



THE TEACHERS SERVICE COMMISSION

**PROPOSED OFFICE BLOCK FOR TEACHERS SERVICE
COMMISSION (TSC) OFFICE BLOCK AT MACHAKOS COUNTY
RE-ADVERTISED**

Tender No.: TSC/T/30/2021-2023

CLOSING DATE: THURSDAY 23RD DECEMBER, 2021 AT 9.00 A

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TENDER DOCUMENTS FOR PROPOSED CONSTRUCTION OF TEACHERS SERVICE COMMISSION OFFICE BLOCK AT MACHAKOS COUNTY (*BUILDING AND ASSOCIATED CIVIL ENGINEERING WORKS*)

1) NAME AND CONTACT ADDRESSES OF PROCURING ENTITY

TEACHERS SERVICE COMMISSION

TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL,

PRIVATE BAG-00100,

NAIROBI.

ddprocurement@tsc.go.ke

2) Invitation to Tender (ITT) No. TSC/T/30/2021-2023

3) Tender Name PROPOSED CONSTRUCTION OF TEACHERS SERVICE COMMISSION OFFICE BLOCK AT MACHAKOS COUNTY (*BUILDING AND ASSOCIATED CIVIL ENGINEERING WORKS*)

INVITATION TO TENDER

PROCURING ENTITY: TEACHERS SERVICE COMMISSION

CONTRACT NAME AND DESCRIPTION:

PROPOSED CONSTRUCTION OF TEACHERS SERVICE COMMISSION OFFICE BLOCK AT MACHAKOS COUNTY (*BUILDING AND ASSOCIATED CIVIL ENGINEERING WORKS*).

1. The **TEACHERS SERVICE COMMISSION** invites sealed tenders for the **PROPOSED CONSTRUCTION OF TEACHERS SERVICE COMMISSION OFFICE BLOCK AT MACHAKOS COUNTY (*BUILDING AND ASSOCIATED CIVIL ENGINEERING WORKS*)**
2. Tendering will be conducted under open competitive method (National) using a standardized tender document. Tendering is open to all qualified and interested Tenderers.
3. Qualified and interested tenderers may obtain further information and inspect the Tender Documents during office hours 0900 to 1600 hours at the address given below.
4. A complete set of tender documents may be purchased or obtained by interested tenders upon payment of a non-refundable fees of **Kshs. 1,000 (Kenya shillings One Thousand Only)** in cash or Banker's Cheque and payable to the Teachers Service Commission at National Bank of Kenya Account No. 01001000905000, Harambee Avenue Branch or Bankers Cheque and present the bank slip to TSC Cash office for official receipt thereafter, attach a copy of the receipt to the Tender Document. Tender documents may be obtained electronically from the Website(s) www.tsc.go.ke or <https://tenders.go.ke>. Tender documents obtained electronically will be free of charge.
5. Tenderers may obtain further information or clarification on the tender at the **Supply Chain Management Services Division**, Teachers Service Commission House, 2nd Floor, Podium Wing at the official working hours 0900 to 1600 HR.
6. Tender documents may be viewed and downloaded for free from the website: www.tsc.go.ke or <https://tenders.go.ke>. Tenderers who download the tender document must forward their particulars immediately to ddprocurement@tsc.go.ke. To facilitate any further clarification or addendum
7. Tenders shall be quoted be in Kenya Shillings and shall include all taxes. Tenders shall remain valid for **150 days** from the date of opening of tenders on **Thursday 23rd December, 2021 at 9.00 am**.
8. All Tenders must be accompanied by a **tender Security** of Kshs. **300,000.00. (Kenya Shillings Three Hundred Thousand Only)**
9. The Tenderer shall chronologically serialize all pages of the tender documents submitted.
10. Completed tender documents shall be enclosed in plain sealed envelopes, marked with the tender number and tender name be deposited in the Tender Box provided at the TSC House, Podium wing, Ground Floor, or be addressed and posted to The Secretary, Teachers Service Commission, P.O. Box Private Bag-00100, Nairobi to be received on or before **Thursday 23rd December, 2021 at 9.00 am (EAT)**.
11. Electronic Tenders **shall not** be permitted.
12. Tenders will be opened immediately after the deadline on **Thursday 23rd December, 2021 at 9.00 am (EAT)**. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.
13. Late tenders shall be rejected and returned unopened. Tenderers who will come late will not be allowed to drop their bid documents but to return back with them.
14. There shall be **Mandatory** Pre-Bid Conference at the TSC office Machakos on **Wednesday 15th December, 2021 at 10.00 am**
15. The addresses referred to above are:

1. Address for obtaining further information and for purchasing tender documents

TEACHERS SERVICE COMMISSION
TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL,
2ND FLOOR SUPPLY CHAIN MANAGEMENT OFFICE
PRIVATE BAG-00100,
NAIROBI

ddprocurement@tsc.go.ke

2. Address for Submission of Tenders.

THE CHIEF EXECUTIVE OFFICER/COMMISSION SECRETARY

TEACHERS SERVICE COMMISSION
TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL,
GROUND FLOOR – TSC BUILDING, PODIUM WING PRIVATE
BAG-00100,

NAIROBI.

Att. ddprocurement@tsc.go.ke

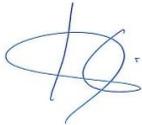
3. Address for Opening of Tenders.

TEACHERS SERVICE COMMISSION
TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL,
3RD FLOOR NUMBER – OPEN SPACE
NAIROBI.

Name: **OIMO LAWRENCE OGANGA**

Designation: **DEPUTY DIRECTOR, SUPPLY CHAIN MANAGEMENT**

Signature:



Date: **8TH DECEMBER, 2021**

PART1: TENDERING PROCEDURES

SECTION I - INSTRUCTIONS TO

TENDERERS GENERAL PROVISIONS

10 Scope of tender

- 11 The Procuring Entity as defined in the Appendix to Conditions of Contract invites tenders for Works Contractas described in the tender documents. The name, identification, and number of lots (contracts) of this Tender Document are specified in the TDS.
- 12 Throughout this tendering document:
- The term “in writing” means communicated in written form (e.g. by mail, e-mail, fax, including if specified in the TDS, distributed or received through the electronic-procurement system used by the Procuring Entity) with proof of receipt;
 - if the context so requires, “singular” means “plural” and vice versa;
 - “Day” means calendar day, unless otherwise specified as “Business Day”. A Business Day is any day that is an official working day of the Procuring Entity. It excludes official public holidays.

20 Fraud and corruption

- 21 The Procuring Entity requires compliance with the provisions of the Public Procurement and Asset Disposal Act, 2015, Section 62 “Declaration not to engage in corruption”. The tender submitted by a person shall include a declaration that the person shall not engage in any corrupt or fraudulent practice and a declaration that the person or his or her sub-contractors are not debarred from participating in public procurement proceedings.
- 22 The Procuring Entity requires compliance with the provisions of the Competition Act 2010, regarding collusive practices in contracting. Any tenderer found to have engaged in collusive conduct shall be disqualified and criminal and/or civil sanctions may be imposed. To this effect, Tenders shall be required to complete and sign the “Certificate of Independent Tender Determination” annexed to the Form of Tender.
- 23 Tenderers shall permit and shall cause their agents (whether declared or not), subcontractors, sub-consultants, service providers, suppliers, and their personnel, to permit the Procuring Entity to inspect all accounts, records and other documents relating to any initial selection process, pre-qualification process, tender submission, proposal submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the Procuring Entity.
- 24 Unfair Competitive Advantage - Fairness and transparency in the tender process require that the firms or their Affiliates competing for a specific assignment do not derive a competitive advantage from having provided consulting services related to this tender. To that end, the Procuring Entity shall indicate in the **Data Sheet** and make available to all the firms together with this tender document all information that would in that respect give such firm any unfair competitive advantage over competing firms.

30 Eligible tenderers

- 31 A Tenderer may be a firm that is a private entity, a state-owned enterprise or institution subject to ITT 3.8, or an individual or any combination of such entities in the form of a joint venture (JV) under an existing agreement with the intent to enter into such an agreement supported by a letter of intent. In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the tendering process and, in the event the JV is awarded the Contract, during contract execution. Members of a joint venture may not also make an individual tender, be a subcontractor in a separate tender or be part of another joint venture for the purposes of the same Tender. The maximum number of JV members shall be specified in the **TDS**.
- 32 Public Officers of the Procuring Entity, their Spouses, Child, Parent, Brothers or Sister. Child, Parent, Brother or Sister of a Spouse, their business associates or agents and firms/organizations in which they have a substantial or controlling interest shall not be eligible to tender or be awarded a contract. Public Officers are also not allowed to participate in any procurement proceedings.
- 33 A Tenderer shall not have a conflict of interest. Any tenderer found to have a conflict of interest shall be disqualified. A tenderer may be considered to have a conflict of interest for the purpose of this tendering process, if the tenderer:

- a) Directly or indirectly controls, is controlled by or is under common control with another tenderer;
 - b) Receives or has received any direct or indirect subsidy from another tenderer;
 - c) Has the same legal representative as another tenderer;
 - d) Has a relationship with another tenderer, directly or through common third parties, that puts it in a position to influence the tender of another tenderer, or influence the decisions of the Procuring Entity regarding this tendering process;
 - e) Any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the goods or works that are the subject of the tender;
 - f) Any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity as a consultant for Contract implementation;
 - g) Would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the contract specified in this Tender Document;
 - h) Has a close business or personal relationship with senior management or professional staff of the Procuring Entity who has the ability to influence the bidding process and:
 - i) Are directly or indirectly involved in the preparation of the Tender document or specifications of the Contract, and/or the Tender evaluation process of such contract; or
 - ii) May be involved in the implementation or supervision of such Contract unless the conflicts stemming from such relationship has been resolved in a manner acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.
- 34** A tenderer shall not be involved in corrupt, coercive, obstructive or fraudulent practice. A tenderer that is proven to have been involved in any of these practices shall be automatically disqualified
- 35** A Tenderer (either individually or as a JV member) shall not participate in more than one Tender, except for permitted alternative tenders. This includes participation as a subcontractor in other Tenders. Such participation shall result in the disqualification of all Tenders in which the firm is involved. Members of a joint venture may not also make an individual tender, be a sub-contractor in a separate tender or be part of another joint venture for the purposes of the same Tender. A firm that is not a tenderer or a JV member may participate as a subcontractor in more than one tender.
- 36** A Tenderer may have the nationality of any country, subject to the restrictions pursuant to ITT3.9. A Tenderer shall be deemed to have the nationality of a country if the Tenderer is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed sub-contractors or sub-consultants for any part of the Contract including related Services.
- 37** A Tenderer that has been debarred from participating in public procurement shall be ineligible to tender or be awarded a contract. The list of debarred firms and individuals is available from the website of PPRA www.ppra.go.ke.
- 38** A Tenderer that is a state-owned enterprise or a public institution in Kenya may be eligible to tender and be awarded Contract(s) only if it is determined by the Procuring Entity to meet the following conditions, i.e. if it is:
- i) A legal public entity of Government and/or public administration,
 - ii) financially autonomous and not receiving any significant subsidies or budget support from any public entity or Government, and;
 - (iii) operating under commercial law and vested with legal rights and liabilities similar to any commercial enterprise to enable it compete with firms in the private sector on an equal basis.
- 39** Firms and individuals shall be ineligible if their countries of origin are:
- (a) As a matter of law or official regulations, Kenya prohibits commercial relations with that country;
 - (b) By an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods or contracting of works or services from that country, or any payments to any country, person, or entity in that country.

A tenderer shall provide such documentary evidence of eligibility satisfactory to the Procuring Entity, as the Procuring Entity shall reasonably request.

- 3.10** Foreign tenderers are required to source at least forty (40%) percent of their contract inputs (in supplies, local sub-contracts and labor) from citizen suppliers and contractors. To this end, a foreign tenderer shall provide in its tender documentary evidence that this requirement is met. Foreign tenderers not meeting this criterion will be automatically disqualified. Information required to enable the Procuring Entity determine if this condition is met shall be provided for this purpose in “*SECTION II - EVALUATION AND QUALIFICATION CRITERIA, Item 9*”.
- 3.11** Pursuant to the eligibility requirements of ITT 3.10, a tender is considered a foreign tenderer, If it is registered in Kenya and has less than 51 percent ownership by nationals of Kenya and if it does not subcontract to foreign firms or individuals more than 10 percent of the contract price, excluding provisional sums. JVs are considered as foreign tenderers if the individual member firms registered in Kenya have less 51 percent ownership by nationals of Kenya. The JV shall not subcontract to foreign firms more than 10 percent of the contract price, excluding provisional sums.
- 3.12** The National Construction Authority Act of Kenya requires that all local and foreign contractors be registered with the National Construction Authority and be issued with a Registration Certificate before they can undertake any construction works in Kenya. Registration shall not be a condition for tender, but it shall be a condition of contract award and signature. A selected tenderer shall be given opportunity to register before such award and signature of contract. Application for registration with National Construction Authority may be accessed from the website www.nca.go.ke.
- 3.13** The Competition Act of Kenya requires that firms wishing to tender as Joint Venture undertakings which may prevent, distort or lessen competition in provision of services are prohibited unless they are exempt in accordance with the provisions of Section 25 of the Competition Act, 2010. JVs will be required to seek for exemption from the Competition Authority. Exemption shall not be a condition for tender, but it shall be a condition of contract award and signature. A JV tenderer shall be given opportunity to seek such exemption as a condition of award and signature of contract. Application for exemption from the Competition Authority of Kenya may be accessed from the website www.cak.go.ke.
- 4.14 A Kenyan tenderer shall be eligible to tender if it provides evidence of having fulfilled his/her tax obligations by producing valid tax compliance certificate or tax exemption certificate issued by the Kenya Revenue Authority.

40 Eligible goods, equipment, and services

- 41** Goods, equipment and services to be supplied under the Contract may have their origin in any country that is not ineligible under ITT 3.9. At the Procuring Entity's request, Tenderers may be required to provide evidence of the origin of Goods, equipment and services.
- 42** Any goods, works and production processes with characteristics that have been declared by the relevant national environmental protection agency or by other competent authority as harmful to human beings and to the environment shall not be eligible for procurement.

50 Tenderer's responsibilities

- 51** The tenderer shall bear all costs associated with the preparation and submission of his/her tender, and the Procuring Entity will in no case be responsible or liable for those costs.
- 52** The tenderer, at the tenderer's own responsibility and risk, is encouraged to visit and examine and inspect the Site of the Works and its surroundings and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be the tenderer's own expense.
- 53** The Tenderer and any of its personnel or agents will be granted permission by the Procuring Entity to enter upon its premises and lands for the purpose of such visit. The Tenderer shall indemnify the Procuring Entity against liability arising from death or personal injury, loss of or damage to property, and any other losses and expenses incurred as a result of the examination and inspection.

54 The tenderer shall provide in the Form of Tender and Qualification Information, a preliminary description of the proposed work method and schedule, including charts, as necessary or required.

B. CONTENTS OF TENDER DOCUMENTS

60 Sections of Tender Document

61 The tender document consists of Parts 1, 2, and 3, which includes all the sections specified below, and which should be read in conjunction with any Addenda issued in accordance with ITT 10.

PART 1: Tendering Procedures

Section I – Instructions to Tenderers

Section II – Tender Data Sheet (TDS)

Section III- Evaluation and Qualification

Criteria Section IV – Tendering Forms

PART 2: Works' Requirements

Section V - Specifications

Section VI - Drawings

PART 3: Conditions of Contract and Contract Forms

Section VI - General Conditions (GCC)

Section VIII - Special Conditions of Contract

Section IX- Contract Forms

62 The Invitation to Tender Notice issued by the Procuring Entity is not part of the Contract documents. Unless obtained directly from the Procuring Entity, the Procuring Entity is not responsible for the completeness of the Tender document, responses to requests for clarification, the minutes of a pre-arranged site visit and those of the pre-Tender meeting (if any), or Addenda to the Tender document in accordance with ITT 10. In case of any contradiction, documents obtained directly from the Procuring Entity shall prevail.

63 The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document and to furnish with its Tender all information and documentation as is required by the Tender document.

70 Clarification of Tender Document, Site Visit, Pre-tender Meeting

71 A Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address specified in the **TDS** or raise its enquiries during the pre-Tender meeting if provided for in accordance with ITT 7.2. The Procuring Entity will respond in writing to any request for clarification, provided that such request is received no later than the period specified in the **TDS** prior to the deadline for submission of tenders. The Procuring Entity shall forward copies of its response to all tenderers who have acquired the Tender documents in accordance with ITT 7.4, including a description of the inquiry but without identifying its source. If so specified in the **TDS**, the Procuring Entity shall also promptly publish its response at the web page identified in the **TDS**. Should the clarification result in changes to the essential elements of the Tender Documents, the Procuring Entity shall amend the Tender Documents following the procedure under ITT 8 and ITT 22.2.

72 The Tenderer, at the Tenderer's own responsibility and risk, is encouraged to visit and examine and inspect the site(s) of the required contracts and obtain all information that may be necessary for preparing a tender. The costs of visiting the Site shall be at the Tenderer's own expense. The Procuring Entity shall specify in the **TDS** if a pre-arranged Site visit and or a pre-tender meeting will be held, when and where. The Tenderer's designated representative is invited to attend a pre-arranged site visit and a pre-tender meeting, as the case may be. The purpose of the site visit and the pre-tender meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

73 The Tenderer is requested to submit any questions in writing, to reach the Procuring Entity not later than the period specified in the **TDS** before the meeting.

74 Minutes of a pre-arranged site visit and those of the pre-tender meeting, if applicable, including the text of the questions asked by Tenderers and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Tenderers who have acquired the Tender Documents. Minutes shall not

identify the source of the questions asked.

75 The Procuring Entity shall also promptly publish anonymized (*no names*) Minutes of the pre-arranged site visit and those of the pre-tender meeting at the web page identified in the **TDS**. Any modification to the Tender Documents that may become necessary as a result of the pre-arranged site visit and those of the pre-tender meeting shall be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT 8 and not through the minutes of the pre-Tender meeting. Non-attendance at the pre-arranged site visit and the pre-tender meeting will not be a cause for disqualification of a Tenderer.

80 Amendment of Tender Documents

81 At any time prior to the deadline for submission of Tenders, the Procuring Entity may amend the Tender Documents by issuing addenda.

82 Any addendum issued shall be part of the Tender Documents and shall be communicated in writing to all who have obtained the Tender Documents from the Procuring Entity. The Procuring Entity shall also promptly publish the addendum on the Procuring Entity's website in accordance with ITT 7.5.

83 To give Tenderers reasonable time in which to take an addendum into account in preparing their Tenders, the Procuring Entity should extend the dead line for the submission of Tenders, pursuant to ITT 22.2.

C. PREPARATION OF TENDERS

9. Cost of Tendering

The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.

10.0 Language of Tender

The Tender, as well as all correspondence and documents relating to the tender exchanged by the tenderer and the Procuring Entity, shall be written in the English Language. Supporting documents and printed literature that are part of the Tender may be in another language provided they are accompanied by an accurate and notarized translation of the relevant passages into the English Language, in which case, for purposes of interpretation of the Tender, such translation shall govern.

11.0 Documents Comprising the Tender

11.1 The Tender shall comprise the following:

- a) Form of Tender prepared in accordance with ITT 12;
- b) Schedules including priced Bill of Quantities, completed in accordance with ITT 12 and ITT 14;
- c) Tender Security or Tender-Securing Declaration, in accordance with ITT 19.1;
- d) Alternative Tender, if permissible, in accordance with ITT 13;
- e) **Authorization**: written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT 20.3;
- f) **Qualifications**: documentary evidence in accordance with ITT 17 establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted;
- g) **Conformity**: a technical proposal in accordance with ITT 16;
- h) Any other document required in the **TDS**.

11.2 In addition to the requirements under ITT 11.1, Tenders submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender, together with a copy of the proposed JV Agreement. Change of membership and conditions of the JV prior to contract signature will render the tender liable for disqualification.

12.0 Form of Tender and Schedules

- 12.1** The Form of Tender and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Tendering Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITT 20.3. All blank spaces shall be filled in with the information requested. The Tenderer shall chronologically serialize all pages of the tender documents submitted.
- 12.2** The Tenderer shall furnish in the Form of Tender information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Tender.

13. Alternative Tenders

- 13.1** Unless otherwise specified in the TDS, alternative Tenders shall not be considered.
- 13.2** When alternative times for completion are explicitly invited, a statement to that effect will be included in the **TDS**, and the method of evaluating different alternative times for completion will be described in Section III, Evaluation and Qualification Criteria.
- 13.3** Except as provided under ITT 13.4 below, Tenderers wishing to offer technical alternatives to the requirements of the Tender Documents must first price the Procuring Entity's design as described in the Tender Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Procuring Entity, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the Tenderer with the Winning Tender conforming to the basic technical requirements shall be considered by the Procuring Entity.
- 13.4** When specified in the **TDS**, Tenderers are permitted to submit alternative technical solutions for specified parts of the Works, and such parts will be identified in the **TDS**, as will the method for their evaluating, and described in Section VI, Works' Requirements.

14.0 Tender Prices and Discounts

- 14.1** The prices and discounts (including any price reduction) quoted by the Tenderer in the Form of Tender and in the Bill of Quantities shall conform to the requirements specified below.
- 14.2** The Tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Tenderer shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Procuring Entity. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Tender, and provided that the Tender is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive Tenderers will be added to the Tender price and the equivalent total cost of the Tender so determined will be used for price comparison.
- 14.3** The price to be quoted in the Form of Tender, in accordance with ITT 12.1, shall be the total price of the Tender, including any discounts offered.
- 14.4** The Tenderer shall quote any discounts and the methodology for their application in the Form of Tender, in accordance with ITT 12.1.
- 14.5** It will be specified in the **TDS** if the rates and prices quoted by the Tenderer are or are not subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, except in cases where the contract is subject to fluctuations and adjustments, not fixed price. In such a case, the Tenderer shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data and the Procuring Entity may require the Tenderer to justify its proposed indices and weightings.
- 14.6** Where tenders are being invited for individual lots (contracts) or for any combination of lots (packages), tenderers wishing to offer discounts for the award of more than one Contract shall specify in their Tender the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITT 14.4, provided the Tenders for all lots (contracts) are opened at the same time.

147 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 30 days prior to the deadline for submission of Tenders, shall be included in the rates and prices and the total Tender Price submitted by the Tenderer.

150 Currencies of Tender and Payment

151 The currency(ies) of the Tender and the currency(ies) of payments shall be the same.

152 Tenderers shall quote entirely in Kenya Shillings. The unit rates and the prices shall be quoted by the Tenderer in the Bill of Quantities, entirely in Kenya shillings.

a) A Tenderer expecting to incur expenditures in other currencies for inputs to the Works supplied from outside Kenya (referred to as “the foreign currency requirements”) shall (if so allowed in the **TDS**) indicate in the Appendix to Tender the percentage(s) of the Tender Price (excluding Provisional Sums), needed by the Tenderer for the payment of such foreign currency requirements, limited to no more than two foreign currencies.

b) The rates of exchange to be used by the Tenderer in arriving at the local currency equivalent and the percentage(s) mentioned in (a) above shall be specified by the Tenderer in the Appendix to Tender and shall be based on the exchange rate provided by the Central Bank of Kenya on the date 30 days prior to the actual date of tender opening. Such exchange rate shall apply for all foreign payments under the Contract.

153 Tenderers may be required by the Procuring Entity to justify, to the Procuring Entity's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Schedule of Adjustment Data in the Appendix to Tender are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Tenderers.

16.0 Documents Comprising the Technical Proposal

The Tenderer shall furnish a technical proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV, Tender Forms, insufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work's requirements and the completion time.

170 Documents Establishing the Eligibility and Qualifications of the Tenderer

171 Tenderers shall complete the Form of Tender, included in Section IV, Tender Forms, to establish Tenderer's eligibility in accordance with ITT 4.

172 In accordance with Section III, Evaluation and Qualification Criteria, to establish its qualifications to perform the Contract the Tenderer shall provide the information requested in the corresponding information sheets included in Section IV, Tender Forms.

173 If a margin of preference applies as specified in accordance with ITT 33.1, national tenderers, individually or in joint ventures, applying for eligibility for national preference shall supply all information required to satisfy the criteria for eligibility specified in accordance with ITT 33.1.

174 Tenderers shall be asked to provide, as part of the data for qualification, such information, including details of ownership, as shall be required to determine whether, according to the classification established by the Procuring Entity, a particular contractor or group of contractors qualifies for a margin of preference. Further the information will enable the Procuring Entity identify any actual or potential conflict of interest in relation to the procurement and/or contract management processes, or a possibility of collusion between tenderers, and thereby help to prevent any corrupt influence in relation to the procurement process or contract management.

175 The purpose of the information described in **ITT 17.4** above overrides any claims to confidentiality which a tenderer may have. There can be no circumstances in which it would be justified for a tenderer to keep information relating to its ownership and control confidential where it is tendering to undertake public sector work and receive public sector funds. Thus, confidentiality will not be accepted by the Procuring Entity as a justification for a Tenderer's failure to disclose, or failure to provide required information on its ownership and control.

176 The Tenderer shall provide further documentary proof, information or authorizations that the Procuring Entity may request in relation to ownership and control which information on any changes to the information which was provided by the tenderer under ITT 6.4. The obligations to require this information shall continue for the duration of the procurement process and contract performance and after completion of the contract, if any change to the information previously provided may reveal a conflict of interest in relation to the award or management of the contract.

177 All information provided by the tenderer pursuant to these requirements must be complete, current and accurate

as at the date of provision to the Procuring Entity. In submitting the information required pursuant to these requirements, the Tenderer shall warrant that the information submitted is complete, current and accurate as at the date of submission to the Procuring Entity.

- 178** If a tenderer fails to submit the information required by these requirements, its tender will be rejected. Similarly, if the Procuring Entity is unable, after taking reasonable steps, to verify to a reasonable degree the information submitted by a tenderer pursuant to these requirements, then the tender will be rejected.
- 179** If information submitted by a tenderer pursuant to these requirements, or obtained by the Procuring Entity (whether through its own enquiries, through notification by the public or otherwise), shows any conflict of interest which could materially and improperly benefit the tenderer in relation to the procurement or contract management process, then:
- i) If the procurement process is still ongoing, the tenderer will be disqualified from the procurement process,
 - ii) if the contract has been awarded to that tenderer, the contract award will be set as is depending the outcome of (iii),
 - iii) the tenderer will be referred to the relevant law enforcement authorities for investigation of whether the tenderer or any other person have committed any criminal offence.
- 17.10** If a tenderer submits information pursuant to these requirements that is incomplete, inaccurate or out-of-date, or attempts to obstruct the verification process, then the consequences ITT 17.8 will ensue unless the tenderer can show to the reasonable satisfaction of the Procuring Entity that any such act was not material, or was due to genuine error which was not attributable to the intentional act, negligence or recklessness of the tenderer.

18.0 Period of Validity of Tenders

- 18.1.** Tenders shall remain valid for the Tender Validity period specified in the **TDS**. The Tender Validity period starts from the date fixed for the Tender submission deadline (as prescribed by the Procuring Entity in accordance with ITT 22). A tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.
- 18.2** In exceptional circumstances, prior to the expiration of the Tender validity period, the Procuring Entity may request Tenderers to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 19, it shall also be extended for thirty (30) days beyond the deadline of the extended validity period. A Tenderer may refuse the request without forfeiting its Tender security. A Tenderer granting the request shall not be required or permitted to modify its Tender.

190 Tender Security

- 191** The Tenderer shall furnish as part of its Tender, either a Tender-Securing Declaration or a Tender Security as specified in the **TDS**, in original form and, in the case of a Tender Security, in the amount and currency specified in the **TDS**. A Tender-Securing Declaration shall use the form included in Section IV, Tender Forms.
- 192** If a Tender Security is specified pursuant to ITT 19.1, the Tender Security shall be a demand guarantee in any of the following forms at the Tenderer's option:
- i) cash;
 - ii) a bank guarantee;
 - iii) a guarantee by an insurance company registered and licensed by the Insurance Regulatory Authority listed by the Authority;
 - (iv) a guarantee issued by a financial institution approved and licensed by the Central Bank of Kenya, from a reputable source, and an eligible country.
- 193** If an unconditional bank guarantee is issued by a bank located outside Kenya, the issuing bank shall have a correspondent bank located in Kenya to make it enforceable. The Tender Security shall be valid for thirty (30) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 18.2.
- 194** If a Tender Security or Tender-Securing Declaration is specified pursuant to ITT 19.1, any Tender not accompanied by a substantially responsive Tender Security or Tender-Securing Declaration shall be rejected by the Procuring Entity as non-responsive.
- 195** If a Tender Security is specified pursuant to ITT 19.1, the Tender Security of unsuccessful Tenderers shall be returned as promptly as possible upon the successful Tenderer's signing the Contract and furnishing the Performance Security and any other documents required in the **TDS**. The Procuring Entity shall also promptly

return the tender security to the tenderers where the procurement proceedings are terminated, all tenders were determined non-responsive or a bidder declines to extend tender validity period.

- 196** The Tender Security of the successful Tenderer shall be returned as promptly as possible once the successful Tenderer has signed the Contract and furnished the required Performance Security, and any other documents required in the TDS.
- 197** The Tender Security may be forfeited or the Tender-Securing Declaration executed:
- a) if a Tenderer withdraws its Tender during the period of Tender validity specified by the Tenderer on the Form of Tender, or any extension thereto provided by the Tenderer; or
 - b) if the successful Tenderer fails to:
 - i) sign the Contract in accordance with ITT47; or
 - ii) furnish a Performance Security and if required in the TDS, and any other documents required in the TDS.
- 198** Where tender securing declaration is executed, the Procuring Entity shall recommend to the PPRA to debar the Tenderer from participating in public procurement as provided in the law.
- 199** The Tender Security or the Tender-Securing Declaration of a JV shall be in the name of the JV that submits the Tender. If the JV has not been legally constituted into a legally enforceable JV at the time of tendering, the Tender Security or the Tender-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITT 4.1 and ITT 11.2.
- 19.10** A tenderer shall not issue a tender security to guarantee itself.

200 Format and Signing of Tender

- 201** The Tenderer shall prepare one original of the documents comprising the Tender as described in ITT 11 and clearly mark it "ORIGINAL." Alternative Tenders, if permitted in accordance with ITT 13, shall be clearly marked "ALTERNATIVE." In addition, the Tenderer shall submit copies of the Tender, in the number specified in the TDS and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.
- 202** Tenderers shall mark as "CONFIDENTIAL" all information in their Tenders which is confidential to their business. This may include proprietary information, trade secrets, or commercial or financially sensitive information.
- 203** The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written confirmation as specified in the TDS and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialed by the person signing the Tender.
- 204** In case the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.
- 205** Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.

D. SUBMISSION AND OPENING OF TENDERS

210 Sealing and Marking of Tenders

- 211** The Tenderer shall deliver the Tender in a single sealed envelope, or in a single sealed package, or in a single sealed container bearing the name and Reference number of the Tender, addressed to the Procuring Entity and a warning not to open before the time and date for Tender opening date. Within the single envelope, package or container, the Tenderer shall place the following separate, sealed envelopes:
- a) in an envelope or package or container marked "ORIGINAL", all documents comprising the Tender, as described in ITT 11; and
 - b) in an envelope or package or container marked "COPIES", all required copies of the Tender; and
 - c) if alternative Tenders are permitted in accordance with ITT 13, and if relevant:

- i) in an envelope or package or container marked “ORIGINAL –ALTERNATIVE TENDER”, the alternative Tender; and
- ii) in the envelope or package or container marked “COPIES- ALTERNATIVE TENDER”, all required copies of the alternative Tender.

The inner envelopes or packages or containers shall:

- a) bear the name and address of the Procuring Entity,
- b) bear the name and address of the Tenderer; and
- c) bear the name and Reference number of the Tender.

212 If an envelope or package or container is not sealed and marked as required, the *Procuring Entity* will assume no responsibility for the misplacement or premature opening of the Tender. Tenders misplaced or opened prematurely will not be accepted.

220 Deadline for Submission of Tenders

221 Tenders must be received by the Procuring Entity at the address specified in the **TDS** and no later than the date and time also specified in the **TDS**. When so specified in the **TDS**, tenderers shall have the option of submitting their Tenders electronically. Tenderers submitting Tenders electronically shall follow the electronic Tender submission procedures specified in the **TDS**.

222 The Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders by amending the Tender Documents in accordance with ITT 8, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline shall thereafter be subject to the deadline as extended.

23.0 Late Tenders

The Procuring Entity shall not consider any Tender that arrives after the deadline for submission of tenders, in accordance with ITT 22. Any Tender received by the Procuring Entity after the deadline for submission of Tenders shall be declared late, rejected, and returned unopened to the Tenderer.

240 Withdrawal, Substitution, and Modification of Tenders

241 A Tenderer may withdraw, substitute, or modify its Tender after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITT 20.3, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Tender must accompany the respective written notice. All notices must be:

- a) prepared and submitted in accordance with ITT 20 and ITT 21 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked “WITHDRAWAL,” “SUBSTITUTION,” “MODIFICATION;” and
- b) received by the Procuring Entity prior to the deadline prescribed for submission of Tenders, in accordance with ITT 22.

242 Tenders requested to be withdrawn in accordance with ITT 24.1 shall be returned unopened to the Tenderers.

243 No Tender may be withdrawn, substituted, or modified in the interval between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Tenderer on the Form of Tender or any extension thereof.

25. Tender Opening

251 Except in the cases specified in ITT 23 and ITT 24.2, the Procuring Entity shall publicly open and read out all Tenders received by the deadline, at the date, time and place specified **in the TDS**, in the presence of Tenderers' designated representatives who chooses to attend. Any specific electronic Tender opening procedures required if electronic Tendering is permitted in accordance with ITT 22.1, shall be as specified in the **TDS**.

252 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelopes with the corresponding Tender shall not be opened but returned to the Tenderer. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Tender opening.

253 Next, envelopes marked “SUBSTITUTION” shall be opened and read out and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned to the

Tenderer. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Tender opening.

- 254 Next, envelopes marked “MODIFICATION” shall be opened and read out with the corresponding Tender. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Tender opening.
- 255 Next, all remaining envelopes shall be opened one at a time, reading out: the name of the Tenderer and whether there is a modification; the total Tender Price, per lot (contract) if applicable, including any discounts and alternative Tenders; the presence or absence of a Tender Security or Tender-Securing Declaration, if required; and any other details as the Procuring Entity may consider appropriate.
- 256 Only Tenders, alternative Tenders and discounts that are opened and read out at Tender opening shall be considered further for evaluation. The Form of Tender and pages of the Bill of Quantities (to be decided on by the tender opening committee) are to be initialed by the members of the tender opening committee attending the opening.
- 257 At the Tender Opening, the Procuring Entity shall neither discuss the merits of any Tender nor reject any Tender (except for late Tenders, in accordance with ITT 23.1).
- 258 The Procuring Entity shall prepare minutes of the Tender Opening that shall include, as a minimum: -
- a) the name of the Tenderer and whether there is a withdrawal, substitution, or modification;
 - b) the Tender Price, per lot (contract) if applicable, including any discounts;
 - c) any alternative Tenders;
 - d) the presence or absence of a Tender Security, if new as required;
 - e) number of pages of each tender document submitted.
- 259 The Tenderers' representatives who are present shall be requested to sign the minutes. The omission of a Tenderer's signature on the minutes shall not invalidate the contents and effect of the minutes. A copy of the tender opening register shall be distributed to all Tenderers.

E. EVALUATION AND COMPARISON OF TENDERS

26. Confidentiality

- 261 Information relating to the evaluation of Tenders and recommendation of contract award shall not be disclosed to Tenderers or any other persons not officially concerned with the Tender process until information on Intention to Award the Contract is transmitted to all Tenderers in accordance with ITT 43.
- 262 Any effort by a Tenderer to influence the Procuring Entity in the evaluation of the Tenders or Contract award decisions may result in the rejection of its tender.
- 263 Notwithstanding ITT 26.2, from the time of tender opening to the time of contract award, if a tenderer wishes to contact the Procuring Entity on any matter related to the tendering process, it shall do so in writing.

27.0 Clarification of Tenders

- 271 To assist in the examination, evaluation, and comparison of the tenders, and qualification of the tenderers, the Procuring Entity may, at its discretion, ask any tenderer for a clarification of its tender, given a reasonable time for a response. Any clarification submitted by a tenderer that is not in response to a request by the Procuring Entity shall not be considered. The Procuring Entity's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the tender shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Procuring Entity in the evaluation of the tenders, in accordance with ITT 31.
- 272 If a tenderer does not provide clarifications of its tender by the date and time set in the Procuring Entity's request for clarification, its Tender may be rejected.

28.0 Deviations, Reservations, and Omissions

- 281 During the evaluation of tenders, the following definitions apply: -
- a) “*Deviation*” is a departure from the requirements specified in the tender document;
 - b) “*Reservation*” is the setting of limiting conditions or withholding from complete acceptance of the

- requirements specified in the tender document; and
- c) “*Omission*” is the failure to submit part or all of the information or documentation required in the Tender document.

29.0 Determination of Responsiveness

- 29.1** The Procuring Entity's determination of a Tender's responsiveness is to be based on the contents of the tender itself, as defined in ITT 11.
- 29.2** A substantially responsive Tender is one that meets the requirements of the Tender document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, if accepted, would:
- a) Affect in any substantial way the scope, quality, or performance of the Works specified in the Contract;
 - b) limit in any substantial way, inconsistent with the tender document, the Procuring Entity's rights or the tenderer's obligations under the proposed contract;
 - c) if rectified, would unfairly affect the competitive position of other tenderers presenting substantially responsive tenders.
- 29.3** The Procuring Entity shall examine the technical aspects of the tender submitted in accordance with ITT 16, to confirm that all requirements of Section VI, Works' Requirements have been met without any material deviation, reservation or omission.
- 29.4** If a tender is not substantially responsive to the requirements of the tender document, it shall be rejected by the Procuring Entity and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

30.0 Non-material Non-conformities

- 30.1** Provided that a tender is substantially responsive, the Procuring Entity may waive any non-conformities in the tender.
- 30.2** Provided that a Tender is substantially responsive, the Procuring Entity may request that the tenderer submit the necessary information or documentation, within a reasonable period of time, to rectify non-material non-conformities in the tender related to documentation requirements. Requesting information or documentation on such non-conformities shall not be related to any aspect of the price of the tender. Failure of the tenderer to comply with the request may result in the rejection of its tender.
- 30.3** Provided that a tender is substantially responsive, the Procuring Entity shall rectify quantifiable non-material non-conformities related to the Tender Price. To this effect, the Tender Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component in the manner specified **in the TDS.**

31.0 Arithmetical Errors

- 31.1** The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity.
- 31.2** Provided that the Tender is substantially responsive, the Procuring Entity shall handle errors on the following basis: -
- a) Any error detected if considered a major deviation that affects the substance of the tender, shall lead to disqualification of the tender as non-responsive.
 - b) Any errors in the submitted tender arising from a miscalculation of unit price, quantity, subtotal and total bid price shall be considered as a major deviation that affects the substance of the tender and shall lead to disqualification of the tender as non-responsive. and
 - c) if there is a discrepancy between words and figures, the amount in words shall prevail
- 31.3** Tenderers shall be notified of any error detected in their bid during the notification of award.

