint venture, the tenderer must submit a separate Form for each member. The beneficial ownership information to be submitted in this Form shall be current as of the date of its submission.

For the purposes of this Form, a Beneficial Owner of a Tenderer is any natural person who ultimately owns or controls the Tenderer by meeting one or more of the following conditions:

- *Directly or indirectly holding 25% or more of the shares.*
- *Directly or in directly holding 25% or more of the voting rights.*
- *Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.*

Tender Reference No.:_____[*insert identification no*]

Name of the Assignment:_____*[insert name of the assignment]* to:

_____*[insert complete name of Procuring Entity]*

In response to your notification of award dated_____*[insert date of notification of award]* to furnish additional information on beneficial ownership:_____*[select one option as applicable and delete the options that are not applicable]*

I) We here by provide the following beneficial ownership information.

Details of beneficial ownership

Identity of Beneficial Owner	**Directly or indirectly holding 25% or more of the shares (Yes / No)**	**Directly or indirectly holding 25 % or more of the Voting Rights (Yes / No)**	**Directly or indirectly having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer (Yes / No)**
[include full name (last, middle, first), nationality, country of residence]			

OR

ii) We declare that there is no Beneficial Owner meeting one or more of the following conditions: directly or indirectly holding 25% or more of the shares. Directly or indirectly holding 25% or more of the voting rights. Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer.

OR

We declare that we are unable to identify any Beneficial Owner meeting one or more of the following conditions. [If this option is selected, the Tenderer shall provide explanation on why it is unable to identify any Beneficial Owner]

Directly or indirectly holding 25% or more of the shares. Directly or indirectly holding25% or more of the voting rights.

Directly or indirectly having the right to appoint a majority of the board of directors or equivalent governing body of the Tenderer]"

Name of the Tenderer: .....[insert complete name of the Tenderer]*_____

*Name of the person duly authorized to sign the Tender on behalf of the Tenderer: ** [insert complete name of person duly authorized to sign the Tender]*

Title of the person signing the Tender: ..... [insert complete title of the person signing the Tender]

Signature of the person named above: ..... [insert signature of person whose name and capacity are shown above]

Date signed ..... [insert date of signing] day of..... [Insert month], [insert year]

SECTION II:

SECTION II – GENERAL AND PARTICULAR ELECTRICAL SPECIFICATIONS

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GENERAL ELECTRICAL SPECIFICATIONS

1.00 INTRODUCTION

This section specifies the general requirement for plant, equipment and materials forming part of the Contract Works and shall apply except where specifically stated elsewhere in the Specification or on Contract Drawings.

1.01 REGULATIONS

The Contract Works shall comply with the current editions of the following: -

1) Electric Power Act and the Rules made there under
2) The Electricity Supply Authority Byelaws.
3) Regulations for the Electrical Equipment of Buildings issued by the Institution of Electrical Engineers of Britain (I.E.E.) with Kenya amendment.
4) The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guide 'K' on electricity in Buildings.
5) The Factories Act for the Kenya Government.
6) Kenya Bureau of Standards (KEBS) standard specifications and code of practise, or other equal and approved standard specifications and codes.
7) The Local Authority Bylaws
8) The Employers Safety Regulations.
9) General Electrical Specifications (GES 1 & 2)

1.02 QUALITY OF MATERIALS

The quality of materials required for completion of the electrical installation works shall be as detailed in this specification and contract drawings unless otherwise instructed. All materials shall be new and of best quality and approved origin.

1.03 TYPE OF INSTALLATION-WIRING SYSTEMS

Electrical installation shall be carried in either one of the following wiring systems;

System A – PVC Insulated and Sheathed Cables Clipped To The Surface Of The Walls And Roof Members Or To The Ceilings

The installation shall be carried out in an approved type twin or three core PVC insulated and sheathed cables, the conductors of which shall be of copper. Cables shall be securely fixed to the surface of the walls and in the roof spaces, or fixed to the underside of the ceilings when there is no reasonable access above the ceiling. Non-corrodible saddles or buckle clips and nails shall be used for fixing and at intervals not exceeding 225mm. Where cables pass through holes they shall be bushed. Wooden bits or plastic bits shall be used as plugs in walls for firmly fixing the saddles or buckle clips on walls or other surfaces.

Under no circumstances will joints of conductors be permitted in the run of a wiring cable. Cables shall be connected together only by looping into the terminals of switches, ceiling rose junction boxes or other accessories or by approved connectors installed in suitable junction boxes. Under no circumstances will taped joints be permitted.

In all cases the cable sheathing shall be carried into the switch, ceiling rose, junction box or other accessories.

Surface installed cables shall not be installed within 300mm of a metal roof, unless clipped to the lower side of wooden member of the roof or otherwise protected from radiant heat.

System B- PVC Insulated And Sheathed Cables Clipped To Roof Members And Run In Metal Or Plastic Conduits Drops Concealed In Walls

The wiring shall be carried out as system A except that cables shall be enclosed in either steel or plastic conduit where drops are required to switches, distribution board, socket outlets or other accessories.

System C – Cables In Steel Screwed Conduit Or Trunking Fixed To The Surfaces Of Walls And Ceilings

The wiring shall be carried out in an approved type of single core, plastic insulated cable enclosed in steel screwed conduit or trunking, mechanically and electrically continuous throughout.

Conduit and trunking shall be run on the surface of the walls and ceilings, or in false ceiling spaces. Conduit shall be secured in position by means of steel galvanized spacer bar saddles, and counter sunk brass screws. Conduit shall run horizontally on the walls or vertically to switches or outlets.

System D – Cables Enclosed In Concealed Steel Screwed Conduit Or Trunking

The wiring shall be carried out in approved type of single core, plastic insulated cable, enclosed in steel screwed conduit or trunking mechanically and electrically continuous throughout.

Conduit shall be buried in the wall and floors of the building and either run in roof space or buried in structural slabs.

System E – PVC Insulated Cables With or Without Earth Continuity Conductor Enclosed In Concealed Non-Metallic Conduit Or Trunking

Wiring shall be carried out in an approved type single core, plastic insulated cable with copper conductor with or without earth continuity conductor enclosed in high impact, heavy gauge, non-metallic conduit or trunking of PVC material or equivalent.

Conduit shall be buried in the walls and floors of building, and either run in roof space or buried in structural slabs.

System F – PVC Insulated Cable With or Without Earth Continuity Conductor Enclosed In Non-Metallic Conduit Or Trunking Fixed To The Surfaces Of Walls And Ceilings

Wiring shall be carried out in an approved type single core plastic insulated cable with or without earth continuity conductor enclosed in high impact, heavy gauge, non-metallic conduit or trunking.

Conduit shall be installed in similar way as system C.

System G- Mineral Insulated Copper Sheathed Cables

The wiring shall be carried out in single core or multi-core mineral insulated copper sheathed cable run on the surfaces of walls and ceilings, in the roof space or concealed in walls and floors.

System H – PVC Insulated Single Wired Armoured And PVC Sheathed (PVC/SWA/PVC), Cable Laid In Ducts, Trenches And Saddles To Walls

Cables shall either be suspended on purpose made frame and hangers, saddled on walls and roof members, drawn through ducts or laid in trenches. Cables suspended on multiple hangers shall be so arranged that one cable can be removed without disturbing the others. Frames, and hangers shall be galvanized or of non-corrosive material and shall not be fixed in contact with other metals with which they are liable to set up electrolytic action. All spacing of cable hangers and support shall not exceed those laid down for the relevant size and type of cable in the current edition of the I.E.E. Regulations or Kenya Bureau of Standard wiring Regulations.

1.04 PVC CONDUITS, TRUNKING AND ASSOCIATED FITTINGS

For the purposes of these specifications, all non-metallic conduits shall be of high impact quality rigid PVC conforming to B.S 4607 or KS04-179: 1988 and IEE regulations and all conduit fittings and accessories shall be of the same quality.

Conduit outlet and switchboxes shall be able to receive an earthing terminal and shall have threaded brass inserts for cover fixings

Solid elbows and tees shall not be permitted without the written approval of the Engineer. No conduit smaller than 20mm (nominal) diameters shall be allowed.

Trunking where required should be of high impact quality rigid PVC of an approved type.

1.05 INSTALLATION OF PVC CONDUITS

i) **Conduit shall be installed** buried in plaster works and floor screed except when run on wooden or metal surface, when they will be installed surface supported with saddles every 600mm. Conduits shall be laid at a time during the building construction as may be approved by the Engineer.

ii) **Conduits run in chase** shall be firmly held in position by means of mild steel pipe hooks to avoid displacement when plastering. It shall be at least 10mm below plaster level. In poured reinforced concrete floors and roof slabs, the conduit shall first be laid before the concrete is cast in situ. It shall be securely fixed in position to prevent displacement during the pouring process and shall be sealed against the ingress of water and cement during in mechanical vibration.

iii) **The conduit system when installed** and before wiring, shall be kept plugged with well fitting plugs and when short conduit pieces are used as plugs, they shall be doubled over and tied firmly together with steel wire. Only after the conduit system has been completely cleansed of bungs, burrs and building debris, shall wiring be carried out.

iv) **Conduits connection** shall either be by a demountables (screwed up) assembly or adhesive fixed and water tight by solution. The conduit and fittings must be clean and free of all grease before applying the adhesive. When connections are made between the conduit and switch boxes circular or non-screwed boxes, care shall be taken that no rough edges of conduit stick out into the boxes. The conduits shall be fixed to the outlet boxes either by gluing the plain end into the marbled spigot of the outlet box or by using a proprietary adaptor (half threaded couplers) and fixing it to thin walled outlet boxes by means of screwed bushes.

v) **Conduits and trunking** shall be mechanically continuous and water tight from the point of entry into the building to the final conduit outlet boxes and such joints as are required in the conduit shall be made with plain conduit couplers glued in position. Care should be taken to ensure all joints are made watertight by using appropriate adhesive.

vi) **Conduits shall be bent and formed** in strict conformity with the manufacturers instructions. Sizes up to 25mm diameter may be bent cold with the use of appropriate sized bending spring. Larger conduits are to be preheated before inserting the rubber cord to prevent kinking. Conduits badly formed or bent or damaged in any way shall not be used and in all cases the inner radius of the bend shall not be less than 2.5 times the diameter of the conduit. Runs between draw in boxes are not to have more than two right angle bends or their equivalent without the approval of the Engineer. The sub contractor may be required to demonstrate to the Engineer that wiring in any particular run is easily withdrawable and sub contractor may, at no extra cost to the contract; be required to install additional draw-in-boxes where required. If conduit installed in straight runs is in excess of 6000mm, expansion couplings as manufactured by Egaweld or equivalent shall be used at intervals of 6000mm.

vii) **Draw-in-boxes** shall be kept to minimum and where they occur of necessity within the floor area, the Engineer shall approve the type in writing.

viii) **Conduit fittings** of the inspection type shall be so located that they remain readily accessible upon final completion of the building.

ix) **Where the conduit loop-in-system is employed**, back outlet boxes shall be used and conduits shall normally be laid in the floor screed on the upper side of the slab. Draw in wires shall not be permitted where the loop-in-system is employed and cables will need to be drawn into conduits with a draw-in-steel tape.

x) **All spare ways in junction boxes** etc. left for possible future extension shall be fitted with stopping plugs. Where conduits runs are to be concealed in pillars and beams the approval of the Structural Engineer shall be obtained. The electrical contractor shall be responsible for determining the accurate position of all holes, chases etc. on site or if the Engineer so directs shall provide the building contractor with dimensional drawings to enable him to mark out and form all holes and chases. Should the electrical contractor fail to inform the building contractor of any inaccuracies in this respect they shall be rectified at the electrical contractor's expense.

xi) **It will be the contractor's responsibility** to ascertain from site, the details of reinforced concrete or structural steelwork and check from the builder's drawings and positions of walls, structural concrete and finishes. No reinforced concrete or steelwork may be drilled without first obtaining the written permission of the Structural Engineer.

xii) The drawings provided with these specifications indicated the appropriate position only of points and switches, but it shall be the electrical contractor's responsibility to mark out and centre on site the accurate position of points and switches where necessary in consultation with the Architect and the Engineer.

xii) Where it is necessary to feed surface mounted equipment the concealed conduit shall first be terminated in a concealed conduit box.

1.06 PVC CONDUIT BOXES AND ACCESSORIES

i) All conduit outlets and accessories of non-metallic material including couplers, ordinary clips, saddles, pipe hooks, reducers, stopping plugs, locknuts and male and female bushes shall be manufactured dimensionally to B.S. 31/1940 BS 4607 part 1, 1970 or to KS 04-179 1979 Part 1.

ii) Solid tees shall not be used while solid inspection elbows or bends or inspection tees shall be used only in exceptional circumstances and then only with the Engineer's approval. Small circular pattern boxes are to be used with conduits up to and including 25mm outside diameter. Rectangular pattern adaptable boxes are to be

used for conduits of 32mm outside diameter and larger. For drawing in of cables in exposed runs of conduits, standard pattern through boxes shall be used.

iii) Boxes shall be not less than 32mm deep and of such dimensions as will enable the largest appropriate number of cables for the conduit sizes to be drawn in without excessive bending.

iv) Boxes will not be permitted in floors unless approved. Boxes cast-in situ must face downwards from the ceiling/ floor section.

v) The circular boxes or equipment loop-in boxes shall be provided and securely fixed for all ceiling points. When the conduit is run on the surface, all circular boxes for ceiling points shall be fixed with screws.

vi) Where ceiling boxes occur and the ceiling box is recessed below the finished level of the ceiling, suitable extension rings to accommodate the ceiling box must be provided.

vii) Where ceiling boxes including extension rings are flush with the ceiling surface, break joint rings(biscuit rings) shall be provided to hide the joints.

viii) In all the cases one ceiling box shall allowed per fitting except where fluorescent fittings are specified when two such boxes per fittings are desirable. When two such boxes per fitting are installed they shall be flush with ceiling and if necessary fitted with break joint rings or dome covers.

ix) Where a non-metallic outlet box of thermoplastic material is used for the suspension of a lighting fitting care shall be taken to ensure that the temperature of the box does not exceed 60^{o}C . The weight suspended from the box shall not exceed 3kg. Where it is intended to fix enclosed lighting fitting directly to a box or to suspend a fitting of weight in excess of 3kg, separate steel insert clips shall be used.

x) All boxes intended for switches, socket outlets, lighting fittings or other outlets shall be fitted with brass ferrules to accommodate the fixing of screws. Ends of lengths of conduit shall be reamed and where they terminate at boxes, trunking and accessories not fitted with sprout entries shall be bushed to prevent damage to cables.

xi) All draw boxes and inspection boxes shall be covered with appropriate box covers with screws of non-corrosive type.

1.07 ADAPTABLE BOXES

Adaptable boxes shall be of PVC or mild steel (of not less than 12 SWG) and to be of black enamelled or steel galvanised finish according to location. They shall be square or oblong shape complete with lids secured by four 2BA brass rounded screws. No adaptable box shall be less than 75mm x 75mm x 50mm or larger than 300mm x 300mm x 75mm and shall be adequate in depth in relation to the size of conduit entering it. Conduits shall only enter boxes by means of couplers and bushes.

1.08 CAPACITIES OF NON-METALLIC AND STEEL CONDUITS

The cable shall be run in the conduits so as not to exceed the capacities as set in latest edition of IEE Regulations. For groups of cables, the numbers and sizes of cables installed shall be such that a space factor of 40% is not exceeded.

Conduits of sizes less than 19mm shall not be used without the written authority of the Engineer.

1.09 PVC INSULATED CABLES AND FLEXIBLE CORDS

All cables used in this contract shall be manufactured in accordance with the current appropriate Kenya Standard Specifications and British Standard. The standards are: -

- PVC insulated cables and Flexible Cords Ks 04-192:1988 or BS 6004
- PVC insulated Armoured Cables KS 04-194: 1990 or BS 6346
- Armouring of electrical cables KS 04-290: 1987

The electrical contractor will be required to submit samples of cables for the Engineer's approval; the Engineer reserves the right to take the samples to Kenya Bureau of Standard for testing at contractor's expense. If the supplied cables fail to meet the required standard the Engineer reserves the right to call for installation of cables of an alternative manufacture without any extra cost being incurred.

PVC installed cables shall be 100/1000 volt grade. No cable smaller than 1.5mm^2 shall be used unless otherwise specified. The colour of cables shall conform to the details stated in the "cable markers and installation colours" Clause 1.14

1.10 INSTALLATION OF CABLES

i) In wiring system where cables will be drawn in conduit, it is only after the conduit system has been completely installed, cleansed of bungs, burrs and building debris and moisture free, shall the cables be drawn into conduits.

ii) The type of insulation protective cover, if any, shall be selected so as to allow compliance and precautions be taken against Mechanical damage, damage by heat, damage by fire or explosion, damage by dampness or corrosive atmosphere and electrical leakage.

iii) For these general specifications unless otherwise specified all cables shall be of copper conductors and PVC insulated. All final sub-circuit cables shall be copper conductors with PVC insulation. Conductors for main and sub-mains distribution shall however be either copper or aluminium and PVC insulation as shown in the contract drawings.

iv) Cable sizes shall be those specified in the contract drawings and Bills of Quantities but the lowest size of cable shall not be less than 1.5mm^2.

v) All cables shall be suitable for operation at system voltage and be able to withstand currents equivalent to those specified for the current protective devices.

vi) All cables connected in parallel circuit shall be of the same size and length to ensure proper division of the current.

vii) Special care shall be exercised when terminating aluminium conductors. Such conductors shall not be placed in contact with terminal of brass or other metal having high copper content unless the terminal is suitably constructed to prevent electrolytic corrosion.

viii) Conductors terminated in a pillar type terminal shall be mechanically swaged and fitted with a phosphor bronze sleeve whilst those to be terminated with lugs shall have these lugs fitted to them with a purpose made compression tool.

ix) Cables shall be drawn into conduits by means of draw steel tape unless otherwise specified. However where there are numerous inspection boxes, it may not be necessary to employ draw wires or tapes. Where draw wires are to be used to draw cables into conduits, they shall be inserted during the erection of the conduit.

x) All cables drawn must not twist round each other but must be parallel throughout the run. Care should be taken to ensure cable insulation is not mechanically damaged when drawing the cables. Cables whose insulation

has been damaged in any part of the length shall not be taped or shrouded but the whole length shall be replaced in full. No cable joints shall be permitted along the length of the conduit but joints shall only be made at terminal boxes.

xi) For these general specifications, wiring shall be carried out on the looping-in principal. All joints shall be made at the terminals of the main switches, distribution boards, ceiling roses, switches, sockets outlets and fixed apparatus only. No joint shall be permitted in inspection boxes, but jointing of cables shall be permitted at terminal boxes. No joints shall be made in any other boxes unless approved and no joints shall be drawn into conduit.

1.11 ARMOURED PVC INSULATED AND SHEATHED CABLES, CABLE MARKERS AND TILES

i) Unless otherwise stated, armoured cables shall be of copper conductors of PVC SWA PVC type having a rating of 600/1000 volts and manufactured to KS 04-194: 1988 and KS 04-187/1988 with an overall extruded PVC insulation covering.

ii) The Steel Wire Armour (SWA) of the cable shall be used wholly as an earth continuity conductor and the resistance of the wire armour shall not be more than twice of the largest current carrying conductor of the cable.

iii) PVC/SWA/PVC cables shall be terminated using approved glands and a PVC tapered sleeve shall be provided to shroud each gland.

iv) Where cables rise from floor level to switch gears etc. they shall be protected by PVC conduit to a height of 600mm from finished floor level, whether the cable is run on the surface or recessed into the wall.

v) Where PVC/SWA/PVC cables are outside the building they shall be laid underground 750mm deep with protecting concrete interlocking cover tiles. The concrete tiles shall be 300mm by 150mm and with a minimum thickness of 25mm and of concrete mix of 1:2:4. The tiles shall be labelled 'HATARI'. The cables shall be laid on 50mm of sifted soil then covered with 50mm of sifted soil and interlocking tiles. The trench shall be carefully backfilled. As a caution cables shall be snaked along their route to allow for ground subsidence or settlement and a 2% allowance shall be given on the measured route length before backfilling.

vi) The electrical contractor will carry out all necessary excavations and reinstatement of ground. The cover tiles shall be continuous and without gaps between.

vii) Where armoured cable is specified on the contract drawings, the electrical contractor shall ensure continuity of the armouring and it's cross bonding to other metal work and services.

viii) All PVC/SWA/PVC cables run inside the building shall be fixed in rising ducts or on ceilings by means of die cast cables hooks or clamps, of appropriate size to suit cables, fixed by studs and back nuts to their channel sections support. The channel sections shall be fixed at an interval of 1500mm by means of rawlbolts for concrete ceiling, or wall and appropriate screws for wooden ceiling.

ix) Where the cables are to be suspended from the concrete ceiling or wall, fixing shall be by BICC claw type cleating system with die-cast cleats and galvanised mild steel back straps or similar approved equal method. For one or two cables run together the cleats shall be fixed on a special channel section supports or backstraps which shall in turn be secured to walls or ceilings of ducts by rawlbolts.

x) In excessively damp or corrosive atmospheric conditions special finishes may be required and the electrical contractor shall apply to the Engineer for further instructions before ordering cleats and channels for such areas. The above type of hooks and clamps and channels or cleats and back straps shall also be used for securing cables in vertical ducts.

xi) Precaution should be taken when handling PVC insulated and / or sheathed cables during period of low temperatures to avoid mechanical damage as PVC insulation cracks due to very low temperatures.

xii) Armoured cables, which might otherwise come into contact with fixed metal works, shall either be segregated or effectively bonded to prevent appreciable voltage difference at such possible points of contact.

xiii) Where cable pass under roadways, ducts as specified on the contract drawings shall be provided. Cable route markers shall be provided to indicate the route of the underground cable as specified in the contract drawings or as required by the Engineer. After installation of armoured cables they shall be tested in accordance with GES No. 2 and the result recorded.

xiv) Single core steel armoured cables **shall not** be installed in cases where the current is alternating current. (NB: if copper cable is used then the armour should be aluminium otherwise use multicore cable for magnetic fields to cancel out)

1.12 CABLE MARKERS AND IDENTIFICATION COLOURS

i) All cables ends connected in switchgear, Main Distribution Board, panels etc shall have the insulation carefully cut back and the ends sealed with hellerman rubber slip as cable end markers. The markers shall be of appropriate phase colour. The insulation cable colours and cable end markers shall be in accordance with details stated below unless otherwise specified.

ii) Every cable used for wiring shall be identified at its terminations throughout in length by colour of its insulation and / or cable end markers.

iii) The method of identification shall be as below: -

Final Sub Circuit

Single phase		Cable insulation Colour	Cable end markers
a)	Phase	red	red
b)	Neutral	black	black
c)	Earth	green	green

Three Phase & Neutral

a)	Phase	red/yellow/blue	red
b)	Neutral	black	blue

Main & Sub Main

Single phase

a)	Phase	red	red
b)	Neutral	black	black
c)	Earth	green	green

Three Phase

Mains

a)	Phase	red	red
		Yellow	yellow
		Blue	blue
b)	Natural	black	black
c)	Earth	green	green

Three Phase & Neutral Multicore Cable

a)	Phase	red	red
		Yellow	yellow
		Blue	blue
b)	Neutral	black	black

iv) Where multicore armoured cables have the same insulation colours the cable shall be numbered with 1, 2, and 3 to signify live phase conductors and the number 0 shall be for the neutral cable. The cable end makers shall be insulation sleeves of appropriate colours or discs.

v) All cores of flexible cable including flexible cord shall be coloured throughout in accordance to the table below.

FLEXIBLE CABLE OR CORD

SYSTEM		**INSULATION COLOURS**
Earthing		Green & yellow or green
Neutral		Blue
Phase	R-Red	Brown or Red
	Y-Yellow	Brown, White, Yellow
	B-Blue	Brown or Blue
	Neutral	Black

vi) Bare conductors shall be made identifiable where necessary by painting with those colours.

v) Where identification markers are used, these shall be machine made from non-deteriorating black trifoliate or similar material and be machine engraved indicating the phase of the cable.

1.13 CABLE SUPPORT

i) To ensure there is no appreciable mechanical strain on any cable termination adequate support shall be provided to conduits runs with cables drawn in them.

ii) Where conduits vertical runs exceed 5 metres there shall be a horizontal bend, which shall be supported as a precaution against undue compression of the insulation of the cable.

iii) Cables laid on trunking with vertical runs exceeding 5m in length shall also have adequately intermediate support. All PVC/SWA/PVC cables in horizontal runs in accessible trunking shall be supported by clips at spacing not exceeding the appropriate value stated in table B.2M of the IEE regulation.

iv) Where it is in an inaccessible position and unlikely to be disturbed support shall be provided at the top of the run by a clip and a rounded support of a radius not less than the appropriate value stated in table B.IM of IEE regulations.

1.14 CABLE LENGTHS, TYPES, SIZES, TERMINATIONS AND JOINTS

i) The cable type and sizes shall be as specified in contract drawings.

ii) The length of the cable shall be as measured from supply point (meter board, distribution board, consumer unit etc) to the intended terminal point (switches, lighting, fitting, apparatus etc). No joint shall be allowed in between. The electrical contractor shall be deemed to have allowed for supply of sufficient cable lengths of each type and size to complete wiring system and for making allowances for any additional lengths due to cutting and waste.

iii) All terminations of cable conductors and bare conductors shall be mechanically and electrically sound. Care should be taken to ensure there is no undue mechanical pressure applied to the conductor by over tightening of a clamping screw or others. The terminal point shall have anchors to secure all the wires. The electrical contractor shall allow sufficient length of cable inside the termination points to avoid undue strain of cables when terminating.

iv) At every cable termination, the insulation shall be removed no further than is necessary. For braided, taped, sheathed or armoured cables the sheath shall be cut as far back from the end of the conductor insulation as may be necessary to prevent undue leakage from live parts of the braid, tape, sheath or armour.

v) Where soldering is to be used for termination the type of solder fluxes shall be non-acidic or corrosive. Cores of sheathed cables from which the sheath has been removed and non-sheathed cables at the termination of the conduit duct or trunking shall be enclosed in a non-combustible material. In dump situation the enclosure shall be damp and dust proof and corrosive resistant.

vi) In a flammable and/or explosive dust, flammable volatile liquid or vapours or gas situation termination shall be avoided but if necessary the terminations shall be enclosed in a flameproof fitting complying with **BS.229**.

vii) Cable glands shall regularly retain the outer sheath or armour of the armoured cable without damage and shall incorporate adequate means of maintaining earth continuity between the armour and the threaded fixing component of the gland.

viii) In termination point where high temperatures are to be encountered insulating sleeves or beads suitable for such temperatures shall be fitted over the individual cores of the cables or flexible cord in such away that the normal insulation of the cores is not affected by the temperatures and are relied upon to prevent a short circuit between conductors and metallic part of termination enclosure or cause earth fault.

ix) Terminations of mineral insulated cables shall be provided with sleeves having temperatures rating similar to that of the seals. Bare conductors in terminations of switches, bushes, consumer units etc which are expected in normal service, shall be protected against accidental contact by screens or barriers or by adequate clearance. Special care shall be exercised when terminating Aluminium conductors. No overdue mechanical pressure should be applied on its conductor by over tightening of the clamping screw. Aluminium conductor shall not be placed in contact with a terminal of brass or other metal having a high copper content to avoid corrosion.

1.15 SUB-CIRCUITS

(i) Sub-Mains

These shall be sub-circuits running from fuses or circuit breakers on the main switchboard or meter box to distribution boards or consumer units, and the cable sizes for these circuits shall be as to comply with IEE regulations and as shown in the contract drawings. No cables less than 4mm^2 shall be used in these sub-mains circuits. Live, neutral, and earth continuity conductors, for these circuits shall all be drawn in the same conduit or enclosure.

(ii) Final Sub-Circuit-General

i) General or consumer circuit final sub-circuit from one distribution board will not serve outlets in an area served by another distribution board or consumer unit fed from the same meter.

ii) No fuse or circuit breakers shall be installed at any point other than on a distribution board, consumer unit, switch fuse or main switchboard except for fused spur boxes.

iii) Bell transformers shall be connected to separate way of a distribution board and form a separate final sub-circuit.

iv) Fire alarms systems shall also be from a separate final sub-circuit.

v) When the sub-main circuit protection comprises HRC fuses, final sub-circuit protection shall either be fuses or MCB's

vi) In all final sub circuits the neutral conductors shall be connected at the distribution board in the same order as that in which the live conductors are connected to the protective devices. All final sub-circuits for lighting points, sockets outlets points etc, wiring shall be carried out in the loop-in-system with no joints whatsoever along the run of cables.

vii) Each final sub-circuit shall be adequately protected against excess current and voltage at the beginning of the circuit. The size of the protective devices for each final sub-circuit shall be as shown in the drawings.

(iii) Lighting final sub-circuits

i) All lighting points shall be wired with cables not less than 1.5mm^2 in size. Each final sub-circuit number for lighting points, in the drawing, indicate lighting points which shall be served or connected to the same final sub-circuit and protected by the same protective device.

ii) No lighting circuit shall comprise more than 20 points when protected by 10A MCB.

iii) All lighting fittings with metal enclosure shall be provided with an earth terminal, which shall be connected, to earth continuity conductor of the same size as the live conductor cable. The earth continuity conductor shall be looped to all such fittings in the same manner as the live and neutral conductor.

iv) All lighting fittings shown in the drawings as being switched by the same switches shall be so wired as to be switched and controlled by the same switch.

(iv) Ring final sub-circuit for socket outlets

The ring sub-circuit shall run in the form of a ring commencing from a way in a distribution board or consumer unit etc. looping into the terminals of socket outlets and returning to the same way of the distribution board or consumer unit etc. The earth continuity conductors shall also run in the form of a ring having both ends connected to earth terminal at the distribution board or consumer unit etc.

The protective device for the final ring sub-circuit for socket outlet or any power points shall be as shown in the contract drawings.

1.16 EARTHING

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

a) (i) it shall be carried out in accordance with the appropriate sections of the current edition of the regulations for Electrical Engineers of Britain.

(ii) Electricity Supply Authority bylaws.

b) (i) Every item of apparatus and every conductor operating at voltage exceeding extract low voltage shall be effectively protected from giving rise to dangerous earth leakage current.

(ii) all metal required to be earthed under statutory rules shall be effectively earthed.

c) (i) all consumers units, Distribution Boards metal boards and switchgear shall have earthing busbar terminal. Throughout every circuit of such an installation an earth continuity conductor shall be provided and connected to the consumer's earthing terminal.

(ii) All exposed metalwork of all apparatus in electrical installation shall be connected to the appropriate earth continuity conductors.

(iii) All metal works of wiring systems other than current carrying parts, including cable sheaths armour, conduit, ducts, trunking, boxes, and caternary wires shall be connected to the appropriate earth continuity conductors.

(iv) The earthing terminal of every socket outlet shall be connected to the earthing continuity conductor of the final sub-circuit. At every lighting point an earthing terminal shall be provided and connected to the earthing continuity conductor of the final sub-circuit unless the fitting is of all insulated enclosure.

(v) Metal works other than current carrying parts and one point of the secondary winding of any transformer shall be connected to the appropriate earth-continuity conductors unless otherwise specified.

d) (i) At all main distribution panels and main services position, a 25mm x 3mm minimum cross section area copper tape (earth busbar) shall be provided and all equipment including the lead sheath and armouring of cable distribution boards and metal frames shall be bonded thereto.

(ii) The earth tape (earth busbar) of the consumer earthing terminal in Clause d(i) above shall be connected to the earth electrode by means of a copper tape or cable of suitable cross sectional area (earth lead). The minimum cross sectional area of the earth lead shall be 2.5mm and the maximum being 70mm^2. The connection of the earthing lead to the earth electrode must be readily accessible and soundly made by soldered joint or clamp. The size of earth lead cable or tape shall be as specified in the contract drawings.

(iii) Where the earth electrode is located outside the building, a removable test link shall be provided inside the building as near as possible to the entry of the tape for isolating the electrode for testing purposes.

(iv) Where necessary, earthing connection shall be protected against chemical damage and corrosion.

(v) All tapes to be soft high conductivity copper, untinned except in corrosive sites or where otherwise specified and where run underground, on or through walls, floors etc. it shall be served with corrosion resisting sleeve or coated with corrosion compound and braided

(vi) Where an earth rod is used for earthing its earth resistance shall be tested in the manner described in the latest edition of the IEE regulation in the presence of the Engineer .The sub –contractor shall provide test equipment.

(vii) Where copper tape is fixed to the building structure it shall be by means of purpose made non ferrous saddles which space the conductor away from the structure at a minimum distance of 10mm. Fixings shall be made using purpose made plugs. No fixing requiring holes to be drilled through the tape will be accepted.

(viii) Joints in copper tape shall be tinned before assembly fitted with a minimum of two copper rivets and seated solid.

(ix) Where connections are made to the earth busbars connecting surface shall be tinned and bolts and nuts shall be of copper or brass. Cables to be bolted to the bus bars shall have appropriate termination non-ferrous lags.

(x) The earth rod shall be 1.5m long by 15mm diameter extensible type. The head of the earth rod shall be driven to 300mm below the surface of the ground and enclosed in a concrete box with concrete inspection covers, that is , Earth Inspection Chamber, as per contract drawings. The rod shall be fitted with hardened steel tip and driving caps and appropriate cable clamp of copper

(xi) In rocky soils conditions the electrical contractor shall obtain approval from the Engineer for an alternative earthing system.

(xii) All Consumer Units, Distribution Boards and switchgear shall have earthing busbars terminal.

(xiii) Should the site condition be such that no effective earthing can be achieved by means of earth electrode rod the Engineer shall instruct the electrical contractor the alternative earthing system.

1.17 BONDING

i) All metallic conduits, trunking, metal enclosure, the metallic sheathing of cables, the cases and enclosures of switchgear boxes fusegears and apparatus of an electrical nature, shall be so bonded as to be directly connected to the respective consumer's earth.

ii) All earthing terminals of every socket outlet and lighting point shall be connected to earth conductivity conductor of the final sub- circuit. Earthing assessments and the resistance of the earth continuity conductor shall comply with IEE regulations.

iii) All lighting switches shall have earthing terminal, which shall be connected to earth continuity conductor unless the switch plates themselves are of plastic moulded type.

iv) All metallic work shall be bonded by earth continuity conductor expect where the metallic works is in isolation or is to be isolated.

v) Isolated switches and incandescent lighting fittings using filament lamps installed above non-conducting ceiling need not be bonded.

vi) The bonding connection to water and gas services (if any) shall be made as near as practicable to the point of entry of these services into the premises.

vii) All consumer metal shall also be bonded. The minimum size of copper bonding lead to bond metalwork shall be $2.5mm^2$.

viii) To avoid a situation where fortuitous faulty contact can occur between electrical apparatus and live conductors, metal works of the apparatus shall be bonded.

iv) The bonding and connections to earth continuity conductor shall be such that no fault of negative impedance of earthed metal work shall be sustained so as to cause danger and electric shock or the risk.

v) No bonding to metal works, water pipes, or members of structural metal works shall be done before the earth continuity conductor is connected to effective earthing installation.

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1.18 PROTECTIVE MULTIPLE EARTHING

Where protective multiple earthing (PME) is provided by the Supply Undertaker, the earthing lead shall be connected to the consumer's earthing terminal together with the neutral conductor of the installation and all shall be so arranged that connection to the neutral conductor of the incoming supply can be carried out linking the earth terminal of the consumer to the neutral terminal of the Supply Undertaker.