32.0 Conversion to Single Currency

For evaluation and comparison purposes, the currency(ies) of the Tender shall be converted in to a single currency as specified in the **TDS.**

330 Margin of Preference and Reservations

331 A margin of preference may be allowed only when the contract is open to international competitive tendering where foreign contractors are expected to participate in the tendering process and where the contract exceeds the value/threshold specified in the Regulations.

332 A margin of preference shall not be allowed unless it is specified so in the **TDS**.

333 Contracts procured on basis of international competitive tendering shall not be subject to reservations exclusive to specific groups as provided in ITT 33.4.

334 Where it is intended to reserve a contract to a specific group of businesses (these groups are Small and Medium Enterprises, Women Enterprises, Youth Enterprises and Enterprises of persons living with disability, as the case may be), and who are appropriately registered as such by the authority to be specified in the **TDS**, a procuring entity shall ensure that the invitation to tender specifically indicates that only businesses or firms belonging to the specified group are eligible to tender. No tender shall be reserved to more than one group. If not so stated in the Invitation to Tender and in the Tender documents, the invitation to tender will be open to all interested tenderers.

340 Nominated Subcontractors

341 Unless otherwise stated in the **TDS**, the Procuring Entity does not intend to execute any specific elements of the Works by subcontractors selected/nominated by the Procuring Entity. In case the Procuring Entity nominates a subcontractor, the subcontract agreement shall be signed by the Subcontractor and the Procuring Entity. The main contract shall specify the working arrangements between the main contractor and the nominated subcontractor.

342 Tenderers may propose sub-contracting up to the percentage of total value of contracts or the volume of works as specified in the **TDS**. Subcontractors proposed by the Tenderer shall be fully qualified for their parts of the Works.

343 Domestic subcontractor's qualifications shall not be used by the Tenderer to qualify for the Works unless their specialized parts of the Works were previously designated so by the Procuring Entity in the **TDS** a scan be met by subcontractors referred to hereafter as 'Specialized Subcontractors', in which case, the qualifications of the Specialized Subcontractors proposed by the Tenderer may be added to the qualifications of the Tenderer.

35. Evaluation of Tenders

35.1 The Procuring Entity shall use the criteria and methodologies listed in this ITT and Section III, Evaluation and Qualification Criteria No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies the Procuring Entity shall determine the Lowest Evaluated Tender in accordance with ITT 40.

35.2 To evaluate a Tender, the Procuring Entity shall consider the following:

- a) Price adjustment in accordance with ITT 31.1 (iii); excluding provisional sums and contingencies, if any, but including Day work items, where priced competitively;
- b) price adjustment due to discounts offered in accordance with ITT 14.4;
- c) converting the amount resulting from applying (a) and (b) above, if relevant, to a single currency in accordance with ITT 32;
- d) price adjustment due to quantifiable non-material non-conformities in accordance with ITT 30.3; and
- e) any additional evaluation factors specified in the **TDS** and Section III, Evaluation and Qualification Criteria.

35.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be considered in Tender evaluation.

35.4 Where the tender involves multiple lots or contracts, the tenderer will be allowed to tender for one or more lots (contracts). Each lot or contract will be evaluated in accordance with ITT 35.2. The methodology to determine the lowest evaluated tenderer or tenderers base done lot (contract) or based on a combination of lots (contracts), will be specified in Section III, Evaluation and Qualification Criteria. In the case of multiple lots or contracts, tenderer will be will be required to prepare the Eligibility and Qualification Criteria Form for each Lot.

36.0 Comparison of tenders

The Procuring Entity shall compare the evaluated costs of all substantially responsive Tenders established in accordance with ITT 35.2 to determine the Tender that has the lowest evaluated cost.

37.0 Abnormally low tenders and abnormally high tenders

Abnormally Low Tenders

- 371** An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price or that genuine competition between Tenderers is compromised.
- 372** In the event of identification of a potentially Abnormally Low Tender, the Procuring Entity shall seek written clarifications from the Tenderer, including detailed price analyses of its Tender price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Tender document.
- 373** After evaluation of the price analyses, in the event that the Procuring Entity determines that the Tenderer has failed to demonstrate its capability to perform the Contract for the offered Tender Price, the Procuring Entity shall reject the Tender.

Abnormally high tenders

- 374** An abnormally high tender price is one where the tender price, in combination with other constituent elements of the Tender, appears unreasonably too high to the extent that the Procuring Entity is concerned that it (the Procuring Entity) may not be getting value for money or it may be paying too high a price for the contract compared with market prices or that genuine competition between Tenderers is compromised.
- 375** In case of a nab normally high price, the Procuring Entity shall make a survey of the market prices, check if the estimated cost of the contract is correct and review the Tender Documents to check if the specifications, scope of work and conditions of contract are contributory to the abnormally high tenders. The Procuring Entity may also seek written clarification from the tenderer on the reason for the high tender price. The Procuring Entity shall proceed as follows:
- i) If the tender price is abnormally high based on wrong estimated cost of the contract, the Procuring Entity may accept or not accept the tender depending on the Procuring Entity's budget considerations.
 - ii) If specifications, scope of work and/or conditions of contract are contributory to the abnormally high tender prices, the Procuring Entity shall reject all tenders and may retender for the contract based on revised estimates, specifications, scope of work and conditions of contract, as the case may be.
- 376** If the Procuring Entity determines that the Tender Price is abnormally too high because genuine competition between tenderers is compromised (*often due to collusion, corruption or other manipulations*), the Procuring Entity shall reject all Tenders and shall institute or cause competent Government Agencies to institute an investigation on the cause of the compromise, before retendering.

38.0 Unbalanced and/ or front-loaded tenders

- 381** If in the Procuring Entity's opinion, the Tender that is evaluated as the lowest evaluated price is seriously unbalanced and/or frontloaded, the Procuring Entity may require the Tenderer to provide written clarifications. Clarifications may include detailed price analyses to demonstrate the consistency of the tender prices with the scope of works, proposed methodology, schedule and any other requirements of the Tender document.
- 382** After the evaluation of the information and detailed price analyses presented by the Tenderer, the Procuring Entity may as appropriate:
- a) accept the Tender;
 - b) require that the total amount of the Performance Security be increased at the expense of the Tenderer to a level not exceeding a 30% of the Contract Price;
 - c) agree on a payment mode that eliminates the inherent risk of the Procuring Entity paying too much for undelivered works;
 - d) reject the Tender,

39.0 Qualifications of the tenderer

39.1 The Procuring Entity shall determine to its satisfaction whether the eligible Tenderer that is selected as having submitted the lowest evaluated cost and substantially responsive Tender, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

39.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to ITT 17. The determination shall not take into consideration the qualifications of other firms such as the Tenderer's subsidiaries, parent entities, affiliates, subcontractors (other than Specialized Sub-contractors if permitted in the Tender document), or any other firm(s) different from the Tenderer.

39.3 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in disqualification of the Tender, in which event the Procuring Entity shall proceed to the Tenderer who offers a substantially responsive Tender with the next lowest evaluated price to make a similar determination of that Tenderer's qualifications to perform satisfactorily.

40.0 Lowest evaluated tender

Having compared the evaluated prices of Tenders, the Procuring Entity shall determine the Lowest Evaluated Tender. The Lowest Evaluated Tender is the Tender of the Tenderer that meets the Qualification Criteria and whose Tender has been determined to be:

- a) Most responsive to the Tender document; and
- b) the lowest evaluated price.

41.0 Procuring entity's right to accept any tender, and to reject any or all tenders.

The Procuring Entity reserves the right to accept or reject any Tender and to annul the Tender process and reject all Tenders at any time prior to Contract Award, without there by incurring any liability to Tenderers. In case of annulment, all Tenders submitted and specifically, Tender securities, shall be promptly returned to the Tenderers.

F. AWARD OF CONTRACT

42.0 Award criteria

The Procuring Entity shall award the Contract to the successful tenderer whose tender has been determined to be the Lowest Evaluated Tender.

43.0 Notice of Intention to Enter into a Contract/Notification of Award

Upon award of the contract and Prior to the expiry of the Tender Validity Period the Procuring Entity shall issue a Notification of Intention to Enter into a Contract/Notification of award to all tenderers which shall contain, at a minimum, the following information:

- a) the name and address of the Tenderer submitting the successful tender;
- b) the Contract price of the successful tender;
- c) a statement of the reason(s) the tender of the unsuccessful tenderer to whom the letter is addressed was unsuccessful, unless the price information in (c) above already reveals the reason;
- d) the expiry date of the Standstill Period; and
- e) instruction son how to request a debriefing and/ or submit a complaint during the stand still period;

44.0 Stand still Period

44.1 The Contract shall not be signed earlier than the expiry of a Standstill Period of 14 days to allow any dissatisfied tender to launch a complaint. Where only one Tender is submitted, the Standstill Period shall not apply.

44.2 Where a Standstill Period applies, it shall commence when the Procuring Entity has transmitted to each Tenderer the Notification of Intention to Enter into a Contract with the successful Tenderer.

450 Debriefing by The Procuring Entity

- 451** On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract referred to in ITT 43, an unsuccessful tenderer may make a written request to the Procuring Entity for a debriefing on specific issues or concerns regarding their tender. The Procuring Entity shall provide the debriefing within five days of receipt of the request.
- 452** Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending such a debriefing meeting.

46.0 Letter of Award

Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period specified in ITT 42.1, upon addressing a complaint that has been filed with in the Standstill Period, the Procuring Entity shall transmit the Letter of Award to the successful Tenderer. The letter of award shall request the successful tenderer to furnish the Performance Security within 21 days of the date of the letter.

47.0 Signing of Contract

- 47.1** Upon the expiry of the fourteen days of the Notification of Intention to enter in to contract and upon the parties meeting their respective statutory requirements, the Procuring Entity shall send the successful Tenderer the Contract Agreement.
- 47.2** Within fourteen (14) days of receipt of the Contract Agreement, the successful Tenderer shall sign, date, and return it to the Procuring Entity.
- 47.3** The written contract shall be entered into within the period specified in the notification of award and before expiry of the tender validity period.

48.0 Performance Security

- 48.1** Within twenty-one (21) days of the receipt of the Letter of Award from the Procuring Entity, the successful Tenderer shall furnish the Performance Security and, any other documents required in the **TDS**, in accordance with the General Conditions of Contract, subject to ITT 38.2 (b), using the Performance Security and other Forms included in Section IX, Contract Forms, or another form acceptable to the Procuring Entity. A foreign institution providing a bank guarantee shall have a correspondent financial institution located in Kenya, unless the Procuring Entity has agreed in writing that a correspondent bank is not required.
- 48.2** Failure of the successful Tenderer to submit the above-mentioned Performance Security and other documents required in the **TDS** or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the Tenderer offering the next Best Evaluated Tender.
- 48.3** Performance security shall not be required for contracts estimated to cost less than the amount specified in the Regulations.

49.0 Publication of Procurement Contract

Within fourteen days after signing the contract, the Procuring Entity shall publish the awarded contract at its notice boards and websites; and on the Website of the Authority. At the minimum, the notice shall contain the following information:

- a) name and address of the Procuring Entity;
- b) name and reference number of the contract being awarded, a summary of its scope and the selection method used;
- c) the name of the successful Tenderer, the final total contract price, the contract duration;
- d) dates of signature, commencement and completion of contract;
- e) names of all Tenderers that submitted Tenders, and their Tender prices as readout at Tender opening.

50.0 Procurement related Complaints and Administrative Review

50.1 The procedures for making Procurement-related Complaints are as specified in the **TDS**.

50.2 A request for administrative review shall be made in the form provided under contract forms.

Section II - Tender Data Sheet (TDS)

The following specific data shall complement, supplement, or amend the provisions in the Instructions to Tenderers (ITT). Whenever there is a conflict, the provisions herein shall prevail over those in ITT.

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
A. General	
ITT 1.1	The name of the contract is: PROPOSED CONSTRUCTION OF TSC OFFICE BLOCK AT MACHAKOS COUNTY The reference number of the Contract is: TSC/T/30/2021-2023 (Re-advertised)
ITT 2.4	The Information made available on competing firms is as follows: Not Applicable
ITT 2.4	The firms that provided consulting services for the contract being tendered for are: <u>PROJECT MANAGERS/ARCHITECTS</u> Dama Services Ltd P.O. Box 9656-00100 Nairobi. Tel. No. +254 020-2628155 E-Mail: damaservices@gmail.com <u>QUANTITY SURVEYORS</u> Integra Consulting Ltd P.O. Box 27974 – 00100, Nairobi. Tel No. 020-2713061 Email: info@integraconsulting.co.ke <u>CIVIL/STRUCTURAL ENGINEERS</u> Inticom Ltd P.O. Box 14105-00100, Nairobi. Email: inticomltd@gmail.com <u>SERVICES ENGINEERS</u> Norkun Intakes Ltd P.O. Box 605-00100, Nairobi. Email: Info@norkun.com
ITT 3.1	Maximum number of members in the Joint Venture (JV) shall be: Two (2) .

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 7.1	<p>(i) The Tenderer will submit any request for clarifications in writing to;</p> <p style="text-align: center;">Deputy Director, Supply Chain Management Services - SCMS</p> <p style="text-align: center;">ddprocurement@tsc.go.ke</p> <p style="text-align: center;">TEACHERS SERVICE COMMISSION</p> <p style="text-align: center;">TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL,</p> <p style="text-align: center;">PRIVATE BAG-00100,</p> <p style="text-align: center;">NAIROBI.</p> <p>to reach the Procuring Entity not later than 7 Days before closing of bids</p> <p>(ii) The Teachers Service Commission shall publish its response at the website www.tsc.go.ke</p>
ITT 7.2	<p>(A) A Mandatory pre-tender site visit shall and Bidder’s Conference shall take place on Wednesday 15th December,2021 from 10.00 am.</p> <p>(B) Pre-Tender meeting shall take place at the TSC Office, Machakos County</p>
ITT 7.3	<p>(A) A pre-arranged pretender site visit shall take place at the following date, time and place: Date: Wednesday 15th December,2021 Time: 10.00am Place: Machakos TSC Office</p> <p>(B) Pre-Tender meeting shall take place at the following date, time and place: Date: Wednesday 15th December,2021 Time: 10.00am Place: Machakos TSC Office</p>
ITT 1.0	<p>Scope of tender</p> <p>1.1 The Teachers Service Commission invites tenders for the PROPOSED CONSTRUCTION OF TSC OFFICE BLOCKS AT MACHAKOS COUNTY.</p> <p>1.2 Throughout this tendering document:</p> <p>a) The term “in writing” means communicated in written form (e.g. e-mail, including Mailsdispatched through Postal Corporation, distributed or received through the electronic- or hand delivery) with proof of receipt;</p> <p>b) if the context so requires, “singular” means “plural” and vice versa;</p> <p>c) “Day” means calendar day; The procurement proceeding of this procurement subject shall be based on calendar days only. “Business Day” shall not be applicable unless expressly indicated.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
<p>ITT 2.0</p>	<p>Fraud and corruption</p> <p>2.1 The Teachers Service Commission shall require compliance with the provisions of the Public Procurement and Asset Disposal Act, 2015, Section 62 “Declaration not to engage in corruption”. The tender submitted by a person or a firm shall include a declaration that the person/s shall not engage in any corrupt or fraudulent practice and a declaration that the person/s or his or her sub-contractors are not debarred from participating in public procurement proceedings.</p> <p>2.2 The Teachers Service Commission requires compliance with the provisions of the Competition Act 2010, regarding collusive practices in contracting. Any tenderer found to have engaged in collusive conduct shall be disqualified and criminal and/or civil sanctions may be imposed. To this effect, Tenders shall be required to complete and sign the “Certificate of Independent Tender Determination” annexed to the Form of Tender.</p> <p>2.3 Tenderers shall permit and shall cause their agents (whether declared or not), subcontractors, sub-consultants, service providers, suppliers, and their personnel, to permit the Teachers Service Commission to inspect all accounts, records and other documents relating to any initial selection process, tender submission, and contract performance (in the case of award), and to have them audited by auditors appointed by the TSC.</p> <p>2.4 Unfair Competitive Advantage - Fairness and transparency in the tender process require that the firms or their Affiliates competing for a specific assignment do not derive a competitive advantage from having provided consulting services related to this tender. To that end, the Teachers Service Commission shall not indicate or make available to all the firms together with this tender document all information that would in that respect give such firm any unfair competitive advantage over competing firms.</p>
<p>ITT 3.0</p> <p>ITT 3.1</p> <p>ITT 3.2</p> <p>ITT 3.1</p>	<p>Eligible tenderers</p> <p>In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the tendering process and, in the event the JV is awarded the Contract, during contract execution. Members of a joint venture may not also make an individual tender, be a subcontractor in a separate tender or be part of another joint venture for the purposes of the same Tender.</p> <p>The maximum number of JV members shall be a minimum of two firms or a maximum of five people/firms.</p> <p>The teachers Service Commission Board Members, Staff, their Spouses, Children, Parent, Brothers or Sister. Child, Parent, Brother or Sister of a Spouse, their business associates or agents and firms/organizations in which they have a substantial or controlling interest shall not be eligible to tender or be awarded a contract.</p> <p>A Tenderer shall not have a conflict of interest. Any tenderer found to have a conflict of interest shall be disqualified. A tenderer may be considered to have a conflict of interest for the purpose of this tendering process, if the tenderer:</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
<p>ITT 5.0</p> <p>ITT 5.1</p> <p>ITT 5.2</p> <p>ITT 5.3</p> <p>ITT 5.4</p>	<p>Tenderer's responsibilities</p> <p>The tenderer shall bear all costs associated with the preparation and submission of his/her tender, and the Teachers Service Commission shall in no case be responsible or liable for those costs.</p> <p>The tenderer, at the tenderer's own responsibility and risk, is encouraged to attend the mandatory site visit, examine and inspect the Site of the Works (TSC Office – Machakos County) and its surroundings and obtain all information that may be necessary for preparing the tender and entering into a contract for construction of the Works. <i>The costs of visiting the Site and attending the pre-bid conference shall be at the tenderer's own expense.</i></p> <p>The Tenderer and any of its personnel or agents will be granted permission by the Teachers Service Commission to enter upon its premises and lands for the purpose of such visit. The Tenderer shall indemnify the TSC against all liability arising from death or personal injury, loss of or damage to property, and any other losses and expenses incurred as a result of the examination and inspection.</p> <p>A mandatory Pre-Tender meeting shall take place on Wednesday 15th December, 2021 at 10.00 am</p>
<p>ITT 6.2</p> <p>ITT 6.3</p>	<p>The Invitation to Tender Notice issued by the Teachers Service Commission shall not be part of the Contract documents unless obtained directly from the Commission. TSC shall not be responsible for the completeness of the Tender document, responses to requests for clarification, the minutes of a pre-arranged site visit and those of the pre-Tender meeting (if any), or Addenda to the Tender document in accordance with ITT 10. In case of any contradiction, documents obtained directly from the Commission, shall or downloaded from the TSC Website or Tender's Portal shall prevail.</p> <p>The Tenderer is expected to examine all instructions, forms, terms, and specifications in the Tender Document and shall furnish with its Tender all information and documentation as required by the Tender document.</p>
<p>ITT 7.0</p> <p>ITT 7.1</p>	<p>Clarification of Tender Document, Site Visit, Pre-tender Meeting</p> <p>A Tenderer requesting any clarification of the Tender Document shall contact the Teachers Service Commission in writing at the email address: <i>ddprocurement@tsc.go.ke</i> or raise its enquiries during the pre-Tender site meeting in accordance with ITT 7.2. The TSC will respond in writing to any request for clarification within three (3) business days, provided that such request is received no later than seven (7) days prior to the deadline for submission of tenders. The TSC shall forward copies of its response to all tenderers who have acquired the Tender documents including a description of the inquiry but without identifying its source. The TSC shall promptly publish its response at the Commission's Website. Should the clarification result in changes to the essential elements of the Tender Documents, the Commission shall amend the Tender Documents and upload an addendum in its website and in the print media if the amendment has been issued within less than seven (7) days. This may result in extension of the opening date by additional seven (7) days.</p> <p style="text-align: center;">TEACHERS SERVICE COMMISSION TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL, 2ND FLOOR SCMS – PODIUM WING PRIVATE BAG-00100, NAIROBI.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	<p style="text-align: center;">OFFICER NAME: DEPUTY DIRECTOR-SCMS</p> <p style="text-align: center;">TELEPHONE NUMBER: 0202812301/0208079033</p> <p style="text-align: center;">ddprocurement@tsc.go.ke</p>
<p>ITT 8.0</p> <p>ITT 8.1</p> <p>ITT 8.2</p> <p>ITT 8.3</p>	<p>Amendment of Tender Documents</p> <p>At any time prior to the deadline for submission of Tenders, Tuesday 19th October, 2021, the Teachers Service Commission may amend the Tender Documents by issuing addenda.</p> <p>Any addendum issued shall be part of the Tender Documents and shall be communicated in writing to all who have obtained the Tender Documents from the Commission. The Commission shall also promptly publish the addendum on its website www.tsc.go.ke, and www.tenders.go.ke. The notice of the addendum shall be published in one of the print media with wide circulation in Kenya.</p> <p>To give Tenderers reasonable time in which to take an addendum into account in preparing their Tenders, the Teachers Service Commission shall extend the dead line for the submission of Tenders, for a maximum of seven (7) days from the earlier communicated date of tender opening Thursday 23rd December, 2021 at 9.00 am.</p>
<p>ITT 7.5</p>	<p>The Tenderer will submit any questions in writing, to reach the Commission not later than 24 hours before the site visit/pre-bid conference meeting.</p>
<p>ITT 9.0</p> <p>ITT 9.1</p>	<p>Cost of Tendering</p> <p>The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Teachers Service Commission shall not be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.</p>
<p>C. Preparation of Tenders</p>	
<p>ITT 11.1 (h)</p>	<p>The Tenderer shall submit the following additional documents in its Tender:</p> <ol style="list-style-type: none"> a) Form of Tender prepared in accordance with ITT 12; b) Schedules including priced Bill of Quantities, completed in accordance with ITT 12 and ITT14; c) Tender Security or Tender-Securing Declaration, in accordance with ITT 19.1; d) Authorization: written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT 20.3; e) Qualifications: documentary evidence in accordance with ITT 17 establishing the Tenderer's qualifications to perform the Contract if its Tender is accepted; f) Conformity: a technical proposal in accordance with ITT 16; g) Tenderers shall also submit additional documents as part of the tender document; <ol style="list-style-type: none"> 1. Registration certificate from National Construction Authority, Category 5 and above in Building works (General Building Contractor). 2. Certified Copy of Valid NCA Practicing License 3. Domestic Sub- Contractors <p>The Bidder must have the following Domestic Sub-Contractors and provide the relevant applicable documents showing their qualification:</p> <ul style="list-style-type: none"> • Plumbing & Drainage Installations Subcontractor National Construction Authority, Category 6 and above. • Electrical Installations Subcontractor National Construction Authority,

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
	<p>Category 6 and above. Energy & Petroleum Regulatory Authority (EPRA) Class B</p> <p>In addition, contractors, both single entity and joint venture, MUST provide the following;</p> <ol style="list-style-type: none"> 1) A Copy of Company Registration Certificates. (Be a registered company incorporated in Kenya under the Companies Act CAP 486). (For Main Contractor and Domestic SubContractors) 2) A copy of Valid Tax Compliance Certificate, including a copy of the company's Pin No. (For Main Contractor and Domestic Sub Contractors) 3) Current Business License. (For Main Contractor and Domestic Sub Contractors) 4) Provide letter of Authority to seek references from tenderer's key referenced clients provided in the tender document. 5) Evidence of physical location of office by providing certified copies of premises ownership / lease, and utility bills. (For Main Contractor and Domestic Sub Contractors) 6) A copy of the company list of directors, beneficial owners, name of proprietor or names of partners (Copy of CR12) issued by the registrar of companies within the last six months showing the list of directors. 7) The Bidders are required to fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer of the Item/Equipment they propose to supply. The Bidders are also required to submit relevant technical brochures/catalogues with the tender document, highlighting the catalogue numbers of the proposed items. Such brochures/catalogues are to indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following: <ul style="list-style-type: none"> (a) Standards of manufacture; (b) Performance ratings/characteristics; (c) Material of manufacture; (d) Electrical power ratings; and (e) Any other necessary requirements
<p>ITT 12.0</p> <p>ITT 12.1</p>	<p>Form of Tender and Schedules</p> <p>The Form of Tender and Schedule of Requirement, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Tendering Forms only. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITT 20.3. All blank spaces shall be filled in with the information requested. The BQ blank spaces not filled with prices shall be assumed to have been catered in the total prices. Tenderers shall not be allowed to negotiate on the blank spaces not filled during tendering. The Tenderer shall chronologically serialize all pages, sign and stamp the tender documents submitted. Tenderers that shall fail to abide by this instruction shall be disqualified.</p>
<p>ITT 13.1</p>	<p>Alternative Tenders shall not be considered nor Accepted.</p>
<p>ITT 13.2</p>	<p>Alternative times for completion shall not be permitted.</p>
<p>ITT 13.4</p>	<p>Tenderers are NOT permitted to submit Alternative Technical Solution.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
<p>ITT 14.0</p> <p>ITT 14.1</p> <p>ITT 14.2</p> <p>ITT 14.5</p>	<p>14.0 Tender Prices and Discounts</p> <p>The Tenderers shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Tenderer shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Teachers Service Commission. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Tender, and provided that the Tender is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive Tenderers will be the final Tender price and the absolute total cost of the Tender so determined for price comparison.</p> <p>The price quoted in the Form of Tender, in accordance with ITT 12.1, shall be the total price of the Tender sum, including any discounts offered.</p> <p>The rates and prices quoted by the Tenderer shall not be subjected to any adjustment during the tender evaluation or performance of the Contract in accordance with the provisions of the Conditions of Contract. Prices shall remain fixed during the contract performance period and may only be considered for adjustment if there is a National Economic Effects pronounced by the National Government. In such a case, the Tenderer and the TSC shall consider the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data, Price Index from KNBS or Inflation Rate from CBK</p>
<p>ITT 15.0</p> <p>ITT 15.1</p>	<p>15.0 Currencies of Tender and Payment</p> <p>Tenderers shall be allowed to quote entirely in Kenya Shillings only. The unit rates and the prices in the Bill of Quantities and any other relevant financial proposal shall be quoted by the Tenderer shall remain entirely in Kenya shillings only.</p>
<p>ITT 16.0</p> <p>ITT 16.1</p> <p>ITT 16.2</p>	<p>Documents Comprising the Technical Proposal</p> <p>The Tenderer shall furnish a technical proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV, Tender Forms.</p> <p>Insufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the work's requirements and the completion time may lead to disqualification</p>
<p>ITT 17.0</p> <p>ITT 17.1</p> <p>ITT 17.2</p> <p>ITT 17.3</p>	<p>Documents Establishing the Eligibility and Qualifications of the Tenderer</p> <p>Tenderers shall complete the Form of Tender, included in Section IV, Tender Forms, to demonstrate Tenderer's eligibility in accordance with ITT 4.</p> <p>Section III of the tender document provides Evaluation and Qualification Criteria, to establish tenderer's qualifications to perform the Contract. Tenderers shall provide the information requested in the corresponding information sheets included in Section IV, Tender Forms.</p> <p>Margin of preference shall apply. <i>Tenderers shall provide, as part of the data for qualification, such information, including details of ownership, to determine whether, they are categorized as citizen contractor. The tenderers must meet the 51% shareholding of the firm applying.</i></p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 17.6	<p>The Tenderer shall provide further documentary proof, information or authorizations that the Teachers Service Commission has requested in relation to ownership and control of the firm/s to determine the information which was provided by the tenderer under ITT 6.4. The obligations to require this information shall continue for the duration of the procurement process and contract performance and after completion of the contract, if any change to the information previously provided may reveal a conflict of interest in relation to the award or management of the contract, the Commission shall be obligated to terminate the procurement proceeding.</p>
ITT 17.7	<p>All information provided by the Tenderer pursuant to these requirements <i>must be complete, current and accurate as at the date of Tender Opening and shall remain valid during the procurement implementation period.</i> In submitting the information required pursuant to these requirements, the Tenderer shall warrant that the information submitted is complete, current and accurate as at the date of submission to the Teachers Service Commission.</p>
ITT 17.8	<p>If a tenderer fails to submit the information demonstrating that it meets eligibility requirements, its tender will be rejected. Similarly, if the TSC is unable, after taking reasonable steps, to verify to a reasonable degree the information submitted by a tenderer pursuant to these requirements, then the tender will be rejected.</p>
ITT 17.9	<p>If information submitted by a tenderer pursuant to these requirements, or obtained by the Teachers Service Commission (whether through its own enquiries, through notification by the public or otherwise), shows any conflict of interest which could materially and improperly benefit the tenderer in relation to the procurement or contract management process, then:</p> <ul style="list-style-type: none"> i) If the procurement process is still ongoing, the tenderer will be disqualified from the procurement process, ii) if the contract has been awarded to that tenderer, the contract award will be set aside pending the outcome of (iii), iii) the tenderer will be referred to the relevant law enforcement authorities for investigations of whether the tenderer or any other person have committed any criminal offence.
ITT 17.10	<p>If a tenderer submits information pursuant to these requirements that is incomplete, inaccurate or out-of-date, or attempts to obstruct the verification process, then the consequences ITT 17.8 will ensue unless the tenderer can show to the reasonable satisfaction of the TSC that any such act was not material, or was due to genuine error which was not attributable to the intentional act, negligence or recklessness of the tenderer.</p>
ITT 18	<p><i>Period of Validity of Tenders</i></p> <p>ITT 18.1 Tenders shall remain valid for a period of 150 calendar days. The Tender Validity period starts from the date fixed for the Tender submission deadline on Thursday 23rd December, 2021 at 9.00 am. A tender valid for a shorter period shall be rejected by the Commission as non-responsive.</p> <p>ITT 18.2 In exceptional circumstances, prior to the expiration of the Tender validity period, the Teachers Service Commission may request Tenderers to extend the period of tender validity to a maximum of 30 days. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 19, it shall also be extended for thirty (30) days beyond the deadline of the extended validity period. A Tenderer granting the request shall not be required or permitted to modify its tender.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 18.3	<p>(a) The Number of days beyond the expiry of the initial tender validity period will be 30 days.</p> <p>(b) The Tender price shall NOT be adjusted by anybody whatsoever during the extension.</p>
ITT 19	<p>Tender Security</p>
	<p>All Tenderer shall furnish as part of its Tender Document a Tender Security of KSHS.300,000.00 for a period of 180 days.</p>
ITT 19.1	<p>The Tender Security shall be in any of the following forms at the Tenderer's option:</p> <ol style="list-style-type: none"> a) a bank guarantee; b) a guarantee by an insurance company registered and licensed by the Insurance Regulatory Authority listed by the Authority; c) a guarantee issued by a financial institution approved and licensed by the Central Bank of Kenya, from a reputable source, and an eligible country.
ITT 19.2	<p>The Tender Security shall be valid for thirty (30) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 18.2.</p>
ITT 19.3	<p>If a Tender is not accompanied by a substantially responsive Tender Security, the tender shall be rejected by the TSC as non-responsive.</p>
ITT 19.4	<p>Tender Security of unsuccessful Tenderers shall be returned as promptly as possible upon the successful Tenderer's signing the Contract and furnishing the Performance Security and any other documents required. The TSC shall also promptly return the tender security to the tenderers where the procurement proceedings are terminated, all tenders were determined non-responsive or a bidder declines to extend tender validity period.</p>
ITT 19.5	<p>The Tender Security of the successful Tenderer shall be returned as promptly as possible once the successful Tenderer has signed the Contract and furnished the required Performance Security, and any other documents required.</p>
ITT 19.6	<p>The Tender Security may be forfeited if:</p> <ol style="list-style-type: none"> a) a Tenderer withdraws its Tender during the Tender validity period of 150 calendar days from the date of tender opening.; or <p>if the successful Tenderer fails to: -</p> <ol style="list-style-type: none"> i) Contract in accordance with ITT 4.7; or ii) furnish a Performance Security, and any other documents required in the TDS.
ITT 19.9	<p>The Tender Security of a JV shall be in the name of the JV that submits the Tender. If the JV has not been legally constituted into a legally enforceable JV at the time of tendering, the Tender Security shall be in the names of all future members as named in the letter of intent referred to in ITT 4.1 and ITT 11.2.</p>
ITT 19.10	<p>A tenderer shall not issue a tender security to guarantee itself.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 20	Format and Signing of Tender
ITT 20.1	The Tenderer shall prepare ONE ORIGINAL of the documents comprising the Tender as described in ITT 11 and clearly mark it “ ORIGINAL .” In addition, the Tenderer shall submit TWO (2) copies of the Tender document, clearly mark them “ COPY .” In the event of any discrepancy between the original and the copies, the original shall prevail.
ITT 20.2	Tenderers shall mark as “ CONFIDENTIAL ” all information in their Tenders which are confidential to their business. This may include proprietary information, trade secrets, or commercial or financially sensitive information.
ITT 20.3	The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written Power of Attorney by the Head of the Company in the position of a Director or General Manager, or a letter from Commissioner of Oath attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialed by the person signing the Tender.
ITT 20.4	In case the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives or law firm.
ITT 20.5	Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Tender.
ITT 20.6	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of: Power of Attorney which demonstrates that the signatory is duly authorized to sign the tender on behalf of JV bidder’s partners. Power of the Attorney shall be signed and stamped by all representatives. If the signatory to the tender is not a director of the company, provide name and attach proof of citizenship of the signatory to the tender.

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 21.0	<p align="center">SUBMISSION AND OPENING OF TENDERS</p> <p>21.0 Sealing and Marking of Tenders</p> <p>21.1 The Tenderer shall deliver the Tender in a single sealed envelope, or in a single sealed package, or in a single sealed container bearing the Name and Reference number of the Tender, addressed to the Commission Secretary, Teachers Service Commission and a warning not to open before Thursday 23rd December, 2021 at 9.00 am. Within the single envelope, package or container, the Tenderer shall place the following separate, sealed envelopes:</p> <p>a) In an envelope or package or container marked “ORIGINAL”, all documents comprising the Tender, as described in ITT 11; and</p> <p>b) In an envelope or package or container marked “COPIES”, all required copies of the Tender;</p> <p>ALTERNATIVE TENDER”, Shall not Apply</p> <p>The inner envelopes or packages or containers shall:</p> <p>a) bear the name and address of the Teachers Service Commission</p> <p>b) bear the name and address of the Tenderer; and</p> <p>c) bear the name and Reference number of the Tender.</p> <p>21.2 If an envelope or package or container is not sealed and marked as required, the Teachers Service Commission will assume no responsibility for the misplacement or premature opening of the Tender. <i>Tenders misplaced or opened prematurely will not be accepted</i></p>
D. Submission and Opening of Tenders	
ITT 22.1	<p>(A) For Tender submission purposes only, the Procuring Entity’s address is:</p> <p>THE CHIEF EXECUTIVE OFFICER</p> <p>TEACHERS SERVICE COMMISSION</p> <p>TSC HOUSE, KILIMANJARO AVENUE, UPPERHILL, 2ND</p> <p>FLOOR NUMBER – SUPPLY CHAIN MANAGEMENT OFFICE</p> <p>PRIVATE BAG-00100, NAIROBI.</p> <p>ddprocurement@tsc.go.ke</p> <p>(4) Date and time for submission of Tenders Thursday 23rd December, 2021 at 9.00 am</p> <p>Tenderers shall not submit tenders electronically.</p> <p>22.2 The Teachers Service Commission may, at its discretion, extend the deadline for the submission of Tenders by amending the Tender Documents in accordance with ITT 8, in which case all rights and obligations of the Commission and Tenderers previously subject to the deadline shall thereafter be subject to the deadline as extended..</p>
ITT 23.0	<p>Late Tenders</p> <p>The Teachers Service Commission shall not consider any Tender that arrives after the deadline for submission of tenders, in accordance with ITT 22. Any Tender received by the Commission after the submission time and date at 9.00 am Thursday, 23rd December, 2021 shall be declared late, rejected, and returned unopened to the Tenderer.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 24.0	<p>Withdrawal, Substitution, and Modification of Tenders</p> <p>24.1 A Tenderer may withdraw, substitute, or modify its Tender after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITT 20.3, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Tender must accompany the respective written notice. All notices must be</p>
ITT 25.0	<p>Tender Opening</p> <p>25.1 Except in the cases of late submission, withdrawal or substitution, and modification of tenders, the Teachers Service Commission shall publicly open and read out all Tenders received by the deadline on Thursday 23rd December, 2021 at 9.00 am at the TSC Building Ground Floor in the presence of Tenderers' designated representatives who chooses to attend. Any Electronic Tender opening procedures shall not apply.</p> <p>25.2 First, envelopes marked “WITHDRAWAL” shall be opened and read out and the envelopes with the corresponding Tender shall not be opened but returned to the Tenderer. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Tender opening.</p> <p>25.3 Next, envelopes marked “SUBSTITUTION” shall be opened and read out and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned to the tenderer.</p> <p>25.4 Next, envelopes marked “MODIFICATION” shall be opened and read out with the corresponding Tender. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Tender opening.</p> <p>25.5 Next, all remaining envelopes shall be opened one at a time, reading out: the name of the Tenderer and whether there is a modification; the total Tender Price, per lot (contract) if applicable, including any discounts and alternative Tenders; the presence or absence of a Tender Security or Tender-Securing Declaration, if required; and any other details as the Procuring Entity may consider appropriate.</p> <p>25.7 At the Tender Opening, the Teachers Service Commission shall neither discuss the merits of any Tender nor reject any Tender except for late Tenders.</p> <p>25.8 The Teachers Service Commission shall prepare minutes of the Tender Opening that shall include, as a minimum: -</p> <ol style="list-style-type: none"> a) the name of the Tenderer and whether there is a withdrawal, substitution, or modification; b) the Tender Price, including any discounts; c) the presence or absence and the amount of a Tender Security, if new as required; e) number of pages of each tender document submitted. <p>25.9 The Tenderers' representatives who are present shall be requested to sign the minutes. The omission of a Tenderer's signature on the minutes shall not invalidate the contents and effect of the minutes. A copy of the tender opening register shall be distributed to all Tenderers.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 26.0	<p>Confidentiality</p> <p>26.1 Information relating to the evaluation of Tenders and recommendation of contract award shall not be disclosed to Tenderers or any other persons not officially concerned with the Tender process until information on Intention to Award the Contract is transmitted to all Tenderers in accordance with ITT 43.</p> <p>26.2 Any effort by a Tenderer to influence the Teachers Service Commission in the evaluation of the Tenders or Contract award decisions shall result in the rejection of its tender.</p> <p>26.3 Notwithstanding ITT 26.2, from the time of tender opening to the time of contract award, if a tenderer wishes to contact the Teachers Service Commission on any matter related to the tendering process, it shall do so in writing.</p>
ITT 27.0	<p>27.0 Clarification of Tenders</p> <p>27.1 To assist in the examination, evaluation, and comparison of the tenders, and qualification of the tenderers, the Teachers Service Commission may, at its discretion, ask any tenderer for a clarification of its tender, given at least four (4) days. Any clarification submitted by a tenderer that is not in response to a request by the Procuring Entity shall not be considered. The Teachers Service Commission's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the tender shall be sought, offered, or permitted.</p> <p>27.2 If a tenderer does not provide clarifications of its tender within four (4) days on TeachersService Commission's request for clarification, its Tender may be rejected.</p>
ITT 29.0	<p>Determination of Responsiveness</p> <p>29.1 The Teachers Service Commission's determination of a Tender's responsiveness is to be based on the contents of the tender itself, as defined in ITT 11.</p> <p>29.2 A substantially responsive Tender is one that meets the requirements of the Tender document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, if accepted, would:</p> <ul style="list-style-type: none"> a) Affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; b) limit in any substantial way, inconsistent with the tender document, the Teachers Service Commission's rights or the tenderer's obligations under the proposed contract; c) if rectified, would unfairly affect the competitive position of other tenderers presenting substantially responsive tenders. <p>29.3 The Teachers Service Commission shall examine the technical aspects of the tender submitted in accordance with ITT 16, to confirm that all requirements of Section VI, Works' Requirements have been met without any material deviation, reservation or omission.</p> <p>29.4 If a tender is not substantially responsive to the requirements of the tender document, it shall be rejected by the Teachers Service Commission and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.</p>
E. Evaluation, and Comparison of Tenders	
ITT 30.0	<p>Provided that a tender is substantially responsive, the Teachers Service Commission shall rectify quantifiable of non-material or non-conformities related to the Tender Price. To this effect, the Tender Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component.</p> <p>30.3 The adjustment shall be based on the average price of the item or component as quoted in other substantially responsive Tenders. If the price of the item or component cannot be derived from the price of other substantially responsive Tenders, the Teachers Service Commission shall use its best estimate.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 31.0	<p>Arithmetical Errors</p> <p>31.1 The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity.</p> <p>31.2 Provided that the Tender is substantially responsive, the Teachers Service Commission shall handle errors on the following basis: -</p> <p>a) Any error detected if considered a major deviation that affects the substance of the tender, shall lead to disqualification of the tender as non-responsive;</p> <p>b) Any errors in the submitted tender arising from a miscalculation of unit price, quantity, subtotal and total bid price shall be considered as a major deviation that affects the substance of the tender and shall lead to disqualification of the tender as non-responsive and;</p> <p>c) If there is a discrepancy between words and figures, the amount in words shall prevail</p> <p>31.3 Tenderers shall be notified of any error detected in their bid during the notification of award.</p>
TT 32.1	The currency that shall be used for Tender evaluation and comparison purposes only to convert at the selling exchange rate all Tender prices expressed in various currencies into a single currency is: Kenya Shillings.
ITT 33.2	A margin of preference shall not apply.
ITT 33.4	Not Applicable
ITT 34.1	The Teachers Service Commission does not intend to execute any specific elements of the Works by subcontractors selected/nominated. The main contract shall specify the working arrangements between the main contractor and the nominated subcontractor.
ITT 34.2	Contractor's may propose subcontracting: Maximum percentage of subcontracting permitted is Limited. To Specialized Works only. Tenderers planning to subcontract more than 10% of total volume of work shall specify, in the Form of Tender, the activity (ies) or parts of the Works to be subcontracted along with complete details of the subcontractors and their qualification and experience.
ITT 34.3	<p>The parts of the Works for which the TSC permits Tenderers to propose Specialized Subcontractors are designated as follows:</p> <ol style="list-style-type: none"> a. Plumbing and Drainage Installation Works b. Electrical Installation Works and LAN and Cabling OR c. LAN and Cabling only. <p>For the above-designated parts of the Works that may require Specialized Subcontractors, the relevant qualifications of the proposed Specialized Subcontractors will be added to the qualifications of the Tenderer for the purpose of evaluation. <i>Any failure by the Nominated/sub-contractor Contractor shall lead to automatic disqualification of both the Main Contractor and the Sub-contractor.</i></p>
ITT 35.0	<p>Evaluation of Tenders</p> <p>35.1 The Teachers Service Commission shall use the criteria and methodologies listed in this ITT and Section III, Evaluation and Qualification Criteria. No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies the Commission shall determine the Lowest Evaluated based on tender requirements and the tender price as read during tender opening. There shall be no price adjustments by anybody whatsoever.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 37.0	<p>37.0 Abnormally low tenders and abnormally high tenders</p> <p>Abnormally Low Tenders</p> <p>37.1 An Abnormally Low Tender is one where the Tender price, in combination with other elements of the Tender, appears so low that it raises material concerns as to the capability of the Tenderer in regards to the Tenderer's ability to perform the Contract for the offered Tender Price or that genuine competition between Tenderers is compromised.</p> <p>37.2 In the event of identification of a potentially Abnormally Low Tender, the Teachers Service Commission shall seek written clarifications from the Tenderer, including detailed price analyses of its Tender price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Tender document.</p> <p>37.3 After evaluation of the price analysis and in the event that the Teachers Service Commission determines that the Tenderer has failed to demonstrate its capability to perform the Contract for the offered Tender Price, the Commission shall reject the Tender.</p> <p>Abnormally high tenders</p> <p>37.4 An abnormally high tender price is one where the tender price, in combination with other constituent elements of the Tender, appears unreasonably too high to the extent that the Teachers Service Commission is concerned that it may not be getting value for money or it may be paying too high a price for the contract compared with market prices or that genuine competition between Tenderers is compromised.</p> <p>37.5 In case of an abnormally high price, the Teachers Service Commission shall conduct a market survey of the market prices, check if the estimated cost of the contract is correct and review the Tender Documents to check if the specifications, scope of work and conditions of contract are contributory to the abnormally high tenders. The Commission may also seek written clarification from the tenderer on the reasons for the high tender price. The Commission shall proceed as follows:</p> <ol style="list-style-type: none"> I. If the tender price is abnormally high based on wrong estimated cost of the contract, The Commission shall reject or disqualify the tender. II. If specifications, scope of work and/or conditions of contract are contributory to the abnormally high tender prices, the Commission shall reject all tenders and may retender for the contract based on revised estimates, specifications, scope of work and conditions of contract, as the case may be. <p>37.6 If the Commission determines that the Tender Price is abnormally too high because genuine competition between tenderers is compromised (often due to collusion, corruption or other manipulations), the Commission shall reject all Tenders and shall institute or cause competent Government Agencies to institute an investigation on the cause of the compromise, before retendering.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 38.0	<p>Unbalanced and/ or front-loaded tenders</p> <p>38.1 If in the Teachers Service Commission's opinion, the Tenderer with the lowest evaluated price is seriously unbalanced and/or frontloaded, the Commission shall request the Tenderer to provide written clarifications. Clarifications shall include detailed price analysis to demonstrate the consistency of the tender prices with the scope of works, proposed methodology, schedule and any other requirements of the Tender document.</p> <p>38.2 After the evaluation of the information and detailed price analysis presented by the Tenderer, the Commission may as appropriate:</p> <p>a) accept the Tender;</p> <p>b) require that the total amount of the Performance Security be increased at the expense of the Tenderer to a level not exceeding a 30% of the Contract Price;</p> <p>c) agree on a payment mode that eliminates the inherent risk of the TSC paying too much for undelivered works;</p> <p>d) reject the Tender,</p>
ITT 39.0	<p>Qualifications of the tenderer</p> <p>39.1 The Teachers Service Commission shall determine to its satisfaction whether the eligible Tenderer that is selected as having submitted the lowest evaluated cost and substantially responsive Tender, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.</p> <p>39.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer. The determination shall take into consideration the qualifications of other firms such as the Tenderer's subcontractors permitted in the Tender document.</p> <p>39.3 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in disqualification of the Tender, in which event the TSC shall proceed to the Tenderer who offers a substantially responsive Tender with the next lowest evaluated price to make a similar determination of that Tenderer's qualifications to perform satisfactorily.</p>
ITT 40.0	<p>Lowest evaluated tender</p> <p>Having compared the evaluated prices of Tenders, the Teachers Service Commission shall determine the Lowest Evaluated Tender. The Lowest Evaluated Tender is the Tender of the Tenderer that meets the Qualification Criteria and whose Tender has been determined to be:</p> <p>a) Most responsive to the Tender document; and</p> <p>b) the lowest evaluated price.</p>
ITT 42.0	<p>Procuring entity's right to accept any tender, and to reject any or all tenders.</p> <p>The Teachers Service Commission reserves the right to accept or reject any Tender and to annul the Tender process and reject all Tenders at any time prior to Contract Award, without thereby incurring any liability to Tenderers. In case of annulment, all Tenders submitted and specifically, Tender securities, shall be promptly returned to the Tenderers.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 43.0	<p>Notice of Intention to Enter into a Contract/Notification of Award</p> <p>Upon award of the contract and Prior to the expiry of the Tender Validity Period the Teachers Service Commission shall issue a Notification of Intention to Enter into a Contract/Notification of award to all tenderers which shall contain, at a minimum, the following information:</p> <p>a) the name and address of the Tenderer submitting the successful tender;</p> <p>b) the Contract price of the successful tender;</p> <p>c) a statement of the reason(s) of the unsuccessful tenderer;</p> <p>d) the expiry date of the Standstill Period; and</p> <p>e) instructions on how to request a debriefing and/ or submit a complaint during the stand still period;</p>
ITT 44.0	<p>Stand still Period</p> <p>44.1 The Contract shall not be signed earlier than the expiry of a Standstill Period of 14 calendar days to allow any dissatisfied tender to launch a complaint. Where only one Tender is submitted, the Standstill Period shall not apply.</p> <p>44.2 The Standstill Period shall commence on the date when the Teachers Service Commission has transmitted to each Tenderer the Notification of Intention to Enter into a Contract with the successful Tenderer</p>
ITT 45.0	<p>Debriefing by The Procuring Entity</p> <p>45.0 On receipt of the Letter of Notification of Intention to Enter into a Contract, an unsuccessful tenderer may make a written request to the Commission for a debriefing on specific issues or concerns regarding their tender. The Commission shall provide the debriefing within five days of receipt of the request.</p> <p>45.1 Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending such a debriefing meeting.</p>
ITT 46.0	<p>Letter of Award</p> <p>Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period of 14 calendar days, a tenderer may address a complaint to the Commission within the Standstill Period, the Commission shall transmit the Letter of Award to the successful Tenderer. The letter of award shall request the successful tenderer to furnish the Performance Security within 21 days of the date of the letter. Contract shall only be signed after submission and confirmation of the Performance Security.</p>
ITT 47.0	<p>Signing of Contract</p> <p>47.1 Upon the expiry of the fourteen (14) Calendar days of the Notification of Intention to enter in to contract and upon the parties meeting their respective statutory requirements, the Teachers Service Commission shall send the successful Tenderer the Contract Agreement.</p> <p>47.2 Within fourteen (14) Calendar days of receipt of the Contract Agreement, the successful Tenderer shall sign, date, and return it to the Commission.</p> <p>47.3 The written contract shall be entered into within the period specified in the notification of award and before expiry of the tender validity period.</p>

Reference to ITC Clause	PARTICULARS OF APPENDIX TO INSTRUCTIONS TO TENDERS
ITT 48.0	<p>Performance Security</p> <p>48.1 Within twenty-one (21) Calendar days of the receipt of the Letter of Award, the successful Tenderer shall (a) furnish the Teachers Service Commission with the Performance Security of 10% of the tender price in form of a bank guarantee from a reputable bank regulated by the CBK.</p> <p>A) Other documents required in the TDS, in accordance with the General Conditions of Contract, INSURANCE CERTIFICATES Failure by the successful Tenderer to submit a Performance Security and other documents required in the TDS or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event, the TSC may award the Contract to the Tenderer offering the next Best Evaluated Tender.</p>
ITT 50.1	<p>The procedures for making a Procurement-related Complaint are detailed in the “Notice of Intention to Award the Contract” herein and are also available from the PPRA Website. www.ppra.go.ke or email complaints@ppra.go.ke.</p> <p>If a Tenderer wishes to make a Procurement-related Complaint, the Tenderer should submit its complaint following these procedures, in writing (by the quickest means available, that is either by hand delivery or email to:</p> <p>For the attention:</p> <p>Title/position: THE CHIEF EXECUTIVE OFFICER/ COMMISSION SECRETARY</p> <p>Procuring Entity: TEACHERS SERVICE COMMISSION</p> <p>Email address: ddprocurement@tsc.go.ke or ceo@tsc.go.ke</p> <p>In summary, a Procurement-related Complaint may challenge any of the following (among others):</p> <p>(i) the terms of the Tender Documents; and</p> <p>(ii) the Teachers Service Commission decision to award the contract.</p>

MANDATORY EVALUATION FOR MAIN CONTRACTORS**STAGE 1-PRELIMINARY EXAMINATION**

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

Domestic Sub-Contractors shall submit the following additional documents as part of its Tender document:
Failure to submit any of the document listed below shall lead to disqualification and the tenderer shall be declared Non-responsive.

MANDATORY REQUIREMENTS FOR DOMESTIC SUB-CONTRACTORS

The Main Contractor MUST team up with domestic Sub-Contractors registered by National Construction Authority (NCA) and MUST meet/provide the requirements below for every service works where applicable:

Preliminary Evaluation: Determination of Responsiveness for Domestic Contractors

SUPPLY, DELIVERY, INSTALATION, TESTING AND COMMISSIONING OF PLUMBING, DRAINAGE, WORKS

S/N	Mandatory Requirements	Responsiveness – YES/NO
MR1	Certificate of Incorporation/Registration from the Registrar of Companies – Kenya	
MR2	Submission of valid CR12 form issued by the registrar of companies within the last three (3) months from the date of tender submission showing the list of directors /shareholding or National Identity Card(s) for Sole Proprietorship /Partnership	
MR3	Valid Tax Compliance Certificate from KRA (2021),	
MR4	Valid NCA Registration Certificate under Category 6 and above in Plumbing, Drainage & Fire Protection Works.	
MR5	Valid NCA Annual Contractor’s Practicing License in Plumbing, Drainage & Fire Protection Works Category 6 and above	
MR6	Duly filled (in ink) Bills of quantities in the format provided	
MR7	Duly signed legally bidding contract between the Main Contractor and the Specialized Firm confirming their agreement to work together and to be jointly liable during the implementation and execution of the contract. ONLY if the main contractor has engaged a sub-contractor	
MR8	Evidence of physical location of office by providing copies of premises ownership / lease, or Utility Bills.	

SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF ELECTRICAL WORKS.

S/N	Mandatory Requirements	Responsiveness – YES/NO
MR1	Certificate of Incorporation/Registration from the Registrar of Companies	
MR2	Submission of valid CR12 form issued by the registrar of companies within the last three months from the date of tender submission showing the list of directors /shareholding or National Identity Card(s) for Sole Proprietorship or Partnership	
MR3	Valid Tax Compliance Certificate from KRA.	
MR4	Valid NCA Registration Certificate Category 6 and above in Electrical Works.	
MR5	Valid NCA Annual Contractor’s Practicing License in Category 6 and above.	

MR6	Copy of current EPRA Licenses in Electrical Installation Works - Class B and above	
MR7	Duly filled (in ink) Bills of quantities in the format provided.	
MR8	Duly signed legally bidding contract between the Main Contractor and the Specialized Firm confirming their agreement to work together and to be jointly liable during the implementation and execution of the contract. ONLY if the main contractor has engaged a sub-contractor	
MR9	Evidence of physical location of office provide certified copies of premises ownership / lease, or Utility Bills.	

ICT INSTALLATION WORKS.

S/N	Mandatory Requirements	Responses YES/NO
MR1	<i>Certificate of Incorporation/Registration</i>	
MR2	<i>Submission of valid CR12 form issued by the registrar of companies within the last three months from the date of tender submission showing the list of directors /shareholding or National Identity Card(s) for Sole Proprietorship or Partnership</i>	
MR3	<i>Valid Tax Compliance Certificate for 2021.</i>	
MR4	<i>Valid copy of NCA Registration Certificate, Category 6 and above in the following works; (a) Structured Cabling and IP-PBX (b) CCTV & Access Control</i>	
MR5	<i>Valid NCA Annual Contractor's Practicing License in Category 6 and above.</i>	
MR6	<i>Copy of Current Class of licenses with the Communication Authority of Kenya (CAK)</i>	
MR7	<i>Duly filled (in ink) Bills of quantities in the format provided.</i>	
MR8	Duly signed legally bidding contract between the Main Contractor and the Specialized Firm confirming their agreement to work together and to be jointly liable during the implementation and execution of the contract. ONLY if the main contractor has engaged a sub-contractor	
MR9	<i>Manufacturer's Authorization Letter for the CCTV cameras, NVRs, P.A.B.X and POE switches and any other active equipment being offered by the bidder</i>	
MR10	Evidence of physical location of office provide certified copies of premises ownership / lease, or Utility Bills.	

1. A copy of the company list of directors, beneficial owners, name of proprietor or names of partners (Copy of CR12) issued within the last three (3) months from the date of the tender opening showing the list of directors.
2. The Bidders are also required to submit relevant technical brochures/catalogues with the tender document, highlighting the catalogue numbers of the proposed items. Such brochures/catalogues are to indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:
 - (a) Standards of manufacture;
 - (b) Performance ratings/characteristics;
 - (c) Material of manufacture;
 - (d) Electrical power ratings; and
 - (e) Any other necessary requirements

SECTION III - EVALUATION AND QUALIFICATION CRITERIA

10 GENERAL PROVISIONS

- 11** This section contains the criteria that the Employer shall use to evaluate tender and qualify tenderers. No other factors, methods or criteria shall be used other than specified in this tender document. The Tenderer shall provide all the information requested in the forms included in Section IV, Tendering Forms. The Procuring Entity shall use **the Standard Tender Evaluation Document for Goods and Works** for evaluating Tenders.
- 12** Wherever a Tenderer is required to state a monetary amount, Tenderers should indicate the Kenya Shilling equivalent using the rate of exchange determined as follows:
- a) For construction turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year is to be converted) was originally established.
 - b) Value of single contract - Exchange rate prevailing on the date of the contract signature.
 - (c) Exchange rates shall be taken from the publicly available source identified in the ITT 14.3. Any error in determining the exchange rates in the Tender may be corrected by the Procuring Entity.

13 EVALUATION AND CONTRACT AWARD CRITERIA

The Procuring Entity shall use the criteria and methodologies listed in this Section to evaluate tenders and arrive at the Lowest Evaluated Tender. The tender that (i) meets the qualification criteria, (ii) has been determined to be substantially responsive to the Tender Documents, and (iii) is determined to have the Lowest Evaluated Tender price shall be selected for award of contract.

2.0 PRELIMINARY EXAMINATION FOR DETERMINATION OF

RESPONSIVENESS Preliminary examination for Determination of Responsiveness

The Teachers Service Commission will start by examining all tenders to ensure that they meet all respects of the eligibility criteria and other mandatory requirements in the ITT, and that the tender is complete in all aspects in meeting the requirements provided for in the preliminary evaluation criteria outlined below. The Standard Tender Evaluation Report Document for Goods and Works for evaluating Tenders provides very clear guide on how to deal with review of these requirements. Tenders that do not pass the Preliminary Examination will be considered non-responsive and will not be considered further.

3.0 TENDER EVALUATION (ITT 35) CRITERIA OF EVALUATION

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

1. Preliminary examination – in 2 stages;
 - (i) Stage i for Main Contractor
 - ii) Stage ii for Domestic Sub- Contractors;
2. Detailed Technical Examination.
3. Financial Evaluation.
4. Recommendation for award

1. Preliminary Mandatory Requirements for the Main Contractor.

Item No.	Qualification Subject	Qualification Requirement	Document To be Completed	Requirements	YES/NO
1.	Form of Tender	The Form of Tender and Schedules of Activity forms. All blank spaces shall be filled with the information requested. ITT 12.1	Form of Tender	-Completed without alterations to the Text -Properly filled, signed and stamp on the tenderer's stationary in a letterhead	
2.	Certificate of Incorporation/ registration	Tenderer must be a registered company incorporated in Kenya under the Companies Act CAP 486.		Copy of Company Registration/Incorporation Certificate or Copies of National Identity Cards if the Company is a Sole Proprietorship or registered under Partnership	
3	Nationality	Nationality in accordance with ITT 3.6	Tender Information Form	Attach proof of citizenship showing the company is owned by Kenyans with at least 51% of shareholding and above. Fill, sign and stamp the Tender Information Form	
4	Shareholders or Sole Proprietorship OR Partnership	Provide Details of Shareholders or Sole Proprietorship or Partnership	Form CR 12 or National IDs for Sole Proprietorship or Partnership	Attach CR 12 Form issued in the last three (3) months from the date of Tender Submission or National IDs for Sole Proprietorship or Partnership	
5	Tax Obligations for Kenyan Tenderers	Must submit current/valid tax clearance compliance certificate or tax exemption certificate issued by Kenya Revenue Authority in 2021 in accordance with ITT 3.14.	Tax Clearance Certificate	-Attach Valid Tax Clearance Compliance Certificate (2021) or Tax Exception Certificate. TCC expiring on or after 30 days from the date of tender submission shall be accompanied by an evidence of renewal from KRA	
6	Conflict of Interest	No conflicts of interest in accordance with ITT 3.3 If information submitted by a tenderer pursuant to these requirements, or obtained by the Teachers Service Commission shows any conflict of interest which could materially and improperly benefit the tenderer in relation to the procurement or contract management process ITT 17.9	Conflict of Interest Form 10.	-Properly Filled, Stamped and Signed	
6	Self-Declaration on Debarment (PPADA 2015)	Not having been declared ineligible by the PPRA as described in ITT 3.7	Form SD1 and SD 2	Properly filled, stamped and signed	

7	Eligibility Confidential Business Questionnaire	All information provided by the tenderer pursuant to these requirements must be complete, current and accurate as at the date of tender submission. If a tenderer fails to submit the information required by these requirements, its tender will be rejected ITT 17.8	Eligibility Confidential Business Questionnaire- Tender Form	Properly filled, signed and stamped Provide all required information	
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8	Certificate of Independent Tender Determination	All information provided by the tenderer pursuant to these requirements must be complete, current and accurate as at the date of tender submission If a tenderer fails to submit the information required by these requirements, its tender will be rejected ITT 17.8	Certificate of Independent Tender Determination	-Properly Filled, Stamped and Signed	
9.	Self-Declaration on Corruption / Fraudulent Practices	A tenderer shall not be involved in corrupt, coercive, obstructive or fraudulent practice. A tenderer that is proven to have been involved in any of these practices shall be automatically disqualified ITT 3.4 Section 62 PPAD ACT 2015	Form SD2	- Properly Filled, Stamped and Signed	
10.	Declaration and Commitment to the Code of Ethics	Public Procurement & Asset Disposal Act, 2015 Regulations and the Code of Ethics for persons participating in Public Procurement and Asset Disposal and my responsibilities under the Code. Section 66 of the PPAD ACT 2015	Form DEC 1	-Properly Filled, Stamped and Signed	

11.	Bill of Quantity	Bill of Quantities, shall be prepared and filled in the format provided. All items shall be priced as provided in the blank spaces. Any space left blank shall be marked N/A or NIL	BOQ	- Properly Filled, Stamped and Signed – The BOQ must be completed without any alterations to the text and no substitutes shall be accepted. – Use Indelible Ink	
12.	Tender Document Pagination or Serialization	The Tenderer shall chronologically serialize all pages of the tender documents submitted ITT 12.1	The Act	All pages of the tender document must be serially paginated from page one (1) to the last page. Failure by a tenderer to chronologically paginate his/her document shall lead to rejection.	
13	NCA Registration Certificate	A Tenderer must be incorporated under the companies Act and Registered by the National Construction Authority under Building/Construction and Civil Works	TDS	Attach copies of valid original Registration Certificate by NCA in category 5 and above (Building, Constructions and Civil Works)	

14.	Practicing License Certificate for NCA5 and Above Building Construction Category	Tenderers shall ensure that they have valid practicing license		Submit a Valid copy of Practicing Certificate for 2021 issued by NCA for NCA5 and Above Building Construction Category	
15.	Pre-tender site visit	The tenderers are required to send their designated key technical staff to attend a MANDATORY pre-arranged site visit and a pre-tendermeeting on Wednesday 15th December, 2021 at 10.00 am	Tender Site Visit Form	Pre-Tender Site Visit or Pre-Tender Bid Meeting Form shall be signed by both theTenderer Technical officer and the TSC Representative	

16.	History of Non-Performing Contracts	Non-performance of a contract did not occur as a result of contractor default since 1 st January 2018.	Form CON-2	- Properly Filled, Stamped and Signed	
17.	On-going Contracts	Provide information on current commitments on all contracts for which a letter of intent/acceptance has been received or for contracts which full completion certificates have not yet issued.	Form FIN3.4	- Properly Filled, Stamped and Signed	
18.	Pending Litigation	Tender's financial position and prospective long-term profitability still sounds according to criteria established in 3.1 and assuming that all pending litigation will NOT be resolved against the Tenderer.	Form CON-2	-Properly Filled, Stamped and Signed	
19	Litigation History	No consistent history of court/arbitral award decisions against the tenderer since 1 st January 2020	Form CON – 2	- Properly Filled, Stamped and Signed	
20.	Financial Capabilities	The Tenderer and its parties shall provide copies of financial statements Sub-factor 3.1	Form FIN - 3.1,	- Properly Filled, Signed and stamped	
21.	Average Annual Construction Turnover	Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contractor.	Form FIN - 3.2	- Properly Filled, Stamped and Signed	
22.	General Construction Experience	Experience under construction contracts as a prime contractor, JV, member, sub-contractor or management contractor.	Form EXP - 4.1	- Properly Filled, Stamped and Signed	

23.	Specific Construction & Contract Management Experience	Participation in at least three (3) similar contracts as the Main Contractor, or Lead JV, Member, Sub-contractor or Management contractor.	Form EXP 4.2(a) and Form EXP 4.2 (b)	- Both Properly Filled, Stamped and Signed.	
24.	Financial Resources	The Tenderer shall demonstrates the financial ability to undertake the construction without financial interruption.	Form FIN 3.3	Properly Filled, Stamped and Signed	

25.	Bid Security	Tenderers must attach an Original Bid Security from the a Bank Regulated by CBK or an Insurance Company approved by PPRA	Bid Security	An original and a copy of Bid Security of Kshs. 300,000.00	
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40 MULTIPLE CONTRACTS

- 41** Multiple contracts will be permitted in accordance with ITT 35.4. Tenderers are evaluated on basis of Lots and a lowest evaluated tenderer identified for each Lot. The Procuring Entity will select one Option of the two Options listed below for award of Contracts.

5.0 ALTERNATIVE TENDERS (ITT 13.1)

60 MARGIN OF PREFERENCE

- 61** After Tenders have been received and reviewed by the Procuring Entity, responsive Tenders shall be assessed to ascertain their percentage of shareholding of Kenyan citizens. Responsive tenders shall be classified into the following groups:
- i) *Group A*: tenders offered by Kenyan Contractors and other Tenderers where Kenyan citizens hold shares of over fifty one percent (51%).
 - ii) *Group B*: tenders offered by foreign Contractors and other Tenderers where Kenyan citizens hold shares of less than fifty one percent (51%). ***NOT APPLICABLE***

7. Post qualification and Contract award (ITT 39), more specifically,

- a) Specifically, the successful tenderer may be subjected to post-qualification. The contract shall be awarded to the lowest evaluated tenderer, subject to confirmation of post-qualification results.
- b) In case the successful tender was not subjected to post-qualification, the tender that has been determined to be the lowest evaluated tenderer shall be considered for contract award, subject to meeting each of the following conditions.
 - i) The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow of **Kenya Shillings 10,000,000.00**
 - ii) Minimum average annual construction turnover of **Kenya Shillings 100,000,000.00**, equivalent calculated as total certified payments received for contracts in progress and/or completed within the last 3 years.
 - iii) At least 3 Number of contract(s) of a similar nature executed within Kenya, or the East African Community or a broad, that have been satisfactorily and substantially completed as a prime contractor, or joint venture member or sub-contractor each of minimum value **Kenya shillings 50,000,000.00** equivalent.
 - iv) Contractor's Representative and Key Personnel, disclosed during the tendering period whose name and qualifications appeared in the list of Key Personnel.

- v) Contractors key equipment listed on the table “Contractor's Equipment” below and more specifically listed as;

No.	Equipment Type and Characteristics	Minimum Number required
1	Lorries minimum capacity of 7 Tones or Equivalent	2
2	Hoist	1
3	Grader	1
4	Poker vibrators	1
5	Concrete mixers with a minimum capacity of 2 Cubic Meters or a batching plant	1

- iv) Other conditions depending on their seriousness.

a) **History of non-performing contracts:**

Tenderer and each member of JV in case the Tenderer is a JV, shall demonstrate that Non- performance of a contract did not occur because of the default of the Tenderer, or the member of a JV in the last 5 years. The required information shall be furnished in the appropriate form.

b) **Pending Litigation**

Financial position and prospective long-term profit ability of the Single Tenderer, and in the case the Tenderer is a JV, of each member of the JV, shall remain sound according to criteria established with respect to Financial Capability under Paragraph (i) above if all pending litigation will be resolved against the Tenderer. Tenderer shall provide information on pending litigations in the appropriate form.

c) **Litigation History**

There shall be no consistent history of court/arbitral award decisions against the Tenderer, in the last 5 years. All parties to the contract shall furnish the information in the appropriate form about any litigation or arbitration resulting from contracts completed or on going under its execution over the years specified. A consistent history of awards against the Tenderer or any member of a JV may result in rejection of the tender.

STAGE 2: TECHNICAL EVALUATION

The Technical Evaluation of the Main Contractor

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

PARAMETER MAXIMUM POINTS

(i) Key personnel.....	20
(ii) Contract Completed in the last (10) years-----	40
(iii) Schedules of contractor's equipment-----	10
(v) Audited Financial Report for the last 3 years-----	25
(vi) Work Plan	5
TOTAL	100

Note: The Main Contractor MUST ensure that sub-contractors/Domestic Subcontractors meet all mandatory requirements to allow the main contractor proceed to the Technical Evaluation Stage. Any failure by the sub-contractor to meet mandatory requirements will lead to disqualification of the main contractor.

TECHNICAL EVALUATION CRITERIA

Item	Description	Point Scored	Max. Point
TEC 1.	<p align="center">Key Personnel (Attach evidence)</p> <p>Director of the firm</p> <ul style="list-style-type: none"> • Holder of degree in relevant Engineering field----- 5 • Holder of diploma in relevant Engineering field-----3 • Holder of certificate in relevant Engineering field ----2 • Holder of trade test certificate in relevant Engineering field --- 2 • No relevant certificate----- 0 <p><i>Attach relevant certificates from a recognized institution of higher learning</i></p>	5	20
	<p>Technical Staff</p> <p>Key Technical Personnel in relevant engineering field</p> <ul style="list-style-type: none"> • 1 No. Project Manager with Degree holders with over 10 years' relevant experience @ 5 marks • 1 No. Site Manager Degree holder with at least 5 years' relevant experience @5 marks • 1 No. Clerk of Works Diploma holder with at least 5 years' relevant experience @ 5 Marks <p><i>Attach relevant academic certificates from a reputable University recognized by the Commission of University Education.</i></p>	15	
TEC2	<p>Contract completed in the last Ten (10) years (Max of 3No. Projects)</p> <ul style="list-style-type: none"> • Must have completed three (3) projects with similar nature, complexity and magnitude in the last Ten (10) years from the date of tender opening each of which must be of a value more than 70% and above of contract price quoted for this project <p><i>Attach a copy of signed contracts with the completion certificates of the same @ 10 marks each</i></p>		40
	<p>Must also submit and additional two reference or recommendation letters from two clients other than the companies listed above under TEC 2 confirming satisfactory performance.</p> <p><i>Attach two signed letters from the clients written on their letterhead @ 5 marks</i></p>	10	

TEC 3.	<p>Schedule of contractor's equipment and transport ownership/Lease) Please attach proof e.g. Valid Lease Agreements or Ownership or Logbooks.</p> <ul style="list-style-type: none"> • Means of transport (2No. Trucks/Tippers/Lorries @2marks • 1 No. Grader • 1 No. Concrete mixer@2marks • Poker vibrators (2No.poker vibrators@1 • No means of transport ----- 0 	4 2 2 2 0	10	10
TEC 4.	Financial Report			
	<p>(i) Bidders must submit Audited Financial Statement for the last two (2) years (2019 and 2020). The Audited financial statements submitted must demonstrate the current soundness of the Tenderer's financial position and indicate its prospective long- term profitability (as demonstrated by Financial Evaluation ratios).</p> <p>Must submit the two years Audited Financial Statements attached with the Auditor's practicing membership number and a valid practicing license from ICPAK. All pages including the Financial Ratio Form must be signed by at least byone of the Directors @ 2.5 marks each year</p> <p>(ii) The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated at a minimum of 20% of Engineer's Estimate for the subject contract(s) net of the Tenderer's other commitments @ 5 marks</p> <p>iii. The Tenderers shall also demonstrate, to the satisfaction of the Teachers Service Commission, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments. Financial Ratios Computation shall be made for the following Ratiosand marks awarded to each of the ratios:</p> <ul style="list-style-type: none"> - Working Capital @ 1 marks - Debt to Equity Ratio @ 1 marks - Current ratio @ 1 marks - Operating Cash Flow ratio @ 2 marks 		20	20
	b) Evidence of Financial Resources		5	
	<p>Attach certified bank statement or linesof credit or over draft facility etc. from your bank indicated in the Audited Financial Statements @ 5 marks</p> <p>The certification must be done by the bank issuing the document.</p>			
TEC 5.	Work program		10	
	Detailed work program outlining critical activities from the expected date of commencement to the fixed duration of the contract for (60 weeks) in a company letterhead signed and stamped by the officer authorized to sign the tender.			
	TOTAL		100	100

NB: After technical evaluation of the tenders, those tenders that shall not have attain a minimum pass marks of 70 shall be declared Non responsive and will be eliminated from the evaluation process and will therefore, not be considered for financial evaluation

SECTION IV - TENDERING FORMS

QUALIFICATION FORMS

1. FOREIGN TENDERERS 40% RULE: NOT APPLICABLE

Pursuant to ITT 3.9, a foreign tenderer must complete this form to demonstrate that the tender fulfils this condition.

ITEM	Description of Work Item	Describe location of Source	COST in K. shillings	Comments, if any
A	Local Labor			
1				
2				
3				
4				
5				
B	Sub contracts from Local sources			
1				
2				
3				
4				
5				
C	Local materials			
1				
2				
3				
4				
5				
D	Use of Local Plant and Equipment			
1				
2				
3				
4				
5				
E	Add any other items			
1				
2				
3				
4				
5				
6				
	TOTAL COST LOCAL CONTENT		XXXXX	
	PERCENTAGE OF CONTRACT PRICE			

2. FORMEQU: EQUIPMENT

The Tenderer shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Tenderer.

Item of equipment		
Equipment information	Name of manufacturer	Model and power rating
	Capacity	Year of manufacture
Current status	Current location	
	Details of current commitments	
Source	Indicate source of the equipment <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

Omit the following information for equipment owned by the Tenderer.

Owner	Name of owner	
	Address of owner	
	Telephone	Contact name and title
	Fax	Telex
Agreements	Details of rental / lease / manufacture agreements specific to the project	

3. FORM PER -1

Contractor's Representative and Key Personnel Schedule

Tenderers should provide the names and details of the suitably qualified Contractor's Representative and Key Personnel to perform the Contract. The data on their experience should be supplied using the Form PER-2 below for each candidate.

Contractor' Representative and Key Personnel

1.	Title of position: Contractor's Representative	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
2.	Title of position: [_____]	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
3.	Title of position: [_____]	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
4.	Title of position: [_____]	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>
5.	Title of position: <i>[insert title]</i>	
	Name of candidate:	
	Duration of appointment:	<i>[insert the whole period (start and end dates) for which this position will be engaged]</i>
	Time commitment: for this position:	<i>[insert the number of days/week/months/ that has been scheduled for this position]</i>
	Expected time schedule for this position:	<i>[insert the expected time schedule for this position (e.g. attach high level Gantt chart)]</i>

4. **FORM PER - 2:**

Resume and Declaration - Contractor's Representative and Key Personnel.

Name of Tenderer:

Position [#1]: <i>[title of position from Form PER-1]</i>		
Personnel information	Name:	Date of birth:
	Address:	E-mail:
	Professional qualifications:	
	Academic qualifications:	
	Language proficiency: <i>[language and levels of speaking, reading and writing skills]</i>	
Details	Address of Procuring Entity:	
	Telephone:	Contact (manager / personnel officer):
	Fax:	
	Job title:	Years with present Procuring Entity:

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

Project	Role	Duration of involvement	Relevant experience
<i>[main project details]</i>	<i>[role and responsibilities on the project]</i>	<i>[time in role]</i>	<i>[describe the experience relevant to this position]</i>

Declaration

I, the undersigned [*insert either "Contractor's Representative" or "Key Personnel" as applicable*], certify that to the best of my knowledge and belief, the information contained in this Form PER-2 correctly describes myself, my qualifications and my experience.