1.19 STEEL CONDUITS AND STEEL TRUNKING

a) Where metal conduits and fittings are to be used they shall be of heavy gauge annealed mild steel Class "B" welded or solid drawn to standard specification KS-04-180: 1985 or BS 1387. In no case will conduit smaller than 20mm diameter is to be used on the works. Conduits installed within buildings shall be black enamelled finish except where specified otherwise. Where installed externally or in damp conditions they shall be galvanized. Conduit fittings, accessories or equipment used in conjunction with galvanized conduits shall also be galvanized.

b) Metal conduit systems shall be electrically continuous and earthed in accordance to IEE regulations section D. All joints shall be made mechanically and electrically continuous by screwing to steel socket or by substantial mechanically clamps and ensuring the threaded joints do not corrode by applying a coat of paint of aluminium or iron oxide. Cables installed in steel conduits shall always be so bunched that the cables of all phases and the neutral conductor (if any) are contained in the same conduit.

c) Where vertical sections of steel conduit used exceed 5m in length staggered bends with draw-in boxes shall be provided at 5m interval to support the weight of the cables.

d) Metal trunking shall be fabricated from mild steel of not less than 18SWG. All sections of trunking shall be rigidly fixed together and attached to the framework of fabric of the building at intervals of not less than 1.2. Jointed trunking shall not have overhang-fixing points of more than 0.5m.

e) All metal trunking shall be made electrically continuous by means of 25x3mm copper links across each joint and where the joints are galvanised the links shall be made by galvanised flat iron strips.

f) All trunking fittings (i.e. bends, tees, etc) shall leave the main trunking completely clear of obstructions, be continuously open except through walls and floors at which points suitable fire resisting barriers shall be provided as may be necessary. The inner edge of bends and tees shall be chamfered where cables large than $35mm^2$ are employed.

g) Where trunking passes through ceilings and walls it shall be properly secured and the cover solidly fixed. Screws and bolts securing covers to trunking or section of covers together shall be so arranged that damage to cables cannot occur either when fixing covers or when installing cables in the trough.

h) Where trunking is used to connect switchgear of fuseboards, such connections shall be made by trunking fittings manufactured for this purpose and not by multiple conduit couplings.

i) Where the wiring system incorporates galvanized conduit the trunking system shall also be galvanized and where the conduit system shall be painted, the trunking systems shall also be painted.

j) The number of cables to be installed in trunking shall be such as to permit easy drawing in without damage to the cables and shall in no circumstances be such that a space factor of 45% is exceeded. All cables shall be drawn or laid in trunking trough in parallel and untwisted.

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k) Where conduits terminate in fuse gear, distribution boards, adaptable boxes, non-sprouted switch boxes etc. they shall, unless otherwise stated, be by means of a socket and bare male brass bushes, compression washers or couplers and male brass bushes. All exposed threads and abrasions shall be painted using an oil paint for black enamelled tubing, aluminium paint or other approved corrosive resistant paints.

l) All bends and sets shall be made cold without altering the section of the conduit by means of approved pipe bending machine. The inner radius of the bend shall not be less than four (4) times the outside diameter of the conduit. Not more than two right angle bends will be permitted in a conduit run without draw-in box. No tee, elbows, sleeves either of inspection or solid type will be permitted as part of conduit installation. Where straight runs of conduit are installed, draw-in-boxes shall be provided at distances not exceeding 5metres.

m) Conduit shall be swabbed out prior to drawing in cables and they shall be laid so as to drain of all condensed moisture without injury to end connections.

n) All boxes shall conform to KS04-668: 1986, be malleable iron and black enamelled or galvanized according to the type of conduit specified. All conduit boxes shall have threaded brass inserts. Box covers where required shall be of heavy guage metal, secured by means of zinc plated or cadmium plated steel screws.

o) Boxes used on surface installation works shall be tapped or drilled to line up with the conduit fixed with spacer type saddles, allowing clearance between conduit and wall, without the need for setting the conduit.

p) Where used in conjunction with mineral insulated copper sheathed cable, galvanizes boxes shall be used and painted after erection.

q) Draw-in-boxes in the floors are generally to be avoided but where they are essential they must be grouped in positions approved by the Engineer and covered by a suitable floor traps, with non-ferrous trays and covers. The covers are to be recessed and fitted in with a material to match the floor surface.

r) Where buried in the ground outside the building the whole of the buried conduit is to be painted with two coats of approved bitumastic composition paint before covering up. Where run on the surface, unpainted fittings and joints shall be painted with two coats of oil bound enamel applied to dust and grease free metalwork.

s) Non-inspection bends shall only be used in special circumstances such as behind a lighting fitting or outer box.

t) When drawing cables into the conduit care must be taken to ensure that they are drawn in parallel throughout the conduit run with no cables twisted round each other.

u) Steel conduits must not be in contact with water pipes, gas pipes or alarm circuits, radio or telephone circuits or other metal works, and where this is unavoidable the conduits shall be bonded to the metalwork of this circuits. All conduits unless installed to be gas-tight must be self-ventilating and provided with means of drawing condensed moistures. Where conduit passes through a wall, ceiling or floor the hole must be made good to full thickness of the material of which the wall or partitions are build.

v) A square adaptable box shall be used where a number of conduits running together change direction. Proper mechanically and electrical continuity must be maintained when using such boxes.

w) Where extra low voltage cables such as telephone services, radio services alarm circuits, run in the same direction with low voltage cables for lighting or for power each category of the cables shall be segregated and run in different compartments or channel of the trunking.

1.20 CABLE DUCTS

i) The electrical contractor shall provide and lay pitch fibre or concrete cement ducts under roadways, concrete walkways etc., through which cables are to be routed. Where called upon the electrical contractor shall haunch or place concrete around the ducts to protect the ducts.

ii) The building contractor will supply and install ducts where required in footings of buildings but it will be the electrical contractor's responsibility to provide accurate details to the building contractor of the required positions of these ducts and to ascertain that they are laid to the correct falls.

iii) After the installation of cable all ducts shall be adequately sealed to restrict the ingress of moisture. The number of cables to be installed in ducts shall be specified in the contract drawings but where not specified they shall be such as to permit easy drawing-in without damage to the cables and a space factor of 35% will not be exceeded.

1.21 MV MAIN SWITCHBOARDS AND SWITCHGEAR

The Main Switchboard is intended to ensure safety during operation, inspection, cleaning and maintenance of the entire electrical installation of the building protected by the board. The Board shall be so arranged as to minimise the risk of fire arising and spreading. It shall incorporate means of insulation, excess-current protection and earth leakage protection of the entire electrical installation.

a) Switchboard Construction

i) The switchboard shall be of free standing type manufactured in accordance with KS04-226, 1985(or BS 162), which coordinates the requirements for electrical power switchgear and associated apparatus. It is not intended that this K.S should cover the requirements for specified apparatus for which separate Kenyan Standard exist. All the other equipments and materials used in the switchboard shall be in accordance with appropriate Kenya Bureau Standard.

ii) The switchboard shall comprise the equipment shown on the drawings together with all current transformers, auxiliary fuses, labels, small wiring, measuring instruments, if any, and interconnections necessary for the satisfactory operation of the switchboard.

iii) The main switchboard shall be of modular construction type, of flush fronted, enclosed back, connected, all of steel construction and neat appreance, painted, with full front or rear access or both, as called for in the particular specifications. It shall be suitable for indoor use, sectionalised as necessary to facilities easy transportation and erection. The switchboard shall first be assembled at the factory, fully wired and checked before being installed on site in order to minimize installation work.

iv) It shall be floor mounted with maximum height of the switchboard being approximately 2.0 metres. A suitable connection chamber containing all field terminals shall be provided at the top or bottom or special chamber of the switchboard as appropriate.

v) Before manufacturing the electrical contractor shall submit to the Engineer for approval of detailed drawings, showing the layout construction and connection of the switchboard.

vi) Unless otherwise specified the switchboard shall be constructed from not less than **10guage** welded bright zinc plated mild steel for frame work and structural sections, and **12 gauge** zinc plated steel sheet for

doors and panels which shall be adequately stiffened by folding or welded stiffeners. All doors shall be properly stiffened and fitted with heavy cadmium plated or any other non-corrosive concealed hinges and flush catches. Removable stiffened zinc plated steel sheets covers shall be provided elsewhere on the switchboard for full access. All doors and covers shall be fitted with cemented neoprene gasket seals to provide a dust proof enclosure. All hardware and fastening shall be heavily cadmium plated or any other non-corrosive fasteners.

vii) No self-tapping screws shall be used. All steelwork shall be clean and free of burrs, scale and blemishes with all raw edges hidden and shall be finished with rust inhibiting treatment, one primer or undercoat and final coat of first quality zinc powder sprayed and baking enamel finish the colour of which shall be to approval.

viii) The switchboard shall be arranged to provide the maximum of safety to personnel and equipment. All electrical wiring and busbars shall be completely enclosed, closure panel, isolating and insulating barriers, and interlocks shall be provided as required for maximum safety. All fuse switches or switch fuses shall be capable of being padlocked in "off" and the "on" positions.

ix) The switchboard shall have provision of removable cross sections for easier cable installation and termination, adequate supports shall be provided for all busbars. Other terminations shall also be provided with adequate support.

x) All switches shall be operatable from floor level with maximum height of the switchboard not exceeding 2500mm from the floor level. The flush mounted indicating meters shall be within 1650mm height.

xi) Mounting arrangements shall be such that individual complete fuse switches or switch fuse may be disconnected and withdrawn when necessary without extensive dismantling work. When switches are arranged in their formation all-necessary horizontal and vertical barriers shall be provided to ensure segregation from adjacent units.

xii) Where spaces on the switchboard are provided for future circuit components to be installed, as shown on the drawings, all ancillary parts shall be provided and installed so that future components may be installed and connected in the least time possible. Full safety precautions shall be provided with all such spaces.

xiii) The mild zinc plated steel angle or channel forming the bottom rear edge (for rear access switchboard) or bottom front edge (for front access switchboard) shall be made up in sections and bolted into position such that any one section may be removed to facilitate installation of cables.

b) Busbars-General

i) All busbars shall be of high conductivity copper and be provided in accordance with KS 04-226: 1985 (or BS 158 and BS 159). The busbars shall be clearly marked or painted with the appropriate phase and neutral colours, which should be red, yellow, blue for live phases and black for neutral. The switchboard shall be such that the busbars are so arranged that the extensions to the left and right may be made in the future with ease should this need arise.

ii) The busbars, busbar connections and bare conductors forming part of the equipment of the switchboard shall be of current ratings as specified in the drawings, they shall also be able to withstand temperatures limits encountered during the normal operations of the switchboard and comply with BS. 159.

iii) Each busbar shall be of adequate strength to withstand the electro-mechanical forces that may be set up by the designed prospective short circuit fault current and they shall be so installed that they are free to

expand and contract as the temperature changes without any damage to themselves or to any other part of the installation.

iv) The busbars shall be mounted fully enclosed within the main enclosure of the switchboard in separate chambers. They shall be fully separated from the incoming and outgoing cable areas. Except for instruments, potential or current connections to fuse switches, switch fuses etc., which shall be clamped in position and be of minimum length, no circuit wiring shall be within the busbar chamber.

v) Most parts of the busbars shall be sheathed in approved, insulating materials in their respective phase colours and secondary insulation shall be provided where they pass through supports to prevent tracing paths.

vi) Interconnections between busbars and switchgears shall be of minimum length, properly insulated and rigidly supported. All contact areas of the busbars and the connection fastened to the busbars shall be either be of heavily silver-plated or solid copper bolts. Joints and connections shall be rigidly made with clamps and high tensile zinc plated steel bolts and nuts used with spring washers to maintain uniform pressure and flat washers to prevent cupping. Ready access to all joints and connection shall be provided. Bare aluminium conductors when terminated into copper busbars shall be suitably protected against corrosion.

vii) The busbars and its interconnections shall be mounted and screened such that with fuse switch or swtichfuse door open it shall not be possible to make contact with live parts. All cables terminations shall have PVC deep moulded shrouds to prevent contact with live parts.

viii) Small wiring emanating from busbars will be neatly arranged, cleated and shall be arranged in accordance with BS 158, the insulation of the wiring shall be coloured according to whether it is phase or neutral cable.

c) Phase Busbars

Termination of cables conductors on all phase busbars and all other busbars shall be through suitable manufactured technical clips. No holes shall be drilled on busbars for the purpose of terminating cables conductors. The clips shall be of cadmium plated, silver plated steel or pure copper suitable to match busbar materials to avoid corrosion in damp conditions.

d) Earth Bars

i) A high conductivity copper earth bars of adequate current rating for the anticipated earth fault current, shall be installed the full length of the switchboard in the outgoing cable area within the switchboard enclosure.

ii) Connection to the earth bar shall be made with approved cable lugs and high tensile terminal clips with galvanised steel nuts and bolts with washers as specified for the phase busbars. No holes shall be drilled on the busbars for the purpose of terminating cables on the busbars.

Neutral Bars

i) A high conductivity copper neutral bar adequately rated and supported for normal and fault conditions shall be installed in the outgoing cable area in the switchboard enclosure. These bars shall be mounted on insulators and shall be divided into sections according to the design of the switchboard.
Copper links double bolted to each section shall connect the section.

ii) Connection on the neutral bars shall be made as specified for the phase busbars. All points of contact on the neutral bars shall be silver-plated.

1.22 LABELS

(i) Switchgear, distribution Boards, consumer Units

i) All switchgear distribution boards consumer units etc shall be clearly and properly labelled in accordance with IEE regulations. Fuse ways and circuit breakers feeding final sub-circuit shall be labelled to indicate power or lighting sub-circuit, the area served, or the equipment served, the circuit number etc, the details of which shall be as given in the contract drawings.

ii) This shall be done by writing neatly on the label normally provided on the distribution boards consumer units etc., the area served and the circuit number etc., with a ball pen (not pencil or felt tip). If no label is provided the electrical contractor shall fix a special made label of the ‘’trifoliyte’’type. (Dymotape will not be accepted)

. iii) The outside cover of all switchgear, distribution boards, consumer units etc shall be clearly labelled with a ‘’trifoliyte’’type label (not dymotape) showing the service provided and any circuit reference number which may be given in the drawings current rating etc.

(ii) Switchgear, switch fuse, switches and isolators

a) Switches or circuit breakers the purpose of which is not obvious shall be labelled to indicate equipment, appliances or apparatus it controls.

b) In labelling Switch fuse, fuse switches and isolators the information required shall include:-

i) Reference number of switch

ii) Special current rating

iii) Where circuit cables have been rated on the basis of close circuit protection the label shall include indication that the fusing factor must not exceed 1.5. in this case labelling shall be of ivorine engraved block on white plate screwed by R.H brass screws

iv) Where more than one phase of supply shall be brought into a multi gang switch box a label shall be fixed to show maximum voltage present and labelled “DANGER”.

All labelling shall be completed before testing commences and the Engineer will accept no test certificates unless this has been done. Other labels shall be fixed where deemed fit and as instructed by the Engineer.

1.23 DISTRIBUTION BOARDS AND CONSUMER UNITS

(i) All enclosures of distribution boards and consumer units shall be metallic with the case made of zinc metal clad steel sheet (galvanised), or zinc powder coated steel sheets. They shall be of surface or recessed mounting pattern. They shall have hinged lids fitted with foam rubber gasket, with enamelled finish. Where called for in the specification, the cases shall be provided with locks.

(ii) Removable undrilled gland plate shall be provided on the top and bottom of the cases for incoming cable terminations. Where the requirement for fuses is indicated on the contract drawings the distribution board shall be fitted with high quality porcelain fuse carriers and bases lined with heatproof material, and

removable insulated shields or shrouds to provide adequate protection against accidental contacts with live metal. They shall also have circuit-indicating labels fixed inside the cover. Such Distribution board shall be complete with HRC fuses to B.586 1952 category 440 volts A.C.5

(iii) Where the requirement for Miniature Circuit Beakers(MCBs) is indicated in the contract drawings the Distribution Boards shall be fitted with moulded thermoplastic units of the combined thermal overload and magnetic short circuit tripping type to KS O4-311 Part 1 1987 or B.S 3871 part 1, having a minimum short circuit breaking capacity of 3000 Amps (3KA). The tripping mechanism shall be of inverse characteristics to prevent temporary overloads tripping and shall not be affected by normal variation in ambient temperature. The operating dolly shall be trip free with a positive movement in both make and break position. Clear indication of the position of the handle "ON and OFF" shall be incorporated.

(iv) In all the distribution Boards a complete list of circuits detailed on typed cartridge paper glued to stiff cardboards and covered with a sheet of Perspex and held in position with four suitable fixings, shall be fitted to the inner face of lids. The appropriate HRC fuse or MCB ratings shall be stated on the circuit chart against each circuit in use. Insulated barriers shall be fitted between phases and neutrals in all boards to shroud live parts. Neutral cables shall not be connected to fuses or MCB's. This shall also apply to earth bars.

(v) All consumer units shall be metal clad steel sheet or zinc-coated sheet of steel enamelled with hinged covers. They shall be either flush or surface mounted. They shall be suitable to be fitted with MCB's. All metallic cases of distribution boards and consumer units shall be effectively bonded to earth continuity conductor.

(vi) The Engineer has already carried out short circuit level calculations when preparing contract drawings but the electrical contractor is advised to check or calculate and assure himself that the prospective fault currents at each level does not exceed the short circuit protection capability of the switch or distribution gears he intends to install as it is his responsibility to sign the appropriate declaration in accordance with section E of the IEE regulations.

1.24 METAL CONTROL PILLAR

i) These shall be metal clad and fabricated with zinc coated steel sheet 12SWG gauge with enamelled finish of corrosive resistant paint as per contract drawings. The electrical contractor shall supply, install test and commission control pillars including supplying, fixing and connecting switchgears as detailed on the appropriate drawings.

ii) The control pillar shall be bonded with earth continuity conductor to comply with IEE regulations. It shall be so constructed as not allow ingestion of moisture into the enclosed switchgears. All cables shall enter the enclosure from below the pillar. All control pillars shall be vandal proof with hinged lockable doors.

1.25 FUSED SWITCHGEAR AND ISOLATORS

All fused switchgear and isolators shall conform to the requirements of KS04-226 PART 1:1985, or KS IEC 60439 Part 1-5. all contacts are to be fully shrouded and are to have a breaking capacity on manual operations as required by KS-04-182: 1980.

i) Fuse links for fused switches are to be of high rupturing capacity cartridge type class 21 confirming to KS04-183: 1978 or BS 88.

ii) The Isolators and fuse links shall be contained in metal clad, dust proof, gasket sealed individual enclosures. Isolators shall be load breaking/ fault breaking isolators without fuses. The fuse links shall be contained in metal clad, dust proof, gasket sealed individual enclosures. Mechanical interlocks are to

be provided between the door and, main switch operating mechanism shall be so arranged that the door may not be opened with the switch in the "ON" position, similarly it shall not be possible to close the switch with the door open except that provision to defeat the mechanical interlock and close the switch with the door in the open position for test purposes. The "ON" and OFF positions of all switches and isolators shall be clearly indicated by a mechanical flag indicator or similar device.

ii) In T.P.N fused switch units, bolted neutral links are to be fitted.

iii) The fuse switch units shall have fault rating at least equal to the fault rating of the switchboard in which they are to be installed. It shall have fast make/break design suitable for on board operations.

v) The handles of the fuse switch shall be non-detachable steel handles capable of being locked in either the "on" or the "off" position. The switch contacts shall be separately and fully shrouded and shall be renewable.

vi) The fuses and miniature circuit breakers (MCBS) shall be the protective devices to the Electrical Installation.

vii) The fuses shall be fitted in Switchfuse, Distribution Boards etc. where they are readily accessible. They shall be so connected as to be in series with circuits they are designed to protect. The current rating of the fuse shall be as shown in Bills of Quantity or contract drawing. All fuses shall be inserted in live conductor only and shall offer class Q1 protection with the fusing factor not exceedingly 1.5 for close protection.

viii) The fuse shall make the circuit dead when the current exceeds 2.4 times the rating of the fuse. They shall be of High Rapture Capacity(HRC) type to **BS 88 or BS 1361** with silver strip as the breaking element and Quartz or Silver Sand filler in a ceramic tube with metal and caps and or/without fixing tags. They shall preferable have fuse blown indicators. The prospective short circuit current of the fuse shall generally be 80 KA for alternating current.

ix) Miniature Circuit breakers shall be used for excess current protection in single phase or triple pole, 240V or 415V finals sub-circuits or sub-mains with HRC fuses as backup in the mains switchboards. The MCBs shall easily be opened and closed by hand and open automatically when overloaded. The MCB shall incorporate both thermal and magnetic overload tripping mechanism such that the bi-metal strip shall offer time – effect for load tripping, while high speed protection against short circuit is given by magnetic operation. The time response against overload and short circuit currents shall be as specified in particular specifications.

1.26 LIGHTING SWITCHES

i) The lighting switch shall be of tumbler type. For direct current (DC) they shall be of quick break type, while for alternating current they shall be of the "Microgap" type. All switches shall be manufactured to KS04-247: 1988 standard. Where wiring systems is surface wiring, surface switches complete with boxes shall be installed and where conduits are concealed in the fabrics of buildings, flush type of switches shall be installed with boxes recessed.

ii) Single cord ceiling switches, where required, shall be of the type where one pull shall put the switch ON the next pull shall put the switch OFF. The switches shall be fitted with shock absorbing springs in the pull cords. All switches shall be mechanically robust able to withstand the constant operation, and the contacts shall be heavy brass and firm enough to carry the rated circuit current without overheating.

iii) Switches controlling discharge lighting fittings shall be so rated as to operate under likely inductive loads of the fittings. All switches shall be inserted on the live conductors of final sub-circuits only.

iv) The switch boxes shall either be plastic moulded or steel/alloy and the current rate of the switches shall be as described in the drawings or Bill of Quantities. All switches installed external to the building and exposed to the weather shall be of weatherproof type.

v) All switches shall be mounted at a height described in contract drawings and in any case they shall be at least at a height of 1.4m above floor level and in a readily accessible position, at least 220mm from the frames on the unhinged side of the door.

vi) Time delay switches where specified shall be able to operate on an "ON" position for at least two minutes and always on the "OFF" position unless operated. Where more than one flush switch is to be installed under one plate in a multigang assembly and where the live conductors are supplied from more than one phase the plate shall be marked "danger 415 Volts".

vii) The switch plates shall be either plastic moulded and coloured as specified or metal clad and coloured as specified. The contact parts shall be enclosed in plastic mould insulation material and be of pure copper hard drawn brass.

1.27 SOCKET OUTLETS AND PLUGS

i) Socket outlets and plugs shall be of the types appropriate to the system of wiring employed. They shall be rated 13Amps of 3Pin shuttered, and switched, manufactured to KS04-246: 1987 standard.

ii) For flush pattern the boxes shall either be steel or plastic moulded while for the surface installation the boxes shall be of steel, steel alloy galvanised or enamel painted with corrosive resistant paint, and also plastic moulded type. The number of gangs and type shall be as specified in the drawings.

iii) The socket base shall be of virtuous porcelain or tough insulation material and the contact tubes which must be self-adjusting to the pins shall either be of phosphor bronze or hard drawn brass with sound terminals. The exposed ends of the tubes shall be below the level of the base to prevent them from being touched accidentally.

iv) The shutter mechanism shall be such that the insertion of the earth pin of the plug shall allow the opening of the live and neutral tubes of the socket outlet.

v) All plugs shall be of substantial construction to clamp to the socket outlet tubes firmly. The plug cover shall be of tough rubber plastic non-combustible materials. All plugs shall have 13A cartridge fuse manufactured to BS1363.

vi) The socket outlet plates shall either be plastic mouldered and coloured or metalclad as specified. All outlets shall be installed at height of 300mm from the finished floor level or in special in cases, especially above benches, at 1.4m. All the earth contact tube shall be connected to earth continuity conductors. The insulation of the socket outlet shall be so constructed as to withstand temperatures likely to be encountered during normal operation and at rated current and voltage.

vii) The plug pins shall clearly be identified by "L" for live contact, "N" for neutral contact and "E" for earth contact. Both the plug and socket outlet shall be so constructed that it shall not be possible for any one pin of the plug to be in live contact with socket outlet while the other pin is exposed.

viii) Where two or more points are shown adjacent to each other on the drawings e.g. socket outlet and telephone outlet they shall be lined vertically or horizontally on the centre lines of the units.

1.28 CEILING ROSES

i) All ceiling roses shall either have three terminal connection plate or four terminal connection plates as specified in the contract drawings. All ceiling roses shall have inbuilt barriers between the terminal. They shall be semi-recessed for direct fixing to conduit boxes. They shall be plastic moulded type with shrouded live terminals. All terminals shall be such that conductors and flexible cords can be easily looped in.

ii) Not more than one flexible cord shall be attached to a ceiling rose unless otherwise specified. Each ceiling rose shall be fitted over a biscuit ring of similar colour. All ceiling roses shall have provision for cord grips.

iii) When specified, the ceiling rose shall have an earth terminal which shall be connected to earth continuity conductor of the final sub circuit. The rating of the ceiling rose shall be as specified in the contract drawings and Bills of Quantities. The ceiling rose shall be so wired that no terminal remains alive when the associated switch is off. All the terminals of the ceiling rose shall be of heavy brass, phosphor bronze or any other high conductive corrosive resistant material.

1.29 LAMPHOLDERS

i) Lamp holders shall be of extra heavy gauge skirted type and shall be either be Bayonet Cap (B.C), Edison screw (ES), or Goliath screw (GS) variety, as specified in the drawings.

ii) All the lamp holders shall have heavy brass type electric solid plunge contacts separately sprung by rust proof steel plunger springs. All lamp holders shall be constructed of or shrouded in insulating materials to prevent contact with the live parts. They shall be so designed for quick removal and replacement of lamp and also be able to hold the lamp in firm metal electrical contact to prevent over heating.

iii) B.C type lamp holder shall comply with BS 52. Where lamp holders are supplied by flexible cord, the holders shall have “cord grip” arrangements and in the case of metal shades, earthing screws shall be provided in each of the holders. The screwed cap of the ES and GS holders shall be connected to neutral. When wiring the lamp holders, care must be taken in bearing the flexible cord. The flexible wires must be well twisted together and should not be allowed to splay, as loose single strand may touch either the metal frame of the holder or the opposite terminal. The braiding should be neatly cut away to prevent cotton fibre touching the terminals.

iv) The current rating of the lampholder shall be as specified in the contract drawings or Bills of Quantities. Lamps that are likely to draw more current than the current rating of lamp holder shall not be used or permitted to be connected to the lamp holder. Where not rated the lamp holder shall be assumed to be 5A, 240 Volts, 50Hz variety. BC lamp holders shall be used with tungsten lamps rated upto 150 W while for lamps up to 200W ES lamp holders are suitable and above 200W all lamp holders shall be GS variety.

v) Lamp holders shall either be insulated type of Bakelite, Plastic moulded type, or the brass type with porcelain interior, as specified.

1.30 LIGHTING FITTINGS

i) The electrical contractor shall allow for the provision of handling charges, taking the delivery, safe storage, wiring(including internal wiring), assembling and erection of all lighting fittings shown on the drawings.

ii) All fittings and pendants shall be fixed to the conduit boxes with brass R/11 screws. These shall be in line with metal finish of fittings. The lighting fittings specified are detailed for the purpose of establishing a high standard of finish, but equal and approved alternative fittings shall be accepted. The metallic parts of the fittings shall be bonded to earth continuity conductor.

iii) In case of rectangular shaped ceiling fittings, the extreme ends of the fittings shall be secured to suitable support in addition to the central conduit supply box. Supports shall be provided and fixed by the electrical contractor. Minimum size of internal wiring cables shall be 1.5mm^2. Where these cables are likely be exposed to risk of damage by heat generated in the fitting, especially for lamps rated 300W and above, silicone rubber sleeves shall be fitted to the cables.

iv) Where sub- circuit cables are not continued into the lighting fittings terminals, they shall be connected to the fittings wires through **Connectors** of approved type (see clause on Connectors.). The insulation of fittings cables employed shall be capable of withstanding the maximum temperature rise of the fittings enclosure.

v) Lighting fittings with chain or tube suspension shall be so mounted that they are in no way supported by the conductors and the whole weight of the fitting shall be borne by the chain.

vi) Lighting fittings should be installed at height indicated in the drawings.
Where not indicated these shall be mounted on the ceiling. Fluorescent fittings mounted on combustible material of the ceiling shall be spaced by 25mm minimum from the ceiling by space couplers or dome covers.

vii) It is very essential that the light fitting supplied by the electrical contractor are those specified in the drawings and particular specification for the fittings. However equivalent and approved type shall be accepted unless otherwise specified elsewhere.

viii) The type of lighting fitting supplied shall be as described in the Bill of Quantities and of a particular catalogue number and manufactured by the company indicated. Equal and approved equivalent fittings shall have similar architectural configuration as the one specified, have equal rated lighting lumens output , and of the same colour rendering as those specified and also with similar characteristics as the required fitting, such as dust proof, corrosive proof, etc. In case of fluorescent fittings or discharge fittings, the starting mechanism of the equivalent lighting fittings must also be similar to the one specified. The electrical contractor must indicate the country of origin of all lighting fittings (in the Technical Schedule) which are deemed to be equivalent to those specified. The type of fitting provided shall be such that spares such as chokes, starters, capacitors etc. are available in the local market.

ix) The electrical contractor shall install the lighting fittings oriented as shown in the drawings. The electrical contractor shall not change the orientation without the approval of the Engineer.

x) Each lighting fitting shall be provided with number type and size of lamps as detailed in the drawings. The colour rendering of the lamps supplied shall be as required and specified in drawings or particular specifications.

1.31 STREET SECURITY OUTDOOR LIGHTS & COLUMNS

i) The Street lighting support column shall be at minimum of 300mm depth in the ground on 100mm thick concrete foundations and, the pole up to 200mm shall be surrounded with concrete with brackets that are welded to the column firmly embedded in the concrete. The diameter of the concrete shall be a minimum of 450mm depending on the width of the pole.

ii) After manufacturing and before erection the columns shall be treated with an approved mordant solution, which shall be washed off, and the whole allowed to dry. Thereafter, the column shall be painted with one undercoat and two coats of anti-corrosive gloss paint to an approved colour.

iii) All columns shall be complete with enclosure chambers for installation of switchgear associated with the lighting fitting. The chamber shall be at a minimum height of 1500mm to 2000mm above the ground. The chamber shall also have a vandal proof locking mechanism.

iv) Cable entry position on the column shall be at minimum 75mm above the concrete surrounding. The supply cable shall be drawn through the entry and terminated at an enclosure chamber in the column that is above the ground at height indicated in the drawings. All terminations of the underground cables shall be through cable glands.

v) The column shall be of either aluminium or heavy galvanised steel as specified in contract drawings the height and width shall be as specified in Bills of Quantities or shown on the drawings.

1.32 COOKER CONTROL UNITS OR OUTLETS

i) These shall be flush mounted with 13A switched socket outlet and neon-indicators. The cooker control units shall be manufactured to KS O4-247: 1988. The construction of the cooker outlet shall be such that all terminals shall be easily accessed and shall be shrouded to avoid accidental contact.

ii) The current and voltage rating of the cooker outlet shall be equivalent to those of the cooker to be connected and the cooker outlet shall be capable of normal operations at ambient temperatures of 20^0 c to 45^0 c.

1.33 CONNECTORS-

i) Where specified in Bills of Quantities and drawings, connectors shall be installed for the purpose of joining cables. When not specified, connectors shall be fitted for joining of looped PVC insulated cables with cables in lighting fittings or any other apparatus. The joint so formed shall be both mechanically and electrically sound.

ii) The connector's insulation shall be as effective as that of cables forming the joint. Care shall be taken in the choice of connectors in joining conductors of dissimilar metal to avoid corrosion. In particular when joining aluminium and copper conductors, the connectors contacts shall be cadmium alloyed variety to prevent electrolytic corrosion.

iii) The connector's screws shall be appropriately shrouded and the whole construction shall comply with KS IEC 60947 Part 1-7 2001 or B.S.196, BS1778 or B.S.4343.The terminals shall be of phosphor Bronze or hard drawn brass complete with screw.

iv) The connector terminals shall be insulated with PVC or porcelain and be shrouded to prevent accidental contact of live parts.

v) When the temperatures are not high Rubber insulated connectors may be used.

1.34 POSITION OF ELECTRICAL PLANT AND APPARATUS

The routes of cables and approximate positions of switchboards etc. as shown on the drawings shall be assumed to be correct for purpose of tendering but exact positions of all electrical equipment and routes of cables must be agreed on site with the Engineer before any work is carried out.

1.35 FLEXIBLE CORDS

i) Circular sheathed white twin TRS flex to BS: 6500:1989 shall be used for plain pendant fittings up to 100watts. For all other types of lighting fittings the flexible cord shall be silicone rubber insulated. No polythene insulated flexible cord/cable shall be used in any lighting fitting or other appliance.

ii) The type of insulation of the flexible cord shall be such as to minimise risk of damage from high temperatures, damp, corrosive situation and mechanical damage. Where flexible cords and cables are likely to be damaged by heat, heat resisting flexible cords shall be used, alternatively conductors shall be sleeved with heat resistant sleeves.

iii) The contractor shall ensure that exposed unsheathed flexible cables of the flexible cords shall be as a short as possible where unavoidable.

iv) Care shall be taken to ensure the flexible cord does not support lighting fitting exceeding 3kg. The flexible cord size and rating shall be as described in the Bills of Quantities or contract drawings. Where the cord is not rated it shall be assumed to be capable of carrying 12Amps.

v) The colour code for the flexible cord shall be brown for live, Blue for neutral or negative and Green and Yellow for earth.

1.36 FUSED SPUR

i) These shall be flush or surface mounted, metal clad or plastic moulded plate of single or double pole switched type, in steel/ plastic moulded box and type and make as specified in the drawings complete with pilot light to KSO4 –247:1988 standard.

ii) The fused spurs box shall be for connection and supply to permanent Electrical Appliances installed or likely to be installed. The rating of HRC fuse shall be as per contract drawings or Bills of Quantities but shall not exceed 13A. Where the fused spur is to be used to supply a hot water heater system in the bath or kitchen, it shall be positioned out of reach of a person using the bath or sink.

1.37 LAMPS AND TUBES

a) The electrical contractor shall supply and fit all lamps, fluorescent tubes, etc., as required for installation.

b) Tungsten filament lamps shall be as manufactured to KSO4 -112:1978 which is also applicable to General Services lamps, which shall be manufactured to KS IEC 60598.

c) Tubular fluorescent lamps shall comply with KSO4 –464:1998.

d) The lamps and tubes shall be suitable for normal stated voltage and frequency and they shall have power rating as shown in the contract drawings and particular specification. For tubular fluorescent tubes the power factor shall be as specified in particular specifications but not be below 0.8.

e) Colour rendering of fluorescent tubes shall be specified in particular specifications or Bills of Quantities. However where not specified the tubes shall be as assumed to be of “white” variety. Lumen output of the lamps and tubes shall also be specified but where not specified the sub –contractor shall notify the Engineer of the omission

1.38 WATER HEATERS

a) Unless otherwise specified water heaters shall be of the self-contained type.

b) Where water heater cylinders are made up locally for immersion heaters, the plain cylinder shall be effectively lagged. Adequate thickness of thermal insulation shall be applied to the entire surface of the cylinder.

c) Each water heater shall be supplied by a separate final sub-circuit from the distribution board or consumer or where its rating equal or exceed 3kw, it shall separately metered by the Power Undertaker.