I confirm that I am available as certified in the following table and throughout the expected time schedule for this position as provided in the Tender:

Commitment	Details
Commitment to duration of contract:	<i>[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]</i>
Time commitment:	<i>[insert period (start and end dates) for which this Contractor's Representative or Key Personnel is available to work on this contract]</i>

I understand that any misrepresentation or omission in this Form may:

- (a) be taken into consideration during Tender evaluation;
- (b) result in my disqualification from participating in the Tender;
- (c) result in my dismissal from the contract.

Name of Contractor's Representative or Key Personnel: [*insert name*]

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Tenderer:

Signature: _____

Date: (day month year): _____

TEACHERS SERVICE COMMISSION



PRE-BID CONFERENCE FORM

WEDNESDAY 15TH DEC 2021 AT 10.00 AM

TSC/T/30/2021/2023: THE PROPOSED OFFICE BLOCK FOR TEACHERS SERVICE COMMISSION (TSC) AT MACHAKOS COUNTY

FORM OF DECLARATION OF TENDERER'S KNOWLEDGE DURING THE PRE-BID CONFERENCE

1. This is to certify that

[Name/s]

Being the authorized representative/Agent of [Name of Bidder]

.....

Has undertaken the Pre-Bid Conference in accordance with the instruction to Bidders, for purposes of bidding for TSC/T/30/2021/2023: PROPOSED OFFICE BLOCK FOR TEACHERS SERVICE COMMISSION (TSC) AT MACHAKOS COUNTY

.....

Held on..... Day of.....20.....

2. Having studied the tender document, I carefully attended the Mandatory Pre-Bid Conference to make myself familiar with the mandatory and Technical requirements likely to guide in the proposed construction of the TSC office in Machakos County and cost thereof.

3. I further certify that I am satisfied with the description of the scope of works, Bills of Quantities and the design drawings provided by the Teachers Service Commission and I understand perfectly the scope of works as specified and implied in the performance of the contract - Proposed Construction of the TSC office in Machakos County.

(Bidder's Representative)
Name _____

Teachers Service Commission
(Authorized Representative)

(Tenderers Technical Officer)
Name: _____

Signature

Sign/Stamp:

5. TENDERERS QUALIFICATION WITHOUT PREQUALIFICATION

To establish its qualifications to perform the contract in accordance with Section III, Evaluation and Qualification Criteria the Tenderer shall provide the information requested in the corresponding Information Sheets included hereunder.

51 FORM ELI -1.1

Tenderer Information Form

Date: _____

ITT No. and title: _____

Tenderer's name
In case of Joint Venture (JV), name of each member:
Tenderer's actual or intended country of registration: <i>[indicate country of Constitution]</i>
Tenderer's actual or intended year of incorporation:
Tenderer's legal address [in country of registration]:
Tenderer's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
1. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITT 3.6 In case of JV, letter of intent to form JV or JV agreement, in accordance with ITT 3.5 <input type="checkbox"/> In case of state-owned enterprise or institution, in accordance with ITT 3.8, documents establishing: <ul style="list-style-type: none">• Legal and financial autonomy• Operation under commercial law1. Establishing that the Tenderer is not under the supervision of the Procuring Entity2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Tenderer's JV Information Form
(to be completed for each member of Tenderer's JV)

Date: _____

ITT No. and title: _____

Tenderer's JV name:
JV member's name:
JV member's country of registration:
JV member's year of constitution:
JV member's legal address in country of constitution:
JV member's authorized representative information Name: _____ Address: _____ Telephone/Fax numbers: _____ E-mail address: _____
<p>1. Attached are copies of original documents of</p> <p><input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITT 3.6.</p> <p><input type="checkbox"/> In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Procuring Entity, in accordance with ITT 3.5.</p> <p>2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.</p>

Historical Contract Non-Performance, Pending Litigation and Litigation History

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Non-Performed Contracts in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> Contract non-performance did not occur since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.1.			
<input type="checkbox"/> Contract(s) not performed since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, requirement 2.1			
<input type="checkbox"/> Contract(s) withdrawn since 1 st January [insert year] specified in Section III, Evaluation and Qualification Criteria, requirement 2.1			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and Kenya Shilling equivalent)
[insert year]	[insert amount and percentage]	Contract Identification: [indicate complete contract name/ number, and any other identification] Name of Procuring Entity: [insert full name] Address of Procuring Entity: [insert street/city/country] Reason(s) for nonperformance: [indicate main reason(s)]	[insert amount]
Pending Litigation, in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> No pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.			
<input type="checkbox"/> Pending litigation in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3 as indicated below.			

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)
		Contract Identification: _____ Name of Procuring Entity: _____ Address of Procuring Entity: _____ Matter in dispute: _____ Party who initiated the dispute: Status of dispute: _____	
		Contract Identification: Name of Procuring Entity: Address of Procuring Entity: Matter in dispute: Party who initiated the dispute: Status of dispute:	
Litigation History in accordance with Section III, Evaluation and Qualification Criteria			
<input type="checkbox"/> No Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.			
<input type="checkbox"/> Litigation History in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4 as indicated below.			

Year of dispute	Amount in dispute (currency)	Contract Identification	Total Contract Amount (currency), Kenya Shilling Equivalent (exchange rate)
<i>[insert year]</i>	<i>[insert percentage]</i>	Contract Identification: <i>[indicate complete contract name, number, and any other identification]</i> Name of Procuring Entity: <i>[insert full name]</i> Address of Procuring Entity: <i>[insert street/city/country]</i> Matter in dispute: <i>[indicate main issues in dispute]</i> Party who initiated the dispute: <i>[indicate "Procuring Entity" or "Contractor"]</i> Reason(s) for Litigation and award decision <i>[indicate main reason(s)]</i>	<i>[insert amount]</i>

Include details relating to potential bid-rigging practices such as previous occasions where tenders were withdrawn, joint bids with competitors, subcontracting work to unsuccessful tenderers, etc.

Financial Situation and Performance

Tenderer’s Name: _____
 Date: _____
 JV Member’s Name _____
 ITT No. and title: _____

5.4.1. Financial Data

Type of Financial information in _____ (currency)	Historic information for previous _____ years, (amount in currency, currency, exchange rate*, USD equivalent)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Total Equity/Net Worth (NW)					
Current Assets (CA)					
Current Liabilities (CL)					
Working Capital (WC)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Cash Flow Information					
Cash Flow from Operating Activities					

*Refer to ITT 15 for the exchange rate

5.4.2 Sources of Finance

Specify sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.

No.	Source of finance	Amount (Kenya Shilling equivalent)
1		
2		
3		

5.4.3 Financial documents

The Tenderer and its parties shall provide copies of financial statements for _____ years pursuant Section III, Evaluation and Qualifications Criteria, Sub-factor 3.1. The financial statements shall:

- (a) reflect the financial situation of the Tenderer or in case of JV member, and not an affiliated entity (such as parent company or group member).
- (b) be independently audited or certified in accordance with local legislation.
- (c) be complete, including all notes to the financial statements.
- (d) correspond to accounting periods already completed and audited.

Attached are copies of financial statements¹ for the _____ years required above; and complying with

The requirements If the most recent set of financial statements is for a period earlier than 12 months from the date of Tender, the reason for this should be justified.

Average Annual Construction Turnover

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Annual turnover data (construction only)			
Year	Amount Currency	Exchange rate	Kenya Shilling equivalent
<i>[indicate year]</i>	<i>[insert amount and indicate currency]</i>		
Average Annual Construction Turnover *			

* See Section III, Evaluation and Qualification Criteria, Sub-Factor 3.2.

Financial Resources

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III, Evaluation and Qualification Criteria

Financial Resources		
No.	Source of financing	Amount (Kenya Shilling equivalent)
1		
2		
3		

Current Contract Commitments / Works in Progress

Tenderers and each member to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Current Contract Commitments					
No.	Name of Contract	Procuring Entity's Contact Address, Tel,	Value of Outstanding Work [Current Kenya Shilling /month Equivalent]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [Kenya Shilling /month]
1					
2					
3					
4					
5					

General Construction Experience

Tenderer's Name: _____
 Date: _____
 JV Member's Name _____
 ITT No. and title: _____

Page _____ of _____ pages

Starting Year	Ending Year	Contract Identification	Role of Tenderer
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Procuring Entity: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Procuring Entity: _____ Address: _____	
		Contract name: _____ Brief Description of the Works performed by the Tenderer: _____ Amount of contract: _____ Name of Procuring Entity: _____ Address: _____	

Specific Construction and Contract Management Experience

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount	Kenya Shilling			
If member in a JV or sub-contractor, specify participation in total Contract Amount				
Procuring Entity's Name:				
Address:				
Telephone/fax number				
E-mail:				

5.9 FORM EXP - 4.2(a)**Specific Construction and Contract Management Experience**

Tenderer's Name: _____

Date: _____

JV Member's Name _____

ITT No. and title: _____

Similar Contract No.	Information			
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount	Kenya Shilling			
If member in a JV or sub-contractor, specify participation in total Contract Amount				
Procuring Entity's Name:				
Address:				
Telephone/fax number				
E-mail:				

5.9 **FORM EXP - 4.2 (a) (cont.)**

Specific Construction and Contract Management Experience (cont.)

Similar Contract No.	Information
Description of the similarity in accordance with Sub-Factor 4.2(a) of Section III:	
1. Amount	
2. Physical size of required works Items	
3. Complexity	
4. Methods/Technology	
5. Construction rate for key activities	
6. Other Characteristics	

5.10 FORM EXP - 4.2(b)

Construction Experience in Key Activities

Tenderer's Name: _____

Date: _____

Tenderer's JV Member Name: Sub-contractor's Name² (as per ITT 34): ITT

No. and title _____

All Sub-contractors for key activities must complete the information in this form as per ITT 34 and Section III, Evaluation and Qualification Criteria, Sub-Factor 4.2.

I. Key Activity No One: _

Information				
Contract Identification				
Award date				
Completion date				
Role in Contract	Prime Contractor <input type="checkbox"/>	Member in JV <input type="checkbox"/>	Management Contractor <input type="checkbox"/>	Sub-contractor <input type="checkbox"/>
Total Contract Amount			Kenya Shilling	
Quantity (Volume, number or rate of production, as applicable) performed under the contract per year or part of the year	Total quantity in the contract (i)	Percentage participation (ii)		Actual Quantity Performed (i) x (ii)
Year 1				
Year 2				
Year 3				
Year 4				
Procuring Entity's Name:				
Address: Telephone/fax number E-mail:				

² If applicable

	Information
Description of the key activities in accordance with Sub-Factor 4.2(b) of Section III:	

- 2. Activity No. Two
- 3.

OTHER FORMS

6. 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) *All italicized 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 this Tender submission: [insert date (as day, month and year) of Tender submission]

Tender No: [insert identification No.]

Name and description of Tender: [Insert as per ITT]

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 sum³ of Kenya Shillings [[Amount in figures]_____Kenya Shillings [amount in words]_____]
2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the **Teachers Service Commission** 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 adhere by this tender until _____ [Insert date – refer to tender validity date and bid security], 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 issued in accordance with ITT 28;
 - ii) Eligibility: We meet the eligibility requirements and have no conflict of interest in accordance with ITT 3 and 4;
 - 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

³ This sum should be carried forward from the Summary of the Bills of Quantities.

⁴ The percentage quoted above should not include provisional sums, and not more than two foreign currencies are allowed.

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,** in case of one lot: Total price is: Kshs..... in figures
 Kenya Shillings

 in words [insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies]; or
- 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 obtain a Performance Security of 10% in form of a bank guarantee of the total tender price from a recognized bank regulated by Central Bank of Kenya;
- xii) **One Tender Per Tender:** We are 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 thereof 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 person acting 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-Declaration of 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]

Date signed _____ day of _____, _____

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.

(a) **TENDERER'S ELIGIBILITY-CONFIDENTIAL BUSINESS QUESTIONNAIRE**

Instruction to Tenderer

Tender is instructed to complete the particulars required in this Form, *one form for each entity if Tender is a JV*. Tenderer is further reminded that it is an offence to give false information on this Form.

(a) Tenderer's details

	ITEM	DESCRIPTION
1	Name of the Procuring Entity	
2	Reference Number of the Tender	
3	Date and Time of Tender Opening	
4	Name of the Tenderer	
5	Full Address and Contact Details of the Tenderer.	1. Country 2. City 3. Location 4. Building 5. Floor 6. Postal Address 7. Name and email of contact person.
6	Current Trade License Registration Number and Expiring date	
7	Name, country and full address (<i>postal and physical addresses, email, and telephone number</i>) of Registering Body/Agency	
8	Description of Nature of Business	
9	Maximum value of business which the Tenderer handles.	
10	State if Tenders Company is listed in stock exchange, give name and full address (<i>postal and physical addresses, email, and telephone number</i>) of state which stock exchange	

General and Specific Details

(b) Sole Proprietor, provide the following details.

Name in full _____ Age _____
Nationality _____ Country of Origin _____
Citizenship _____

(c) Partnership, provide the following details.

	Names of Partners	Nationality	Citizenship	% Shares owned
1				
2				
3				

(d) Registered Company, provide the following details.

I) Private or public Company _____

ii) State the nominal and issued capital of the Company_____

Nominal Kenya Shillings (Equivalent).....

Issued Kenya Shillings (Equivalent).....

iii) Give details of Directors as follows.

	Names of Director	Nationality	Citizenship	% Shares owned
1				
2				
3				

(e) DISCLOSURE OF INTEREST - Interest of the Firm in the Procuring Entity.

i) Are there any person/persons in..... (*Name of Procuring Entity*) who has/have an interest or relationship in this firm? Yes/No.....

If yes, provide details as follows.

	Names of Person	Designation in the Procuring Entity	Interest or Relationship with Tenderer
1			
2			
3			

(iii) Conflict of interest disclosure

	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
1	Tenderer is directly or indirectly controls, is controlled by or is under common control with another tenderer.		
2	Tenderer receives or has received any direct or indirect subsidy from another tenderer.		
3	Tenderer has the same legal representative as another tenderer		
4	Tender has a relationship with another tenderer, directly or through common third parties, that puts it in a position to influence the tender of another tenderer, or influence the decisions of the Procuring Entity regarding this tendering process.		
5	Any of the Tenderer's affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the tender.		
6	Tenderer would be providing goods, works, non-consulting services or consulting services during implementation of the contract specified in this Tender Document.		
7	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who are directly or indirectly involved in the preparation of the		

	Type of Conflict	Disclosure YES OR NO	If YES provide details of the relationship with Tenderer
	Tender document or specifications of the Contract, and/or the Tender evaluation process of such contract.		
8	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who would be involved in the implementation or supervision of the such Contract.		
9	Has the conflict stemming from such relationship stated in item 7 and 8 above been resolved in a manner acceptable to the Procuring Entity throughout the tendering process and execution of the Contract.		

Certification

On behalf of the Tenderer, I certify that the information given above is complete, current and accurate as at the date of submission.

Full Name _____

Title or Designation _____

(Signature)

(Date)

Company Rubber Stamp.....

b) CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Letter of Tender to the _____
_____ [Name of Procuring Entity] for:
_____ [Name and number of tender] in
response to the request for tenders made by: _____ [Name of Tenderer] do hereby
make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of _____ [Name of Tenderer] that:

1. I have read and I understand the contents of this Certificate;
2. I understand that the Tender will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am the authorized representative of the Tenderer with authority to sign this Certificate, and to submit the Tender on behalf of the Tenderer;
4. For the purposes of this Certificate and the Tender, I understand that the word “competitor” shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:
 - a) Has been requested to submit a Tender in response to this request for tenders;
 - b) could potentially submit a tender in response to this request for tenders, based on their qualifications, abilities or experience;
5. The Tenderer discloses that [check one of the following, as applicable]:
 - a) The Tenderer has arrived at the Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor;
 - b) The Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this request for tenders, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements;
6. In particular, without limiting the generality of paragraphs (5)(a) or (5)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - a) prices;
 - b) methods, factors or formulas used to calculate prices;
 - c) the intention or decision to submit, or not to submit, a tender; or
 - d) the submission of a tender which does not meet the specifications of the request for Tenders; except as specifically disclosed pursuant to paragraph (5)(b) above;
7. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the works or services to which this request for tenders relates, except as specifically authorized by the procuring authority or as specifically disclosed pursuant to paragraph (5)(b) above;
8. The terms of the Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (5)(b) above.

Name _____
Title _____
Date _____

[Name, title and signature of authorized agent of Tenderer and Date] and must be stamp

(c) **SELF-DECLARATION FORMS**

FORM SD1

SELF DECLARATION THAT THE PERSON/TENDERER IS NOT DEBARRED IN THE MATTER OF THE PUBLIC PROCUREMENT AND ASSET DISPOSAL ACT 2015.

I,, of Post Office Box being a resident of..... in the Republic of do hereby make a statement as follows: -

1. THAT I am the Company Secretary/ Chief Executive/Managing Director/Principal Officer/Director of *(insert name of the Company)* who is a Bidder in respect of **Tender No.** for *(insert tender title/description)* for *(insert name of the Procuring entity)* and duly authorized and competent to make this statement.
2. THAT the aforesaid Bidder, its Directors and subcontractors have not been debarred from participating in procurement proceeding under Part IV of the Act.
3. THAT what is deponed to here in above is true to the best of my knowledge, information and belief.

.....
(Title)

.....
(Signature)

.....
(Date)

Bidder Official Stamp

FORM SD2

SELF DECLARATION THAT THE PERSON/TENDERER WILL NOT ENGAGE IN ANY CORRUPT OR FRAUDULENT PRACTICE.

I,of P.O. Box being a resident of in the Republic of do hereby make a statement as follows: -

1. THAT I am the Chief Executive/Managing Director/Principal Officer/Director of (insert name of the Company) who is a Bidder in respect of **Tender No.....** for (*insert tender title/description*) for (*insert name of the Procuring entity*) and duly authorized and competent to make this statement.

2. THAT the aforesaid Bidder, its servants and/or agents/subcontractors will not engage in any corrupt or fraudulent practice and has not been requested to pay any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (*insert name of the Procuring entity*) which is the procuring entity.

3. THAT the aforesaid Bidder, its servants and/or agents /subcontractors have not offered any inducement to any member of the Board, Management, Staff and/or employees and/or agents of (*name of the procuring entity*).

4. THAT the aforesaid Bidder will not engage /has not engaged in any corrosive practice with other bidders participating in the subject tender

5. THAT what is deponed to here in above is true to the best of my knowledge information and belief.

.....
(Title)

.....
(Signature)

.....
(Date)

Bidder's Official Stamp

DECLARATION AND COMMITMENT TO THE CODE OF ETHICS

I (person) on behalf of (*Name of the Business/ Company/Firm*)
..... declare that I have read and fully understood the contents of the
Public Procurement & Asset Disposal Act, 2015, Regulations and the Code of Ethics for persons participating in
Public Procurement and Asset Disposal and my responsibilities under the Code.

I do here by commit to abide by the provisions of the Code of Ethics for persons participating in Public Procurement
and Asset Disposal.

Name of Authorized signatory.....

Sign.....

Position.....

Office address..... Telephone.....

E-mail.....

Name of the Firm/Company.....

Date.....

(Company Seal/ Rubber Stamp where applicable)

Witness

Name.....

Sign.....

Date.....

(d) APPENDIX 1 - FRAUD AND CORRUPTION

(Appendix 1 shall not be modified)

1. Purpose

1.1 The Government of Kenya's Anti-Corruption and Economic Crime laws and their sanction's policies and procedures, Public Procurement and Asset Disposal Act (*no. 33 of 2015*) and its Regulation, and any other Kenya's Acts or Regulations related to Fraud and Corruption, and similar offences, shall apply with respect to Public Procurement Processes and Contracts that are governed by the laws of Kenya.

2. Requirements

2.1 The Government of Kenya requires that all parties including Procuring Entities, Tenderers, (applicants/proposers), Consultants, Contractors and Suppliers; any Sub-contractors, Sub-consultants, Service providers or Suppliers; any Agents (whether declared or not); and any of their Personnel, involved and engaged in procurement under Kenya's Laws and Regulation, observe the highest standard of ethics during the procurement process, selection and contract execution of all contracts, and refrain from Fraud and Corruption and fully comply with Kenya's laws and Regulations as per paragraphs 1.1 above.

2.2 Kenya's public procurement and asset disposal act (*no. 33 of 2015*) under Section 66 describes rules to be followed and actions to be taken in dealing with Corrupt, Coercive, Obstructive, Collusive or Fraudulent practices, and Conflicts of Interest in procurement including consequences for offences committed. A few of the provisions noted below highlight Kenya's policy of no tolerance for such practices and behavior:

- 1) A person to whom this Act applies shall not be involved in any corrupt, coercive, obstructive, collusive or fraudulent practice; or conflicts of interest in any procurement or as set disposal proceeding;
- 2) A person referred to under subsection (1) who contravenes the provisions of that sub-section commits an offence;
- 3) Without limiting the generality of the subsection (1) and (2), the person shall be: -
 - a) disqualified from entering into a contract for a procurement or asset disposal proceeding; or
 - b) if a contract has already been entered into with the person, the contract shall be voidable;
- 4) The voiding of a contract by the procuring entity under subsection (7) does not limit any legal remedy the procuring entity may have;
- 5) An employee or agent of the procuring entity or a member of the Board or committee of the procuring entity who has a conflict of interest with respect to a procurement: -
 - a) Shall not take part in the procurement proceedings;
 - b) shall not, after a procurement contract has been entered in to, take part in any decision relating to the procurement or contract; and
 - c) shall not be a subcontractor or for the tender to whom was awarded contract, or a member of the group of tenderers to whom the contract was awarded, but the subcontractor appointed shall meet all the requirements of this Act.
- 6) An employee, agent or member described in subsection (1) who refrains from doing anything prohibited under that subsection, but for that subsection, would have been within his or her duties shall disclose the conflict of interest to the procuring entity;
- 7) If a person contravenes subsection (1) with respect to a conflict of interest described in subsection (5)(a) and the contract is awarded to the person or his relative or to another person in whom one of them had a direct or indirect pecuniary interest, the contract shall be terminated and all costs incurred by the public entity shall be made good by the awarding officer. Etc.

3. In compliance with Kenya's laws, regulations and policies mentioned above, the Procuring Entity:

- a) Defines broadly, for the purposes of the above provisions, the terms set forth below as follows:
- i) “corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
 - ii) “fraudulent practice” is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;
 - iii) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party; “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - iv) “obstructive practice” is:
 - Deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede investigation by Public Procurement Regulatory Authority (PPRA) or any other appropriate authority appointed by Government of Kenya into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
 - acts intended to materially impede the exercise of the PPRA's or the appointed authority's inspection and audit rights provided for under paragraph 2.3 e. below.
- b) Defines more specifically, in accordance with the above procurement Act provisions set forth for fraudulent and collusive practices as follows:
- "fraudulent practice" includes a misrepresentation of fact in order to influence a procurement or disposal process or the exercise of a contract to the detriment of the procuring entity or the tenderer or the contractor, and includes collusive practices amongst tenderers prior to or after tender submission designed to establish tender prices at artificial non-competitive levels and to deprive the procuring entity of the benefits of free and open competition.
- c) Rejects a proposal for award¹ of a contract if PPRA determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
 - d) Pursuant to the Kenya's above stated Acts and Regulations, may recommend to appropriate authority(ies) for sanctioning and debarment of a firm or individual, as applicable under the Acts and Regulations;
 - e) Requires that a clause be included in Tender documents and Request for Proposal documents requiring(i) Tenderers (applicants/proposers), Consultants, Contractors, and Suppliers, and their Sub-contractors, Sub-consultants, Service providers, Suppliers, Agents personnel, permit the PPRA or any other appropriate authority appointed by Government of Kenya to inspect² all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the PPRA or any other appropriate authority appointed by Government of Kenya; and
 - f) Pursuant to Section 62 of the above Act, requires Applicants/Tenderers to submit along with their Applications/Tenders/Proposals a “Self-Declaration Form” as included in the procurement document declaring that they and all parties involved in the procurement process and contract execution have not engaged/will not engage in any corrupt or fraudulent practices.

¹For the avoidance of doubt, a party's in eligibility to be awarded a contract shall includee, without limitation, (i) applying for pre-qualification, expressing interest in a consultancy, and tendering, either directly or as a nominated sub-contractor, nominated consultant, nominated manufacturer or supplier, or nominated service provider, in respect of such contract, and (ii) entering into an addendum or amendment introducing a material modification to any existing contract.

²Inspections in this context usually are investigative (i.e., forensic) in nature. They involve fact-finding activities undertaken by the Investigating Authority or persons appointed by the Procuring Entity to address specific matters related to investigations/audits, such as evaluating the veracity of an allegation of possible Fraud and Corruption, through the appropriate mechanisms. Such activity includes but is not limited to: accessing and examining a firm's or individual's financial records and information, and making copies thereof as relevant; accessing and examining any other documents, data and information (whether in hard copy or electronic format) deemed relevant for the investigation/audit, and making copies thereof as relevant; interviewing staff and other relevant individuals; performing physical inspections and site visits; and obtaining third party verification of information.

FORM OF TENDER SECURITY-[Option 1–Demand Bank Guarantee]

Beneficiary: _____

Request for Tenders No:

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

1. We have been informed that _____ (here in after called "the Applicant") has submitted or will submit to the Beneficiary its Tender (here in after called" the Tender") for the execution of _____ under Request for Tenders No. _____ ("the ITT").

2. Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.

3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of _____ (_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:
 - (a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or

 - b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension there to provide by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance.

4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) thirty days after the end of the Tender Validity Period.

5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

[signature(s)]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

FORMAT OF TENDER SECURITY [Option 2–Insurance Guarantee]

TENDER GUARANTEE No.: _____

1. Whereas [*Name of the tenderer*] (hereinafter called “the tenderer”) has submitted its tender dated [*Date of submission of tender*] for the..... [*Name and/or description of the tender*] (hereinafter called “the Tender”) for the execution of _____ under Request for Tenders No. _____ (“the ITT”).
2. KNOW ALL PEOPLE by these presents that WE of [**Name of Insurance Company**] having our registered office at (hereinafter called “the Guarantor”), are bound unto [*Name of Procuring Entity*] (hereinafter called “the Procuring Entity”) in the sum of (Currency and guarantee amount) for which payment well and truly to be made to the said Procuring Entity, the Guarantor binds itself, its successors and assigns, jointly and severally, firmly by these presents.

Sealed with the Common Seal of the said Guarantor this ____ day of _____ 20 ____.

3. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Applicant:
 - a) has withdrawn its Tender during the period of Tender validity set forth in the Principal's Letter of Tender (“the Tender Validity Period”), or any extension thereto provided by the Principal; or
 - b) having been notified of the acceptance of its Tender by the Procuring Entity during the Tender Validity Period or any extension thereto provided by the Principal; (i) failed to execute the Contract agreement; or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to tenderers (“ITT”) of the Procuring Entity's Tendering document.

then the guarantee undertakes to immediately pay to the Procuring Entity up to the above amount upon receipt of the Procuring Entity's first written demand, without the Procuring Entity having to substantiate its demand, provided that in its demand the Procuring Entity shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has occurred.

4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii) twenty-eight days after the end of the Tender Validity Period.
5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

[Date]

[Signature of the Guarantor]

[Witness]

[Seal]

Note: All italicized text is for use in preparing this form and shall be deleted from the final product.

FORM OF TENDER - SECURING DECLARATION

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

Date: *[insert date (as day, month and year) of Tender Submission]*

Tender No. *[insert number of tendering process]*

To:..... *[insert complete name of Purchaser]* I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Tender-Securing Declaration.
2. I/We accept that I/we will automatically be suspended from being eligible for tendering in any contract with the Purchaser for the period of time of *[insert number of months or years]* starting on *[insert date]*, if we are in breach of our obligation(s) under the bid conditions, because we—(a) have withdrawn our tender during the period of tender validity specified by us in the Tendering Data Sheet; or (b) having been notified of the acceptance of our Bid by the Purchaser during the period of bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the instructions to tenders.
3. I/We understand that this Tender Securing Declaration shall expire if we are not the successful Tenderer(s), upon the earlier of:
 - a) Our receipt of a copy of your notification of the name of the successful Tenderer; or
 - b) thirty days after the expiration of our Tender.
4. I/We understand that if I am /we are/ in a Joint Venture, the Tender Securing Declaration must be in the name of the Joint Venture that submits the bid, and the Joint Venture has not been legally constituted at the time of bidding, the Tender Securing Declaration shall be in the names of all future partners as named in the letter of intent.

Signed:Capacity/title (director or partner or sole proprietor, etc.)

Name:..... Duly authorized to sign the bid for and on behalf of: *[insert complete name of Tenderer]*

Dated on day of,..... *[Insert date of signing]* Seal or stamp

Appendix to Tender

Schedule of Currency requirements

Summary of currencies of the Tender for _____ [Insert name of Section of the Works]

<i>Name of currency</i>	<i>Amounts payable</i>
Local currency: _____	
Foreign currency #1: _____	
Foreign currency #2: _____	
Foreign currency #3: _____	
Provisional sums expressed in local currency _____	[To be entered by the Procuring Entity]

NOT APPLICABLE

PART II - WORKS REQUIREMENTS

SECTION V - BILLS OF QUANTITIES

See annexed document

SECTION V – SPECIFICATIONS

Specifications applicable are those by the Ministry of Public Works General Specifications dated March 1976 (together with any amendments issued thereof). The Contractor should obtain a copy from the Ministry of Public Works. No liability will be admitted nor claim allowed in respect of errors in Contractors tender arising from the lack of knowledge on the said specification.

Goods, materials and workmanship meeting other authoritative standards and which promise to ensure equal or higher quality than the standards specified, will also be acceptable

SECTION VI - DRAWINGS

<u>SCHEDULE OF DRAWINGS</u>		
NO.	DESCRIPTION	DRAWING NO.
<u>ARCHITECTURAL DRAWINGS</u>		
	Site Plan	01
	Ground Floor	02
	First Floor Plan	03
	Second Floor Plan	04
	Front Elevation, Rear Elevation	05
	Side Elevation 1, Side Elevation 2	06
	Section IXX	07
	Door Schedule A	08
	Door Schedule B	09
	Window Schedule	10
	Curtain Window Schedule	11
	Guard House Plan, Guard House Elevation	12
	Guard House Section, Member Details	13
<u>STURACTURAL DRAWINGS</u>		
	Foundation Layout, Base Details and Column Details	126/05
	First and Second Floor Beam Details	126/06
	First and Second Floor R.C Slab Details, Roof Layout, Truss Details and Staircase Details	126/07
	Underground R.C Details	126/08
	Lift Shaft Details	126/09
	Septic Tank R.C Details	126/10
	Switch room and Guard House Details	126/11
	Boundary Wall Details	126/12
	Civil Work Details	126/13
<u>ELECTRICAL DRAWINGS</u>		
	Ground Floor Lighting and Fire Alarm Layout	E-GF L&F 00
	First Floor Lighting and Fire Alarm Layout	E-FF L&F 00
	Second Floor Lighting and Fire Alarm Layout	E-SF L&F 00
	Ground Floor Power, ICT, and Cable Raceway Layout	E-GF P&I 00
	First Floor Power, ICT, and Cable Raceway Layout	E-FF P&I 00
	Second Floor Power, ICT, and Cable Raceway Layout	E-SF P&I 00
	Power Schematics 01	NI/2112/E- PS01
	Power Schematics 02	NI/2112/E- PS02
	Power Schematics 03	NI/2112/E- PS03
	Power Schematics 04	NI/2112/E- PS04

MECHANICAL DRAWINGS

Site Plan Plumbing and Fire Fighting Layout	M-PF01
Ground Floor Plumbing and Fire Fighting Layout	M-PF02
First Floor Plumbing and Fire Fighting Layout	M-PF03
Second Floor Plumbing and Fire Fighting Layout	M-PF04
Roof Plumbing and Fire Fighting Layout	M-PF05
Ground Floor Drainage Layout	M-DR02
First Floor Drainage Layout	M-DR03
Second Floor Drainage Layout	M-DR04
Roof Drainage Layout	M-DR05
Ground Floor Air conditioning	M-AC01
First Floor Air conditioning	M-AC02

PART III - THE CONDITIONS OF CONTRACT AND CONTRACT

SECTION VI - GENERAL CONDITIONS OF CONTRACT (GCC)

The Employer is:

Teachers Service Commission

**TSC House, Kilimanjaro Avenue, Upper
hill, Private Bag-00100,**

Nairobi. ddprocurement@tsc.go.ke

The name of the Contract is

Proposed Construction of Office Block for Teachers Service Commission (TSC) At Machakos County

The Project Manager is:

Dama Sevices Ltd

P.O. Box 9656-00100

Nairobi.

Tel.No. +254 020-2628155

E-Mail: damaservices@gmail.com

General Conditions of Contract

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**” means the date of completion of the Works as certified by the Engineer.

“**Contract Price**” means the price defined in the contract and thereafter 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's Personnel” 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 time by 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 or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], which extends over the days stated in the Special Conditions of Contract.

“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 [Application for Final Payment Certificate].

“Force Majeure” is defined in Clause 19 [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 are factual and interpretative about the surface and sub-surface condition at 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.

“Tests on 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, sent or transmitted to the address for 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 address from which the request was issued.
- 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

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

142 The ruling language of the 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 form annexed 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 assign 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

1.81 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.

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

1.83 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.

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

1.9 Timely provision of Drawings or Instructions

1.91 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.

1.92 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.

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

1.94 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 As agreed 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 Entity for 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 permit or 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 of the Procuring Entity's inspection and audit rights constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility 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 the time (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 of any foundation, 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.

22 Permits, Licenses or Approvals

22.1 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.

23 Procuring Entity's Personnel

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

- a) co-operate with the Contractor's efforts under Sub-Clause 4.6 [Co-operation], and
- b) take actions similar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [Safety Procedures] and under Sub-Clause 4.18 [Protection of the Environment].

24 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 Clause 14 [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 assigned 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 Architect is required to obtain the approval of the Procuring Entity before exercising a specified authority, the requirements shall be as stated in the **Special 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 approval is required, then (for the purposes of the Contract) the contractor shall require the Architect to provide evidence 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 shall be deemed to act for the Procuring 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) any act by the Architect in response to a Contractor's request shall be notified in writing to the Contractor within 14 days of receipt.

3.16 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-Clause 13.4: Specifying the amount payable in each of the applicable three currencies.

3.17 Notwithstanding 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.

32 Delegation by the Engineer

3.21 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].

3.22 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.

33 Instructions of the Engineer

3.31 The Architect may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary 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.

3.32 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 Architect or 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).

34 Replacement of the Engineer

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

35 Determinations

35.1 Whenever these Conditions provide that the Architect shall proceed in accordance with this Sub-Clause 3.5 to agree or 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 agreement or 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, and shall 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 design or 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, be fit 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 Architect the "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.

42 Performance Security

- 421 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.
- 422 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.
- 423 The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and 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.
- 424 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.
- 425 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.
- 426 The Procuring Entity shall return the Performance Security to the Contractor within 14 days after receiving a copy of the Taking-Over Certificate.
- 427 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.

43 Contractor's Representative

- 431 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**.
- 432 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 withheld 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 another suitable person for such appointment.
- 433 The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.
- 434 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.
- 435 The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [Instructions of the Engineer].
- 436 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.
- 437 The Contractor's Representative shall be fluent in the language for communications defined in Sub-Clause 1.4

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

44 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 they were the acts 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 Where practicable, the Contractor shall give fair and reasonable opportunity for contractors from Kenya to be appointed as Subcontractors.

45 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.

46 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 causes the Contractor to suffer delays and/or to incur 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.

47 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 Contract 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.

4.73 If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in 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 this.

48 Safety Procedures

The Contractor shall:

- a) Comply with all applicable safety regulations,
- b) Take care 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.

49 Quality Assurance

49.1 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 entitled to audit any aspect of the system.

49.2 Details of all procedures and compliance documents shall be submitted to the Architect for 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.

410 Site Data

410.1 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.

410.2 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 The Contractor 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 shall describe 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 Contract or when submitting the Tender, which shall be made available by the Contractor, but shall not be bound by the Contractor's interpretation of any such evidence.

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 outside the Site

which he may require for the purposes of the Works.

414 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.

415 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 between 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 availability 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.

416 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 the transport of Goods and shall negotiate and pay all claims arising from their transport.

417 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.

418 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 shall 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 Entity shall 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-Clause 3.5 [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, defect or 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 [Nominated Subcontractors]),
 - 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.

422 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.

423 Contractor's Operations on Site

423.1 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 adjacent land.

423.2 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.

423.3 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.

424 Fossils

424.1 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.

424.2 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].

52 **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 his obligations 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].

53 **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].

54 **Evidence of Payments**

54.1 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, directly to 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**

62.1 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 the Contractor.

- 622 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.

63 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.

64 Labor 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.

65 Working Hours

No work 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.

66 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.

67 Health and Safety

- 67.1 The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health 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.
- 67.2 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 whatever is required by this person to exercise this responsibility and authority.
- 67.3 The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. 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.
- 67.4 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.

68 Contractor's Superintendence

- 68.1 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 superintendence to plan, arrange, direct, manage, inspect and test the work.

6.82 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

6.91 The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Contractor's 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 of the Works.

6.92 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 Site an 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 at all 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 thereof 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 employment, 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 in 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.

- 7.33 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

- 7.41 This Sub-Clause shall apply to all tests specified in the Contract.
- 7.42 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 place for the specified testing of any Plant, Materials and other parts of the Works.
- 7.43 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, notwithstanding other provisions of the Contract.
- 7.44 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.
- 7.45 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.
- 7.46 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.
- 7.47 The Contractor shall promptly forward to the Architect duly certified reports of the tests. When the specified tests have been passed, 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

- 7.51 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.
- 7.52 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

- 7.61 Notwithstanding any previous test or certification, the Architect may instruct the Contractor to:
- 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.

- 7.62 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).
- 7.63 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.
- 7.64 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 incorporated 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) The disposal of material from demolitions and excavations and of other surplus material (whether natural or man-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 have 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-Clause 16.2 [Termination by Contractor].

8.1.3 The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date and shall then 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 Tests on 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 within 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.

832 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.

833 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.

834 If, at any time, 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.

84 Extension of Time for Completion

84.1 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.