In which case the Final sub-circuit shall be from a Double pole switchfuse (or Double Pole MCB) in the Meterboard. The wiring shall be complete from the distribution board, meterboard, or consumer unit to water heater switch without introduction of a plug and socket outlet. An approved heat resistant cable of butyl rubber insulated as CMA reference 610 butyl of voltage rating 600/1000 volts shall then connect the water heater switch to the immersion heater terminals.

d) Small domestic water heaters in kitchen will be controlled by means of a switch fused spur with neon indicator and labelled" water heater". The switch shall comply with **BS 1363**. The electrical supply will be brought out to the appliance, through a round box with a dome lid situated close to the point of connection of the appliance. The connection will be in M.I.C.C. cable terminated in appropriate glands designed for use in conjunction with this class of cable. The conductors shall be insulated with porcelain beads or appropriate heat resistance sleeves from the gland to the point of connection at the water heater.

e) All water heater switches shall be placed out of reach from a person using the bath or sink. The water heater shall be properly earthed from an earth terminal on the apparatus plate to the general earth connection or earth continuity conductor. The pipe work of the hot water systems should not be relied upon as an earth continuity conductor, but shall be bonded.

f) The final sub-circuit of the water heater shall be protected by HRC fuse or MCB of appropriate current rating as shown in contract drawings.
The water heater switch shall be a micro gap double pole switch labelled "WATER HEATER".

1.39 PROSPECTIVE CURRENTS AND DISCRIMINATION

Prospective Currents

Prospective current of the installation or Short Circuit Current Fault level is the RMS value of the alternating component of an Alternating Current (AC) that would flow in a circuit due to applied voltage, when a link is placed between the live and neutral conductors at any position of the circuit.

Thus when the live and the neutral conductor of a final sub-circuit is shorted through a link and voltage applied the RMS value of the short circuit current which shall flow shall be short circuit Current Fault level or the **prospectiv**e **current level of the final sub-circuit at the position of the shorted point**.

The value of the current is limited by the impedance of **Supply Transformer**, winding impedance, cable impedance, impedance of joints and equipment between the transformer and the fault position.

Generally the short Circuit Fault level at the Final sub-circuit is not expected to be higher than 3KA while at the Main Distribution Board the fault level may be as high or approximately 14KA. The Engineering design of the installation is such that all excess current protective device specified in Bills of Quantities and contract drawings are of specified prospective fault current level and any change in the installation with different protective devices introduced by the contractor could affect the design.

The contractor shall notify the Engineer of any changes he is likely to incorporate in the installation of protective device for approval before installation especially if the devices he intends to install are of different make from those specified. The installed fuses and MCBS must conform to the specified prospective fault current levels.

Discrimination

The installation shall be considered to offer effective discrimination when only the faulty final sub-circuit or a particular faulty apparatus is isolated.

Discrimination between two or more protective devices in series shall be proved to occur when, on the incidence of a short circuit or an over-current, only the device intended to operate does so.

Where HRC fuses are used as protective device in conjunction with MCBS the fuses shall provide back up protection to cut off high prospective currents rapidly thus reducing damage to the installation. The MCB shall offer rapid interruption of low prospective short circuit current in the Sub-main and Final sub-circuits. In general discrimination between two devices shall occur when **pre-arcing (1^2t)** of the major device, say HRC fuse-device of high current rating is greater than the total operational **(1^2t)** of the minor device of lower current rating, say an MCB, at its designed **prospective short circuit fault level current(I).**

The electrical contractor before installing the prospective devices shall ensure that the characteristics and specifications of such devices comply with the above criteria as well as the specifications drawn in particular specification for fuses and MCBS. **(1^2)** shall be the square of Ampere RMS value of **prospective short circuit fault level current** and **(t)** the time period in seconds.

1.40 RESIDUAL CURRENT CIRCUIT BREAKERS OR EARTHLEAKAGE CIRCUIT BREAKERS

(i) The Residual Current Circuit Breakers or Earth Leakage Circuit Breakers shall be installed whenever indicated on the drawings and required by the regulation. However wherever a socket outlet is placed within 2 metres from a sink irrespective of the type of building, an Earth Leakage Circuit Breaker shall be installed to protect the ring main where the socket outlet forms part.

(ii) The current operated Earth leakage circuit breaker shall be installed if the product of its operating current in amperes and the earth loop impedance in ohms exceed 40. The operating current of the current operated Earth leakage circuit breaker in this specification shall not be more than 30mA and shall be of high sensitivity such that they shall trip in less than 30ms for a leakage current of 30mA(equal to the operating current). They shall be of the type not requiring a mains supply to operate the trip mechanism under fault conditions. The current operated Earth Leakage Circuit Breaker shall also be able to trip automatically when the neutral of the supply is absent, thus ensuring that there is no likely danger of a live-to earth fault being present on the neutral side of the load. The Earth Leakage Circuit Breaker shall incorporate a test button and shall also protect the installation against excess current and short circuit fault in addition to earth leakage faults.

iii) Where the installation involves current operated earth leakage circuit breaker the consumer earthing terminal shall be connected to a suitable earth electrode.

iv) Where voltage operated earth leakage circuit breaker is specified for single phase installation the operating coil of the circuit shall be connected between the consumer earth terminal and an earth electrode through the earth lead. The earth electrode used with any voltage operated earth leakage circuit breaker shall be placed outside the resistance area of any parallel earth which may exist. The earthing lead between the operating coil and the earth electrode shall be effectively insulated. The Voltage Operated Earth Leakage Circuit Breaker shall incorporate means of testing through a finger operated test button.

v) For three phase voltage Earth Leakage Circuit Breaker, connection to consumer earth terminal is not necessary. The Earth Leakage Circuit Breaker may be arranged to work in place of MCCB or MCB, or operate as a back up protection. The voltage operated Earth Leakage Circuit Breaker shall be necessary when the earth loop impedance exceeds the values applicable to fuses or MCBs. For example, for fuse of current Rate 100A the measured earth loop impedance is required to be 0.8Ohms. Value above that will necessitate installation of voltage operated Earth Leakage Circuit Breaker or improvement of earthing installation.

1.41 METER BOXES (METERBOARDS) AND CABLE-LOOP-IN BOXES

i) The electrical contractor shall supply and install standard single or Dual Tariff Meter Box or any other specified Meterboard where called on in contract Drawings. He shall also provide the necessary conduits for Kenya Power and Lighting Service Line cable entry.

ii) Where more than two meters are to be installed in a Meterboard or Main Switchboard with provision for meters, the electrical contractor shall ensure adequate provision is provided for installation of both KPLC meters and accompanying Cut-outs. The meterboard shall be of dimensions approved by the Engineer.

iii) All meterboards shall either be constructed of galvanized steel sheet or of zinc powder coated and painted steel sheet to Engineers approval.

iv) Cable loop in – Box shall be to MOW drawing No. SFB (69) 7006D unless otherwise specified. They shall be fitted with Lucy Type connecting Blocks or equivalent. Appropriate current protecting device such as Double pole MCBs, HRC fuses etc. where specified in the drawing shall enclosed in the Cable loop. The Cable-Loop-in Box cover shall be complete with neoprene gasket or equivalent

1.42 TELEPHONE OUTLET

i) The electrical contractor shall install conduit for telephone wiring as shown in the drawings. The minimum conduit size shall be 25mm diameter PVC or steel conduit as specified

ii) Draw wires shall be left in all the conduits for telephone installation, in case telephone wiring shall be required to be installed later. The conduits shall be terminated to suitable Telephone outlet boxes of steel/alloy or Plastic moulded.

iii) Where telephone lines are to be installed along trunking they shall be installed in a separate channel or compartment of the trunking to ensure segregation from other cables of high voltage supply.

iv) Outlet plates shall be as specified in contract Drawing and Bills of Quantities and in any case shall be of the type complying to **KS 1588-3:2001.**

v) Where telephone points are to be wired the cables used shall conform to **KS 1588-3:2001.** The cables so installed shall be terminated in appropriate termination Block or Discase.

1.43 MINERAL INSULATED COPPER SHEATHED CABLES(MICSC)

i) Mineral insulated copper sheathed cables, where required especially in flame proof installation, shall be of those manufactured in accordance with B.S.3207 by an approved manufacturer. Where installed in corrosive situations, and for purposes other than for flame proof installation, they shall be P.V.C. sheathed in addition. The cables shall be of 440/600V Grade.

ii) The cables sizes shall be as specified in contract drawings. Where installed on walls or any non conductive surface the cables shall be fixed on the surface by copper saddles.

iii) Where bare MICS cables are fixed to cable tray, the fixing shall be by means of bare copper saddles where the cable tray is of PVC material. If the cable tray is of steel galvanized or steelwork, then the MICS cable should have extruded PVC cover or the steel tray must be painted.

(v) Where PVC covered MICS cables are fixed direct to the structure of the building, the fixing shall be by means of PVC covered copper saddles and brass bolts and nuts.

vi) MICs cables must be protected from mechanical damage by covering them when drawing them in short lengths of PVC conduit. The cable end shall be sealed by the use of metal screw-pot type seal. The cable shall first be prepared by cutting away a suitable length of copper tube and removing magnesium oxide inside, leaving the bare copper conductors to protrude. The metal pot shall then be screwed on the copper tubing, cutting its own thread. The pot shall be sealed with plastic compound well rammed in, and a sub-assembly comprising a fibre cap and neoprene insulating sleeves, shall then be threaded over the conductors and cramped into position with a special tool.

vii) The cables where required shall enter into metal or PVC switchboxes, Distribution Boxes etc. by special glands which shall screwed into boxes and hold the sealed ends of the cables in a secure grip. In special conditions flameproof glands may be used.

viii) In areas where flameproof insulation shall be specified the glands shall be of a flameproof type. For maximum operating temperature of upto 150º (302ºF) the seal shall comprise of a brass pot, a silicone bonded glass disc and fluorinated ethylene propylene(FEP) or elastic insulating sleeves and porcelain wedges.

ix) The contractor shall provide the Engineer all the tools necessary for termination MICS cables after the installation.

x) Ferrous plates or structures through which the cables are required to pass shall be slotted and brass glands and sockets shall be used.

xi) Where single core MICS cables are to be used all necessary precautions shall be taken to prevent hysteretic and eddy currents.

xii) After installation within 24 hours the whole installation of MICS cable shall be tested and commissioned.

1.44 AS INSTALLED DRAWINGS.

The installation shall not be considered complete until test certificate and "As installed" drawings have been submitted and approved by the Engineer.

1.45 TESTING AND COMMISSIONING OF ELECTRICAL INSTALLATION ON SITE

The electrical contractor shall conduct, during and, at the completion of the installation and if required again at the expiration of the maintenance period, tests in accordance with the relevant section of IEE regulations and also to rule 3 of the Electrical Power Act, for additional test not covered by the regulations, and the Electricity Supply Authority by-laws.

The results of the tests shall be recorded on a test and commissioning certificate supplied by the Engineer or his representative. Two copies of each certificate shall be provided.

Additionally, in the case of underground cables, test shall be carried out to establish continuity, phase sequence and high voltage tests if required by the Engineer.

a) Tests shall be carried out to prove that all fuse and single pole switches are installed in the "Live" Conductor.

b) Tests shall be carried out to prove that all socket outlets and switched socket outlets are connected to the "Live " conductor in the terminal marked as such and that each Earth pin is effectively bonded to the earth continuity system.

c) Tests shall be carried out to verify the continuity of all conductors of each "Ring" circuit.

d) Phase tests shall be carried out on completion of the installation to ensure that correct phase sequence is maintained throughout the installation. Triplicate copies of the results of the above tests shall be provided within 14days of the witnessed tests and contractor will be required to issue to the Engineer the requisite certificate upon completion as required by the regulations referred above. In case of underground cables, tests shall be carried to establish the continuity, phase sequence and high voltage tests.

e) Inspection shall be carried out to ensure;

i) No terminal in the Ceiling Rose is "LIVE" when the corresponding switch for that Ceiling Rose is in off position

ii) All conduit termination, conduit boxes, consumer unit, Distribution Boards, Adaptable boxes etc., shall not have rough edges and are bushed.

iii)All fixed metal works close to Electrical installation are bonded to earth continuity conductor

f) Other tests may be conducted to test whether the arrangement of protective devices can afford Discrimination i.e., a fault in the furthest power point or lighting point does not blow or trip Fuses or MCBs respectively in the Meter Board, as an example, but blows or trips those that are in the consumer unit that are protecting the respective Final sub-circuits with the faults.

g) Other tests shall include;

i) Installation Resistance Tests to various circuits and conductors and apparatus,

ii) Earth-continuity conductor impedance tests,

iii) Earth loop impendence tests,

iv) Earth Electrode resistance tests.

h) Any apparent fault, defects or omission or faulty Workmanship, incorrectly positioned or installed parts of the installation found by such inspections or tests shall be rectified by the contractor at his own expense.

i) The electrical contractor shall provide accurate instruments and apparatus and all labour required to carryout the tests. The instruments and apparatus shall be made available to the services Engineer to enable him to carryout such tests as he may require. The contractor shall generally attend on other contractors employed on the project and carryout such electrical tests as may be necessary.

The Engineer and the contractor shall also participate in testing and commissioning of all other equipment plant and apparatus forming part of the works, in particular insulation tests, before connecting any power or other supply and setting to works such plant or apparatus.

Where such equipment etc. forms part of or is connected to a system whether primarily of an electric nature or otherwise (e.g. Air conditioning systems) the electrical contractor shall attend on and assist in balancing regulating, testing, and commissioning the systems to the service Engineer's approval.

Space Factor

Ensure not many Electrical cables are drawn in the same conduit and a space factor of 40% is maintained.

Illumination Level

The illumination level shall be as per design specification. A Lux meter may be used to test the illumination level of various rooms in the building

Manuals

Obtain from the contractor all the maintenance manuals as required by the specifications

Earthing

Inspect the Earthing Chamber to ensure the earth lead is enclosed in conduit up to the point of connection to the Earth rod Clamp. Ensure the earth lead cable termination at the earth rod clamp is be corrosive resistant.

Radial Circuits

Inspect and ensure that for all Appliances, Equipment, Apparatus etc that are required to be supplied by radial circuits directly from Distribution boards, Consumer Units etc., without the circuit supplying any other equipment, this requirement is achieved.

***Underground Cables**

All Armoured Cable installation shall be tested in accordance with GES No. 2 and the result recorded.

Non-metallic conduits shall be of high impact quality rigid PVC conforming to B.S 4607 or KS04-179: 1988 and IEE

B.S. 31/1940 BS 4607 part 1, 1970 or to KS 04-179 1979 Part 1

- PVC insulated cables and Flexible Cords Ks 04-192:1988 or BS 6004
- PVC insulated Armoured Cables KS 04-194: 1990 or BS 6346
- Armouring of electrical cables KS 04-290: 1987

PVC SWA PVC type having a rating of 600/1000 volts and manufactured to KS 04-194: 1988 and KS 04-187/188 with an overall extruded PVC insulation covering shall be manufactured dimensionally to B.S. 31/1940 BS 4607 part 1, 1970 or to KS 04-179 1979 Part 1.

Where metal conduits and fittings are to be used they shall be of heavy gauge annealed mild steel Class “B” welded or solid drawn to standard specification KS-04-180: 1985 or BS 1387

All boxes shall conform to KS04-668: 1986

The switchboard shall be manufactured in accordance with KS04-226 (or BS 162),

The busbars, busbar connections and bare conductors forming part of the equipment of the switchboard shall be of current ratings as specified in the drawings, they shall also be able to withstand temperatures limits encountered during the normal operations of the switchboard and comply with BS. 159

All fused switchgear and isolators shall conform to the requirements of KS04-226 PART 1:1985, all contacts are to be fully shrouded and are to have a breaking capacity on manual operations as required by KS-04-182: 1980.

All switches shall be manufactured to KS04-247: 1988 standard.

Socket outlets and plugs shall be of the types appropriate to the system of wiring employed. They shall be rated 13Amps of 3Pin shuttered, and switched, manufactured to KS04-246: 1987 standard 13A cartridge fuse manufactured to BS1363.

B.C type lamp holder shall comply with BS 52

Such Distribution board shall be complete with HRC fuses to B.586 1952 category 440 volts A.C.5

The cooker control units shall be manufactured to KS O4-247: 1988

The connector's screws shall be appropriately shrouded and the whole construction, shall comply with KS IEC 60947 Part 1-7 2001 or B.S.196, BS1778 or B.S.4343.

These shall be flush or surface mounted, metal clad or plastic moulded plate of single or double pole switched type, in steel/ plastic moulded box and type and make as specified in the drawings complete with pilot light to KSO4 –247:1988 standard.

Tungsten filament lamps shall be as manufactured to KSO4 -112:1978 which is also applicable to General Services lamps, KS IEC 60598.

Tubular fluorescent lamps shall comply with KSO4 –464:1998.

Small domestic water heaters in kitchen will be controlled by means of a switch fused spur with neon indicator and labelled" water heater". The switch shall complying with **BS 1363**

All fused switchgear and isolators shall conform to the requirements of KS IEC 60439 Part 1-5. They shall be of High Rapture Capacity(HRC) type to **BS 88 or BS 1361** with silver strip as the breaking element and

Outlet plates shall be as specified in contract Drawing and Bills of Quantities and in any case shall be of the type complying to **KS 1588-3:2001.**

Where telephone points are to be wired the cables used shall conform to **KS 1588-3:2001.** The cables so installed shall be terminated in appropriate termination Block or Discase.

Mineral insulated copper sheathed cables, where required especially in flame proof installation, shall be of those manufactured in accordance with B.S.3207 by an approved.