84.2 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 Architect shall review previous determinations and may increase, but shall not decrease, the total extension of time.

85 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].

86 Rate of Progress

- 861 If, at any time:
- 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.
- 862 Unless the Architect notifies otherwise, the Contractor shall adopt these revised methods, which may require 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.
- 863 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.

87 Delay Damages

- 87.1 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.
- 87.2 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.

88 Suspension of Work

- 88.1 The Architect may at any time 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 against any deterioration, loss or damage.
- 88.2 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.

89 Consequences of Suspension

- 89.1 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.
- 89.2 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.
- 89.3 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 Prolonged Suspension

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 receiving from the Architect an 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 results of 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 Tests on 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 carry out the Tests on Completion within the period of 21 days, the Procuring Entity's Personnel may proceed with the Test at 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 as accurate.

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-Clause 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 Contractor 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 Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding 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 under this 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 the last 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 Contract 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 thereafter 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.

103 Interference with Tests on Completion

- 103.1 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.
- 103.2 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.
- 103.3 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.
- 103.4 After receiving this notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

104 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 (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter, 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.

- 1132 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 apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and/ or Materials would otherwise have expired.

114 Failure to Remedy Defects

- 114.1 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.
- 114.2 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[Cost of 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) Require the 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 Contract as 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 Contract 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.

115 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.

116 Further Tests

- 116.1 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.
- 116.2 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.

117 Right of Access

Until the 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.

118 Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defect on 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.

119 Completion Certificate

- 119.1 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.

11.92 The Architect shall issue the Completion Certificate within 30 days after the latest of the expiry dates of the Defects Liability Period, or as soon thereafter 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 Completion Certificate shall be issued to the Procuring Entity.

11.93 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 AND EVALUATION

12.1 Works to be Measured

12.1.1 The Works shall be measured, and valued for payment, in accordance with this Clause. The Contractor shall 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 agree the records 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 payment of the 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.

123 Evaluation

- 123.1 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 worked 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.
- 123.2 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.
- 123.3 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.
- 123.4 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 Clause 13 [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.
- 123.5 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.
- 123.6 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.
- 123.7 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: $(\text{corrected tender price} - \text{tender price}) / \text{tender price} \times 100$.

124 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, would have been 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 invalidate 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 other characteristics 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.

13.14 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.

132 Variation Order Procedure

1321 Prior to any 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.

1322 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 Works rendered useless by any such variation,
- b) The cost of 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 finance costs, 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.

1323 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-Clause 13.3.

133 Value Engineering

133.1 The Contractor may, at any time, 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.

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

- 1323 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 be half (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

- 1341 If the Architect requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as 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.
- 1342 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 awaiting a response.
- 1343 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.
- 1344 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 Payment in 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

- 1361 Each Provisional Sum shall only be used, in whole or in part, in accordance with the Architect instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such 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, Materials or 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.
- 1362 The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

- 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 deliver each 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 Notwithstanding 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:

$$P = A + B \frac{I_m}{I_o}$$

where:

P is the adjustment factor for the portion of the Contract Price payable.

A and **B** are coefficients **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 **I_o** 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.

- 1394 The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall 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.
- 1395 In cases 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.
- 1396 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.
- 1397 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 applicable on 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.
- 1398 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:
- 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;
 - 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];
 - 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 Clause 12 [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 cash flow 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 advance 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 the case 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 a form 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 their part on the progress during this month in accordance with Sub-Clause 4.21 [Progress Reports].

- 1432 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 Contract otherwise, including those under Clause 20 [Claims, Disputes and Arbitration]; and
 - g) the deduction of amounts certified in all previous Payment Certificates.

144 Schedule of Payments

- 1441 If the 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.
- 1442 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.

145 Plant and Materials intended for the Works

- 1451 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].
- 1452 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.
- 1453 The Architect shall determine and certify each addition if the following conditions are satisfied:
- 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, en-route 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-Clause 14.2 [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 Statement if 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], whichever 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 [Termination by 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 is issued.

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 interbank 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 be half (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 be half (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 shall 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-Clause 13.8 [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.

14.102 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 Contract 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 becomes 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 outstanding 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 30 days 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 the Contractor 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) other payments and deductions 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 these acts 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, in competing for or in executing the Contract.

1522 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 subparagraph (e) or (f) or (g) or (h), the Procuring Entity may by notice terminate the Contract immediately.

1523 The Procuring Entity's election to terminate the Contract shall not prejudice any other rights of the Procuring Entity, under the Contractor otherwise.

1524 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.

1525 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.

1526 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.

153 Valuation at Date of Termination

As soon 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.

154 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 [Procuring 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.

155 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-Clause in 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].

156 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 be and 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 [Termination by 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/or incurs 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-Clause 14.7 [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].

1632 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.

1633 The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract otherwise.

164 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.

165 Payment on Termination

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 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 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.

1722 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.

1723 If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contract or is responsible for 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.

1724 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.

173 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.

174 Consequences of Procuring Entity's Risks

1741 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.

1742 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 Time for Completion], and
- (b) Payment of any 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.

1743 After receiving this further notice, the Architect shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

175 Intellectual and Industrial Property Rights

1751 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.

1752 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.

- 1753 The Procuring Entity shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:
- a) An unavoidable result of the Contractor's compliance with the Contract, or
 - b) A result of any Works being used 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.
- 1754 The Contractor shall indemnify and hold the Procuring Entity harmless against and 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.
- 1755 If a Party is entitled to be indemnified 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.
- 1756 For operation and maintenance of any plant or equipment 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 contractor has received the rights to grant sub-licenses and shall also grant to the Procuring Entity a non-exclusive and non-transferable right (without the rights to sub-license) to use the know-how and other technical information disclosed to the contractor 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 any Works, loss of profit, loss of any contractor for any 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 attempts 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 Contract 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 Contract 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, liabilities or 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.

182 Insurance for Works and Contractor's Equipment

- 182.1 The insuring Party shall insure the Works, Plant, Material and 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.
- 182.2 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]).
- 182.3 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.
- 182.4 Unless otherwise stated in the Special Conditions, insurances under 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, 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, this 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) a part of the Works which is lost or damaged in order 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) a part 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].
- 182.5 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 as the 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].

183 Insurance against Injury to Persons and Damage to Property

- 183.1 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.
- 183.2 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.
- 183.3 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.

184 Insurance for Contractor's Personnel

- 184.1 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.
- 184.2 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 Contractor or any other of 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.
- 184.3 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 overcome, 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, so long 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 lockout by persons other than the Contractor's Personnel,
 - d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, 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 Notwithstanding 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.

194 Consequences of Force Majeure

194.1 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-Clause 18.2 [Insurance for Works and Contractor's Equipment].

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

195 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.

196 Optional Termination, Payment and Release

196.1 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].

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

- a) the amounts payable for any work carried out for which a price is stated in the Contract;
- 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's disposal;
- 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.

197 Release from Performance

Notwithstanding 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 Party of such event or circumstance:

- 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 The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another 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 42 days 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 event or 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.

202 Procuring Entity's Claims

- 202.1 If the Procuring Entity considers itself to be entitled to any payment under any Clause of these Conditions or 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.
- 202.2 The notice shall be given as soon as practicable and no longer than 30 days after the 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.
- 202.3 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].
- 202.4 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.

203 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 arbitration after 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.

204 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.

205 Arbitration

- 205.1 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.
- 205.2 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.
- 205.3 Notwithstanding 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.
- 205.4 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 award any sums which ought to have been the subject of or included in any certificate.

- 2055 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.
- 2056 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.
- 2057 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.
- 2057 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.
- 2058 The terms of the remuneration 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.

206 Arbitration with National Contractors

- 206.1 If the Contract is with national contractors, arbitration proceedings will be conducted in accordance with the Arbitration Laws of Kenya. 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
- 2062 The institution written to first by the aggrieved party shall take precedence over all other institutions.

207 Arbitration with Foreign Contractors

- 207.1 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.
- 207.2 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-Clause 1.4 [Law and Language].

208 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.

209 Failure to Comply with Arbitrator's Decision

- 209.1 The award of such Arbitrator shall be final and binding up on the parties.
- 209.2 In the even that 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 VIII - 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.

Sub-Clause No	Conditions	Contract Data
1.0	Procuring Entity's name and address	Teachers Service Commission TSC House, Kilimanjaro Avenue, Upper hill, Private Bag-00100, Nairobi ceo@tsc.go.ke or ddprocurement@tsc.go.ke
1.1	Name and Reference No. of the Contract	Proposed Construction of Office Blocks for Teachers Service Commission (TSC) At Machakos County
3.1.1	Engineers – Project Manager Name and address	Dama Services Ltd P.O. Box 9656-00100 Nairobi, Kenya. Tel. No. 020 2628155 Email: damaservices@gmail.com
1.1	Contract Duration	Sixty (60) Calendar Weeks from the date of Commencement
1.3	Defect Notification Period	Twenty Four (24) Calendar weeks from the date of defect notification letter/notice
1.1.6	Communications	All communications shall be transmitted through hand delivery, sent by mail or courier as follows: <ul style="list-style-type: none"> a) All payment certificates shall be addressed to the Project Manager with a copy to the Commission Secretary; b) All approvals of the samples and tests shall be addressed to the Project Manager; c) Requests for approvals for variations or amendments shall be addressed to Commission Secretary with a copy to the Project Manager <p>Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed more than 10 working days. When a payment certificate is issued to the Teachers Service Commission, the Project Manager shall send a copy to the Commission within five (5) working days. When a notice is issued to Teachers Service Commission, by the other Party or the Engineer, a copy shall be sent to the Architect or the other Party, within five (5) working days.</p>
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

		<p>of the documents shall be in accordance with the following sequence:</p> <ol style="list-style-type: none"> 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 of activities j) The Bid document of the successful tenderer k) The Letter of Notification of Award m) and any other documents forming part of the Contract. <p>If an ambiguity or discrepancy is found in the documents, the Architect shall issue any necessary clarification or instruction.</p>
1.6	Contract Agreement	The Teachers Service Commission shall enter into a Contract Agreement within 14 days after the Notification of Award.
1.7	Assignment	<p>The Contractor;</p> <ol style="list-style-type: none"> a) May assign part of the work listed under special works to its domestic sub-contractors with prior consent from the Teachers Service Commission and b) shall not assign any benefit or interest under the contract as a security in favor of a bank or financial institution, assign its right to moneys due, or to become due, under the Contract.
1.8		
2.1	Right of Access to the Site	The Teachers Service Commission shall give the Contractor right of access to, and possession of, all parts of the Site within 10 working days after signing the contract.
3.1	Architect Duties and Authority	<p>The Teachers Service Commission has appointed</p> <p>Dama Services Ltd P.O. Box 9656- 00100 Nairobi, Kenya.</p> <p>The Architect shall carry out the duties as signed to him in the Contract.</p>
3.1.2	Contract Amendment	The Architect shall have no authority to amend the Contract until or unless the authority is granted by the Teachers Service Commission in accordance to the provisions of the PPADA, 2015

3.1.3	Approval of Architect Authority	The Architect shall be required to obtain the approval of the Commission before exercising a specified authority. The requirements shall be discussed during site meetings, be escalated to the Contract Implementation Team (CIT). The CIT shall seek approval from the Commission Secretary through the Head of Procurement.
4.2.1	Performance Security	The Performance Security shall be 10% of the contract sum in form of Bank Guaranty from a reputable bank in Kenya regulated by CBK denominated in Kenyan SHS.
4.3.1	Contractor's Representative	The Contractor's Representative's Name and Address: <i>Insert the Name and Address of the Representative</i>
6.5	Normal Working Hours	0800 to 1700 hours
8.1	Commencement Date	Within 10 working days from the date of signing of the contract
8.7.1	Delay Damages	These delay damages shall be calculated at 0.01% of the contract price per day.
8.7.1	Maximum Delay Damage	10%
13.6.(b)(i)	Provisional Sum	4%
13.9	Adjustments for Changes in Cost	Not Applicable
14.2.1	Advance Payment	The Teachers Service Commission may give advance payment to the contractor at a rate of 20% of the contract sum after the Contractor's submission of a bank guarantee of the same amount from a reputable bank regulated by CBK.
14.2.5	Repayment amortization rate of advance payment	Proportionate to the valuation amount
14.3.1	Application for Interim Payment	The Contractor shall submit a Statement for payment in four (4) copies to the Architect at the end of each month in a form 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 the report on the progress of the current month in accordance with Sub-Clause 4.21 [Progress Reports].
14.3.2(c)	Percentage on Retention	10% of gross Valuation amount
14.3.2(c)	Limit of Retention money	5% of the accepted contract amount
14.5.3(b)(i)	Plant and Materials	Not Applicable
14.6.2	Minimum Amount of Interim Payment Certificates	Not Applicable

14.8	Publishing source of commercial interest rates for financial charges in case of delayed payment	Central Bank of Kenya Published Interest Rates.
16.9	Key Personnel	<i>Insert the name and address of the two representatives</i>
17.6.2	Maximum total liability of the Contractor to the Procuring Entity	Full value of the Accepted Contract Amount
18.1.6	Periods for submission of insurance: a. evidence of insurance. b. relevant policies	14 days 14 days
18.2.4 (d)	Maximum amount of deductibles for insurance of the Procuring Entity's risks	<ol style="list-style-type: none"> 1. The minimum cover for insurance of the Works and of Plant and Materials in respect of the Contractor's faulty works is; Contractor's All Risk Policy 2. The minimum cover for loss or damage to Equipment is Full Value of the Equipment. 3. The minimum for insurance of other property is Full Value of the Property. 4. The minimum cover for personal injury or death insurance <ul style="list-style-type: none"> • For the Contractor's employees is; As per the laws applicable in Kenya
18.3.2	Minimum amount of third-party insurance	As per the laws applicable in Kenya
20.7.2	The place of arbitration	Nairobi-Kenya

SECTION IX - CONTRACT FORMS

FORM No. 1 - NOTIFICATION OF INTENTION TO AWARD

FORM NO. 2 – REQUEST FOR REVIEW

FORM No. 3-LETTEROF AWARD

FORM No. 4 - CONTRACT AGREEMENT

FORM No. 5 - PERFORMANCE SECURITY [Option 1 - Unconditional Demand Bank Guarantee]

FORM No. 6- PERFORMANCE SECURITY [Option 2– Performance Bond]

FORM No. 7 - ADVANCE PAYMENT SECURITY

FORM No. 8 - RETENTION MONEY SECURITY

FORM No 1: NOTIFICATION OF INTENTION TO AWARD OF CONTRACT

This Notification of Award shall be sent to each Tenderer that submitted a Tender and was not successful. Send this Notification to the Tenderer's Authorized Representative named in the Tender Information Form on the format below.

FORMAT

1. For the attention of Tenderer's Authorized Representative

- i) Name: *[insert Authorized Representative's name]*
- ii) Address: *[insert Authorized Representative's Address]*
- iii) Telephone: *[insert Authorized Representative's telephone/fax numbers]*
- iv) Email Address: *[insert Authorized Representative's email address]*

[IMPORTANT: insert the date that this Notification is transmitted to Tenderers. The Notification must be sent to all Tenderers simultaneously. This means on the same date and as close to the same time as possible.]

2. Date of transmission: *[email]* on *[date]* (local time)

This Notification is sent by (*Name and designation*) _____

3. Notification of Award

- i) Procuring Entity: *[insert the name of the Procuring Entity]*
- ii) Project: *[insert name of project]*
- iii) Contract title: *[insert the name of the contract]*
- iv) ITT No: *[insert ITT reference number from Procurement Plan]*

This Notification of Intention to Award (Notification) notifies you of our decision to award the above contract. The transmission of this Notification begins the Standstill Period. During the Standstill Period, you may:

4. Request a debriefing in relation to the evaluation of your tender by submitting a Procurement-related Complaint in relation to the decision to award the contracts.

a) The successful tenderers

i) Name of successful Tender _____

ii) Address of the successful Tender _____

iii) Contract price of the successful Tender Kenya Shillings: _____
(in words _____)

b) The reasons for your tender being unsuccessful are as follows:

c) Other Tenderers

Names of all Tenderers that submitted a Tender. If the Tender's price was evaluated include the evaluated price as well as the Tender price as read out.

S/No	Name of Tender	Tender Price as read out	Tender's evaluated price (Note a)	One Reason Why Not Evaluated
1				
2				
3				
4				
5				

(Note a) State NE if not evaluated

5. **How to request a debriefing?**

- a) DEADLINE: The dead line to request a debriefing expires at midnight on [insert date] (local time).
- b) You may request a debriefing in relation to the results of the evaluation of your Tender. If you decide to request a debriefing your written request must be made within three (5) Business Days of receipt of this Notification of Intention to Award.
- c) Provide the contract name, reference number, name of the Tenderer, contact details; and address the request for debriefing as follows:
 - i) Attention: [insert full name of person, if applicable]
 - ii) Title/position: [insert title/position]
 - iii) Agency: [insert name of Procuring Entity]
 - iv) Email address: [insert email address]
- d) If your request for a debriefing is received within the 3 Days deadline, we will provide the debriefing within five (3) Business Days of receipt of your request. If we are unable to provide the debriefing within this period, the Standstill Period shall be extended by five (3) Days after the date that the debriefing is provided. If this happens, we will notify you and confirm the date that the extended Standstill Period will end.
- e) The debriefing may be in writing, by phone, video conference call or in person. We shall promptly advise you in writing how the debriefing will take place and confirm the date and time.
- f) If the deadline to request a debriefing has expired, you may still request a debriefing. In this case, we will provide the debriefing as soon as practicable, and normally no later than fifteen (15) Days from the date of publication of the Contract Award Notice.

6. **How to make a complaint?**

- a) Period: Procurement-related Complaint challenging the decision to award shall be submitted by midnight, [insert date] (local time).
- b) Provide the contract name, reference number, name of the Tenderer, contact details; and address the Procurement-related Complaint as follows:
 - i) Attention: [insert full name of person, if applicable]
 - ii) Title/position: [insert title/position]
 - iii) Agency: [insert name of Procuring Entity]
 - iv) Email address: [insert email address]
- c) At this point in the procurement process, you may submit a Procurement-related Complaint challenging the decision to award the contract. You do not need to have requested, or received, a debriefing before making this complaint. Your complaint must be submitted within the Standstill Period and received by us before the Standstill Period ends.
- d) Further information: For more information refer to the Public Procurement and Disposals Act 2015 and its Regulations available from the Website www.ppra.go.ke.

You should read these documents before preparing and submitting your complaint.

- e) There are four essential requirements:
 - i) You must be an 'interested party'. In this case, that means a Tenderer who submitted a Tender in this tendering process and is the recipient of a Notification of Intention to Award.
 - ii) The complaint can only challenge the decision to award the contract.
 - iii) You must submit the complaint within the period stated above.
 - iv) You must include, in your complaint, all of the information required to support your complaint.

7. Standstill Period

- i) DEADLINE: The Standstill Period is due to end at midnight on [*insert date*] (local time).
- ii) The Standstill Period lasts ten (14) Days after the date of transmission of this Notification of Intention to Award.
- iii) The Standstill Period may be extended as stated in paragraph Section 5(d) above.

If you have any questions regarding this Notification please do not hesitate to contact us. On behalf of the Procuring Entity:

Signature: _____

Name: _____

Title/position: _____

Telephone: _____

FORM NO. 2- REQUEST FOR REVIEW

FORM FOR REVIEW (r.203(1))

PUBLIC PROCUREMENT ADMINISTRATIVE REVIEW BOARD

APPLICATION NO..... OF.....20.....

BETWEEN

..... APPLICANT AND

.....RESPONDENT (Procuring Entity)

Request for review of the decision of the..... (Name of the Procuring Entity of..... dated the...day of20.....in the matter of Tender No.....of20..... for (Tender description).

REQUEST FOR REVIEW

I/We....., the above named Applicant(s), of address: Physical address..... P. O. Box No..... Tel. No..... Email, hereby request the Public Procurement Administrative Review Board to review the whole/part of the above mentioned decision on the following grounds, namely:

- 1.
- 2.

By this memorandum, the Applicant requests the Board for an order/orders that:

- 1.
- 2.

SIGNED (Applicant) Dated on..... day of/...20.....

FOR OFFICIAL USE ONLY Lodged with the Secretary Public Procurement Administrative Review Board on day of20.....

SIGNED

Board Secretary

FORM NO 3: LETTER OF AWARD

letterhead paper of the Procuring Entity]

[date]

To: *[name and address of the Contractor]*

This is to notify you that your Tender dated *[date]* for execution of the *[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount *[amount in numbers and words]* *[name of currency]*, as corrected and modified in accordance with the Instructions to Tenderers, is here by accepted by *(name of Procuring Entity)*.

You are requested to furnish the Performance Security within in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms included in Section VI, Contract Forms, of the Tender Document.

Authorized Signature:

Name and Title of Signatory:

Name of Procuring Entity:

Attachment: *Contract Agreement*:

FORM NO 4: CONTRACT AGREEMENT

THIS AGREEMENT made the day of..... 20....., between.....
.....of.....(hereinafter “the Procuring
Entity”), of the one part, and _____ of _____ (hereinafter
“the Contractor”), of the other part:

WHEREAS the Procuring Entity desires that the Works known as _____ should be
executed by the Contractor, and has accepted a Tender by the Contractor for the execution and completion of these
Works and the remedying of any defects there in,

The Procuring Entity and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - a) The Notification of Award
 - b) the Form of Tender
 - c) the addenda Nos _____ (if any)
 - d) the Special Conditions of Contract
 - e) the General Conditions of Contract;
 - f) the Specifications
 - g) the Drawings; and
 - h) the completed Schedules and any other documents forming part of the contract.
3. In consideration of the payments to be made by the Procuring Entity to the Contractor as specified in this Agreement, the Contractor here by covenants with the Procuring Entity to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Procuring Entity here by covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects there in, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

INWITNESS where of the parties here to have caused this Agreement to be executed in accordance with the
Laws of Kenya on the day, month and year specified above.

Signed and sealed by _____ (for the Procuring Entity)

Signed and sealed by _____ (for the Contractor).

FORM NO. 5 - PERFORMANCE SECURITY

[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 informed that _____ (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. At the 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 itself 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.....,²², 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]*, in response to the 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.*

¹The 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.

²Insert 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. 6- PERFORMANCE SECURITY:

[Option 2– Performance Bond] Shall not be applicable as indicated in the Notes below:

[Note: Procuring Entities are advised to use Performance Security – Un conditional Demand Bank Guarantee instead of Performance Bond due to difficulties involved in calling Bond holder to action]

[Guarantor letterhead or SWIFT identifier code]

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

_____ *[Insert date of issue]*

PERFORMANCE BOND No.: _____

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

1. By this Bond _____ as Principal (hereinafter called “the Contractor”) and _____] as Surety (hereinafter called “the Surety”) are held and firmly bound un to] as Obligee (hereinafter called “the Procuring Entity”) in the amount of _____ for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.
2. WHEREAS the Contractor has entered into a written Agreement with the Procuring Entity dated the _____ day of _____, 20_____, for _____ in accordance with the documents, plans, specifications, and amendments there to, which to the extent here in provided for, are by reference made part here of and are here in after referred to as the Contract.
3. NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Procuring Entity to be, in default under the Contract, the Procuring Entity having performed the Procuring Entity's obligations there under, the Surety may promptly remedy the default, or shall promptly:
 - a) Complete the Contract in accordance with its terms and conditions; or
 - b) Obtain a tender or tenders from qualified tenderers for submission to the Procuring Entity for completing the Contract in accordance with its terms and conditions, and upon determination by the Procuring Entity and the Surety of the lowest responsive Tenderers, arrange for a Contract between such Tenderer, and Procuring Entity and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term “Balance of the Contract Price,” as used in this paragraph, shall mean the total amount payable by Procuring Entity to Contractor under the Contract, less the amount properly paid by Procuring Entity to Contractor; or
 - c) Pay the Procuring Entity the amount required by Procuring Entity to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.
4. The Surety shall not be liable for a greater sum than the specified penalty of this Bond.
5. Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate. No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Procuring Entity named here in or the heirs, executors, administrators, successors, and assigns of the Procuring Entity.
6. In testimony whereof, the Contractor has here unto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly at tested by the signature of his legal representative, this day _____ of _____ 20_____.

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

SIGNED ON _____ on behalf of _____

By _____ in the capacity of _____

In the presence of _____

FORM NO. 7 - ADVANCE PAYMENT SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ [Insert name and Address of Procuring Entity]

Date: _____ [Insert date of issue]

ADVANCE PAYMENT GUARANTEE No.: [Insert guarantee reference number]

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

1. We have been informed that _____ (hereinafter called "the Contractor") has entered into Contract No. _____ dated _____ with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____ (in words _____) is to be made against an advance payment guarantee.
3. At the 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 upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:
 - a) Has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or
 - b) Has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Contractor on its account number _____ at _____.
5. The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the _____ day of _____, 2 _____, ² whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.
6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the 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.

¹The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency of the advance payment as specified in the Contract.

²Insert the expected expiration date of the Time for Completion. The Procuring Entity should note that in the event of an extension of the time 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. 8 – RETENTION MONEY SECURITY

[Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary: _____ *[Insert name and Address of Procuring Entity]*

Date: _____ *[Insert date of issue]*

Advance payment guarantee no. *[Insert guarantee reference number]*

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

1. We have been informed that _____ *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Contractor") has entered into Contract No. _____ *[insert reference number of the contract]* dated _____ with the Beneficiary, for the execution of _____ *[insert name of contract and brief description of Works]* (hereinafter called "the Contract").
2. Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, and payment of *[insert the second half of the Retention Money]* is to be made against a Retention Money guarantee.
3. At the request of the Contractor, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* _____ *([insert amount in words _____])*¹ upon receipt by us of the Beneficiary's complying demands up ported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or showgrounds for your demand or the sum specified there in.
4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the second half of the Retention Money as referred to above has been credited to the Contractor on its account number _____ at _____ *[insert name and address of Applicant's bank]*.
5. 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.
6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months]* *[one year]*, in response to the 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.*

²Insert a date that is twenty-eight days after the expiry of retention period after the actual completion date of the contract. 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)
<i>[include full name (last, middle, first), nationality, country of residence]</i>			

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 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]”

*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]

PART NO. 2

PARTICULAR PRELIMINARIES

PARTICULAR PRELIMINARIES

ITEM	DESCRIPTION									
<p>A</p> <p>B</p>	<p>PRICING ITEMS FOR PRELIMINARIES Prices shall be inserted against items of 'preliminaries' in the tenderer's priced Bill of Quantities. The Contractor is advised to read and understand all preliminaries. Preliminary items not priced shall be deemed to have been included in the rates of items in the Bill of Quantities.</p> <p>DESCRIPTION OF THE WORKS The works to be carried out under this contract comprise construction of a 3 – Storey Office Block with all associated specialized services installations and external works. The total approximate built- up area is as follows: -</p> <table border="0" style="margin-left: 40px;"> <tr> <td>01. Office Block –</td> <td style="text-align: right;">756 S.M.</td> </tr> <tr> <td>02. Guard House –</td> <td style="text-align: right;">10 S.M</td> </tr> <tr> <td>03. Switch Room –</td> <td style="text-align: right;">17 S.M</td> </tr> <tr> <td style="text-align: center;">TOTAL</td> <td style="text-align: right; border-top: 1px solid black;">783 S.M</td> </tr> </table> <p>The building structure is in reinforced concrete foundation, reinforced concrete frame, masonry walling and a pitched roof with timber truss members.</p> <p>Windows are generally aluminium framed infilled with clear and/or obscure glass. Doors are Aluminium glass doors externally & semi-solid core flush doors internally.</p> <p>Wall finishes are generally plastered and painted in common areas. Ceramic wall tiles to internal wet areas.</p> <p>Ceiling finishes are plastered and painted slab soffits, Gypsum ceiling to the top floor.</p> <p>The external works include storm water drainage, foul water drainage, underground water tank, Septic Tank, soak pit, Boundary Wall, paving to parking and other landscaping works.</p> <p>The Services Installations include General Electrical Works, Structured Cabling, Plumbing, Fire Fighting Installations, Air Conditioning & Mechanical Ventilation Systems and Lift Installation Works</p>	01. Office Block –	756 S.M.	02. Guard House –	10 S.M	03. Switch Room –	17 S.M	TOTAL	783 S.M	
01. Office Block –	756 S.M.									
02. Guard House –	10 S.M									
03. Switch Room –	17 S.M									
TOTAL	783 S.M									
	<p>Carried to Collection</p>	<p align="right">KSHS</p>								

ITEM	DESCRIPTION
A	<p>MEASUREMENTS In the event of discrepancy between the Bill of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any Contract documents shall immediately be reported to the Project Manager in accordance with Clause 22 of the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with Clause 22 of the said Conditions.</p>
B	<p>LOCATION OF THE SITE The site is located within Machakos Town.</p>
C	<p>CLEARING AWAY The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate, upon completion of the works, remove, clear away all plants, equipment, rubbish, unused materials, stains and leave in a clean tidy state to the satisfaction of the Project Manager. The whole of the works shall be delivered up clean, complete, and perfect condition in every respect to the satisfaction of the Project Manager.</p>
D	<p>CLAIMS It shall be a condition of this Contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and/or expenses due to any of the Contract Conditions, or by any other reason whatsoever, he shall present such claim or intent to claim notice to the Project Manager within the Contract period. No claim shall be entertained upon the expiry of the said Contract period.</p> <p>PAYMENTS</p>
E	<p>Payment will be done on monthly basis by the Project Manager on application by the Contractor. All payments shall be made by Client Department upon certification by the Project Manager. Subcontractors shall be paid through the Main Contractor. The Main Contractor must confirm that they have paid sub-contractors to be eligible for subsequent certificates.</p>
F	<p>PREVENTION OF ACCIDENTS, DAMAGE OR LOSS The Contractor is notified that the works are to be carried out on a fairly busy, high security conscious site where the Client is going on with other normal activities. He/she is therefore instructed to take reasonable care in the execution of the works so as to prevent accidents, damage or loss and disruption of normal activities being carried out by the Client. The Contractor shall allow in his rates any expenses he deems necessary by taking such care within the site.</p>
	<p>Carried to Collection KSHS.</p>

ITEM	DESCRIPTION
A	<p>WORKING CONDITIONS The Contractor shall allow in his rates for any interference that he may encounter in the course of execution of the works.</p>
B	<p>SIGN BOARD. Allow for providing, erecting, maintaining throughout the Contract period and clearing afterwards a sign board as designed and approved by the Project Manager.</p>
C	<p>LABOUR CAMPS The Contractor shall NOT be allowed to house his labourers on site. Allow also for transporting workers to and from site during the Contract Period as may be necessary.</p>
D	<p>PROJECT MANAGER'S SITE OFFICE Allow for maintaining throughout the project period temporary site office size 8x10m long comprising 50x100mm cypress timber structure, flat roof covered with 30gauge corrugated iron sheets, 32gauge corrugated iron sheet cladded walls, 100mm thick floor well compacted and finished smooth with cement and sand (1:3) screed, timber doors, windows and all necessary office furniture (15no. arm chairs, table, calendar, visitors and site instruction books). The Contractor shall also allow for the Project Manager use desktop computer complete with email connecting devices as well as provision for scratch cards and payment for email or internet connectivity expenses, stationery for the duration of the contract.</p>
E	<p>PRICING NOTES The tenderer shall include for all cost in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract.</p>
F	<p>FLUCTUATIONS This is a fixed price contract and no fluctuations are allowed.</p>
	<p>Carried to Collection KSHS</p>

ITEM	DESCRIPTION	
<p>A</p>	<p>SECURITY OF THE WORKS</p> <p>The Contractor shall allow for providing adequate security for the works and workers during the Contract. No claim will be entertained for lack of enough security in this respect.</p>	
<p>B</p>	<p>URGENCY OF THE WORKS</p> <p>The Contractor should note that these works are very urgent and must be completed within the agreed contract period.</p>	
<p>C</p>	<p>PAYMENT FOR MATERIALS ON SITE</p> <p>All materials for incorporation in the works must be in the site stores before they are considered for payment, unless specifically exempted by the Project Manager. This is to include materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.</p>	
<p>D</p>	<p>EXISTING SERVICES</p> <p>Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the and he/she shall make whatever provisions that may be required by the authority for support, maintenance and protection of such services.</p>	
<p>E</p>	<p>PHASED IMPLEMENTATION AND SECTIONAL COMPLETION</p> <p>The Client based on various factors may consider sectional completion or phased implementation of the works. The Contractor will be instructed by the Project Manager to abide by such directions to suit the requirements of the Employer.</p> <p>Tenderers are also notified that no contractual claims or increase in prices will be allowed due to any Phased implementation of the works</p> <p>The last of the contract works are however to be completed within the overall Contract Completion Period.</p>	
	<p>Carried to Collection</p>	<p>KSHS</p>

ITEM	DESCRIPTION	
A	<p>PERFORMANCE BOND</p> <p>A performance bond in the form of unconditional bank guarantee required is 10% of the bid price. On award of contract, no payment on account for the works executed will be made to the Contractor until he has submitted the Performance Bond to the Project Manager duly signed, sealed and stamped from an approved bank.</p>	
B	<p>TENDER DOCUMENT</p> <p>Tender documents are listed in the Instruction to Tenderers and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents.</p> <p>Tenders will be opened at the time specified in the letter accompanying these documents. Tenders delivered or received later than the above time will not be opened.</p>	
C	<p>VALUE ADDED TAX</p> <p>The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1st September, 1993 which requires payment of VAT on all contracts. The Contractor must therefore include V.A.T in their rates.</p>	
D	<p>FORM OF CONTRACT</p> <p>The form of Contract shall be as stipulated in the Republic of Kenya's Standard Tender Document for Procurement of Building Works and Associated Civil Engineering Works (2021 Edition) included under this Proposal. The Conditions of Contract are also included herein (General Conditions of Contract & Special Conditions of Contract) Particulars of insertion to be made in the Appendix to the Contract Agreement will be found in Part No.5 Section IV OTHER FORMS.</p>	
	Carried to Collection	KSHS

ITEM	DESCRIPTION	
	<p>COLLECTION</p> <p>Brought Forward from Page 1</p> <p>Brought Forward from Page 2</p> <p>Brought Forward from Page 3</p> <p>Brought Forward from Page 4</p> <p>Brought Forward from Page 5</p>	
	<p>TOTAL FOR PART NO. 2 CARRIED TO MAIN SUMMARY</p>	<p>KSHS</p>

PART NO. 3

GENERAL PRELIMINARIES

ITEM	DESCRIPTION	KSHS	CTS
	GENERAL PRELIMINARIES		
A	<p>PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES Prices shall be inserted against items of preliminaries in the Contractor's priced Bills of Quantities and Specifications.</p> <p>The Contractor shall be deemed to have included in his prices or rates for various items in the Bills of Quantities of Specifications for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract.</p>		
B	<p>Throughout these bills, units of measurement and terms are abbreviated and shall be interpreted as follows</p> <p>CM Shall mean cubic metre</p> <p>SM Shall mean square metre</p> <p>LM Shall mean linear metre</p> <p>MM Shall mean millimeter</p> <p>KG Shall mean kilogram</p> <p>NO Shall mean numbers</p> <p>PRS Shall mean pairs</p> <p>BS Shall mean the British Specification published by the British Standard Institution , 2 Park Street, London W.I England</p> <p>DITTO Shall mean the whole of the preceding description except as qualified in the description in which it occurs.</p> <p>M.S Shall mean measured separately</p> <p>a.b.d Shall mean as above described.</p>		
	<p>Carried to Collection</p> <p style="text-align: right;">KSHS</p>		