SECTION VII:

DRAWINGS

Note

1. A list of drawings should be inserted here.

2. The actual Contract drawings including site plans should be annexed in a separate booklet.

ELECTRICAL DRAWING ISSUE REGISTER:

CLIENT: CHUKA UNIVERSITY
PROJECT: PROPOSED CHUKA LIBRARY BLOCK
DATE: 2017/12/04

Drawing Number	Latest Revision	Date	Drawing Content	Print Size	FORMAT
MC/187/01/E1		12/04/2017		A1	DWG/PDF
MC/187/01/E2		12/04/2017		A1	DWG/PDF
MC/187/01/E3		12/04/2017		A1	DWG/PDF
MC/187/01/E4		12/04/2017		A1	DWG/PDF
MC/187/01/E5		12/04/2017		A1	DWG/PDF
MC/187/01/E6		12/04/2017		A1	DWG/PDF
MC/187/01/E7		12/04/2017		A1	DWG/PDF
MC/187/01/E8		12/04/2017		A1	DWG/PDF
MC/187/01/E9		12/04/2017		A1	DWG/PDF
MC/187/01/E10		12/04/2017		A1	DWG/PDF
MC/187/01/E11		12/04/2017		A1	DWG/PDF
MC/187/01/E12		12/04/2017		A1	DWG/PDF
MC/187/01/E13		12/04/2017		A1	DWG/PDF
MC/187/01/E14		12/04/2017		A1	DWG/PDF
MC/187/01/E15		12/04/2017		A1	DWG/PDF
MC/187/01/E16		12/04/2017		A1	DWG/PDF
MC/187/01/E17		12/04/2017		A1	DWG/PDF
MC/187/01/E18		12/04/2017		A1	DWG/PDF
MC/187/01/E19		12/04/2017		A1	DWG/PDF
MC/187/01/E20		12/04/2017		A1	DWG/PDF
MC/187/01/E21		12/04/2017		A1	DWG/PDF
MC/187/01/E22		12/04/2017		A1	DWG/PDF

SECTION IIII:

BILLS OF QUANTITIES

Notes for preparing Bills of Quantities

1.0 **Preamble to Bill of Quantities**

a) The Bill of Quantities shall form part of the Contract Documents and is to be read in conjunction with the Instructions to Tenderers, Conditions of Contract Parts I and II, Specifications and Drawings.

b) The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.

c) The Quantities set forth in the Bill of Quantities are estimated and provisional, representing substantially the work to be carried out, and are given to provide a common basis for tendering and comparing of Tenders. There is no guarantee to the Contractor that he will be required to carry out all the quantities of work indicated under any one particular item or group of items in the Bill of Quantities. The basis of payment shall be the Contractor's rates and the quantities of work actually done in fulfilment of his obligation under the Contract.

d) The prices and rates inserted in the Bills of Quantities will be used for valuing work executed, and the Engineer will measure the whole of the works executed in accordance with this Contract.

e) A price or rate shall be entered in ink against every item in the Bill of Quantities with the exception of items, which already have provisional sums, affixed thereto. The Tenderers are reminded that no "nil" or "included" rates or "lump-sum" discounts will be accepted. The rates for various items should include discounts if any. Tenderers who fail to comply will be disqualified.

f) Provisional sums (including Dayworks) in the Bill of Quantities shall be expended in whole or in part at the discretion of the Engineer in accordance with Sub-clause 52.4 and Clause 58 of part of the Conditions of Contract.

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

h) Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:
   (i) Where there is a discrepancy between amount in words and figures, the amount in words will govern; and

(ii) 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.

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

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

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

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

l) (a) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 150 brake horse power (112 kilowatt) with a single, rear-mounted, hydraulic ripper. Boulders of more than $0.2m^3$ occuring in soft material shall be classified as hard material
(b) Soft material shall be all material other than hard material.

2.0 The objectives of the Bills of Quantities are;

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

and

(b) when a Contract has been entered into, to provide a priced Bills of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be 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 should be as simple and brief as possible.

3.0 The Bills of Quantities should be divided generally into the following sections:

(a) Preliminaries.

The preliminaries should indicate the inclusiveness of the unit prices, and should 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 should be 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 should be included in the Contractor's rates.

(b) Work Items

(i) The items in the Bills of Quantities should be 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 may be grouped as a separate section in the Bills of Quantities.

(ii) The brief description of the items in the Bill of Quantities should in no way modify or supersede the detailed descriptions given in the Contract drawings, Conditions of Contract and Specifications.

(iii) Quantities should be computed net from the Drawings, unless directed otherwise in the Contract, and no
allowance should be made for bulking, shrinkage or waste. Quantities should be rounded up or down where appropriate.

(iv) The following units of measurement and abbreviations are recommended for use.

Unit	*Abbreviation*	*Unit*	*Abbreviation*
cubic meter	M^3 or cu m	millimeter	mm
hectare	ha	month	mon
hour	h	number	nr
kilogram	kg	square meter	m^2 or sq m
lump sum	sum	square millimeter	mm^2 or sq mm
meter	m	week	wk
metric ton (1,000 kg)	t		

(v) The commencing surface should be identified in the description of each item for Work involving excavation, boring or drilling, for which the commencing surface is not also the original surface. The excavated surface should be identified in the description of each item for Work involving excavation for which the excavated surface is not also the final surface. The depths of Work should be measured from the commencing surface to the excavated surface, as defined.

(c) Day work Schedule

A Daywork 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 Daywork Schedule should normally comprise:

(i) a list of the various classes of labour, and materials for which basic Daywork 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 Daywork basis; and

(j) a percentage to be entered by the tenderer against each basic Daywork Subtotal amount for labour, materials and plant representing the Contractor's profit, overheads, supervision and other charges.

(d) Provisional Quantities and Provisional Sums

(i) Provision for quantity contingencies in any particular tem or class of Work with a high expectation of quantity overrun should be made by entering specific "Provisional Quantities" or "Provisional Items" in the Bills of Quantities, and *not* by increasing the quantities for that item or class of Work beyond those of the Work normally expected to be required. To the extent not covered above, a general provision for physical contingencies (quantity overruns) should be made by including a "Provisional Sum" in the Summary of the Bills of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a "Provisional Sum" in the Summary of the Bills of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises.

(ii) Provisional Sums to cover specialized works normally carried out by Nominated Sub Contractors should be avoided and instead Bills of Quantities of the specialised Works should be included as a section of the main Bill of Quantities to be priced by the Main Contractor. The Main Contractor should be required to indicate the name (s) of the specialised firms he proposes to engage to carry out the specialized Works as his approved domestic sub-contractors. Only Provisional Sums to cover specialized Works by statutory authorities should be included in the Bills of Quantities.

(iii) Unless otherwise provided in the Contract, the Provisional Sums included in the Bills of Quantities should always be expended in whole or in part at the discretion of the Engineer after full consultation with the Employer.

(e) Summary

The Summary should contain a tabulation of the separate parts of the Bills of Quantities carried forward, with Provisional Sums for Dayworks, physical (quantity) contingencies, and price contingencies (upward price adjustment) where applicable.

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS**				
	Supply, install, test, commission and maintain:-				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	205		
1.1.02	Ditto, for two way lighting points	No.	363		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	58		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	12		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	3		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	40		
1.1.07	600 x 600mm x 60 mm LED Panel Lights,45W as ROBUS complete with LED lamps and all other accessories Type "L4"	No.	185		
1.1.08	Ditto but c/w emergency conversion kit, Type "L4E"	No.	16		
1.1.09	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5" (PROVISIONAL)	No.	42		
1.1.10	Ditto but c/w emergency conversion kit, Type "L5E"	No.	9		
1.1.11	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2" (PROVISIONAL)	No.	45		
1.1.12	Ditto but c/w emergency conversion kit, Type "L2E"	No.	7		
1.1.13	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	168		
1.1.14	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	8		
1.1.15	Ditto but c/w emergency conversion kit, Type "A5E"	No.	9		
1.1.16	1200mm 36W single corrosion resistant luminare as Philips Cat. No. TCW216 TL-D 36W complete with lamps Type "F1"	No.	16		
1.1.17	20W Circular LED fiiting as Philips Essential Smartbright bulkhead, Type "S3"	No.	26		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS** **Supply, install, test, commission and maintain:-**				
1.1.18	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.19	Polycarbonate bulkhead with black/white base, tool-less gear tray fixation. With unique honeycomb prismatic or opal screw fixed diffuser. As Thorn Leopard or Approved Equivalent. Type "L3"	No.	26		
1.1.20	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	8		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS** **Supply, install, test, commission and maintain:-**				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	224		
1.2.02	Ditto but for Hand dryers/Fused spur units	No.	8		
1.2.03	Booster Pumps circuit wired in 5 x 25sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	LM	40		
1.2.04	Fire fighting Pumps circuit wired in 5 x 25sq mm PVC SC copper cables drawn in 50mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	LM	60		
1.2.05	Mechanical Ventilation fan circuit wired in 5 x 2.5sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	8		
1.2.06	250 x 50mm three compartment trunking surface mounted prepainted and baked steel trunking made out of 16 swg sheets and frame complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	120		
1.2.07	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	8		
1.2.08	20A flex outlet as MK K 1090 WHI	No.	8		
1.2.09	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	202		
1.2.10	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	27		
1.2.09	13A 2 gang switchsocket-outlet as MK K 2647WHI	No.	1		
1.2.10	13A flush Non standard 2 gang switchsocket-outlet as MK K 1246D1WHI complete with 13A Plug	No.	1		
1.2.11	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
1.2.12	Heavy Duty floor box as Legrand Cat. No. 089621 Or Approved equivalent, with IP 66 Cover to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.13	Heavy Duty floor box as Legrand Cat. No. 089621, Or Approved Equivalent with IP66 Cover, to accommodate four twin socket outlets complete with knockoutsand earth connections in each compartment with cover and allnecessary accessories but excluding socket/data outlet plate	No.	1		
1.2.14	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	16		
1.2.15	Prepainted pedestal manufactured from galvanised steel sheets to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	2		
1.2.16	32A TP Isolator as Katko	No.	2		
1.2.17	63A TP Isolator as Katko	No.	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	75		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	400		
1.3.04	150mm dia. H.G PVC conduit through beams	LM	50		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY

ELECTRICAL INSTALLATIONS - SUB-BASEMENT FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.01	8-way TPN distribution board "DBR B1" as Schneider with a 125A TP integral Isolator as complete with the following:-				
	2No. 20A SP MCB				
	12 No.30A SP MCB				
	9 No. Blanking plates	No.	1		
1.4.02	8-way TPN distribution board "DBR B2" as Schneider with a 125A TP integral Isolator as complete with the following:-				
	3No. 20A SP MCB				
	8 No.30A SP MCB				
	9 No. Blanking plates	No.	1		
1.4.03	10-way TPN distribution board "DBR B3" as Schneider with a 125A TP integral Isolator as complete with the following:-				
	4No. 20A SP MCB				
	11 No.30A SP MCB				
	11 No. Blanking plates	No.	1		
1.4.04	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power				
	Sub-board to the above Distribution boards	LM	60		
1.4.05	Cables glands and lugs for the 16 sq mm 4 Core				
	PVC SWA PVC cables complete with shroud	No.	6		
1.4.06	10-way TPN distribution board "DBC B1,B2,B3" as Merlin Gerlin with a 125A TP integral Isolator as complete with the following:-				
	8 No. 30A SP MCB				
	6 No.63A TP MCB				
	7 No. Blanking plates	No.	3		
1.4.07	Sub-mains comprising of 4C 25 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power				
	Sub-board to the above Distribution boards	LM	280		
1.4.08	Cables glands and lugs for the 25 sq mm 4 Core				
	PVC SWA PVC cables complete with shroud	No.	6		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - SUB-BASEMENT FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.09	16-way TPN distribution board "DBR L1" as Schneider with a 160A TP integral Isolator as complete with the following:- (Lighting DB) 3No. 10A SP MCB 6 No.63A TP MCB 9 No. Blanking plates	No.	1		
1.4.10	Sub-mains comprising of 4C 35 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution boards	LM	40		
1.4.11	Cables glands and lugs for the 35 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.12	6-way TPN distribution board "DBR L2,L3,L4" as Schneider with a 125A TP integral Isolator as complete with the following:- 5 No. 10A SP MCB 6 No.63A SP MCB 7 No. Blanking plates	No.	3		
1.4.13	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution boards	LM	280		
1.4.14	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	6		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM **Install, test, commission and maintain the following items :-**				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	68		
1.5.02	Ditto, from Control Panel to alarm bell	No.	6		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	6		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	6		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	62		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 117				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - SUB-BASEMENT FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 109				
	BROUGHT FORWARD FROM PAGE No. 110				
	BROUGHT FORWARD FROM PAGE No. 111				
	BROUGHT FORWARD FROM PAGE No. 112				
	BROUGHT FORWARD FROM PAGE No. 113				
	BROUGHT FORWARD FROM PAGE No. 114				
	BROUGHT FORWARD FROM PAGE No. 115				
	BROUGHT FORWARD FROM PAGE No. 116				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS**				
	Supply, install, test, commission and maintain:-				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	305		
1.1.02	Ditto, for two way lighting points	No.	613		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	42		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	6		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	2		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	42		
1.1.07	600 x 600mm x 60 mm LED Panel Lights,45W as ROBUS complete with LED lamps and all other accessories Type "L4"	No.	98		
1.1.08	Ditto but c/w emergency conversion kit Type "L4E"	No.	10		
1.1.09	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5"	No.	36		
1.1.10	Ditto but c/w emergency conversion kit, Type "L5E"	No.	10		
1.1.11	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2" (PROVISIONAL)	No.	275		
1.1.12	Ditto but c/w emergency conversion kit, Type "L2E"	No.	32		
1.1.13	13W, IP44, 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2"	No.	20		
1.1.14	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	245		
1.1.15	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	2		
1.1.16	Ditto but c/w emergency conversion kit	No.	4		
1.1.17	20W Circular LED fiiting as Philips Essential Smartbright bulkhead, Type "S3"	No.	18		
1.1.18	1200mm 36W single corrosion resistant luminare as Philips Cat. No. TCW216 TL-D 36W complete with lamps Type "F1"	No.	10		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS** **Supply, install, test, commission and maintain:-**				
1.1.19	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.20	Polycarbonate bulkhead with black/white base, tool-less gear tray fixation. With unique honeycomb prismatic or opal screw fixed diffuser. As Thorn Leopard or Approved Equivalent. Type "L3"	No.	5		
1.1.21	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	12		
1.1.22	LED spotlight and integrated driver As Thorn Tonic Spot. Type SP	No.	28		
1.1.23	LED Tape Striplights Kit 5M 12W Warm White complete with transformers (PROVISIONAL)	LM	500		
1.1.24	Philips Edge Table Lamp, 4.8W, Grey - Built In Led, Phi-915005394001, Type "R"	No.	10		
1.1.25	10W 1200mm LED fitting as Philips True Line, Surface mounted	No.	50		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS** **Supply, install, test, commission and maintain:-**				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	202		
1.2.02	Ditto but for Hand dryers/Fused spur units/Water heater	No.	16		
1.2.03	Cooker circuit wired in 3 x 6sq mm PVC SC copper cables drawn in 25mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the cooker control unit	No.	4		
1.2.04	Mechanical Ventilation fan circuit wired in 5 x 4sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	18		
1.2.05	250 x 50mm three compartment trunking surface mounted prepainted and baked steel trunking made out of 16 swg sheets and frame complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	160		
1.2.06	250 x 50mm three compartment trunking surface mounted white PVC trunking complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.07	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	24		
1.2.08	20A flex outlet as MK K 1090 WHI	No.	24		
1.2.09	45A DP cooker control unit with switchsocket-outlet as MK K 5236 WHI	No.	4		
1.2.10	Flush cooker connection unit as MK K 5045 WHI	No.	4		
1.2.11	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	144		
1.2.12	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	58		
1.2.13	13A 2 gang switchsocket-outlet as MK K 2647WHI	No.	1		
1.2.14	13A flush Non standard 2 gang switchsocket-outlet as MK K 1246D1WHI complete with 13A Plug	No.	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.15	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
1.2.16	Heavy Duty floor box as Legrand Cat. No. 089621, IP 66 Cover to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	3		
1.2.17	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	1		
1.2.18	Prepainted pedestal manufactured from galvanised steel sheets to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	85		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	450		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION** **Supply, install, test, commission and maintain :-**				
1.4.01	8-way TPN distribution board "DBR G1" as Schneider with a 125A TP integral Isolator as complete with the following:- 4No. 20A SP MCB 10 No.30A SP MCB 7 No. Blanking plates	No.	1		
1.4.02	8-way TPN distribution board "DBR G2" as Schneider with a 125A TP integral Isolator as complete with the following:- 3No. 20A SP MCB 8 No.30A SP MCB 9 No. Blanking plates	No.	1		
1.4.04	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution boards	LM	10		
1.4.05	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	4		
1.4.03	16-way TPN distribution board "DBR G3" as Schneider with a 160A TP integral Isolator as complete with the following:- 14No. 20A SP MCB 12 No.30A SP MCB 18 No. Blanking plates	No.	1		
1.4.04	Sub-mains comprising of 4C 35 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution board	LM	10		
1.4.05	Cables glands and lugs for the 35 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.06	6-way TPN distribution board "DBC G1,G2" as Merlin Gerlin with a 100A TP integral Isolator as complete with the following as For the pump room:- 10 No. 30A SP MCB 7 No. Blanking plates	No.	3		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION** **Supply, install, test, commission and maintain :-**				
1.4.07	Sub-mains comprising of 4C 25 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution boards	LM	20		
1.4.08	Cables glands and lugs for the 25 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	6		
1.4.09	16-way TPN distribution board "DBR G4" as Schneider with a 160A TP integral Isolator as complete with the following as For the Kitchen:- 2 No. 10A SP MCB 3 No. 20A SP MCB 5 No. 30A SP MCB 4 No.32A TP MCB 26 No. Blanking plates	No.	1		
1.4.10	Sub-mains comprising of 4C 35 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the switch board to the above Distribution board	LM	50		
1.4.11	Cables glands and lugs for the 35 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.12	6-way SPN Consumer unit "CU G1,G2,G3" as Schneider with a 100A integral Isolator following as :- (LIGHTING) 5 No. 10A SP MCB 1 No. Blanking plates	No.	3		
1.4.13	Sub-mains comprising of 2C 10 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the DB BL1L2L3 to the above Consumer Unit	LM	30		
1.4.14	Cables glands and lugs for the 10 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	2		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM **Install, test, commission and maintain the following items :-**				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	54		
1.5.02	Ditto, from Control Panel to alarm bell	No.	6		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	6		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	6		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	48		
1.5.06	Four Loop analogue fire alarm control/ indicator panel as Menvier Cat.No. DF6000/4P complete with integral Printer, battery charger, 2 x 4 A/H sealed recombination lead acid battery suitable for 72 hour + 1/2 hour alarm	No.	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 126				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 118				
	BROUGHT FORWARD FROM PAGE No. 119				
	BROUGHT FORWARD FROM PAGE No. 120				
	BROUGHT FORWARD FROM PAGE No. 121				
	BROUGHT FORWARD FROM PAGE No. 122				
	BROUGHT FORWARD FROM PAGE No. 123				
	BROUGHT FORWARD FROM PAGE No. 124				
	BROUGHT FORWARD FROM PAGE No. 125				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS** **Supply, install, test, commission and maintain:-**				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	350		
1.1.02	Ditto, for two way lighting points	No.	718		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	26		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	4		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	1		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	48		
1.1.07	600 x 600mm x 60 mm LED Panel Lights,45W as ROBUS complete with LED lamps and all other accessories Type "L4" (PROVISIONAL)	No.	84		
1.1.08	Ditto but c/w emergency conversion kit Type "L4E"	No.	13		
1.1.09	150 x 150mm x 60 mm LED Panel Lights, 18W as ROBUS complete with LED lamps and all other accessories Type "L6" (PROVISIONAL)	No.	220		
1.1.10	Ditto but c/w emergency conversion kit Type "L6E"	No.	20		
1.1.11	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5"(PROVISIONAL)	No.	12		
1.1.12	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2"(PROVISIONAL)	No.	48		
1.1.13	Ditto but c/w emergency conversion kit Type "L2E"	No.	6		
1.1.14	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	520		
1.1.15	Ditto but c/w emergency conversion kit Type "L1E"	No.	18		
1.1.16	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	2		
1.1.17	Ditto but c/w emergency conversion kit	No.	10		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.1.18	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.19	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	12		
1.1.20	LED Tape Striplights Kit 5M 12W Warm White complete with transformers (PROVISIONAL)	LM	500		
1.1.21	10W 1200mm LED fitting as Philips True Line, Surface mounted (PROVISIONAL)	No.	50		
1.1.22	Philips Edge Table Lamp, 4.8W, Grey - Built In Led, Phi-915005394001, Type "T1"	No.	12		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - FIRST FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	464		
1.2.02	Ditto but for Hand dryers/Fused spur units/Water heater	No.	8		
1.2.03	Cooker circuit wired in 3 x 6sq mm PVC SC copper cables drawn in 25mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the cooker control unit	No.	1		
1.2.04	Mechanical Ventilation fan circuit wired in 5 x 2.5sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	8		
1.2.06	250 x 50mm three compartment trunking surface mounted prepainted and baked steel trunking made out of 16 swg sheets and frame complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.05	250 x 50mm three compartment trunking surface mounted white PVC trunking complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.06	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	8		
1.2.07	20A flex outlet as MK K 1090 WHI	No.	8		
1.2.08	45A DP cooker control unit with switchsocket-outlet as MK K 5236 WHI	No.	1		
1.2.09	Flush cooker connection unit as MK K 5045 WHI	No.	1		
1.2.10	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	426		
1.2.11	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	38		
1.2.12	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.13	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	96		
1.2.14	Prepainted pedestal manufactured from galvanised steel sheets to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	6		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	85		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	450		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - FIRST FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.01	10-way TPN distribution board "DBR FT1,2,3" as Schneider with a 125A TP integral Isolator as complete with the following:- 4No. 20A SP MCB 19 No.30A SP MCB 7 No. Blanking plates	No.	3		
1.4.02	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution boards	LM	15		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	4		
1.4.04	4-way TPN distribution board "DBC FT2" as Schneider with a 100A TP integral Isolator as complete with the following as :- 10 No. 30A SP MCB 7 No. Blanking plates	No.	1		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution board	LM	20		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	4		
1.4.04	6-way TPN distribution board "DBC FT3" as Schneider with a 100A TP integral Isolator as complete with the following as :- 10 No. 30A SP MCB 7 No. Blanking plates	No.	1		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution boards	LM	20		
1.4.12	6-way SPN Consumer unit "CU FT1,2,3" as Schneider with a 100A integral Isolator following as :- (LIGHTING) 5 No. 10A SP MCB 1 No. Blanking plates	No.	3		
1.4.13	Sub-mains comprising of 2C 10 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the DB FT,L1,L2,L3 to the above Consumer Unit	LM	30		
1.4.14	Cables glands and lugs for the 10 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	2		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM **Install, test, commission and maintain the following items :-**				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	54		
1.5.02	Ditto, from Control Panel to alarm bell	No.	6		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	6		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	6		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	48		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 134				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 127				
	BROUGHT FORWARD FROM PAGE No. 128				
	BROUGHT FORWARD FROM PAGE No. 129				
	BROUGHT FORWARD FROM PAGE No. 130				
	BROUGHT FORWARD FROM PAGE No. 131				
	BROUGHT FORWARD FROM PAGE No. 132				
	BROUGHT FORWARD FROM PAGE No. 133				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS**				
	Supply, install, test, commission and maintain:-				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	350		
1.1.02	Ditto, for two way lighting points	No.	718		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	26		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	4		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	1		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	48		
1.1.07	600 x 600mm x 60 mm LED Panel Lights,45W as ROBUS complete with LED lamps and all other accessories Type "L4" (PROVISIONAL)	No.	70		
1.1.08	Ditto but c/w emergency conversion kit Type "L4E"	No.	13		
1.1.09	150 x 150mm x 60 mm LED Panel Lights, 18W as ROBUS complete with LED lamps and all other accessories Type "L6" (PROVISIONAL)	No.	220		
1.1.10	Ditto but c/w emergency conversion kit Type "L6E"	No.	20		
1.1.11	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5"(PROVISIONAL)	No.	6		
1.1.12	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2"(PROVISIONAL)	No.	44		
1.1.13	Ditto but c/w emergency conversion kit Type "L2E"	No.	6		
1.1.14	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	520		
1.1.15	Ditto but c/w emergency conversion kit Type "L1E"	No.	18		
1.1.16	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	2		
1.1.17	Ditto but c/w emergency conversion kit	No.	10		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - SECOND FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.1.18	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.19	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	8		
1.1.20	LED Tape Striplights Kit 5M 12W Warm White complete with transformers (PROVISIONAL)	LM	500		
1.1.21	10W 1200mm LED fitting as Philips True Line, Surface mounted (PROVISIONAL)	No.	50		
1.1.22	Philips Edge Table Lamp, 4.8W, Grey - Built In Led, Phi-915005394001, Type "T1"	No.	12		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - SECOND FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	596		
1.2.02	Ditto but for Hand dryers/Fused spur units/Water heater	No.	8		
1.2.03	Cooker circuit wired in 3 x 6sq mm PVC SC copper cables drawn in 25mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the cooker control unit	No.	1		
1.2.04	Mechanical Ventilation fan circuit wired in 5 x 2.5sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	8		
1.2.06	250 x 50mm three compartment trunking surface mounted prepainted and baked steel trunking made out of 16 swg sheets and frame complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.05	250 x 50mm three compartment trunking surface mounted white PVC trunking complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.06	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	8		
1.2.07	20A flex outlet as MK K 1090 WHI	No.	8		
1.2.08	45A DP cooker control unit with switchsocket-outlet as MK K 5236 WHI	No.	1		
1.2.09	Flush cooker connection unit as MK K 5045 WHI	No.	1		
1.2.10	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	426		
1.2.11	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	170		
1.2.12	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.13	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	135		
1.2.14	Prepainted pedestal manufactured from galvanised steel sheets to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	6		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	85		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	450		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.01	10-way TPN distribution board "DBR S1,2,3" as Schneider with a 125A TP integral Isolator as complete with the following:- 4No. 20A SP MCB 19 No.30A SP MCB 7 No. Blanking plates	No.	3		
1.4.02	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution boards	LM	15		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	4		
1.4.04	6-way TPN distribution board "DBC S1,2" as Schneider with a 100A TP integral Isolator as complete with the following as :- 12 No. 30A SP MCB 6 No. Blanking plates	No.	3		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution board	LM	60		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	8		
1.4.04	6-way TPN distribution board "DBC S3" as Schneider with a 100A TP integral Isolator as complete with the following as :- 10 No. 30A SP MCB 7 No. Blanking plates	No.	1		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution boards	LM	20		
1.4.12	6-way SPN Consumer unit "CU S1,2,3" as Schneider with a 100A integral Isolator following as :- (LIGHTING) 5 No. 10A SP MCB 1 No. Blanking plates	No.	3		
1.4.13	Sub-mains comprising of 2C 10 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the DB FT,L1,L2,L3 to the above Consumer Unit	LM	60		
1.4.14	Cables glands and lugs for the 10 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	2		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM **Install, test, commission and maintain the following items :-**				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	54		
1.5.02	Ditto, from Control Panel to alarm bell	No.	6		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	6		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	6		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	48		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 142				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 135				
	BROUGHT FORWARD FROM PAGE No. 136				
	BROUGHT FORWARD FROM PAGE No. 137				
	BROUGHT FORWARD FROM PAGE No. 138				
	BROUGHT FORWARD FROM PAGE No. 139				
	BROUGHT FORWARD FROM PAGE No. 140				
	BROUGHT FORWARD FROM PAGE No. 141				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS** **Supply, install, test, commission and maintain:-**				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	350		
1.1.02	Ditto, for two way lighting points	No.	718		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	26		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	4		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	1		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	48		
1.1.07	600 x 600mm x 60 mm LED Panel Lights,45W as ROBUS complete with LED lamps and all other accessories Type "L4" (PROVISIONAL)	No.	84		
1.1.08	Ditto but c/w emergency conversion kit Type "L4E"	No.	13		
1.1.09	150 x 150mm x 60 mm LED Panel Lights, 18W as ROBUS complete with LED lamps and all other accessories Type "L6" (PROVISIONAL)	No.	220		
1.1.10	Ditto but c/w emergency conversion kit Type "L6E"	No.	20		
1.1.11	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5"(PROVISIONAL)	No.	12		
1.1.12	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2"(PROVISIONAL)	No.	48		
1.1.13	Ditto but c/w emergency conversion kit Type "L2E"	No.	6		
1.1.14	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	520		
1.1.15	Ditto but c/w emergency conversion kit Type "L1E"	No.	18		
1.1.16	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	2		
1.1.17	Ditto but c/w emergency conversion kit	No.	10		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.1.18	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.19	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	12		
1.1.20	LED Tape Striplights Kit 5M 12W Warm White complete with transformers (PROVISIONAL)	LM	500		
1.1.21	10W 1200mm LED fitting as Philips True Line, Surface mounted (PROVISIONAL)	No.	50		
1.1.22	Philips Edge Table Lamp, 4.8W, Grey - Built In Led, Phi-915005394001, Type "T1"	No.	22		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	606		
1.2.02	Ditto but for Hand dryers/Fused spur units/Water heater	No.	8		
1.2.03	Cooker circuit wired in 3 x 6sq mm PVC SC copper cables drawn in 25mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the cooker control unit	No.	1		
1.2.04	Mechanical Ventilation fan circuit wired in 5 x 2.5sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	8		
1.2.06	250 x 50mm three compartment trunking surface mounted prepainted and baked steel trunking made out of 16 swg sheets and frame complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.05	250 x 50mm three compartment trunking surface mounted white PVC trunking complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.06	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	8		
1.2.07	20A flex outlet as MK K 1090 WHI	No.	8		
1.2.08	45A DP cooker control unit with switchsocket-outlet as MK K 5236 WHI	No.	1		
1.2.09	Flush cooker connection unit as MK K 5045 WHI	No.	1		
1.2.10	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	426		
1.2.11	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	180		
1.2.12	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.13	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	135		
1.2.14	Prepainted pedestal manufactured from galvanised steel sheets to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	6		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	160		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	450		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - THIRD FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.01	10-way TPN distribution board "DBR T1,2,3" as Schneider with a 125A TP integral Isolator as complete with the following:- 4No. 20A SP MCB 19 No.30A SP MCB 7 No. Blanking plates	No.	3		
1.4.02	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution boards	LM	15		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	6		
1.4.04	4-way TPN distribution board "DBC T1,2" as Schneider with a 100A TP integral Isolator as complete with the following as :- 10 No. 30A SP MCB 7 No. Blanking plates	No.	2		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution board	LM	60		
1.4.04	6-way TPN distribution board "DBC T3" as Schneider with a 100A TP integral Isolator as complete with the following as :- 10 No. 30A SP MCB 7 No. Blanking plates	No.	1		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution boards	LM	40		
1.4.06	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.12	6-way SPN Consumer unit "CU T1,2,3" as Schneider with a 100A integral Isolator following as :- (LIGHTING) 5 No. 10A SP MCB 1 No. Blanking plates	No.	3		
1.4.13	Sub-mains comprising of 2C 10 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the DB FT,L1,L2,L3 to the above Consumer Unit	LM	60		
1.4.14	Cables glands and lugs for the 10 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	2		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM **Install, test, commission and maintain the following items :-**				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	54		
1.5.02	Ditto, from Control Panel to alarm bell	No.	6		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	6		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	6		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	48		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 150				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 143				
	BROUGHT FORWARD FROM PAGE No. 144				
	BROUGHT FORWARD FROM PAGE No. 145				
	BROUGHT FORWARD FROM PAGE No. 146				
	BROUGHT FORWARD FROM PAGE No. 147				
	BROUGHT FORWARD FROM PAGE No. 148				
	BROUGHT FORWARD FROM PAGE No. 149				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY

ELECTRICAL INSTALLATIONS - FOURTH FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS**				
	Supply, install, test, commission and maintain:-				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	94		
1.1.02	Ditto, for two way lighting points	No.	201		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	26		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	4		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	1		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	48		
1.1.07	600 x 600mm x 60 mm LED Panel Lights,45W as ROBUS complete with LED lamps and all other accessories Type "L4" (PROVISIONAL)	No.	6		
1.1.08	Ditto but c/w emergency conversion kit Type "L4E"	No.	2		
1.1.09	150 x 150mm x 60 mm LED Panel Lights, 18W as ROBUS complete with LED lamps and all other accessories Type "L6" (PROVISIONAL)	No.	110		
1.1.10	Ditto but c/w emergency conversion kit Type "L6E"	No.	10		
1.1.11	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5"(PROVISIONAL)	No.	3		
1.1.12	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2"(PROVISIONAL)	No.	55		
1.1.13	Ditto but c/w emergency conversion kit Type "L2E"	No.	6		
1.1.14	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	148		
1.1.15	Ditto but c/w emergency conversion kit Type "L1E"	No.	10		
1.1.16	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	2		
1.1.17	Ditto but c/w emergency conversion kit	No.	10		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - FOURTH FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.1.18	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.19	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	6		
1.1.20	LED Tape Striplights Kit 5M 12W Warm White complete with transformers (PROVISIONAL)	LM	400		
1.1.22	Philips Edge Table Lamp, 4.8W, Grey - Built In Led, Phi-915005394001, Type "T1"	No.	8		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	425		
1.2.02	Ditto but for Hand dryers/Fused spur units/Water heater	No.	8		
1.2.03	Cooker circuit wired in 3 x 6sq mm PVC SC copper cables drawn in 25mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the cooker control unit	No.	1		
1.2.04	Mechanical Ventilation fan circuit wired in 5 x 2.5sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	8		
1.2.06	250 x 50mm three compartment trunking surface mounted prepainted and baked steel trunking made out of 16 swg sheets and frame complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.05	250 x 50mm three compartment trunking surface mounted white PVC trunking complete with cover, switch boxes, cross over bridges, fixing accessories and faceplates	LM.	100		
1.2.06	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	8		
1.2.07	20A flex outlet as MK K 1090 WHI	No.	8		
1.2.08	45A DP cooker control unit with switchsocket-outlet as MK K 5236 WHI	No.	1		
1.2.09	Flush cooker connection unit as MK K 5045 WHI	No.	1		
1.2.10	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	400		
1.2.11	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	25		
1.2.12	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158				

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY
ELECTRICAL INSTALLATIONS - FOURTH FLOOR

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.13	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	53		
1.2.14	Prepainted pedestal manufactured from galvanised steel sheets to accommodate two twin socket outlets and two data outlet plates complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	6		

TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	160		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	450		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.01	10-way TPN distribution board "DBR T1,2,3" as Schneider with a 125A TP integral Isolator as complete with the following:- 4No. 20A SP MCB 19 No.30A SP MCB 7 No. Blanking plates	No.	3		
1.4.02	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution boards	LM	100		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	6		
1.4.04	4-way TPN distribution board "DBC T1,2" as Schneider with a 100A TP integral Isolator as complete with the following as :- 10 No. 30A SP MCB 7 No. Blanking plates	No.	2		
1.4.05	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the Clean Power Sub-board to the above Distribution board	LM	60		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.12	6-way SPN Consumer unit "CU T1,2,3" as Schneider with a 100A integral Isolator following as :- (LIGHTING) 5 No. 10A SP MCB 1 No. Blanking plates	No.	3		
1.4.13	Sub-mains comprising of 2C 10 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the DB FT,L1,L2,L3 to the above Consumer Unit	LM	60		
1.4.14	Cables glands and lugs for the 10 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.15	63A TP load break switch as Telemecanique Reference No. VC 2 G	No.	3		
1.4.16	Lift motor circuit wired in 5 x 16sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	LM	60		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM **Install, test, commission and maintain the following items :-**				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	14		
1.5.02	Ditto, from Control Panel to alarm bell	No.	4		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	4		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	4		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	10		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 158				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 151				
	BROUGHT FORWARD FROM PAGE No. 152				
	BROUGHT FORWARD FROM PAGE No. 153				
	BROUGHT FORWARD FROM PAGE No. 154				
	BROUGHT FORWARD FROM PAGE No. 155				
	BROUGHT FORWARD FROM PAGE No. 156				
	BROUGHT FORWARD FROM PAGE No. 157				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.1.00	**LIGHTING POINTS AND FITTINGS** **Supply, install, test, commission and maintain:-**				
1.1.01	Lighting points wired in 1.5sqmm PVC insulated single core (SC) copper wires drawn in 20 mm HG PVC conduits concealed in walls and floors,one way switched with all accessoriesbut excluding switch and fitting	No.	94		
1.1.02	Ditto, for two way lighting points	No.	201		
1.1.03	10A wide rocker plateswitch 1 gang two-way SP as MK K4781WHI	No.	26		
1.1.04	10A wide rocker plateswitch 2 gang two-way SP as MK K4782WHI	No.	4		
1.1.05	10A wide rocker plateswitch 3 gang two-way SP as MK K4782WHI	No.	1		
1.1.06	Occupancy sensor package as 752/CD2RC Clipsal 752 Dual-Tech Or Approved Equivalent consisting both ultrasonic and PIR sensing technologies complete with wiring	No.	28		
1.1.07	21W 150mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L5"(PROVISIONAL)	No.	94		
1.1.08	13W 100mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L2"(PROVISIONAL)	No.	86		
1.1.09	Ditto but c/w emergency conversion kit Type "L2E"	No.	6		
1.1.10	6.5W 75mm Diameter Recessed Circular LED fiiting, as Philips CoreLine SlimDownlight, Type "L1" (PROVISIONAL)	No.	22		
1.1.11	Ditto but c/w emergency conversion kit Type "L1E"	No.	2		
1.1.12	18W Circular LED ceiling lamp as Nlux XD9002T, Type "A5"	No.	2		
1.1.13	Ditto but c/w emergency conversion kit	No.	2		
1.1.14	Philips Gardco Up and Down wall mount fitting, Type W2	No.	8		
1.1.16	26W Thorn Chalice 190 LED ECO Downlighter	No.	68		
1.1.17	Wall mounted luminaires for compact fluorescent lamps as Philips FWG 230 WH complete with 18W PL-C lamps, Type "S"	No.	3		
1.1.18	LED Tape Striplights Kit 5M 12W Warm White complete with transformers (PROVISIONAL)	LM	350		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 165				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.1.19	Maintained emergency exit luminare illuminated by L.E.D.s with 3hr NiCd battery backup with extruded aluminium support rail enclosing l.e.d's on linear PCB, supported by chains, suspended from ABS injection moulded housing, enclosing battery and electronic control circuits,Type "EXIT"	No.	6		
1.1.20	Allow a PC sum for Decorative Chanderlier	No.	8		
1.1.21	Labour for installation of item 1.1.20	No.	8		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 165				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.2.00	**POWER POINTS AND OUTLETS**				
	Supply, install, test, commission and maintain:-				
1.2.01	13 Amp ring twin socket outlet points wired in 3 x 2.5sq mm PVC SC copper cables drawn in 20mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the socket outlet plate	No.	86		
1.2.02	Ditto but for Hand dryers/Fused spur units/Water heater	No.	8		
1.2.03	Mechanical Ventilation fan circuit wired in 5 x 2.5sq mm PVC SC copper cables drawn in 32mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the isolator switch	No.	8		
1.2.04	20A flush DP switch with pilot lamp as MK S4787N WHI	No.	8		
1.2.05	20A flex outlet as MK K 1090 WHI	No.	8		
1.2.06	13A 2 gang metalclad switchsocket-outlet as MK K 1248D6ALM	No.	84		
1.2.07	13A flush Non standard 2 gang switchsocket-outlet as MK K 1248D6ALM complete with 13A Plug	No.	2		
1.2.08	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
1.2.09	Prepainted pedestal manufactured from galvanised steel sheets to accommodate four twin socket outlets complete with knockouts and earth connections in each compartment with cover and all necessary accessories but excluding socket/data outlet plate	No.	22		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 165				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
1.3.00	**TELEPHONE AND PUBLIC ADDRESS SYSTEM**				
	Supply, install, test, commission and maintain :-				
1.3.01	Telephone/Speaker/CCTV outlet points comprising of 25 mm diameter HG PVC conduits and draw wire concealed in walls and floor with all accessories excluding outlet plate	No.	80		
1.3.02	300 x 300 x 75mm prepainted steel adaptable box	No.	8		
1.3.03	50mm dia. H.G PVC conduit for linking the adaptable box concealed in the wall or floor with all accessories	LM.	200		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 165				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
1.4.00	**SUB-MAINS AND DISTRIBUTION**				
	Supply, install, test, commission and maintain :-				
1.4.01	10-way TPN distribution board "DBR FF1" as Schneider with a 125A TP integral Isolator as complete with the following:- 4No. 20A SP MCB 19 No.30A SP MCB 7 No. Blanking plates	No.	1		
1.4.02	Sub-mains comprising of 4C 16 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the tap off unit to the above Distribution boards	LM	10		
1.4.03	Cables glands and lugs for the 16 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	2		
1.4.04	6-way SPN Consumer unit "CU FF1,2," as Schneider with a 100A integral Isolator following as :- (LIGHTING) 5 No. 10A SP MCB 1 No. Blanking plates	No.	2		
1.4.05	Sub-mains comprising of 2C 10 sq mm PVC/SWA/PVC CU cable drawn in 50 mm HG PVC conduits from the DB FF,L1,L2, to the above Consumer Unit	LM	100		
1.4.06	Cables glands and lugs for the 10 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	2		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 165				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
1.5.00	FIRE ALARM SYSTEM				
	Install, test, commission and maintain the following items :-				
1.5.01	Single loop Wiring for addressable call/detector points comprising 1.5 sq mm 3 core copper fire defence cable with CPC drawn in 20 mm diameter HG PVC conduits concealed in floors and walls from the Addressable Control Panel to alarm points	No.	14		
1.5.02	Ditto, from Control Panel to alarm bell	No.	4		
1.5.03	24 V DC fire alarm Electronic sounder as Menvier Cat. MAS 850LPS	No.	4		
1.5.04	Addressable break glasss call point as Menvier MBG814	No.	4		
1.5.05	Analogue photo/thermal detector as Menvier MAOH 850 complete with mounting base as Menvier MAB 800	No.	31		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 165				

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 159				
	BROUGHT FORWARD FROM PAGE No. 160				
	BROUGHT FORWARD FROM PAGE No. 161				
	BROUGHT FORWARD FROM PAGE No. 162				
	BROUGHT FORWARD FROM PAGE No. 163				
	BROUGHT FORWARD FROM PAGE No. 164				
	ALLOW FOR A PROVISIONALCONTIGENCY				400,000.00

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
				SHS.	SHS.
2.1.00	**LIGHTNING PROTECTION**				
	Supply, install, test, commission and maintain:-				
2.1.01	25mm wide x 3mm thick copper tape down link complete with copper saddles at 1500mm intervals as Furse TC 030	LM.	500		
2.1.02	25 x 3 mm copper tape clips as Furse CP 510	No.	80		
2.1.03	Earth mesh comprising of 25 x 3mm copper tape complete with red soil, merconite and clamps, installed into the ground around the building and connected to the test clamps complete with all accessories	Item	4		
2.1.04	Rod to Tape Clamp as Furse CR 105	No.	4		
2.1.05	Screw down copper test clamp for straight through tape joint as Furse CN 108	No.	4		
2.1.06	Concrete Inspection Pit 320 x 320 x 120 mm with cover as Furse as PT 005	No.	4		
2.1.07	Copper air terminations as Furse comprising multiple copper stem base complete with all fixing materials	No.	4		
2.1.08	50 mm diameter H.G PVC conduits for drawing in down conductor copper tape from the roof to the ground concealed in the walls complete with all accessories	LM.	450		
	TOTAL CARRIED FORWARD TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
3.1.00	**POWER RETICULATION** **Supply, install, test, commission and maintain :-**				
3.1.01	Trenching, sifting and backfilling the duct trench after laying the ducts and compaction	LM	300		
3.1.02	150mm duct with 150 mm thick 1:3:6 concrete surround	LM	300		
3.1.03	600 x 600 x 450mm power manhole complete with cover	No.	15		
3.1.04	Free standing switch board to house 1 No. 3 phase KP&LC meter fabricated from 16 SWG steel sheets and frames complete with the the following:- - 2 No. 800A TPN ACB as ABB with Shunt trip - 2 No. 800A TPN COPPER BUSBARS - 2 No. 800A TPN MANUAL BYPASS SWITCH - 1 No. 800A TPN AUTOMATIC CHANGEOVER SWITCH - 1 No. 400A TP MCCB as ABB - 3 No. 250A TP MCCB as ABB - 1 No. 200A TP MCCB as ABB - 2 No. 125A TP MCCB as ABB - 250A TPN metal clad isolator (UPS) - 250A TP UPS manual bypass unit LIGHTING CONTROL CIRCUIT - 1 No. 160A TP MCCB as ABB - 1 No. 160A TP CONTACTOR as ABB - 6 No. TPN Spare ways - 100KVAr automatic power factor Capacitor bank in 1 steps of 30 KVAr, 1 steps of 20KVAr, 3 steps of 10 KVAr and 4 steps of 5KVAr - Current,Voltage and power factor meters complete with all associated accessories The Switch board to be finished in auto lacquer, IP55 Degree of Protection and as manufactured by Power Technics Ltd	Item	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 172				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
3.1.05	Free standing Clean Power Sub Board fabricated from 16 SWG steel sheets and frames complete with the the following:- - 1 No. 250A TPN Adjustable MCCB as ABB - 1 No. 250A TPN COPPER BUSBARS - 4 No. 125A TP MCCB as ABB - 5 No. TPN Spare ways - Current and Voltage meters complete with all associated accessories The Switch board to be finished in auto lacquer, IP55 Degree of Protection and as manufactured by Power Technics Ltd	Item	1		
3.1.06	Earth mesh comprising of 25 x 3mm copper tape complete with red soil, merconite and clamps, installed into the ground around the building and connected to the test clamps complete with all accessories	Item	2		
3.1.07	Earthing cable comprising of 1 run of 95 sq mm 1C SWA/PVC/SWA cable drawn in cable trays from the switchboard to the earth pit	LM	30		
3.1.08	Sub-mains comprising of one runs of 4C 240 sq mm PVC/SWA/PVC CU cable drawn in cable trays and conduits from the switchroom to the riser busbar A	LM	80		
3.1.08	Sub-mains comprising of 4C 95 sq mm PVC/SWA/PVC CU cable drawn in cable trays and conduits from the switchroom to the Riser Busbar B & C	LM	250		
3.1.09	Allow for attendance to the structured cabling installations subcontractor	Item	1		
3.1.10	Allow for attendance to the security system installations subcontractor	Item	1		
3.1.09	Allow for attendance to the standby generator installations subcontractor	Item	1		
3.1.11	Allow for attendance to the lift installations subcontractor	Item	1		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 172				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
	Supply, install, test and commission:-				
3.1.12	Allow for attendance to the audio visual installations subcontractor	Item	1		
3.1.13	600x50mm powder coated steel cable tray made out of 16 swg complete with mounting brackets	LM	400		
3.1.14	Allow for attendance and follow up for KP & LC services comprising of application for service line, service line installation, and meter connections	Item	1		
3.1.15	300mm powder coated steel cable tray made out of 16 swg complete with mounting brackets	LM	400		
3.1.16	Fireman's switch circuit wired in 3 x 4 sq mm PVC SC copper cables drawn in 25mm HG PVC conduits concealed in the wall and floors complete with all accessories but excluding the Fireman's switch	LM	200		
3.1.17	Fireman's switch as MEM 230AF	No.	1		
3.1.18	RISING BUSBAR A 400A TP/N Copper Busbar Riser - Length - 40 Meters 400A TP/N end feed unit 6 No. Standard fire barriers for duct openings with a width of 300mm by a length of 1500mm Bus bar End caps 6 No. 160A Tap off and MCCB as ABB 1 No. 200A Tap off and MCCB as ABB Bus bar support clamp set for the entire bus bar	LOT	1		
3.1.19	RISING BUSBAR B & C 250A TP/N Copper Busbar Riser - Length - 40 Meters 250A TP/N end feed unit 6 No. Standard fire barriers for duct openings with a width of 300mm by a length of 1500mm Bus bar End caps 6 No. 160A Tap off and MCCB as ABB Bus bar support clamp set for the entire bus bar	LOT	2		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 172				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
	Supply, install, test and commission:-				
	TELEPHONE RETICULATION				
3.1.20	Telephone manhole, TMH as per KP & TC "JF4"	No.	8		
3.1.21	100mm duct with 150 mm thick 1:3:6 concrete surround for linking the manholes complete with draw wire	LM	300		
3.1.22	Trenching, sifting and backfilling the duct trench after laying the ducts and compaction	LM	300		
3.1.23	300 x 300 x 150 mm prepainted steel adaptable box.	No.	8		
3.1.24	300x50mm prepainted steel cable tray made out of 16 swg complete with mounting brackets	LM	200		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 172				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
	Supply, install, test and commission:-				
3.1.25	**VOLTAGE STABILIZER** 450 KVA Servo Mechanical Voltage stabilizer with static control with a nominal input Voltage range of 3 x 311 to 3 x 518 V and ouput Voltage accuracy of 2.5%, frequency range of 48 - 63hz, rated continuous power output of 450KVA, star connection coupling, complete with selectionalising switch and fuse, Signal lamp, Digital Multimeter DMK50 indicating 3V Input, 3V Output 3 Ammeter Ouput and Frequency. The Stabilizer should be air natural/air forced cooled and operate at ambient temperature of -20 to 45 degrees centigrade and a storage temperature of -50 to 50 degrees centigrade and a relative humidity of 95% non condensing as Manufactured by BELOTTI MILANO List No. BST-T40-IR Warranty 2 Years	No.	1		
3.1.26	Sub-mains comprising of 4C 240 sq mm PVC/SWA/PVC CU cable drawn in cable trays and conduits from the switch board to the Stabilizer	LM	50		
3.1.27	Cables glands and lugs for the 240 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	4		
	UPS INSTALLATION				
3.1.28	Sub-mains comprising of 4C 95 sq mm PVC/SWA/PVC CU cable drawn in cable trays and conduits from the switch board to the UPS	LM	60		
3.1.29	Cables glands and lugs for the 95 sq mm 4 Core PVC SWA PVC cables complete with shroud	No.	4		
	TOTAL CARRIED FORWARD TO COLLECTION PAGE No. 172				

ITEM	DESCRIPTION	UNIT	QTY	RATE SHS.	AMOUNT SHS.
	COLLECTION PAGE				
	BROUGHT FORWARD FROM PAGE No. 167				
	BROUGHT FORWARD FROM PAGE No. 168				
	BROUGHT FORWARD FROM PAGE No. 169				
	BROUGHT FORWARD FROM PAGE No. 170				
	BROUGHT FORWARD FROM PAGE No. 171				
	ALLOW FOR A PROVISIONAL CONTINGENCY				500,000.00
	TOTAL CARRIED FORWARD TO SUMMARY PAGE				

ITEM	DESCRIPTION	UNIT	QTY.	RATE SHS.	AMOUNT SHS.
5.1.00	**AREA LIGHTING**				
	Supply, install, test and commission:-				
5.1.01	2.5 sq mm 2 core PVC SWA PVC armoured copper cable drawn in ducts and trenches	LM.	800		
5.1.02	Cables glands and lugs for the 2.5 sq mm 2 Core PVC SWA PVC cables complete with shroud	No.	150		
5.1.03	32 mm diameter H.G PVC conduits for linking the area light fittings concealed in the walls and floor with all accessories	LM.	800		
5.1.04	Lucy connectors for looping the cables complete with all accessories	No.	60		
5.1.05	Earthing at every third street light pole with 15mm diameter 1500mm long copper earth electode and 2.5sq. Mm earting lead	No.	15		
5.1.06	30A D.P contactor with metal enclosure as Telemecanique GC1-M30	No.	4		
5.1.07	Lucy cut-out with 5A catridge fuse	No.	16		
5.1.08	Photocell light control module as complete with 100A D.P contactor complete with prepainted steel housing with cover and all accessories	No.	1		
5.1.09	Time switch as Telemecanique wired in 2.5 sq mm single core copper cable drawn in 20mm diameter HG PVC conduits complete with 150 x 150 x 75mm prepainted adaptable box	No.	6		
5.1.10	3 metre post top mounted lantern as Philips UrbanScape LED Post-Top (MPTC) 108W LED lamp as Type "S1"	No.	44		
5.1.11	Philips LED Bollard II BCP150/151 as Type S5	No.	25		
	TOTAL CARRIED FORWARD TO SUMMARY PAGE				

SUMMARY PAGE

PROPOSED MAIN LIBRARY BLOCK COMPLEX AT CHUKA UNIVERSITY

ELECTRICAL INSTALLATIONS

ITEM	DESCRIPTION	AMOUNT KSHS
A	Preliminaries	
B	Total Brought Forward From Page No. 117 for Sub-Basement Floor	
C	Total Brought Forward From Page No. 126 for Ground Floor	
D	Total Brought Forward From Page No. 134 for First Floor	
E	Total Brought Forward From Page No. 142 for Second Floor	
F	Total Brought Forward From Page No. 150 for Third Floor	
G	Total Brought Forward From Page No. 158 for Fourth Floor	
H	Total Brought Forward From Page No. 165 for Fifth Floor & Roof Level	
I	Total Brought Forward From Page No. 166 for Lightning Protection	
J	Total Brought Forward From Page No. 172 for Power & Telephone Reticulation	
K	Total Brought Forward From Page No. 173 for Area Lighting	
	TOTAL FOR ELECTRICAL INSTALLATIONS CARRIED FORWARD TO FORM OF TENDER	

Amount in Figures: Kshs.……..…….

Amount in Words: Kenya Shillings……..

……

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Official Stamp & Address:……..

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……

Tenderer's Signature:……...Date:……..……

Witness' Name:……..……Witness' Signature:……..

Address:……..

……

……

Date:……..