ITEM	DESCRIPTION	KSHS	CTS
A	<p>EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT</p> <p>Attendance; Clause B19(a) of the Standard Method of Measurement is deleted and the following Clause is substituted:-</p> <p>Attendance on nominated Sub-Contractors shall be given as an item in each case and shall be deemed to include: allowing use of standing scaffolding, mesh rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary, providing space for office accommodation, and for storage of plant and materials; providing light and water for the works; clearing away rubbish; unloading checking providing electric power and removing and replacing duct covers, pipe chasings and the like necessary for the execution and testing of Sub-Contractor's work and being responsible for the accuracy of the same.</p> <p>Fix Only; "Fix Only" Shall mean take delivery on site where necessary, distribute to position, hoist and fix only.</p>		
B	<p>THE EMPLOYER</p> <p>The term "Employer" and "Client" wherever used in the Contract Document shall be synonymous.</p>		
C	<p>PROJECT MANAGER</p> <p>The term "PM" wherever used in this Bills of Quantities shall be deemed to imply the Project Manager as defined in Conditions of Contract or such person or persons as may be duly authorized to represent him on behalf of the Employer. The Project Manager shall be deemed to mean Messrs. Dama Services Ltd. of P.O. Box 9656-00100, NAIROBI, Tel. Nos. +254 020-2628155 or +254-722 299466 Email: damaservices@gmail.com</p>		
D	<p>ARCHITECT</p> <p>The term Architect shall be deemed to mean Messrs. Dama Services Ltd. of P.O. Box 9656-00100, NAIROBI, Tel. Nos. +254 020-2628155 or +254-722 299466 Email: damaservices@gmail.com</p>		
E	<p>QUANTITY SURVEYOR</p> <p>The term "Quantity Surveyor" shall be deemed to mean the firm of Messrs Integra Consulting Limited of address P.O. Box 27974-00100 Nairobi. Tel: 020-2713061. Email: info@integraconsulting.co.ke</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	SERVICES ENGINEER The term "Services Engineer (Electrical and Mechanical)" shall be deemed to mean Messrs. Norkun Intakes Ltd P.O Box. 605 - 00100, Nairobi. Tel. No. +254 729 381 360 I +254 736 230 287 Email: info@norkun.com		
B	STRUCTURAL & CIVIL ENGINEER The term "Structural & Civil Engineer" shall be deemed to mean the Firm of Messrs. Inticom Consulting Ltd, P.O Box 14105 -00100, NAIROBI, Tel. No. +245 722343406 Email: inticomltd@gmail.com		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>PLANT, TOOLS AND VEHICLES</p> <p>Allow for providing all scaffolding, plants, tools and vehicles required for the works except in so far as may be stated otherwise herein and except for such items specifically and only required for use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork, or temporary works of any kind should be afterwards in the permanent works.</p>		
B	<p>TRANSPORT</p> <p>Allow for transport of workmen, materials, etc. to and from the site at such hours and by such routes as may be permitted by competent Authorities in liaison with the PROJECT MANAGER.</p>		
C	<p>MATERIALS AND WORKMANSHIP</p> <p>All materials and workmanship used in the execution of the works shall be of the best quality and description unless otherwise stated. The Contractor shall order all materials to be obtained from overseas immediately after the contract is signed and shall also order for materials to be obtained from local sources as early as necessary to ensure that they are onsite when required for use in the works. The Bills of Quantities shall not be used for the purposes of ordering materials.</p>		
D	<p>SIGN FOR MATERIALS SUPPLIED</p> <p>The Contractor shall be required to sign receipts for all articles and materials supplied by the Project Manager at the time of taking delivery thereof, as having received them in good order and condition, and will thereafter be responsible for any such loss or damage and for replacement of such any loss with articles and/or materials which shall be supplied by the Project Manager at the current market prices including Customs Duty and VAT, all at the Contractors own cost and expenses, to the satisfaction of the PROJECT MANAGER.</p>		
E	<p>STORAGE OF MATERIALS</p> <p>The Contractor shall provide at his own risk and cost where directed on the site weather proof lock-up sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the PROJECT MANAGER. NOMINATED SUB-CONTRACTORS are to be made liable for the cost of any storage accommodation provided specifically for their use.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>SAMPLES</p> <p>The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete test cubes required for the works that may be called for by the PROJECT MANAGER for his approval. The PROJECT MANAGER may reject any materials or workmanship in his opinion not to the approved sample. The PROJECT MANAGER shall arrange for testing of such materials as he/she may at his/her discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the PROJECT MANAGER. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by Ministry of Public Works</p> <p>The procedure for submitting samples of materials for testing and the method of marking for identification shall be laid down by the PROJECT MANAGER. The Contractor shall allow in his tender for such samples and tests except for those in connection with nominated subcontractor's work.</p>		
B	<p>GOVERNMENT ACT REGARDING WORK PEOPLE ETC.</p> <p>Allow for complying with Government Acts, order and Regulations in connection with the employment of Labor and other matters related to the execution of the works. In particular, the Contractor's attention is drawn to the provisions of the Factory Act of 1950 and the tenderer must include for all costs arising or resulting from compliance with any Act Order or Regulation relating to insurance, pensions, and holidays for work people or so the safety and welfare of the work people. The Contractor must make himself fully acquainted with current Acts and Regulations including police regulations regarding movements, housing, security and control of labor, labor camps, passes for transport etc. It is important that the Contractor before tendering obtain information regarding all such regulations and/or restrictions which may affect the organization of the works, supply and control of labor etc: and allow accordingly in his tender. No claim shall be entertained for lack of knowledge in this respect.</p>		
C	<p>SECURITY OF WORKS, ETC.</p> <p>The Contractor shall be entirely responsible for the security of the works, materials, plant, personnel etc, both his own and subcontractor's and must provide all necessary watching, lighting and precautions necessary to ensure security against theft, loss or damage and the protection of the public.</p>		
D	<p>PROTECTIVE CLOTHING</p> <p>The Contractor shall provide all protective or any other special clothing or equipment for his employees that may be necessary.</p> <p>The contractor is notified that in certain areas the workers will be required to put on special protective wear on the head, nose, ears, eyes, body and feet.</p> <p>These shall include, inter-alia, safety helmets, gloves, goggles, earmuffs, safety overalls, etc., according to the type of work. The Contractor shall ensure that safety helmets are worn by all staff at all times.</p> <p>The Contractor shall allow for providing clean lab coat, reflector jacket safety boots and helmets to the Client's representatives and Consultants whenever they visit the site. Allow for a minimum twelve people.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>HEALTH AND SAFETY</p> <p>The Contractor shall comply at all times with the requirements of the Occupational Safety and Health Act (OSHA) 2007 and ensure that the safety of his work people and authorised visitors to the Site is protected at all times. In particular there shall be proper provision of planked footways and guard-rails to scaffolding, etc., protection against falling materials and tools and the Site shall be tidy and clear of debris. The Contractor shall appoint a safety officer as required by OSHA and notify the Directorate of Safety and Health Inspector of his name. The safety Officer shall be on Site at all times and all directions given by the PROJECT MANAGER to the Safety Officer shall be deemed to be Project Manager's Instructions, and shall be complied with promptly without additional cost to the contract.</p> <p>The PROJECT MANAGER shall be empowered to suspend work on the Site should he considers these conditions are not being observed, and no claim arising from such suspension will be allowed.</p>		
B	<p>PUBLIC AND PRIVATE ROADS</p> <p>Maintain as required throughout the execution of the works and make good any damage to Public or Private roads arising from or subsequent upon the execution of the works to the satisfaction of the local and other competent authority and the Project Manager.</p>		
C	<p>EXISTING PROPERTY</p> <p>The Contractor shall take every precaution to avoid damage to existing property including roads, cables, drains and other services and he will be held responsible for and shall make good all such damages arising from the execution of this Contract at his own expense at his own cost to the satisfaction of the Project Manager.</p>		
D	<p>VISIT THE SITE AND EXAMINE DRAWINGS</p> <p>The Contractor is advised to examine the drawings and visit the site location of which is described in the Particular Preliminaries hereof in liaison with PROJECT MANAGER. He shall be deemed to have acquainted him/ herself therewith as to its nature, position, means of access or any other matter which may affect his tender. No claim arising from his failure to comply with this advice shall be entertained.</p>		
E	<p>ACCESS TO SITE AND TEMPORARY ROADS</p> <p>Means of accessing the site shall be agreed with the PROJECT MANAGER prior to commencement of the works and the Contractor must allow for building any necessary temporary access road for the transport of materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossings or any other means of accessing the site. Upon completing the works, the Contractor shall remove temporary access roads, temporary culverts etc; and make good, reinstate all works and surfaces disturbed to the satisfaction of the PROJECT MANAGER.</p>		
F	<p>AREA TO BE OCCUPIED BY THE CONTRACTOR</p> <p>The area of the site which may be occupied by the Contractor for site office, storage and for the purpose of erecting workshops etc; shall be defined on site by the PROJECT MANAGER.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>OFFICE FOR THE PROJECT MANAGER</p> <p>The Contractor shall erect and maintain where directed on site and afterwards dismantle the site office of the type noted in Particular Preliminaries, complete with furniture. He shall also provide strong metal trunk complete with strong hasp and staple fastening and two keys. He shall provide and maintain a lock-up type water or bucket closet for the sole use of the PROJECT MANAGER including connections to the drain where applicable in conformity with Public Health Authorities and shall provide services of a cleaner and pay all conservancy charges and keep both office and closet in a clean and sanitary condition from commencement to completion of the works and thereafter dismantle and make good disturbed surfaces. The office and the closet shall be erected before the contractor is permitted to commence the works. The Contractor shall make available on site as and when required by the PROJECT MANAGER a modern and accurate level together with leveling staff, ranging rods and 50 metre metallic or linen tape measure.</p>		
B	<p>WATER AND ELECTRICITY SUPPLY</p> <p>The Contractor shall provide at his own risk all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangement for connection to the nearest suitable water mains available and for metering the water used. He must also provide temporary water tank and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the PROJECT MANAGER. The Contractor shall pay all charges in connection herewith. No guarantee is given or implied that sufficient water will be available from mains and the Contractor must make his own arrangement for augmenting this supply at his own cost.</p>		
C	<p>SANITATION</p> <p>The sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the PROJECT MANAGER.</p>		
D	<p>ACCIDENTS</p> <p>The Contractor shall endeavor to ensure that no accident occurs at any of his sites by Adopting best practices and the mitigation measures spelt out in the Environmental and Social Management Plan. One accident will be considered "one too many". However, should any accident or incident occur at any one time, the Contractor shall forthwith report the same to the Project Manager in writing, spelling out clearly the circumstances under which it occurred and await further instructions from the Project Manager. He shall forthwith report the accident to the Police and The Directorate of Occupational Safety and Health and cooperate with them to ensure thorough and conclusive investigations. All these shall be at his own cost and indemnify the affected party.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>PRIME COST OR PC SUMS</p> <p>The term "Prime Cost or PC Sum" whenever used in these Bills of Quantities shall be expended upon the authority of the Project Manager.</p>		
B	<p>PROGRESS CHART</p> <p>The Contractor shall provide within two weeks of Possession of Site and in Agreement with the PROJECT MANAGER a Progress Chart for the whole of the works including the works of Nominated Subcontractors; one copy to be handed to the PROJECT MANAGER and a further copy to be retained on site. Progress to be recorded and chart to be amended as necessary as the work proceeds.</p>		
C	<p>ADJUSTMENT OF PC SUMS</p> <p>In the final account, all P.C Sums shall be deducted and the amount properly expended upon the PROJECT MANAGER'S order in respect of each of them added to the Contract Sum. The Contractor shall produce to the PROJECT MANAGER such quotations, invoices or bills, properly receipted as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C Sums shall be adjusted in the final account pro-rata to the amount paid. Items of attendance (as previously described) following P.C Sums shall be adjusted to the physical extent of the work executed (not pro-rata to the amount paid) and shall apply even though the Contractors Priced Bills shows a percentage in the rate column in respect of them.</p> <p>Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C Sum is included in the Bills of Quantities, profit and attendance will be allowed as it would be if the work were executed by a Nominated Sub-contractor.</p>		
	<p>Carried to Collection</p>	<p>KSHS</p>	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>ADJUSTMENT OF PROVISIONAL SUMS</p> <p>In the final account all Provisional Sums shall be deducted and the amount properly executed in respect of them upon the PROJECT MANAGER's order added to the Contract Sum. Such works shall be valued as described for Variations in Condition No.22 of the Conditions of Contract, but the value of such work or articles for the work to be supplied by a Nominated Subcontractor, the value of such work or article to be supplied by a Nominated Supplier, the value of such work or article shall be treated as a P.C Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.</p>		
B	<p>NOMINATED SUB-CONTRACTORS</p> <p>When any work is ordered by the PROJECT MANAGER to be executed by nominated Sub-contractors, the Main Contractor shall enter into a Sub-contract as described in Condition No.7 of the Conditions of Contract and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described, the Contractor is to provide for such Sub- contractors any or all the facilities in these Preliminaries. They should price for these with the nominated Subcontract Contractor's work concerned in the P.C Sums under the description "Add for Attendance".</p>		
C	<p>DIRECT CONTRACTS</p> <p>Notwithstanding the foregoing conditions, the Employer reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C Sum the priced Bills of Quantities will be adjusted as described for P.C Sums and allowed.</p>		
D	<p>ATTENDANCE UPON OTHER TRADESMEN ETC.</p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or any other persons employed for the execution of any work not included in this Contract every facility for carrying out the work and for use in his ordinary scaffolding. The Contractor, however, shall perform such carting away for and making good after the work of such tradesmen or persons as may be ordered by the PROJECT MANAGER and the work will be measured and paid for to the extent executed at rates provided in these bills.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>INSURANCE</p> <p>The Contractor shall insure as required and as outlined in the Appendix to the Conditions of Contract. No payment on account in respect of the works shall be made to the Contractor unless he/she has satisfied the PROJECT MANAGER either by production of an Insurance Policy certificate that the foregoing Insurance Clauses have been complied within all respects. Thereafter the PROJECT MANAGER shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce receipted premium renewals for the PROJECT MANAGER's inspection.</p>		
B	<p>PROVISIONAL WORK</p> <p>All work described as "Provisional" in these Bills of Quantities is subject to re-measurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract be left uncovered for a reasonable period of time to enable all measurements needed to be taken by the PROJECT MANAGER. Immediately the work is ready for measuring, the Contractor shall give notice to the PROJECT MANAGER. If the Contractor makes default in these respects he/she shall if the PROJECT MANAGER so directs uncover the work to enable all measurements to be taken afterwards reinstate at his own expense.</p>		
C	<p>ALTERATION TO BILLS, PRICING ETC.</p> <p>Any unauthorized alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and in any case be ignored. The Contractor shall be deemed to have made allowance in his/her prices generally to cover any items against which no price has been inserted in the Priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the prices of each item before they will be accepted.</p>		
D	<p>BLASTING OPERATIONS</p> <p>Blasting shall only be allowed with the express permission of the PROJECT MANAGER in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being and any special regulations laid down by the PROJECT MANAGER governing the use and storage of explosives.</p>		
	<p>Carried to Collection</p>	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>MATERIALS ARISING FROM EXCAVATIONS</p> <p>Materials of any kind obtained from excavations shall be the property of the Client. Unless the PROJECT MANAGER directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution for materials which the Contractor will otherwise have had to supply with the written permission of the PROJECT MANAGER. Should such permission be given, the Contractor shall make due allowance for materials so used at a price to be agreed.</p>		
B	<p>PROTECTION OF THE WORKS</p> <p>Provide protection of the whole of the works contained in the Bills of Quantities, including casing, casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the PROJECT MANAGER and remove such protection when no longer required and make good any damage which nevertheless have been done at completion free of cost to the to Government.</p>		
C	<p>REMOVAL OF RUBBISH ETC.</p> <p>Removal of rubbish and debris from the buildings and site as it accumulates and at the completion of the works and remove all plant, scaffolding and unused materials at completion.</p>		
D	<p>WORKS TO BE DELIVERED UP CLEAN</p> <p>Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metal work and leave the whole of the buildings water tight, clean, perfect and fit for occupation to the approval of the PROJECT MANAGER.</p>		
	<p>Carried to Collection</p>	<p>KSHS</p>	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>GENERAL SPECIFICATION.</p> <p>For the full description of materials and workmanship, method of execution of the works and notes for pricing, the Contractor is referred to Ministry of Public Works and Housing General Specification dated 1976 or any subsequent revision thereof, and which shall be allowed for in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.</p>		
B	<p>TRAINING LEVY</p> <p>The Contractor's attention is drawn to legal notice No. 237 of October, 1971 which requires payment by Contractor of a Training levy at the rate of 1/4% of the Contract Sum on all Contracts of more than Kshs. 500,000.00 in value.</p>		
C	<p>MATERIALS ON SITE</p> <p>All materials for incorporation into the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the PROJECT MANAGER. This includes the materials of the Main Contractor, Nominated Subcontractors and Nominated Suppliers.</p>		
D	<p>HOARDING</p> <p>The Contractor shall enclose the site of the works under construction with a hoarding 2400mm high consisting of iron sheets on 100x50mm timber posts firmly secured at 1800mm centres with two 75x50mm timber rails. The Contractor is in addition required to take precautions necessary for the safe custody of the works, materials, plant, public and Employer's property on the site.</p>		
E	<p>CONTRACTOR'S SUPERINTENDENCE/ SITE AGENT</p> <p>The Contractor shall constantly keep on the works a literate English and Kiswahili speaking Agent Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the PROJECT MANAGER and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract.</p>		
F	<p>COMPLIANCE TO ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) APPROVED BY NEMA</p> <p>The Contractor shall at his own cost fully comply with the Environmental and Social Management Plan as per the NEMA License. He shall ensure that all mitigation measures spelt out in the plan are strictly and fully adhered to. Failure to adhere to any of the terms spelt out in the plan may lead to suspension of the works by the Project Manager with all associated costs being borne by the Contractor.</p> <p>The ESMP for this project shall provide all the details of project activities, impacts, mitigation measures, time schedules, costs, responsibilities and commitments proposed to minimize environmental impacts.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	KSHS	CTS
A	<p>ADHERENCE TO COVID-19 PREVENTION PROTOCOLS</p> <p>The contractor shall at his own cost put in place Covid-19 prevention protocols and clearly elaborate them in a Covid-19 Action Plan all in compliance with the Standards for Management of Construction Sites and Welfare of Workers and the community by The National Construction Authority as clearly spelt out in the Ministry of Health Guidelines i.e. screening, hand wash points, mask wearing, social distance enforcement, controlled movement, communication principles etc.</p>		
	Carried to Collection	KSHS	

ITEM	DESCRIPTION	
	<p>COLLECTION</p> <p>Brought Forward from Page 1</p> <p>Brought Forward from Page 2</p> <p>Brought Forward from Page 3</p> <p>Brought Forward from Page 4</p> <p>Brought Forward from Page 5</p> <p>Brought Forward from Page 6</p> <p>Brought Forward from Page 7</p> <p>Brought Forward from Page 8</p> <p>Brought Forward from Page 9</p> <p>Brought Forward from Page 10</p> <p>Brought Forward from Page 11</p> <p>Brought Forward from Page 12</p> <p>Brought Forward from Page 13</p>	
	<p>TOTAL FOR PART NO. 3 CARRIED TO MAIN SUMMARY</p>	<p>KSHS</p>

PART NO. 4
OFFICE BLOCK

		Qty	Unit	Rate	KSHS	CTS
D20 EXCAVATING AND FILLING;						
SITE PREPARATION;						
a	Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material; Bushes, shrubs, undergrowth, hedges or the like; including small trees not exceeding 600mm girth and cart away from site;	349	m2			
EXCAVATING						
b	Topsoil for preservation; Excavate 200 mm average depth starting from existing ground level;	349	m2			
c	Excavations for column bases; Not exceeding 1.5 m deep starting from stripped level;	88	m3			
d	Over 1.5 m deep but Not exceeding 3.0m from stripped level;	83	m3			
e	Excavation for strip foundation footing; Not exceeding 1.5 m deep starting from stripped level;	163	m3			
f	Over 1.5 m deep but Not exceeding 3.0m from stripped level;	136	m3			
g	Excavation for Lift Base; Not exceeding 1.5 m deep starting from stripped level;	13	m3			
h	Over 1.5 m deep but Not exceeding 3.0m from stripped level;	13	m3			
i	Extra over excavation irrespective of depth for breaking out; Soft rock;	89	m3			
j	Hard rock;	60	m3			
DISPOSAL						
k	Excavated material; Remove from site to contractor's tip for disposal	149	m3			
FILLING TO EXCAVATIONS						
l	Selected excavated material to make up levels well compacted in layers not exceeding 225mm to approval of the Structural Engineer;	348	m3			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	D20 EXCAVATING AND FILLING Continued..... ;					
	APPROVED HARDCORE					
a	Over 300 mm thick; well compacted in layers of 150mm maximum thickness to approval of the Structural Engineer;	120	m3			
	QUARRY DUST BLINDING					
b	Blinding on surfaces of hardcore fill; 50 mm thick;	271	m2			
	HERBICIDES / INSECTICIDES					
c	Applying to surfaces Apply anti-termite treatment; "Termidor" or equal and approved in accordance with manufacturers' printed specifications and ten years guarantee;	271	m2			
	SURFACE TREATMENTS					
d	Planking and Strutting Labour and materials; to uphold the sides of excavations; generally		Item			
e	Disposal of Water Labour and materials; Keeping excavations free from general water		Item			
	E05 IN SITU CONCRETE CONSTRUCTION GENERALLY					
	50 mm thick mass concrete 1:3:6 foundation blinding;					
f	To column bases; Generally;	59	m2			
g	To strip foundation footings; Generally;	64	m2			
h	To Lift base; Generally;	9	m2			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION GENERALLY Continued.....;						
Vibrated Reinforced Concrete; Class 25 (20mm agg); mix 1:1.5:3;						
	Column Bases;					
a	Generally;	21	m3			
	Strip foundation footings;					
b	Generally;	22	m3			
	Lift Bases;					
c	Generally;	5	m3			
	Columns;					
d	Generally;	4	m3			
	Steps;					
e	Generally;	2	m3			
	Lift Shaft;					
f	200mm;	22	m2			
	Floor bed;					
g	150 mm thick;	264	m2			
	Ramp;					
h	150 mm thick;	7	m2			
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Sides of Strip Foundation Footings;					
i	Over 300 mm wide;	73	m2			
	Sides of Column bases;					
j	Over 300 mm wide;	54	m2			
	Sides of Lift Base;					
k	Over 300 mm wide;	7	m2			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
a	Sides of Lift Shaft; Over 300 mm wide;	43	m2			
b	Sides of Columns; Over 300 mm wide;	71	m2			
c	Sides of Steps; Over 300 mm wide;	2	m2			
d	Edges of Floor Bed; Over 75 mm but not exceeding 150 mm girth;	110	m			
e	Edges of Ramp; Over 75 mm but not exceeding 150 mm girth;	21	m			
f	Edges of Risers; Over 75 mm but not exceeding 150 mm girth;	27	m			
E30 REINFORCEMENT FOR IN SITU CONCRETE						
REINFORCEMENT						
g	Fabric reinforcement to BS 4483; A 142 mesh weight 2.22kgs per square metre (measured net - no allowance made for laps); including bends, tying wire, distance blocks and spacers; Generally;	271	m2			
Bars; Round ribbed bars; cold worked to KS 573: 2014, including bends, hooks tying wire, distance blocks and spacers all in position as necessary;						
Deformed Bars						
h	8 mm Diameter;	2170	Kg			
i	10 mm Diameter;	1540	Kg			
j	12 mm Diameter;	2590	Kg			
k	16 mm Diameter;	700	Kg			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	F20 NATURAL STONE WALLING					
	Natural quarry stone work rough chissel dressed; jointed in cement sand mortar (1:3)					
	Walls					
a	200 mm thick	518	m2			
	F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING					
	DAMP PROOF COURSES					
	On surfaces					
b	200 mm wide;	116	m			
c	100 mm wide;	19	m			
	Polythene based damp proof Membrane 1000 gauge;					
	On surfaces					
d	Over 300 mm wide	271	m2			
	M10 SAND CEMENT /RENDERING					
	20 mm thick Cement and sand (1:3) rendering; finishing trowelled smooth					
	Walls					
e	Over 300 wide	44	m2			
	M12 TROWELLED BITUMEN					
	Lightweight bituminous insulating paint;					
	Walls					
f	Over 300 wide; external	44	m2			
				To Collection KSHS		

	Qty	Unit	Rate	KSHS	CTS
<p>Collection</p> <p>Total from Page 1</p> <p>Total from Page 2</p> <p>Total from Page 3</p> <p>Total from Page 4</p> <p>Total from Page 5</p>					
			To Summary KSHS		

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION						
GENERALLY						
Vibrated Reinforced Concrete; Class 25 (20mm agg); mix 1:1.5:3;						
	Columns;					
a	Generally;	10	m3			
	Ring Beams;					
b	Generally;	14	m3			
	Beams;					
c	Generally;	17	m3			
	Suspended Slab;					
d	200 mm thick:	495	m2			
	Lift Shaft;					
e	200 mm thick:	65	m2			
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Sides and soffits of ring beams;					
f	Over 300 mm wide;	181	m2			
	Sides and soffits of beams;					
g	Over 300 mm wide;	230	m2			
	Sides of columns;					
h	Over 300 mm wide;	187	m2			
	Soffits of suspended slabs;					
i	Over 300 mm wide;	495	m2			
	Sides of Lift Shaft;					
j	Over 300 mm wide;	130	m2			
	Edges of suspended slabs;					
k	Over 150mm but not exceeding 225 mm wide;	359	m			
	Boxing Formwork;					
l	Overall Size 1250 x 2400mm high;	3	No			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
E30 REINFORCEMENT FOR IN SITU CONCRETE						
REINFORCEMENT						
Bars; Round Ribbed Bars; cold worked; KS 573: 2014, including bends, hooks tying wire, distance blocks and spacers all in position as necessary;						
Deformed Bars;						
a	8 mm Diameter;	3671	Kg			
b	10 mm Diameter;	4039	Kg			
c	12 mm Diameter;	4589	Kg			
d	16 mm Diameter;	2754	Kg			
e	20 mm Diameter;	1836	Kg			
f	20 mm Diameter;	1469	Kg			
					To Collection KSHS	

	Qty	Unit	Rate	KSHS	CTS
<p>Collection</p> <p>Total from Page 7</p> <p>Total from Page 8</p>					
To Summary KSHS					

		Qty	Unit	Rate	KSHS	CTS
G10 STRUCTURAL TIMBER FRAMING						
The following in seasoned pressure impregnated cypress second grade or equal and approved softwood timber members; erected to height not exceeding 12000 mm above ground floor level;						
The following in 1 No. Trusses Type T1						
a	150 x 50 mm; Rafters;	14	m			
b	150 x 50 mm; Ceiling Joists;	12	m			
c	100 x 50 mm; Struts & Ties;	20	m			
d	100 x 50 mm; King Post;	3	m			
The following in 3 No. Truss Type T2						
e	150 x 50 mm; Rafters;	43	m			
f	150 x 50 mm; Ceiling Joists;	35	m			
g	100 x 50 mm; Struts & Ties;	62	m			
h	100 x 50 mm; King Post;	8	m			
The following in 1 No. Truss Type T3						
i	150 x 50 mm; Top members;	13	m			
j	150 x 50 mm; Ceiling Joists;	10	m			
k	100 x 50 mm; Struts & Ties;	20	m			
l	100 x 50 mm; King Post;	3	m			
The following in 2 No. Truss Type T4						
m	150 x 50 mm; Rafters;	19	m			
n	150 x 50 mm; Ceiling Joists;	17	m			
o	100 x 50 mm; Struts & Ties;	29	m			
p	150 x 50 mm; King Post;	5	m			
The following in 4 No. Truss Type T5						
q	150 x 50 mm; Rafters;	19	m			
r	150 x 50 mm; Ceiling Joists;	16	m			
s	100 x 50 mm; Struts & Ties;	16	m			
t	150 x 50 mm; King Post;	5	m			
The following in 2 No. Truss Type T6						
u	150 x 50 mm; Rafters;	10	m			
v	150 x 50 mm; Ceiling Joists;	9	m			
w	100 x 50 mm; Struts & Ties;	7	m			
x	150 x 50 mm; King Post;	3	m			
To Collection KSHS						

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS						ROOF	
		Qty	Unit	Rate	KSHS	CTS	
G10 STRUCTURAL TIMBER FRAMING Continued...;							
The following in 1 No. Truss Type T7							
a	150 x 50 mm; Top members;	7	m				
b	150 x 50 mm; Ceiling Joists;	6	m				
c	100 x 50 mm; Struts & Ties;	6	m				
d	100 x 50 mm; King Post;	1	m				
The following in 2 No. Truss Type T8							
e	150 x 50 mm; Rafters;	13	m				
f	150 x 50 mm; Ceiling Joists;	11	m				
g	100 x 50 mm; Struts & Ties;	15	m				
h	150 x 50 mm; King Post;	3	m				
The following in 1 No. Truss Type T9							
i	150 x 50 mm; Top members;	8	m				
j	150 x 50 mm; Ceiling Joists;	6	m				
k	100 x 50 mm; Struts & Ties;	12	m				
The following in 2 No. Truss Type T10							
l	150 x 50 mm; Top members;	7	m				
m	150 x 50 mm; Ceiling Joists;	5	m				
n	100 x 50 mm; Struts & Ties;	4	m				
o	150 x 50 mm; King Post;	2	m				
The following in 1 No. Truss Type T11							
p	150 x 50 mm; Rafters;	4	m				
q	150 x 50 mm; Ceiling Joists;	3	m				
r	100 x 50 mm; Struts & Ties;	2	m				
s	150 x 50 mm; King Post;	1	m				
The following in 2 No. Trusses Type T12							
t	150 x 50 mm; Rafters;	5	m				
u	150 x 50 mm; Ceiling Joists;	4	m				
v	100 x 50 mm; Struts & Ties;	5	m				
w	150 x 50 mm; King Post;	2	m				
					To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
G10 STRUCTURAL TIMBER FRAMING Continued...;						
a	100 x 50 mm; Common rafters;	90	m			
b	150 x 50 mm Wall Plate secured with and including 12mm diameter mild steel j-bolts including mortise in concrete grouted in cement and sand (1:3) mortar	163	m			
c	150 x 50 mm; Valleys rafters;	32	m			
d	150 x 50 mm; Hip rafters;	8	m			
e	150 x 50 mm; Ridge board;	13	m			
f	75 x 50 mm; Purlins;	786	m			
K20 BOARD LININGS						
Chamfered wrought cypress in fascia and barge boards with splayed heading joints;						
g	Size 300 x 25 mm fixed to ends of rafters;	81	m			
Tongue and Groove boarding						
h	Size 20 x 100 mm wide tongue and groove timber boarding; fixed onto and including 50 x 25 mm battens; to eaves;	49	m2			
PLASTIC PROFILES						
Supply and fix approved uPVC rainwater system with solvent welded seal ring or dry joints to manufacturer's printed instructions;						
i	Heavy gauge; 150mm diameter grey down pipe; Gutters;	144	m			
j	Half round; 150 mm diameter; joint brackets in the running length; fixing with support brackets;	81	m			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	PLASTIC PROFILES Continued...					
	Supply and fix approved uPVC rainwater system with solvent welded seal ring or dry joints to manufacturer's printed instructions;					
a	Extra Over for Gutters for Swan neck; 150mm diameter	16	No.			
b	Ditto Shoe; 150mm diameter	16	No.			
	H70 MALLEABLE METAL SHEET PREBONDED COVERINGS					
	Supply and fix galvanised, guage 26, IT5 prepainted metal roofing sheet covering; of approved colour and size, including edging trim, firmly secured with galvanised steel nails with end and side laps; fixed onto timber structure with all necessary curvatures, hoisting, placing and connections;					
	Coverings; fixing to timber purlins (m/s) with galvanized steel nails ; 150 mm end lapsand one and a half corrugation side laps;					
c	Sloping not exceeding 30 degrees from horizontal;	367	m2			
d	350 mm Ridge cap to match	13	m			
e	350 mm Hip cap to match	69	m			
f	350 mm Valleys to match ; (GI plain sheet)	32	m			
	M60 PAINTING/CLEAR FINISHING					
	Touch up primer; prepare and apply three coats gloss oil paint on timber surfaces as described in :-					
	General surfaces of fascia / barge board;					
g	Over 200 wide but not exceeding 300 mm wide; externally;	81	m			
	Prepare surfaces: apply three coats polyurethane clear lacquer or other equal approved: on timber surfaces: to					
	General surfaces					
h	Over 300 mm wide;	49	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 10</p> <p>Total from Page 11</p> <p>Total from Page 12</p> <p>Total from Page 13</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION GENERALLY						
Reinforced concrete; class 25; mix 1:1.5:3;						
	Staircases					
a	Generally	4	m3			
	Landings;					
b	150 mm Thick landing;	8	m2			
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Soffits of landings					
c	Over 300 mm wide;	8	m2			
	Sloping soffits of stairs;					
d	Over 300 mm wide;	18	m2			
	Edges of landing;					
e	Over 75 mm wide but not exceeding 150 mm high	17	m			
	Edges of risers;					
f	Over 75 mm wide but not exceeding 150 mm high	56	m			
	Open edge of strings;					
g	Over 300 mm wide; including cutting to profile;	8	m2			
E30 REINFORCEMENT FOR IN SITU CONCRETE						
Bars; high yield steel; cold worked; KS 573: 2014, including bends, hooks tying wire, distance blocks and spacers all in position as necessary;						
	Deformed Bars;					
h	10 mm Diameter;	293	Kg			
i	12 mm Diameter;	358	Kg			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
L30 STAIRS /WALKWAYS /BALUSTRADES						
	<p>Stainless steel balustrading; comprising of 50 mm diameter x 3 mm thick stainless steel handrail welded onto 25 mm diameter Stainless steel solid rod welded onto 38 mm diameter x 2 mm Stainless steel CHS baluster fixed on the steps at 1000 mm centres; 20 mm diameter Stainless steel bars welded onto the balusters at 150 mm centres vertically; all welded, grounded smooth and fixed specialist fabricator's details and shop drawings and to architect's approval</p>					
a	<p>Staircases;</p> <p>900 mm high;</p>	52	m			
b	<p>Stainless steel Handrail; Comprising 50 mm diameter x 3 mm thick Stainless steel handrail welded onto 20 mm solid stainless steel pin welded onto 75 mm diameter x 10 mm thick plate plugged and screwed into the wall with four bolts; all welded, ground smooth and fixed to specialist fabricator's details and shop drawings and to architect's approval</p> <p>Staircases;</p> <p>Fixed 900 mm high from floor;</p>	15	m			
M10 SAND CEMENT /CONCRETE SCREEDS /FLOORING						
	<p>32 mm thick cement and sand (1:4) flooring; wood floated receive ceramic floor tiles (m.s)</p>					
c	<p>Landing Floors;</p> <p>Over 300 mm wide;</p>	8	m ²			
d	<p>Treads</p> <p>275 mm wide</p>	56	m			
e	<p>Risers</p> <p>150 mm high</p>	56	m			
f	<p>Skirtings</p> <p>100 mm high</p>	17	m			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	M20 PLASTERED /RENDERED					
	Plaster cement and sand 1:3; work to concrete or blockwork;					
	12 mm thick in two coats;					
a	Over 300 mm; sloping soffits of staircase;	18	m2			
b	Over 300 mm; soffits of landings;	8	m2			
c	Over 300 mm wide; sides of staircase;	8	m2			
	M40 TILING					
	NOTE:					
	Tenderer to Add for taking delivery and fixing on the P.C. Rate provided for fixing of tiles;					
	Approved size Polished Ceramic tiles - P.C. Rate of Kshs. 1,200 per square metre including fixing on cement sand screed backing (m.s);					
d	Landings; over 300 mm wide	8	m2			
e	100 mm high; skirtings;	17	m			
f	275 mm wide; treads;	56	m			
g	150 mm high; Risers;	56	m			
	M60 PAINTING/CLEAR FINISHING					
	PAINTING					
	Prepare by skimming plastered surface; apply one undercoat; two coats Premium Quality Silk Vinyl paint to Crown paints or equal and approved;					
h	Over 300 girth; to smooth plastered surfaces; internally; soffits of staircase	18	m2			
i	Over 300 girth; to smooth plastered surfaces; internally; soffits of landing	8	m2			
j	Over 300 mm wide; Sides of staircase	8	m2			
To Collection KSHS						

	Qty	Unit	Rate	KSHS	CTS
<p>Collection</p> <p>Total from Page 15</p> <p>Total from Page 16</p> <p>Total from Page 17</p>					
To Summary KSHS					

		Qty	Unit	Rate	KSHS	CTS
F21 NATURAL STONE / MASONRY WALLING						
Approved local stone; squared; machine cut or fine chisel dressed; bedding and jointed in cement sand mortar (1:4);						
a	External walling; 200 mm thick;	238	m2			
b	Internal walling; 200 mm thick;	500	m2			
c	100 mm thick	88	m2			
ALUMINIUM FRAMED PARTITIONING						
Supply and fix powder coated Aluminium partition not exceeding 3000 mm high; standard hollow or angle sections; 19 x 45 x 2.5mm thick butterfly powder coated Aluminium frame sections mitred at corners including reinforcing cleats and all necessary ironmongery; infilled with All to Architect's Detail;						
Complete with 20 mm thick laminated double sided MDF board 900mm high to bottom section and 6mm Float glass panel 2100mm to top section; sealing with mastic; oiling and adjusting on completion; all to Architect's drawing;						
d	Over 300 mm wide;	170	m2			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 19</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
	F31 PRECAST CONCRETE CILLS					
	Approved pre-cast concrete cill: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement;					
	Cills;					
a	265 x 50 mm thick cill; once weathered and throated; reinforced as necessary for handling	97	m			
	G20 CARPENTRY/TIMBER FRAMING					
	WROT HARDWOOD: PRIME GRADE;					
b	150 x 25 mm Window board; plugged;	133	m			
c	25 mm Quadrant beading	133	m			
	WROUGHT IRON					
	Curtain rods;					
	Supply and fix 25mm diameter, 3mm thick hollow wrought iron curtain rod complete set including wrought iron rod mounting and support brackets fixed onto walls with metal lugs; decorative finials to specifications; painted to architect's approval					
d	Curtain rods;	146	m			
	L10 WINDOWS					
	ALUMINIUM WINDOWS & CURTAIN WALL;					
	Supply and fix powder coated Aluminum Window; standard hollow or angle sections; frames mitred at corners including reinforcing cleats and all necessary ironmongery;					
	Complete with 6 mm thick One- Way glass; fixing with aluminium screws; plugging or fixing to concrete, blockwork or stone work; sealing with mastic: oiling and adjusting on completion; all to referenced Architect's drawings;					
e	Window overall size 1,500 x 1,600 mm high; Sliding casement window; Ref. W06 (b)	6	No.			
f	Window overall size 1,650 x 2,050 mm high; sliding window; Ref. W06 (c)	2	No.			
g	Window overall size 2,150 x 2,250 mm high; Sliding window; Ref. W02	6	No.			
h	Window overall size 3,550 x 2,250 mm high; Sliding window; Ref. W01	2	No.			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	ALUMINIUM WINDOWS & CURTAIN WALL; Continued...					
	Supply and fix powder coated Aluminum Window; standard hollow or angle sections; frames mitred at corners including reinforcing cleats and all necessary ironmongery;					
a	Window overall size 2,800 x 1,600 mm high; Corner window; Ref. W12	4	No			
b	Window overall size 1,750 x 650 mm high; Top hung casement window; Ref. W04	3	No			
c	Window overall size 1,350 x 650 mm high; Top hung casement window; Ref. W06 (a)	6	No			
	L10 SCREENS / FACADE / CURTAIN WALL					
	Supply and fix Anodised Aluminium or Equal and approved; 50mm thick curtain walls with a 6mm One- Way glass; 100 x 50 x 2.5mm thick Anodised Aluminium RHS horizontal and vertical frame members mitred at corners including reinforcing cleats, endcaps, silicone, supporting brackets, coner cleats with press, vertical, central and horizontal Mullion gaskets, adjustment parts and all necessary ironmongery; window openings including fly screen planes and accesories; fixing with (DIN ISO 7049 -A2) 4.8 x 25 stainless steel screws and M10 x 75 stud anchor cast in concrete with 100x50x3mm steel plates and fastened with nuts and washers; plugging or fixing to concrete, block work, steel/aluminium members or stone work; with all necessary steel accesories and structures including galvanizing and painting of all elements, supports and brackets; and exposed concrete and steel elements to match anodised aluminium sections; to the approval of the Project Manager.					
d	Aluminium profile Curtain wall size 3,400 x 8,050 mm high; Including top hung sashes; Ref. W03	1	No.			
e	Aluminium profile Curtain wall size 4,960 x 5,050 mm high; Including top hung sashes; Ref. W 09	2	No.			
f	Aluminium profile Curtain wall size 3,655 x 5,050 mm high; Including top hung sashes; Ref. W 10	2	No.			
g	Aluminium profile Curtain wall size 4,700 x 5,050 mm high; Including top hung sashes; Ref. W 11	1	No.			
h	Aluminium profile Curtain wall size 3,400 x 8,050 mm high; Including top hung sashes; Ref. W 08	1	No.			
i	Aluminium profile Curtain wall size 3,820 x 2,050 mm high; Including top hung sashes; Ref. W 07	3	No.			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>M60 PAINTING/CLEAR FINISHING</p> <p>PAINTING WOOD Prepare and apply one coat of aluminium wood primer on timber surfaces in contact with concrete or masonry surfaces;</p> <p>Painting Wood;</p> <p>a Surfaces over 100 but not exceeding 200 mm girth</p> <p>Prepare surfaces: apply three coats polyurethane varnish on wood: to surfaces;</p> <p>Varnishing wood;</p> <p>b Surfaces over 100 but not exceeding 200 mm girth:</p> <p>M60 PAINTING/CLEAR FINISHING...Continued</p> <p>PAINTING METAL</p> <p>Prepare and apply one under coat; two coats oil paint full gloss finish; to cown paint or equal and approved;</p> <p>c Surfaces not exceeding 100 mm girth: Curtain Rods</p>	133	m			
		133	m			
		146	m			
To Collection KSHS						

	Qty	Unit	Rate	KSHS	CTS
<p>Collection</p> <p>Total from Page 21</p> <p>Total from Page 22</p> <p>Total from Page 23</p>					
To Summary KSHS					

		Qty	Unit	Rate	KSHS	CTS
L20 DOORS /SHUTTERS /HATCHES						
ALUMINIUM DOORS;						
	Supply and fix 75 x 50 mm powder coated aluminium frame door complete with 8 mm thick clear glass; including reinforcing cleats and all necessary ironmongery including 6 No Brass hinges as "union"or equivalent, 2 lever mortice locks and 2 No door stops,matching fixed handle set set for passive door; fixing with steel screws; plugging or fixing to concrete,block work or stone work; sealing with mastic; oiling and adjusting on completion; to referenced Architect's drawings					
a	Double leaf; Single swing door; overall size 4,500 x 2,400 mm high; complete with double sidelights to architect's drawings; Ref. D01	1	No.			
b	Double leaf; Single swing door; overall size 1500 x 2400 mm high; to architect's drawings; Ref. D03	1	No.			
	Supply and fix 75 x 50 mm powder coated aluminium frame door complete with 8 mm thick clear glass; including reinforcing cleats and all necessary ironmongery including sliding gear as "union"or equivalent and 2 lever mortice locks; fixing with steel screws; plugging or fixing to concrete,block work or stone work; sealing with mastic; oiling and adjusting on completion; to referenced Architect's drawings					
LOUVRED ALUMINIUM DOORS						
	Supply and fix 75 x 50 mm powder coated aluminium frame door complete with 45 degrees angled aluminium fixed louvres; including reinforcing cleats and all necessary ironmongery; fixing with steel screws; plugging or fixing to concrete, block work or stone work; sealing with mastic; oiling and adjusting on completion;					
c	Door overall size 700 x 2,150 mm high double leaf; in two equal leaves; complete with heavy duty Brass hinges as "union"or equivalent, 2 lever mortice locks as "union"or equivalent, all to Architects finish;	14	No.			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	FLUSH DOORS;					
	Supply and fix 50 mm Thick flush door: Semi-solid core; mahogany veneer facing to both sides: mahogany lipped edges to BS 459; to Architect's details;					
a	Single leaf, single swing door overall size 900 x 2,400 mm high; complete with 200mm fanlight in 6 mm thick one-way glass to Architects' drawings;Ref. D2	16	No.			
b	Single leaf, single swing door overall size 900 x 2,400 mm high; complete with 200mm fanlight in 6 mm thick one-way glass to Architects' drawings;Ref. D4	1	No.			
c	Single leaf, single swing door overall size 1,100 x 2,400 mm high; complete with 200mm fanlight in 6 mm thick one-way glass to Architects' drawings;Ref. D5 (a)	3	No.			
d	Single leaf, single swing door overall size 1,100 x 2,400 mm high; to Architects' drawings;Ref. D5 (b)	3	No.			
e	Single leaf, single swing door overall size 1000 x 2,400 mm high; complete with 250mm fanlight in 6 mm thick one-way glass to Architects' drawings;Ref. D6	6	No.			
f	Single leaf, single swing door overall size 900 x 2,000 mm high; to Architects' drawings;Ref. D7	15	No.			
	PRIME GRADE STAINED; MAHOGANY					
	Door frames;					
g	150 x 50 mm thick; including 50 x 25 mm linings;	227	m			
	Architrave;					
h	45 x 25 mm thick;	227	m			
	Quadrant;					
i	25 mm quadrant;	227	m			
	Transomes					
j	200 x 50 mm thick;	25	m			
	M60 PAINTING/CLEAR FINISHING					
	Prepare and apply one coat of aluminium wood primer on timber surfaces in contact with concrete or masonry;					
	General surfaces					
k	Over 100 but not exceeding 200 mm girth; Frame	227	m			
l	Not exceeding 100 mm girth; Architrave	227	m			
m	Not exceeding 100 mm girth; Quadrant	227	m			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
M60 PAINTING/CLEAR FINISHING						
Prepare surfaces: apply three coats polyurethane clear lacquer or other equal approved: on timber surfaces: to						
General surfaces						
a	Over 100 mm but not exceeding 200 mm girth;Frame;	252	m			
b	Not exceeding 100 mm girth; Architrave	227	m			
c	Not exceeding 100 mm girth; Quadrant	227	m			
d	Doors; Over 300 mm girth; both sides measured;	188	m2			
P21 IRONMONGERY						
NOTE: This section caters for <u>FLUSH AND PANEL DOORS ONLY</u>. Therefore all bidders <u>MUST</u> factor in their cost of all ironmongery and any other accessories as may be required in their rates of all other doors						
Supply and Fix the following as per Union Catalogue or other equal and approved; to soft wood, hardwood or the like; fixing with screws;						
Hinges;						
e	100 mm brass, heavy duty 2 ball bearing hinges;	67	Pairs			
Mortice Locks;						
f	Two lever mortice lock single turn as 'Eurostar' complete with one pair of aluminium satin finish handles	35	No			
g	400 x 100 mm push plates	9	No.			
h	200 x 50 mm pull handles	12	No.			
i	Medium duty door closer	12	No.			
j	Door stops; rubber; fitted onto wall or floor 38 mm	19	No.			
k	1000 x 500 mm Kick plates	3	No			
l	Indicator lock as union or equivalent	15	No			
m	Aluminium Sex Indicator Plates	6	No.			
					To Collection KSHS	

	Qty	Unit	Rate	KSHS	CTS
<p>Collection</p> <p>Total from Page 25</p> <p>Total from Page 26</p> <p>Total from Page 27</p>					
			To Summary KSHS		

		Qty	Unit	Rate	KSHS	CTS
	M10 SAND CEMENT /CONCRETE SCREEDS /FLOORING					
	CEMENT AND SAND					
	15 mm thick backing screed; wood floated to receive Ceramic wall tiles; (m/s) to concrete or blockwork base generally;					
a	Over 300 mm wide;	541	m2			
b	100 mm wide	212	m			
	M20 PLASTERED /RENDERED					
	Render; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;					
	External surfaces;					
c	Walls; over 300 mm wide;	238	m2			
d	Beams; Over 300 mm wide;	69	m2			
e	Columns; Over 300 mm wide;	46	m2			
	Plaster; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;					
	12 mm thick in 2 No coats work; to concrete or blockwork base (m/s); generally to internal surfaces;					
f	Walls; over 300 mm wide;	1055	m2			
g	Beams; Over 300 mm wide;	299	m2			
h	Columns; Over 300 mm wide;	27	m2			
i	Lift Shaft; Over 300 mm wide;	65	m3			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC</p> <p>NOTE:</p> <p>Tenderer to Add for taking delivery and fixing on the P.C. Rate provided for fixing of tiles;</p> <p>Approved size ceramic wall tiles - P.C. Rate of Kshs. 1,200 per square metre including fixing on cement sand screed backing (m.s);</p> <p>Approved size; butt joints straight both ways; to cement and sand base (m/s); Over 300 mm wide;;</p>					
a		541	m2			
b	100 x 6 mm thick; Ceramic Border;	212	m			
	<p>M60 PAINTING/CLEAR FINISHING</p> <p>PAINTING PLASTER</p> <p>Prepare by skimming plastered surface; apply one undercoat; two coats Premium Quality Silk Vinly paint to Crown paints or equal and approved;</p> <p>Steel trowelled plastered surfaces;</p>					
c	Walls; over 300 mm wide;	1055	m2			
d	Beams; Over 300 mm wide;	299	m2			
e	Columns; Over 300 mm wide;	27	m2			
f	Lift Shaft; Over 300 mm wide;	65	m2			
	<p>PAINTING RENDER</p> <p>Prepare and apply one undercoat; finishing coat of textured special effect paint to crown paints or equal and approved;</p> <p>To Steel trowelled plastered surfaces;</p>					
g	Walls; over 300 mm wide;	238	m2			
h	Beams; Over 300 mm wide;	69	m2			
i	Columns; Over 300 mm wide;	46	m2			
				To Collection KSHS		

	Qty	Unit	Rate	KSHS CTS
Collection Total from Page 29 Total from Page 30				
To Summary KSHS				

		Qty	Unit	Rate	KSHS	CTS
M10 SAND CEMENT /CONCRETE SCREEDS						
CEMENT AND SAND						
a	32 mm thick backing; wood floated to receive Non-slip ceramic tiles (m/s) to concrete or block work base generally; Over 300 mm wide;	117	m2			
b	32 mm thick backing; wood floated to receive polished ceramic tiles (m/s) to concrete or block work base generally; Over 300 mm wide;	457	m2			
c	100 mm high skirting;	338	m			
d	32 mm thick backing; wood floated to receive carpet roll (m/s) to concrete or block work base generally; Over 300 mm wide;	89	m2			
e	100 mm high skirting;	76	m			
M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC						
Tenderer to Add for taking delivery and fixing on the P.C. Rate provided for fixing of tiles;						
f	Approved non-slip ceramic tiles - P.C. Rate of Kshs.1,200, per square metre including fixing on cement sand screed backing (m.s); 300 x 300 x 8 mm thick approved size; butt joints straight both ways; to cement and sand base (m/s); over 300 mm wide;	117	m2			
g	Approved Size Polished Ceramic tiles - P.C. Rate of Kshs.1,200 per square metre including fixing on cement sand screed backing (m.s); Approved size; butt joints straight both ways; to cement and sand base (m/s); over 300 mm wide;	457	m2			
h	100 mm high Skirting;	338	m			
i	Supply and install 12 mm thick carpet roll consisting of woolen/ polyester carpet pile with backing fitted with underlay to manufacturer's details including naplocks and all fitting accessories; Over 300 mm wide;	90	m2			
j	100 mm high Mahogany Skirting;	76	m			
					To Collection KSHS	

	Qty	Unit	Rate	KSHS	CTS
Collection Total from Page 32					
To Summary KSHS					

		Qty	Unit	Rate	KSHS	CTS
	K10 CEILINGS					
	12 mm thick Gypsum profiled Ceilings or equal and approved ceiling cover; tapered edge wallboard; joints taped and filled; firmly secured with and including fixing to steel or aluminium studwork branding support system with rounded, smooth compound sanded edges, edge trims, plastered, joints taped and filled finished to receive direct decoration; allow for provision of recessed mouldings / bulk heads on gypsum ceiling to allow for indirect lighting to detail; all in accordance with Architect's drawings;					
	Gypsum board profiled Ceilings;					
a	Over 300 wide;	219	m2			
b	100 mm wide moulded cornice;	229	m			
	M20 PLASTERED /RENDERED					
	Plaster; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;					
	12mm thick 2 No. coats work; to concrete or blockwork base (m/s) generally to internal surfaces					
c	Ceilings; over 300 mm wide;	495	m2			
	M60 PAINTING/CLEAR FINISHING					
	PAINTING PLASTER					
	Prepare by skimming plastered surface; apply one undercoat; two coats Premium Quality Silk Vinly paint to Crown paints or equal and approved;					
d	Plastered Ceiling Surfaces; over 300 mm wide;	495	m2			
e	Gypsum Ceilng; Over 300 mm wide;	219	m2			
f	Moulded Cornice; not exceeding 100mm wide;	229	m			
To Collection KSHS						

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS

	Qty	Unit	Rate	KSHS	CTS
<p>Summary</p> <p>SUBSTRUCTURES Page 6</p> <p>FRAME Page 9</p> <p>ROOF Page 14</p> <p>STAIRS Page 18</p> <p>WALLS Page 20</p> <p>WINDOWS Page 24</p> <p>DOORS Page 28</p> <p>WALL FINISHES Page 31</p> <p>FLOOR FINISHES Page 33</p> <p>CEILING FINISHES Page 35</p>					
Total for Bill KSHS					

PART NO. 5
EXTERNAL WORKS

		Qty	Unit	Rate	KSHS	CTS
<u>SWITCH ROOM</u>						
D20 EXCAVATING AND FILLING;						
SITE PREPARATION;						
Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material;						
a	Bushes, shrubs, undergrowth, hedges or the like; including small trees not exceeding 600mm girth and cart away from site;	24	m2			
EXCAVATING						
Topsoil for preservation;						
b	Excavate 200 mm average depth starting from existing ground level;	24	m2			
Excavations for column bases;						
c	Not exceeding 1.5 m deep starting from stripped level;	3	m3			
Excavation for strip foundation footing;						
d	Not exceeding 1.5 m deep starting from stripped level;	18	m3			
Extra over excavation irrespective of depth for breaking out;						
e	Soft rock;	4	m3			
f	Hard rock;	3	m3			
DISPOSAL						
Excavated material;						
g		9	m3			
FILLING TO EXCAVATIONS						
h	Selected excavated material to make up levels well compacted in layers not exceeding 225mm to approval of the Structural Engineer;	5	m3			
To Collection KSHS						

		Qty	Unit	Rate	
	D20 EXCAVATING AND FILLING Continued ;				
	APPROVED HARDCORE				
a	300 mm thick; well compacted in layers of 150mm maximum thickness to approval of the Structural Engineer;	24	m2		
	QUARRY DUST BLINDING				
b	Blinding on surfaces of hardcore fill; 50 mm thick;	24	m2		
	HERBICIDES / INSECTICIDES				
c	Applying to surfaces Apply anti-termite treatment; "Termidor" or equal and approved in accordance with manufacturers' printed specifications and ten years guarantee;	24	m2		
	SURFACE TREATMENTS				
d	Planking and Strutting Labour and materials; to uphold the sides of excavations; generally		Item		
e	Disposal of Water Labour and materials; Keeping excavations free from general water		Item		
	E05 IN SITU CONCRETE CONSTRUCTION GENERALLY				
	50 mm thick mass concrete 1:3:6 foundation blinding;				
f	To column bases; Generally;	2	m2		
g	To strip foundation footings; Generally;	12	m2		
				To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION						
GENERALLY Continued.....;						
Vibrated Reinforced Concrete; Class 25 (20mm agg); mix 1:1.5:3;						
	Column Bases;					
a	Generally;	1	m3			
	Strip foundation footings;					
b	Generally;	3	m3			
	Columns;					
c	Generally;	1	m3			
	Floor bed;					
d	150 mm thick;	24	m2			
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Sides of Strip Foundation Footings;					
e	Over 300 mm wide;	8	m2			
	Sides of Column bases;					
f	Over 300 mm wide;	2	m2			
	Sides of Columns;					
g	Over 300 mm wide;	4	m2			
	Edges of Suspended slab					
h	Over 75mm but not exceeding 150mm	17	m			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
E30 REINFORCEMENT FOR IN SITU CONCRETE						
REINFORCEMENT						
Fabric reinforcement to BS 4483; reference A 142 mesh weight 2.22kgs per square metre (measured net - no allowance made for laps); including bends, tying wire, distance blocks and spacers;						
a	Generally;	24	m2			
Bars; Round ribbed bars; cold worked to B.S. 4449 - 2005, including bends, hooks tying wire, distance blocks and spacers all in position as necessary;						
Deformed Bars						
b	8 mm Diameter;	150	Kg			
c	10 mm Diameter;	210	Kg			
d	12 mm Diameter;	240	Kg			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>F20 NATURAL STONE WALLING</p> <p>Natural quarry stone work rough chissel dressed; jointed in cement sand mortar (1:3)</p> <p>Walls</p> <p>a 200 mm thick</p>	32	m2			
	<p>F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING</p> <p>DAMP PROOF COURSES</p> <p>Damp proof courses bedded in cement mortar B.S 743; type A; Bitumen hessian base; 150 mm laps; no allowance made for laps</p> <p>b Horizontal; 200 mm wide;</p>	20	m			
	<p>DAMP PROOF MEMBRANE</p> <p>Polythene; 1000 gauge; 150 mm laps; no allowance made for laps</p> <p>c Horizontal; Over 300 mm wide</p>	7	m2			
	<p>M10 SAND CEMENT /RENDERING</p> <p>20 mm thick Cement and sand (1:3) rendering; finishing trowelled smooth</p> <p>Walls</p> <p>d Over 300 wide</p>	7	m2			
	<p>M12 TROWELLED BITUMEN</p> <p>Lightweight bituminous insulating paint;</p> <p>Walls</p> <p>e Over 300 wide; external</p>	7	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 1</p> <p>Total from Page 2</p> <p>Total from Page 3</p> <p>Total from Page 4</p> <p>Total from Page 5</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION						
GENERALLY						
Vibrated Reinforced Concrete; Class 25 (20mm agg); mix 1:1.5:3;						
	Columns;					
a	Generally;	1	m3			
	Ring Beams;					
b	Generally;	1	m3			
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Sides and soffits of ring beams;					
c	Over 300 mm wide;	16	m2			
	Sides of columns;					
d	Over 300 mm wide;	7	m2			
E30 REINFORCEMENT FOR IN SITU CONCRETE						
REINFORCEMENT						
Bars; Round Ribbed Bars; cold worked; B.S. 4449 - 2005, including bends, hooks tying wire, distance blocks and spacers all in position as necessary;						
	Deformed Bars;					
e	8 mm Diameter;	70	Kg			
f	10 mm Diameter;	90	Kg			
g	12 mm Diameter;	80	Kg			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 7</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
G10 STRUCTURAL TIMBER FRAMING						
The following in seasoned pressure impregnated cypress second grade or equal and approved softwood timber members; erected to height not exceeding 5000 mm above ground;						
a	75 x 50 mm; Rafters;	26	m			
b	75 x 50 mm; Purlins;	40	m			
c	150 x 50 mm Wall Plate secured with and including 12mm diameter mild steel j-bolts including mortise in concrete grouted in cement and sand (1:3) mortar	20	m			
K20 BOARD LININGS						
Chamfered wrought cypress in fascia and barge boards with splayed heading joints;						
d	Size 300 x 25 mm fixed to ends of rafters;	10	m			
Tongue and Groove boarding						
e	Size 20 x 100 mm wide tongue and groove timber boarding; fixed onto and including 50 x 25 mm battens; to eaves;	6	m ²			
PLASTIC PROFILES						
Supply and fix approved uPVC rainwater system with solvent welded seal ring or dry joints to manufacturer's printed instructions;						
f	Heavy gauge; 150mm diameter grey down pipe;	3	m			
Gutters;						
g	Half round; 150 mm diameter; joint brackets in the running length; fixing with support brackets;	3	m			
Supply and fix approved uPVC rainwater system with solvent welded seal ring or dry joints to manufacturer's printed instructions;						
h	Extra Over for Gutters for Swan neck; 150mm diameter	1	No.			
i	Ditto Shoe; 150mm diameter	1	No.			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>H70 MALLEABLE METAL SHEET PREBONDED COVERINGS</p> <p>Supply and fix galvanised, guage 26, IT5 prepainted metal roofing sheet covering; with heavy weight double sided 2 way reinforced fire redundant aluminium foil insulation from approved manufacturer (m/s) and of approved colour and size, including edging trim, firmly secured with galvanised steel nails with end and side laps; fixed onto timber structure with all necessary curvatures, hoisting, placing and connections;</p> <p>Coverings; fixing to timber purlins (m/s) with galvanized steel nails ; 150 mm end laps and one and a half corrugation side laps;</p>					
a	<p>Sloping not exceeding 30 degrees from horizontal;</p>	22	m2			
	<p>Sisalation insulation membrane in 5 mm thick closed cell polyethylene foam laminated with reinforced aluminium reflective foil; laid in accordance with the manufacturers printed instructions;</p> <p>Under roof coverings;</p>					
b	<p>Sloping not exceeding 45 degrees from horizontal;</p>	22	m2			
	<p>M60 PAINTING/CLEAR FINISHING</p> <p>Touch up primer; prepare and apply three coats gloss oil paint on timber surfaces as described in :-</p> <p>General surfaces of fascia / barge board;</p>					
c	<p>Over 200 wide but not exceeding 300 mm wide; externally;</p>	10	m			
	<p>Prepare surfaces: apply three coats polyurethane clear lacquer or other equal approved: on timber surfaces: to</p> <p>General surfaces</p>					
d	<p>Over 300 mm wide;</p>	6	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 9</p> <p>Total from Page 10</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
F21 NATURAL STONE / MASONRY WALLING						
Approved local stone; squared; machine cut or fine chisel dressed; bedding and jointed in cement sand mortar (1:4);						
	External walling;					
a	200 mm thick;	48	m2			
	Internal walling;					
b	200 mm thick;	7	m2			
	Gable walling;					
c	200 mm thick;	3	m2			
	Fair Raking Cutting;					
d	200 mm wide;	6	m			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 12</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
	F31 PRECAST CONCRETE CILLS					
	Approved pre-cast concrete cill: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement;					
	Cills;					
a	265 x 50 mm thick cill; once weathered and throated; reinforced as necessary for handling	3	m			
	G20 CARPENTRY/TIMBER FRAMING					
	WROT HARDWOOD: PRIME GRADE;					
b	150 x 25 mm Window board; plugged;	3	m			
c	25 mm Quadrant beading	3	m			
	L10 WINDOWS					
	LOUVERED ALUMINIUM WINDOWS					
	Supply and fix powder coated Aluminum Window; standard hollow or angle sections; frames mitred at corners including reinforcing cleats and all necessary ironmongery;					
	Complete with 6 mm thick One- Way glass; fixing with aluminium screws; plugging or fixing to concrete, blockwork or stone work; sealing with mastic: oiling and adjusting on completion; all to referenced Architect's drawings;					
d	Window overall size 700 x 1,900 mm high; Sliding casement window;	1	No.			
e	Window overall size 2200 x 1,900 mm high; Sliding casement window;	1	No.			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>M60 PAINTING/CLEAR FINISHING</p> <p>PAINTING WOOD</p> <p>Prepare and apply one coat of aluminium wood primer on timber surfaces in contact with concrete or masonry surfaces;</p> <p>Painting Wood;</p> <p>a Surfaces over 100 but not exceeding 200 mm girth</p> <p>Prepare surfaces: apply three coats polyurethane varnish on wood: to surfaces;</p> <p>Varnishing wood;</p> <p>b Surfaces over 100 but not exceeding 200 mm girth:</p>	3	m			
				To Collection	KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 14</p> <p>Total from Page 15</p>					
				To Summary KSHS		

		Qty	Unit	Rate	KSHS	CTS
	L20 DOORS /SHUTTERS /HATCHES					
	LOUVRED ALUMINIUM DOORS					
	Supply and fix 75 x 50 mm powder coated aluminium frame door complete with 45 degrees angled aluminium fixed louvres; including reinforcing cleats and all necessary ironmongery; fixing with steel screws; plugging or fixing to concrete, block work or stone work; sealing with mastic; oiling and adjusting on completion;					
a	Single leaf; Single swing door; overall size 1,100 x 2,400 mm high; complete with double sidelights to architect's drawings;	1	No.			
b	Double leaf; Single swing door; overall size 1,800 x 2,400 mm high; complete with double sidelights to architect's drawings;	1	No.			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 17</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
M20 PLASTERED /RENDERED						
Render; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;						
External surfaces;						
a	Walls; over 300 mm wide;	51	m2			
b	Beams; Over 300 mm wide;	5	m2			
c	Columns; Over 300 mm wide;	2	m2			
Plaster; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;						
12 mm thick in 2 No coats work; to concrete or blockwork base (m/s); generally to internal surfaces;						
d	Walls; over 300 mm wide;	65	m2			
e	Beams; Over 300 mm wide;	7	m2			
f	Columns; Over 300 mm wide;	2	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
M60 PAINTING/CLEAR FINISHING						
PAINTING PLASTER						
Prepare by skimming plastered surface; apply one undercoat; two coats Premium Quality Silk Vinly paint to Crown paints or equal and approved;						
Steel trowelled plastered surfaces;						
a	Walls; over 300 mm wide;	65	m2			
b	Beams; Over 300 mm wide;	7	m2			
c	Columns; Over 300 mm wide;	2	m2			
PAINTING RENDER						
Prepare and apply one undercoat; finishing coat of textured special effect paint to crown paints or equal and approved;						
To Steel trowelled plastered surfaces;						
d	Walls; over 300 mm wide;	51	m2			
e	Beams; Over 300 mm wide;	5	m2			
f	Columns; Over 300 mm wide;	2	m2			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 19</p> <p>Total from Page 20</p>					
				To Summary KSHS		

		Qty	Unit	Rate	KSHS	CTS
	<p>M10 SAND CEMENT /CONCRETE SCREEDS</p> <p>CEMENT AND SAND</p> <p>32 mm thick backing; wood floated to receive Ceramic tiles (m/s) to concrete or block work base generally;</p> <p>a Over 300 mm wide;</p> <p>b 100 mm high skirting;</p>	24	m2			
	<p>M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC</p> <p>Tenderer to Add for taking delivery and fixing on the P.C. Rate provided for fixing of tiles;</p> <p>Approved polished ceramic tiles - P.C. Rate of Kshs.1,200, per square metre including fixing on cement sand screed backing (m.s);</p> <p>c 300 x 300 x 8 mm thick approved size; butt joints straight both ways; to cement and sand base (m/s); over 300 mm wide;</p> <p>d 100 mm high Skirting;</p>	24	m2			
		23	m			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 22</p>					
To Summary KSHS						

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS

		Qty	Unit	Rate	KSHS	CTS
	<p>Summary</p> <p>SUBSTRUCTURES Page 6</p> <p>FRAME Page 8</p> <p>ROOF Page 11</p> <p>WALLS Page 13</p> <p>WINDOWS Page 16</p> <p>DOORS Page 18</p> <p>WALL FINISHES Page 21</p> <p>FLOOR FINISHES Page 23</p>					
					Total for Switch Room & Generator Room KSHS	

		Qty	Unit	Rate	KSHS	CTS
<u>GUARD HOUSE</u>						
D20 EXCAVATING AND FILLING;						
SITE PREPARATION;						
Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material;						
a	Bushes, shrubs, undergrowth, hedges or the like; including small trees not exceeding 600mm girth and cart away from site;	13	m2			
EXCAVATING						
Topsoil for preservation;						
b	Excavate 200 mm average depth starting from existing ground level;	13	m2			
Excavation for strip foundation footing;						
c	Not exceeding 1.5 m deep starting from stripped level;	13	m3			
Extra over excavation irrespective of depth for breaking out;						
d	Soft rock;	2	m3			
e	Hard rock;	2	m3			
DISPOSAL						
Excavated material;						
f	Remove from site to contractor's tip for disposal	6	m3			
FILLING TO EXCAVATIONS						
g	Selected excavated material to make up levels well compacted in layers not exceeding 225mm to approval of the Structural Engineer;	7	m3			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	D20 EXCAVATING AND FILLING Continued ;					
	APPROVED HARDCORE					
a	300 mm thick; well compacted in layers of 150mm maximum thickness to approval of the Structural Engineer;	10	m2			
	QUARRY DUST BLINDING					
b	Blinding on surfaces of hardcore fill; 50 mm thick;	10	m2			
	HERBICIDES / INSECTICIDES					
c	Applying to surfaces Apply anti-termite treatment; "Termidor" or equal and approved in accordance with manufacturers' printed specifications and ten years guarantee;	10	m2			
	SURFACE TREATMENTS					
d	Planking and Strutting Labour and materials; to uphold the sides of excavations; generally		Item			
e	Disposal of Water Labour and materials; Keeping excavations free from general water		Item			
	E05 IN SITU CONCRETE CONSTRUCTION GENERALLY					
f	50 mm thick mass concrete 1:3:6 foundation blinding; To strip foundation footings; Generally;	9	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION GENERALLY Continued.....;						
Vibrated Reinforced Concrete; Class 25 (20mm agg); mix 1:1.5:3;						
Strip foundation footings;						
a	Generally;	2	m3			
Floor bed;						
b	150 mm thick;	10	m2			
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
Sides of Strip Foundation Footings;						
c	Over 300 mm wide;	6	m2			
Edges of Suspended slab						
d	Over 75mm but not exceeding 150mm	13	m			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	E30 REINFORCEMENT FOR IN SITU CONCRETE					
	REINFORCEMENT					
	Fabric reinforcement to BS 4483; reference A 142 mesh weight 2.22kgs per square metre (measured net - no allowance made for laps); including bends, tying wire, distance blocks and spacers;					
a	Generally;	10	m2			
	Bars; Round ribbed bars; cold worked to B.S. 4449 - 2005, including bends, hooks tying wire, distance blocks and spacers all in position as necessary;					
	Deformed Bars					
b	8 mm Diameter;	108	Kg			
c	10 mm Diameter;	132	Kg			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	<p>F20 NATURAL STONE WALLING</p> <p>Natural quarry stone work rough chissel dressed; jointed in cement sand mortar (1:3)</p> <p>Walls</p>					
a	<p>200 mm thick</p> <p>F30 ACCESSORIES AND SUNDRY ITEMS FOR BRICK, BLOCK AND STONE WALLING</p> <p>DAMP PROOF COURSES</p> <p>Damp proof courses bedded in cement mortar B.S 743; type A; Bitumen hessian base; 150 mm laps; no allowance made for laps</p>	23	m2			
b	<p>Horizontal; 200 mm wide;</p> <p>DAMP PROOF MEMBRANE</p> <p>Polythene; 1000 gauge; 150 mm laps; no allowance made for laps</p>	14	m			
c	<p>Horizontal; Over 300 mm wide</p> <p>M10 SAND CEMENT /RENDERING</p> <p>20 mm thick Cement and sand (1:3) rendering; finishing trowelled smooth</p> <p>Walls</p>	10	m2			
d	<p>Over 300 wide</p> <p>M12 TROWELLED BITUMEN</p> <p>Lightweight bituminous insulating paint;</p> <p>Walls</p>	6	m2			
e	<p>Over 300 wide; external</p>	6	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 25</p> <p>Total from Page 26</p> <p>Total from Page 27</p> <p>Total from Page 28</p> <p>Total from Page 29</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>E05 IN SITU CONCRETE CONSTRUCTION GENERALLY</p> <p>Vibrated Reinforced Concrete; Class 25 (20mm agg); mix 1:1.5:3;</p> <p>Beams;</p> <p>a Generally;</p>	1	m3			
	<p>E20 FORMWORK FOR IN SITU CONCRETE</p> <p>SAWN FORMWORK</p> <p>Sides and soffits of Beams;</p> <p>b Over 300 mm wide;</p>	12	m2			
	<p>E30 REINFORCEMENT FOR IN SITU CONCRETE</p> <p>REINFORCEMENT</p> <p>Bars; Round Ribbed Bars; cold worked; B.S. 4449 - 2005,including bends, hooks tying wire, distance blocks and spacers all in position as necessary;</p> <p>Deformed Bars;</p> <p>c 8 mm Diameter;</p> <p>d 12 mm Diameter;</p>	50	Kg			
		70	Kg			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 31</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
G10 STRUCTURAL TIMBER FRAMING						
The following in seasoned pressure impregnated cypress second grade or equal and approved softwood timber members; erected to height not exceeding 5000 mm above ground;						
The following in 3 No. Trusses Type T1						
a	100 x 50 mm; Rafters;	17	m			
b	100 x 50 mm; Ceiling Joists;	13	m			
c	100 x 50 mm; King Posts;	3	m			
d	100 x 50 mm; Struts and Ties;	10	m			
b	75 x 50 mm; Purlins;	27	m			
c	150 x 50 mm Wall Plate secured with and including 12mm diameter mild steel j-bolts including mortise in concrete grouted in cement and sand (1:3) mortar	14	m			
K20 BOARD LININGS						
Chamfered wrought cypress in fascia and barge boards with splayed heading joints;						
d	Size 300 x 25 mm fixed to ends of rafters;	11	m			
Tongue and Groove boarding						
e	Size 20 x 100 mm wide tongue and groove timber boarding; fixed onto and including 50 x 25 mm battens; to eaves;	7	m2			
PLASTIC PROFILES						
Supply and fix approved uPVC rainwater system with solvent welded seal ring or dry joints to manufacturer's printed instructions;						
f	Heavy gauge; 150mm diameter grey down pipe;	6	m			
Gutters;						
g	Half round; 150 mm diameter; joint brackets in the running length; fixing with support brackets;	5	m			
Supply and fix approved uPVC rainwater system with solvent welded seal ring or dry joints to manufacturer's printed instructions;						
h	Extra Over for Gutters for Swan neck; 150mm diameter	2	No.			
i	Ditto Shoe; 150mm diameter	2	No.			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	H70 MALLEABLE METAL SHEET PREBONDED COVERINGS					
	<p>Supply and fix galvanised, guage 26, IT5 prepainted metal roofing sheet covering; with heavy weight double sided 2 way reinforced fire redundant aluminium foil insulation from approved manufacturer (m/s) and of approved colour and size, including edging trim, firmly secured with galvanised steel screws or nails with end and side laps; fixed onto timber structure with all necessary curvatures, hoisting, placing and connections;</p> <p>Coverings; fixing every tile with two 38 mm galvanised nails; to 75 mm laps;</p>					
a	Sloping not exceeding 30 degrees from horizontal;	16	m2			
b	350 mm Ridge cap to match	3	m			
	M60 PAINTING/CLEAR FINISHING					
	<p>Touch up primer; prepare and apply three coats gloss oil paint on timber surfaces as described in :-</p> <p>General surfaces of fascia / barge board;</p>					
c	Over 200 wide but not exceeding 300 mm wide; externally;	11	m			
	<p>Prepare surfaces: apply three coats polyurethane clear lacquer or other equal approved: on timber surfaces: to</p> <p>General surfaces</p>					
d	Over 300 mm wide;	7	m2			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 33</p> <p>Total from Page 34</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
F21 NATURAL STONE / MASONRY WALLING						
Approved local stone; squared; machine cut or fine chisel dressed; bedding and jointed in cement sand mortar (1:4);						
	External walling;					
a	200 mm thick;	30	m2			
	Gable walling;					
b	200 mm thick;	4	m2			
	Fair Raking Cutting;					
c	200 mm wide;	9	m			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 36</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
	F31 PRECAST CONCRETE CILLS					
	Approved pre-cast concrete cill: bedded and jointed in cement sand (1:3) mortar: pointed in matching coloured cement;					
	Cills;					
a	265 x 50 mm thick cill; once weathered and throated; reinforced as necessary for handling	4	m			
	G20 CARPENTRY/TIMBER FRAMING					
	WROT HARDWOOD: PRIME GRADE;					
b	150 x 25 mm Window board; plugged;	4	m			
c	25 mm Quadrant beading	4	m			
	L10 WINDOWS					
	ALUMINIUM WINDOWS & CURTAIN WALL;					
	Supply and fix powder coated Aluminum Window; standard hollow or angle sections; frames mitred at corners including reinforcing cleats and all necessary ironmongery;					
	Complete with 6 mm thick One- Way glass; fixing with aluminium screws; plugging or fixing to concrete, blockwork or stone work; sealing with mastic: oiling and adjusting on completion; all to referenced Architect's drawings;					
d	Window overall size 1,700 x 1,500 mm high; Sliding casement window;	1	No.			
e	Window overall size 900 x 900 mm high; Sliding casement window;	1	No.			
	Window overall size 1200 x 1500 mm high; Sliding casement window;	1	No.			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>M60 PAINTING/CLEAR FINISHING</p> <p>PAINTING WOOD</p> <p>Prepare and apply one coat of aluminium wood primer on timber surfaces in contact with concrete or masonry surfaces;</p> <p>Painting Wood;</p> <p>a Surfaces over 100 but not exceeding 200 mm girth</p> <p>Prepare surfaces: apply three coats polyurethane varnish on wood: to surfaces;</p> <p>Varnishing wood;</p> <p>b Surfaces over 100 but not exceeding 200 mm girth:</p>	4	m			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 38</p> <p>Total from Page 39</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
	L20 DOORS /SHUTTERS /HATCHES					
	FLUSH DOORS;					
	Supply and fix 50 mm Thick flush door: Semi-solid core; mahogany veneer facing to both sides: mahogany lipped edges to BS 459; to Architect's details;					
a	Single leaf, single swing door overall size 900 x 2,100 mm high; to Architects' drawings;	2	No.			
	PRIME GRADE STAINED; MAHOGANY					
	Door frames;					
b	150 x 50 mm thick; including 50 x 25 mm linings;	10	m			
	Architrave;					
c	45 x 25 mm thick;	10	m			
	Quadrant;					
d	25 mm quadrant;	10	m			
	M60 PAINTING/CLEAR FINISHING					
	Prepare and apply one coat of aluminium wood primer on timber surfaces in contact with concrete or masonry;					
	General surfaces					
e	Over 100 but not exceeding 200 mm girth; Frame	10	m			
f	Not exceeding 100 mm girth; Architrave	10	m			
g	Not exceeding 100 mm girth; Quadrant	10	m			
	M60 PAINTING/CLEAR FINISHING					
	Prepare surfaces: apply three coats polyurethane clear lacquer or other equal approved: on timber surfaces: to					
	General surfaces					
h	Over 100 mm but not exceeding 200 mm girth;Frame;	10	m			
i	Not exceeding 100 mm girth; Architrave	10	m			
j	Not exceeding 100 mm girth; Quadrant	10	m			
k	Doors; Over 300 mm girth; both sides measured;	8	m2			
	P21 IRONMONGERY					
	NOTE: This section caters for <u>FLUSH AND PANEL DOORS ONLY</u>. Therefore all bidders MUST factor in their cost of all ironmongery and any other accessories as may be required in their rates of all other doors					
	Supply and Fix the following as per Union Catalogue or other equal and approved; to soft wood, hardwood or the like; fixing with screws;					
	Hinges;					
l	100 mm brass, heavy duty 2 ball bearing hinges;	3	Pairs			
	Mortice Locks;					
m	Two lever mortice lock single turn as 'Eurostar' complete with one pair of aluminium satin finish handles	2	No			
n	Door stops; rubber; fitted onto wall or floor 38 mm	2	No.			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 41</p>					
To Summary KSHS						

		Qty	Unit	Rate	KSHS	CTS
	M20 PLASTERED /RENDERED					
	Render; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;					
	External surfaces;					
a	Walls; over 300 mm wide;	30	m2			
b	Beams; Over 300 mm wide;	4	m2			
	Plaster; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;					
	12 mm thick in 2 No coats work; to concrete or blockwork base (m/s); generally to internal surfaces;					
c	Walls; over 300 mm wide;	39	m2			
d	Beams; Over 300 mm wide;	5	m2			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	<p>M10 SAND CEMENT /CONCRETE SCREEDS /FLOORING</p> <p>CEMENT AND SAND</p> <p>15 mm thick backing screed; wood floated to receive Ceramic wall tiles; (m/s) to concrete or blockwork base generally;</p>					
a	Over 300 mm wide;	14	m2			
b	100 mm wide	7	m			
	<p>M60 PAINTING/CLEAR FINISHING</p> <p>PAINTING PLASTER</p> <p>Prepare by skimming plastered surface; apply one undercoat; two coats Premium Quality Silk Vinly paint to Crown paints or equal and approved;</p> <p>Steel trowelled plastered surfaces;</p>					
c	Walls; over 300 mm wide;	39	m2			
d	Beams; Over 300 mm wide;	5	m2			
	<p>PAINTING RENDER</p> <p>Prepare and apply one undercoat; finishing coat of textured special effect paint to crown paints or equal and approved;</p> <p>To Steel trowelled plastered surfaces;</p>					
e	Walls; over 300 mm wide;	30	m2			
f	Beams; Over 300 mm wide;	4	m2			
	<p>M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC</p> <p>NOTE:</p> <p>Tenderer to Add for taking delivery and fixing on the P.C. Rate provided for fixing of tiles;</p> <p>Approved size polished ceramic wall tiles - P.C. Rate of Kshs. 1,200 per square metre including fixing on cement sand screed backing (m.s);</p>					
g	Approved size; butt joints straight both ways; to cement and sand base (m/s); Over 300 mm wide;;	14	m2			
h	100 x 6 mm thick; Ceramic Border;	7	m			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 43</p> <p>Total from Page 44</p>					
				To Summary KSHS		

		Qty	Unit	Rate	KSHS	CTS
	<p>M10 SAND CEMENT /CONCRETE SCREEDS</p> <p>CEMENT AND SAND</p> <p>32 mm thick backing; wood floated to receive Non-slip Ceramic tiles (m/s) to concrete or block work base generally;</p> <p>a Over 300 mm wide;</p> <p>b 100 mm high skirting;</p>	10	m2			
	<p>M40 STONE /CONCRETE /QUARRY /CERAMIC TILING/MOSAIC</p> <p>Tenderer to Add for taking delivery and fixing on the P.C. Rate provided for fixing of tiles;</p> <p>Approved polished ceramic tiles - P.C. Rate of Kshs.1,200, per square metre including fixing on cement sand screed backing (m.s);</p> <p>c 300 x 300 x 15 mm thick approved size; butt joints straight both ways; to cement and sand base (m/s); over 300 mm wide;</p> <p>d 100 mm high Skirting;</p>	10	m2			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 46</p>					
				To Summary KSHS		

		Qty	Unit	Rate	KSHS	CTS
K10 CEILINGS						
<p>12 mm thick Gypsum profiled Ceilings or equal and approved ceiling cover; tapered edge wallboard; joints taped and filled; firmly secured with and including fixing to steel or aluminium studwork brandering support system with rounded, smooth compound sanded edges, edge trims, plastered, joints taped and filled finished to receive direct decoration; allow for provision of ressed mouldings / bulk heads on gypsum ceiling to allow for indirect lighting to detail; all in accordance with Architect's drawings;</p>						
	Gypsum board profiled Ceilings;					
a	Over 300 wide;	7	m2			
b	100 mm wide moulded cornice;	15	m			
M60 PAINTING/CLEAR FINISHING						
<p>Prepare by skimming plastered surface; apply one undercoat; two coats Premium Quality Silk Vinly paint to Crown paints or equal and approved;</p>						
c	Gypsum Ceiling; Over 300 mm wide;	7	m2			
d	Moulded Cornice; not exceeding 100mm wide;	15	m			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 48</p>					
To Summary KSHS						

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS

		Qty	Unit	Rate	KSHS	CTS
	<p>Summary</p> <p>SUBSTRUCTURES Page 30</p> <p>FRAME Page 32</p> <p>ROOF Page 35</p> <p>WALLS Page 37</p> <p>WINDOWS Page 40</p> <p>DOORS Page 42</p> <p>WALL FINISHES Page 45</p> <p>FLOOR FINISHES Page 47</p> <p>CEILING FINISHES Page 49</p>					
				Total for Gate House KSHS		

		Qty	Unit	Rate	KSHS	CTS
UNDERGROUND WATER TANK						
D20 EXCAVATING AND FILLING;						
SITE PREPARATION;						
	Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material;					
a	Bushes, shrubs, undergrowth, hedges or the like; including small trees not exceeding 600mm girth and cart away from site;	55	m2			
EXCAVATING						
	Topsoil for preservation;					
b	Excavate 200 mm average depth starting from existing ground level;	55	m2			
	Bulk excavation for Water Tank;					
c	Not exceeding 1.5 m deep starting from stripped level;	83	m3			
d	Over 1.5 m but not exceeding 3.0 m deep;	78	m3			
	Extra over excavation irrespective of depth for breaking out;					
e	Soft rock;	29	m3			
f	Hard rock;	19	m3			
DISPOSAL						
	Excavated material;					
g	Off site to contractor's tip;	161	m3			
SURFACE TREATMENTS						
	Trimming bottoms of excavations to achieve uniformity					
h	Bottoms of Water Tank;	55	m2			
	Planking and Strutting					
i	Labour and materials; to uphold the sides of excavations; generally		item			
	Disposal of Water;					
j	Labour and materials; Keeping excavations free from general water		item			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION GENERALLY						
	50 mm thick mass concrete 1:3:6 foundation blinding; To Floor Bed;					
a	Generally;	55	m2			
Vibrated Reinforced Concrete; Class 25(20mm agg); mix 1:1.5:3 to;						
	Bottom Slab;					
b	200mm thick	55	m2			
	Sump Base;					
c	200mm thick	1	m2			
	Tank walls;					
d	200mm thick	90	m2			
	Suspended Slab;					
e	150mm thick	55	m2			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Sides of Tank walls;					
a	Over 300 mm wide	181	m2			
	Soffits of Suspended Slab;					
b	Over 300 mm wide	55	m2			
	Edges of floor bed;					
c	Over 150 mm but not exceeding 225 mm girth;	31	m			
	Edges Suspended Slab;					
d	Over 75 mm but not exceeding 150 mm girth;	31	m			
	Extra over for boxing formwork;					
e	Size 450 x 600 mm;	2	No			
f	Size 1000 x 1000 mm;	4	No			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
E30 REINFORCEMENT FOR IN SITU CONCRETE						
Bars; high yield steel; cold worked; b.s. 4449 - 2005,including bends, hooks tying wire, distance blocks and spacers all in position as necessary;						
Deformed Bars; (All Provisional)						
a	8 mm Diameter;	1128	Kg			
b	10 mm Diameter;	1354	Kg			
c	12 mm Diameter;	2031	Kg			
F30 ACCESSORIES AND SUNDRY ITEMS FOR STONE WALLING						
Waterproofing;						
Crystalline based waterproofing material as "VENDEX", "SIKA", "MASTERSEAL" or equivalent and approved; laid in accordance with the suppliers printed specifications and to the approval of the Engineer; on and including 10 years guarantee;						
d	50mm thick to tank walls	98	m2			
e	Tank Base and Top slab; Generally;	98	m2			
f	50 x 50 mm angle fillet dressing at joints;	30	m			
M20 PLASTERED/ RENDERED						
CEMENT AND SAND						
Plaster to sides of walls finished with a steel trowel thickness 10 mm						
g	Tank walls; over 300 mm wide; 32 mm thick backing; steel trowelled hard and smooth; to concrete or block work base generally;	98	m2			
h	Tank Base and Top slab; Generally;	98	m2			
Water bars						
PVC bulb-edge strip as "SIKA" or other equal and approved water bar, in concrete laid to manufacturers specifications;						
g	150 mm wide;	30	m			
ACCESS MANHOLES						
h	Water tight 450 x 600 mm PVC Medium duty manhole cover and frame	2	No			
					To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 51</p> <p>Total from Page 52</p> <p>Total from Page 53</p> <p>Total from Page 54</p>					
					<p>Total for Underground Water Tank KSHS</p>	

		Qty	Unit	Rate	KSHS	CTS
SEPTIC TANK						
D20 EXCAVATING AND FILLING;						
SITE PREPARATION;						
	Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material;					
a	Bushes, shrubs, undergrowth, hedges or the like; including small trees not exceeding 600mm girth and cart away from site;	23	m2			
EXCAVATING						
	Topsoil for preservation;					
b	Excavate 200 mm average depth starting from existing ground level;	23	m2			
	Bulk excavation for Water Tank;					
c	Not exceeding 1.5 m deep starting from stripped level;	34	m3			
d	Over 1.5 m but not exceeding 3.0 m deep;	21	m3			
	Extra over excavation irrespective of depth for breaking out;					
e	Soft rock;	7	m3			
f	Hard rock;	10	m3			
DISPOSAL						
	Excavated material;					
g	Off site to contractor's tip;	55	m3			
SURFACE TREATMENTS						
	Trimming bottoms of excavations to achieve uniformity					
h	Bottoms of Water Tank;	23	m2			
	Planking and Strutting					
i	Labour and materials; to uphold the sides of excavations; generally		item			
	Disposal of Water;					
j	Labour and materials; Keeping excavations free from general water		item			
					To collection Kshs.	

		Qty	Unit	Rate	KSHS	CTS
E05 IN SITU CONCRETE CONSTRUCTION GENERALLY						
50 mm thick class 15 concrete 1:3:6 foundation blinding;						
	To Floor Bed;					
a	Generally;	23	m2			
Vibrated Reinforced Concrete; Class 25(20mm agg); mix 1:1.5:3 to;						
	Base slab;					
b	150mm thick	23	m2			
	Tank walls;					
c	200mm thick	52	m2			
	Buffle walls;					
d	100mm thick	4	m2			
	Beam;					
e	Generally;	1	m3			
	Suspended Slab;					
f	150mm thick	23	m2			
					To collection Kshs.	

		Qty	Unit	Rate	KSHS	CTS
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
a	Sides of Tank walls; Over 300 mm wide	105	m2			
b	Soffits of Suspended Slab; Over 300 mm wide	23	m2			
c	Sides and Soffits of Beam; Over 300 mm wide	2	m2			
d	Sides and Soffits of Buffle walls; Over 300 mm wide	8	m2			
e	Edges of base slab; Over 75 mm but not exceeding 150 mm girth;	26	m			
f	Edges Suspended Slab; Over 75 mm but not exceeding 150 mm girth;	26	m			
g	Extra over for boxing formwork; Size 450 x 600 mm;	2	No			
F20 NATURAL STONE WALLING						
Natural quarry stone work machine dressed; jointed in cement sand mortar (1:3)						
h	Walls 150 mm thick	1	m2			
					To collection Kshs.	

		Qty	Unit	Rate	KSHS	CTS
	E30 REINFORCEMENT FOR IN SITU CONCRETE					
	Fabric reinforcement to BS 4483; reference A 142 mesh weight 2.22kgs per square metre (measured net - no allowance made for laps);including bends, tying wire, distance blocks and spacers;					
a	Generally;	8	m2			
	Bars; high yield steel; cold worked; b.s. 4449 - 2005,including bends, hooks tying wire, distance blocks and spacers all in position as necessary;					
	Deformed Bars;					
b	8 mm Diameter;	216	Kg			
c	10 mm Diameter;	1080	Kg			
d	12 mm Diameter;	864	Kg			
	F30 ACCESSORIES AND SUNDRY ITEMS FOR STONE WALLING					
	Waterproofing;					
	Crystalline based waterproofing material as "VENDEX", "SIKA", " MASTERSEAL" or equivalent and approved; laid in accordance with the suppliers printed specifications and to the approval of the Engineer; on and including 10 years guaratee;					
e	50mm thick to tank walls	115	m2			
f	Ditto to Tank Base and Top slab; Generally;	47	m2			
g	50 x 50 mm angle fillet dressing at joints;	21	m			
	Water bars					
	PVC bulb-edge strip as "SIKA" or other equal and approved water bar, in concrete laid to manufacturers specifications;					
h	150 mm wide;	21	m			
				To collection Kshs.		

SEPTIC TANK					
PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS		Qty	Unit	Rate	KSHS CTS
	M20 PLASTERED/ RENDERED				
	CEMENT AND SAND				
	Plaster to sides of walls finished with a steel trowel thickness 10 mm				
a	Tank walls; over 300 mm wide;	115	m2		
b	Beams; over 300 mm wide;	2	m2		
	32 mm thick backing; steel trowelled hard and smooth; to concrete or block work base generally;				
c	Over 300 mm wide;	47	m2		
	MANHOLE COVER				
	Medium duty cast iron inspection cover; complete with frame				
d	Cover Size; 600 x 450 mm;	2	No		
	PIPE WORK				
	Key Terrain UPVC drain pipes and fittings				
	Pipes; solvent weld straight couplings				
d	200 mm diameter with lip seal joints	4	m		

		Qty	Unit	Rate	KSHS	CTS	
	<p>Collection</p> <p>Total from Page 56</p> <p>Total from Page 57</p> <p>Total from Page 58</p> <p>Total from Page 59</p> <p>Total from Page 60</p>						
		Total For Septic Tank Kshs.					

		Qty	Unit	Rate	KSHS	CTS
SOAK PIT						
D20 EXCAVATING AND FILLING;						
EXCAVATING						
SITE PREPARATION;						
Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material;						
a	Bushes, shrubs, undergrowth or the like and cart away from site; Bulk excavation for Soak Pit;	3	m2			
	Not exceeding 1.5 m deep starting from stripped level;	4	m3			
b	Over 1.5 m but not exceeding 3.0 m deep;	2	m3			
c	Over 3.0 m but not exceeding 4.5 m deep;	2	m3			
d	Over 4.5 m but not exceeding 6.0 m deep;	2	m3			
e	Over 6.0 m but not exceeding 7.5 m deep;	2	m3			
f	Over 7.5 m but not exceeding 9.0 m deep;	2	m3			
g	Over 9.0 m but not exceeding 10.5 m deep;	2	m3			
Extra over excavation irrespective of depth for breaking out;						
h	Soft rock;	4	m3			
i	Hard rock;	6	m3			
DISPOSAL						
Excavated material;						
j	Remove from site to contractor's tip for disposal	8	m3			
FILLING TO EXCAVATIONS						
k	Selected excavated material to make up levels well compacted in layers not exceeding 225mm to approval of the Structural Engineer;	2	m3			
APPROVED HARDCORE						
l	Over 300 mm thick; well compacted in layers of 150mm maximum thickness to approval of the Structural Engineer;	13	m3			
SURFACE TREATMENTS						
Planking and Strutting						
m	Labour and materials; to uphold the sides of excavations; generally	1	Item			
Disposal of Water;						
n	Labour and materials; Keeping excavations free from general water	1	Item			
					To Collection KSHS	

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS				SOAK PIT	
		Qty	Unit	Rate	KSHS CTS
E05 IN SITU CONCRETE CONSTRUCTION					
GENERALLY					
50 mm thick mass concrete 1:3:6 foundation blinding;					
	To Strip footing;				
a	Generally;	2	m2		
Vibrated Reinforced Concrete; Class 25(20mm agg); mix 1:1.5:3 to;					
	Strip footing;				
b	Generally;	1	m3		
	Suspended slab;				
c	150mm thick;	2	m2		
E20 FORMWORK FOR IN SITU CONCRETE					
SAWN FORMWORK					
	Sides of Strip footing;				
d	Over 300 mm wide	2	m2		
	Soffits of Suspended slab;				
e	Over 300 mm wide	2	m2		
	Edges of Suspended slab;				
f	Over 75 mm but not exceeding 150 mm girth;	5	m		
	Extra over for boxing formwork;				
g	Size 600 x 450 mm;	1	No		
E30 REINFORCEMENT FOR IN SITU CONCRETE					
Bars; Round Ribbed; cold worked; B.S. 4449 - 2005,including bends, hooks tying wire, distance blocks and spacers all in position as necessary;					
	Deformed Bars;				
h	8 mm Diameter;	47	Kg		
i	10 mm Diameter;	70	Kg		
j	12 mm Diameter;	39	Kg		
				To Collection KSHS	

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS				SOAK PIT	
		Qty	Unit	Rate	KSHS CTS
	F20 NATURAL STONE WALLING				
	Natural quarry stone work rough chissel dressed; jointed in cement sand mortar (1:3)				
	Walls				
a	200 mm thick	8	m2		
	F30 ACCESSORIES AND SUNDRY ITEMS FOR STONE WALLING				
	Waterproofing;				
	Crystalline based waterproofing material as "VENDEX", "SIKA", " MASTERSEAL" or equivalent and approved; laid in accordance with the suppliers printed specifications and to the approval of the Engineer; on and including 10 years guarantee;				
b	To top of suspended slab; over 300mm wide	2	m2		
c	Walls and soffits of suspended slab; over 300 mm wide;	10	m2		
	M20 PLASTERED/ RENDERED				
	CEMENT AND SAND				
	Plaster to sides of walls finished with a steel trowel thickness 10 mm				
d	Walls and soffits of suspended slab; over 300 mm wide;	10	m2		
	32 mm thick backing; steel trowelled hard and smooth; to concrete or block work base generally;				
e	To top of suspended slab; over 300mm wide	2	m2		
	MANHOLES				
f	Medium duty water tight 530 mm diameter circular polysynthetic manhole cover and frame set in concrete slab;	1	No.		
	PVC PIPES				
g	100 mm diameter Golden brown PVC soil pipes	2	m		
				To Collection KSHS	

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 62</p> <p>Total from Page 63</p> <p>Total from Page 64</p>					
Total For Soak Pit Kshs.						

		Qty	Unit	Rate	KSHS	CTS
Parking & Walkways						
D20 EXCAVATING AND FILLING;						
SITE PREPARATION;						
Clearing site vegetation, grubbing up roots and filling up voids left with selected excavated material;						
a	Bushes, shrubs, undergrowth or the like and cart away from site including cutting down trees not exceeding 900mm girth;	187	m2			
EXCAVATING						
Excavations to reduce levels;						
b	Excavate for reduced levels not exceeding 1.5 m depth starting from existing ground level;	65	m3			
Extra over excavation irrespective of depth for breaking out;						
c	Soft rock;	2	m3			
d	Hard rock;	1	m3			
SURFACE TREATMENTS						
Grading and compacting subgrade to receive roads;						
e	Over 300 mm wide;	187	m2			
DISPOSAL						
Excavated material;						
f	Remove from site to contractor's tip for disposal	65	m3			
MURRAM						
g	300 mm thick; well compacted in layers of 150mm maximum thickness to 100% B.S compaction; all to approval of the Structural Engineer;	108	m2			
HAND PACKED HARDCORE						
i	300 mm thick; well compacted in layers of 150mm maximum thickness to approval of the Structural Engineer;	108	m2			
SAND BED						
Blinding on surfaces of hand packed stone fill;						
j	50 mm thick;	187	m2			
Q PAVING/PLANTING/FENCING/SITE FURNITURE						
Q10 Kerbs/Edgings/Channels/paving accessories						
Precast concrete; nominal; class 20/(20 mm); vibrated; part surface fair finish; kerbs; sprayed; B.S. 340; bedding, jointing and pointing in cement, sand mortar (1:3); including all necessary formwork, excavations and disposal;						
k	125 x 250 mm high half battered; on and including 100 mm thick plain insitu concrete class 20/(20mm) haunched base and back 325 mm wide;	34	m			
l	Ditto but curved to any radius;	16	m			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	Q PAVING/PLANTING/FENCING/SITE FURNITURE...Continued					
	Channel; B.S. 340; bedding, jointing and pointing in cement:sand mortar (1:3); including all necessary excavation, disposal and formwork;					
a	125 x 100 mm precast concrete flush channel laid flat including plain insitu concrete class 20/(20 mm) base and 100 mm thick haunch; 300 mm girth	34	m			
b	Ditto but curved to any radius;	16	m			
	Q24 Interlocking brick/block roads/Cabro pavings					
	80 mm thick Medium duty concrete interlocking blocks; 'Cabbro' or equal and approved; herring bone pattern; laid to manufacturer's specifications;					
	Roads, loading zone, Walkways and surface parking; to falls crossfalls;Horizontal;					
c	Over 300 mm wide;	108	m2			
	Precast Concrete Paving slabs					
	Precast Concrete Paving slabs; jointed and grouted up in cement:sand 1:3 mortar					
	600x600x50mm slabs; jointed and grouted up in cement:sand 1:3 mortar; laid on and including 50mm sand bed					
d	Over 300 mm wide;	79	m2			
	ROAD MARKING PAINT (PROVISIONAL)					
	Prepare and apply one coat approved quality reflective road marking paint on paving blocks					
	Externally;					
e	100 mm wide;	60	m			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 66</p> <p>Total from Page 67</p>					
				Total for Paving KSHS		

		Qty	Unit	Rate	KSHS	CTS
	Storm Water Drainage					
	D20 EXCAVATING AND FILLING;					
a	Excavate trenches for invert block drain; 900 mm wide; depth not exceeding 1.5 m deep; return, fill and ram soft soil around drain and cart away surplus spoil	41	m			
	F50 PRECAST CONCRETE WATER CHANNELS AND PIPES					
	PRECAST CONCRETE WATER CHANNELS					
b	Precast concrete water channels and drains; invert block drain; in concrete class 20 / (20 mm); vibrated; jointed and bedded in cement / sand (1:3) mortar and laid on and including 100 mm thick compacted gravel; 450 mm wide x 225 mm deep (300 mm internal diameter); half round Shallow drain comprising 150 mm thick bed and 600 x 230 x 75mm precast concrete slab side walls sloped to approval	26	m			
c	Precast concrete; normal class 20 (20mm agg.); vibrated; Part surface fair finish; channel; sprayed; B.S 340; bedding, jointing and pointing in cement, sand mortar (1:3); including all necessary formwork; 650 x 900 mm deep;on and including 50 mm thick plain insitu concrete class 20 (20 mm agg.) haunched base 850 mm wide; all and including 50 x 50 x 6mm thick Z-section frame fixed with D12 lugs into concrete at 300 mm center to center spacing;37 x 37 x 6 mm thick mild steel angle section frame to receive angle frame; all to structural engineer's details;	15	m			
	PRECAST CONCRETE WATER PIPES (CULVERT)					
d	Normal class 20 (20mm agg.); vibrated; Part surface fair finish; pipe; sprayed; B.S 340; bedding, jointing and pointing in cement, sand mortar (1:3); including all necessary formwork; 900 x 900 mm deep (600mm internal diameter);on and including 150 mm thick plain insitu concrete class 20 (20 mm agg.) bed and surround; Hed Walls; Wing Walls; aprons all reinforced with BRC Mesh A142 and including all necessary excavations and backfilling; all to structural engineer's details;	6	m			
	H31 METAL PROFILED/ FLAT SHEET CLADDING/ COVERING/ SIDING					
	GALVANIZED MILD STEEL					
e	Grating cover; 400mm wide x 37 mm thick mild steel grating cover comprising 37 x 37 x 6 mm thick mild steel angle section frame on either side; 37 x 6mm mild steel flats at 50mm c/c welded to the frame; all ground and finished smooth to structural engineers details;	15	m			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 69</p>					
					<p>Total For Storm Water Drainage KSHS</p>	

		Qty	Unit	Rate	KSHS	CTS
Foul Water Drainage						
D20 EXCAVATING AND FILLING;						
EXCAVATING TRENCHES TO RECEIVE PIPES						
Excavations for pipe;						
a	500 mm wide for 200 mm diameter pipe including 150 mm wide concrete surround(m/s); depth not exceeding 1.5 m deep; Return fill and ram soft soil around pipe and cart away surplus spoil;	37	m			
b	Ditto but over 1.5 m but not exceeding 3.0 m deep;	24	m			
PVC PIPES						
c	Plain concrete 1:3:6 (25 mm aggregate) bed and surround to 200 mm diameter pipe;	61	m			
d	200 mm diameter Golden brown PVC soil pipes laid down to trench	61	m			
F50 PRECAST CONCRETE CHANNELS/PIPES						
MANHOLES						
Construct 950mm wide x 750mm long x 1000mm deep (External dimensions) sewer inspection chamber, comprising 150mm thick concrete class 15 bed, 150mm thick natural stone walling in cement and sand (1:3) mortar, 100mm thick concrete class 20 cover slab with requisite reinforcement, 450 x 600mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar internally plastered and screeded in 12mm thick lime plaster ; 100mm thick concrete class 20 benching ; complete with necessary excavation form work and 2No. connections to pipes not exceeding 200mm diameter						
e	950 x 750 mm external dimensions; 1000 mm average depth to invert level;	11	No			
Construct 1300mm wide x 1050mm long x 1500mm deep (External dimensions) sewer inspection chamber, comprising 150mm thick concrete class 15 bed, 150mm thick natural stone walling in cement and sand (1:3) mortar, 100mm thick concrete class 20 cover slab with requisite reinforcement, 450 x 600mm heavy duty cast iron cover and frame bedded in cement and sand (1:3) mortar internally plastered and screeded in 12mm thick lime plaster ; 100mm thick concrete class 20 benching ; complete with necessary excavation form work and 4No. connections to pipes not exceeding 200mm diameter						
f	1300 x 1050 mm external dimensions; 1500 mm average depth to invert level;	4	No			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	<p>Collection</p> <p>Total from Page 71</p>					
					<p>Total For Foul Water Drainage KSHS</p>	

		Qty	Unit	Rate	KSHS	CTS
<u>BOUNDARY WALL</u>						
D20 EXCAVATING AND FILLING; (ALL PROVISIONAL)						
SITE PREPARATION;						
Clearing site vegetation, including cutting shrubs, small trees, hedges etc. and cutting away to designated area or to contractor's tip						
a	Generally	98	m2			
EXCAVATING						
Topsoil for preservation;						
b	200 mm average depth; cart away from site	98	m2			
Excavation for Strip Footing;						
c	Not exceeding 1.5 m deep from reduced level;;	88	m3			
Excavation for column bases;						
d	Not exceeding 1.5 m deep from reduced level;;	61	m3			
Extra over excavation irrespective of depth for breaking out;						
e	Soft rock and compacted foundation hardcore material;	18	m3			
f	Hard rock;	27	m3			
Disposal						
Material arising from the excavations						
g	Remove from site for disposal by machine to contractor's tip;	54	m3			
FILLING TO EXCAVATIONS						
h	Selected excavated material to make up levels compacted in layers not exceeding 225mm to approval of the Structural Engineer;	95	m3			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	Planking and Strutting					
a	Labour and Materials; to uphold the sides of excavations; generally		Item			
	Disposal of Water					
b	Labour and Materials: Keeping excavations free from general water;		Item			
	HERBICIDES / INSECTICIDES					
	HERBICIDES					
	Applying to surfaces					
c	Apply anti-termite treatment; "Termidor" or equal and approved in accordance with manufacturers' printed specifications and ten years guarantee;	98	m2			
	E05 IN SITU CONCRETE CONSTRUCTION GENERALLY					
	PLAIN					
	Mass concrete mix 1:3:6;					
d	50 mm blinding to column bases;	41	m2			
e	50 mm blinding to strip footing;	59	m2			
	Reinforced concrete; class 25 (20mm agg); mix 1:1.5:3;					
	Strip Foundation					
f	Generally	12	m3			
	Column Bases					
g	Generally	8	m3			
	Columns in foundations					
h	Generally	5	m3			
	Columns					
i	Generally	10	m3			
	Ground beam					
j	Generally	6	m3			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
E20 FORMWORK FOR IN SITU CONCRETE						
SAWN FORMWORK						
	Strip Foundation					
a	Over 300 mm wide;	39	m2			
	Column Bases					
b	Over 300 mm wide;	33	m2			
	Columns in foundations					
c	Over 300 mm wide;	71	m2			
	Columns					
d	Over 300 mm wide;	132	m2			
	Ground beam;					
e	Over 300 mm wide;	59	m2			
E30 REINFORCEMENT FOR IN SITU CONCRETE						
Bars; Round Ribbed Bars; cold worked; B.S. 4449 - 2005 including bends, hooks, tying wire, distance blocks and spacers;						
f	8 mm Diameter;	1,374	Kg			
g	10 mm Diameter;	1,080	Kg			
h	12 mm Diameter;	2,454	Kg			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	MASONRY					
	Approved local stone; squared; machine cut ; bedding and jointing in cement sand mortar (1:4) and recessed pointing one side in cement sand mortar (1:4) as work proceeds.					
	Walling;					
a	200 mm thick; In foundations;	122	m2			
b	200 mm thick;	59	m2			
	E40 DESIGNED JOINTS FOR IN SITU CONCRETE					
	JOINTS					
	Fillers					
c	20 mm thick expansion joint with flexcell joint filler between concrete/masonry surfaces or similar including all necessary supports to Engineer's approval;	10	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	MASONRY continued ...					
	F30 Accessories/Sundry items for brick/block/stone walling					
	Damp proof courses bedded in cement mortar					
	Polythene; 1000 gauge; 150 mm laps; no allowance made for laps					
a	Horizontal; 200 mm wide;	98	m			
	F31 Precast concrete sills/lintels/copings/features					
	Copings					
	300 x 75 mm thick precast concrete class 20/20 coping, splayed top; weathered and twice throated; finished fair on exposed surfaces bedded straight on masonry walls;					
b	Straight	98	m			
	Column caps					
	Precast concrete class 20/20 coping, splayed top; weathered and twice throated; finished fair on exposed surfaces bedded on collumns;					
c	500 x 500 x 75 mm	41	No			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	M20 PLASTERED /RENDERED					
	Render; 9 mm first coat of cement and sand 1:6; 3 mm second coat of cement sand and lime putty (1:10); steel trowelled smooth;					
	External surfaces;					
	Walls;					
a	Over 300 mm wide;	117	m2			
	Columns;					
b	Over 300 wide;	132	m2			
	PAINTING RENDER					
	Prepare and apply one undercoat; two coats vinyl emulsion external paint to crown paints or equal and approved;					
c	Walls; over 300 mm wide;	117	m2			
d	Columns; over 300 mm wide;	132	m2			
	METAL WORK					
	STANDARD UNITS					
	Mild steel grille comprising 50 x 25 x 3 mm thick RHS Frame and Transome and 25 x 25 x 2 mm thick SHS in fill welded at 200 mm centres horizontally, including fixing to wall with metal lugs;					
e	Overall size 2,700 x 1,900 mm high; to Architect's drawing	33.00	No.			
				To Collection KSHS		

		Qty	Unit	Rate	KSHS	CTS
	MAIN GATE					
	MILD STEEL GATE					
	Mild steel gate in two equal leaves; comprising of 50x25x3mm RHS Frame, transomes and vertical members with 3mm thick sheet infill and 25 x 25 x 2mm thick SHS vertical members at 100mm centre to centre; all to receive undercoat and steel grey paint finish: to Architects details					
a	Overall size, 6000 x 2500mm high	1	No			
	MILD STEEL PEDESTRIAN GATE					
	Single leaf mild steel pedestrian gate;comprising of 50x25x3mm RHS Frame, transomes and vertical members with 3mm thick sheet infill and 25 x 25 x 2mm thick SHS vertical members at 100mm centre to centre; all to receive undercoat and steel grey paint finish: to Architects details					
b	Overall size, 1150 x 2500mm high	1	No			
	M60 PAINTING/CLEAR FINISHING					
	Prepare and apply one undercoat and two finishing coats of gloss oil paint;					
	Generally metal surfaces;					
c	Over 300 mm wide; both sides measured;	374	m2			
To Collection KSHS						

		Qty	Unit	Rate	KSHS	CTS
	Collection					
	Total from Page 73					
	Total from Page 74					
	Total from Page 75					
	Total from Page 76					
	Total from Page 77					
	Total from Page 78					
	Total from Page 79					

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS

	Qty	Unit	Rate	KSHS	CTS
<p>Summary</p> <p>SWITCH ROOM & GENERATOR ROOM Page 24</p> <p>GATE HOUSE Page 50</p> <p>UNDERGROUND TANK Page 55</p> <p>SEPTIC TANK Page 61</p> <p>SOAK PIT Page 65</p> <p>PAVING Page 68</p> <p>STORMWATER DRAINAGE Page 70</p> <p>FOUL WATER DRAINAGE Page 72</p> <p>BOUNDARY WALL Page 80</p>					
			Total for Bill KSHS		

PART NO. 6

MECHANICAL INSTALLATION WORKS

PLUMBING

FIRE FIGHTING

AND

DRAINAGE

INSTALLATIONS

2d. PARTICULAR SPECIFICATIONS

PARTICULAR SPECIFICATIONS FOR PLUMBING, FIRE FIGHTING AND DRAINAGE

Introduction

This section covers the general requirement for plant, equipment and materials forming part of the mechanical works and shall apply except where Specifically stated elsewhere in the Specification. These works shall be as by regulations and standards.

Regulations and Standards

The Works shall comply with the current editions of the following:

- a) The Kenya Government Regulations.
- b) The Kenya Bureau of Standards
- c) The National Environmental Management Authority Regulations.
- d) The Kenya Building Code Regulations
- e) Local Authority By-laws.
- f) The Electricity Supply Authority By-Laws
- g) British Standard and Codes of Practice as published by the British Standards Institution (BSI)
- h) The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guides.
- i) The United Kingdom Institution of Electrical Engineers (IEE) Regulations for the Electrical Equipment of Buildings.
- j) The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guides.

SCOPE

These specifications cover the execution of plumbing and drainage installation at the mentioned site to be supervised by the Engineer or his representative and the sub-contractor should read them in conjunction with other relevant specifications, drawings and contract documents issued to the sub-contractor for the works.

The works include, unless otherwise specified, installations, testing, commissioning and setting to work all the installations described in the specifications and shown on contract/working drawings.

The provision of all labour, tools, instruments, testing apparatus and scaffolding necessary to execute the work in a first class manner and all other implement and material not specifically mentioned in the project or contract documents but are necessary for the satisfactory completion of the works, including such elements as;-

- a) Cold water supply pipework and fittings to the water storage tanks from the existing water mains.
- b) Water storage tanks complete with all covers, fittings, washout, drain and overflow pipes, backnuts, supports etc. The overflow, washout and drain pipes shall terminate away at reasonable discharge points are required.
- c) The Water storage supply pipework to the functional and sanitary fittings as shown plus the necessary fixing supporting and jointing materials or compounds.
- d) The sanitary and operational fittings including all accessories together with the fixing, mountings, supports and jointing to the supply and discharge pipes.
- e) Electrical wiring in plant rooms from isolator and all control wiring including cables, conduits, pipes etc from central facilities to working area.

WELDING

Joints to be made by welding shall be accurately cut to size with edges sheared, flame cut and machined to suit the required type of joint. The prepared surface shall be free from all visible defects such as laminations, surface imperfections due to shearing or flame cutting operation etc, and shall be free from rust scale, grease and other foreign matter.

All welding shall be carried out by electrical process using covered electrodes in accordance with B.S. 639.

Gas welding may be employed in certain circumstances provided that prior approval is obtained in writing from the Engineer.

All pipe weld shall be carried out in accordance with the requirements of BS 806.

All welding of mild steel components other than pipework shall comply with the general requirement of BS 1856.

ELECTRICAL REQUIREMENTS

Plant and equipment supplied under this sub-contract be complete with all necessary motor starters, control boards, and other control apparatus. Where control panels incorporating several starters are supplied, they shall be complete with main isolator. The supply power up to and including local isolator will be provided and installed by the Electrical sub-contractor. All other wiring shall be installed as described by the sub-contractor.

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting current as described in the Kenya Power and Lighting Company By-Laws.

All electrical plant and equipment supplied by the sub-contractor shall be rated for the supply voltage and frequency obtained in Kenya, that is 415 volt, 50Hz, 3-phase or 240 volts, 50Hz, 1-phase as specified.

All equipment or plant that is not rated for the above currents, voltages and frequencies shall be rejected by the Engineer.

The sub-contractor shall supply three copies of all schematic, cabling and wiring diagrams for the Engineer's approval before commencement of works.

COLOUR CODING

When all installations have been set to work, tested and commissioned the sub-contractor shall prime all the works with an undercoat and then give the same two coats of gloss paint in accordance with the latest edition of BS 1710 on colour and to the satisfaction of the Engineer.

MATERIALS AND STANDARDS

Pipework and Fittings

a) Black Steel Pipework

All black steel pipework upto 65mm nominal bore shall be manufactured in accordance with B.S. 21. All fittings shall be of malleable iron and manufactured in accordance with B.S. 143.

Pipe joints shall be screwed and socketed and sufficient couplings and unions shall be allowed so that fittings can be disconnected without cutting the pipe. Running nipples and long screws shall not be permitted unless exceptionally approved by the Engineer.

All black steel pipework, 80mm nominal bore upto 150mm nominal bore, shall be manufactured to comply in all respects with the specification for 65mm pipe, except that screwed and bolted flanges shall replace unions and couplings for the jointing of pipes to valves and other items of plant.

All flanges shall comply with the requirements of B.S. 10 to the relevant classifications contained hereinafter section C of the Specifications.

a) Galvanized Steel Pipework

Galvanized steel pipework shall be manufactured to comply in all respects with the standards described for black steel pipework in paragraph (a) above.

Galvanizing shall be carried out in accordance with the requirements of B.S. 1387 and BS 143 respectively.

b) Polypropylene Pipes –Random (PP-R) Type 3

PP-R type3 pipe work shall be manufactured in accordance with B.S. 7291part 2001.Dimesnsions and quality of PP-R Pipes shall be in accordance with DIN 8077 and pipelines in plastics materials joints, Components parts, Installation to be in accordance DIN 16928. Joints and fittings to be in accordance DIN16962.

CPVC & HDPE pipes and fittings please refer to manufactures printed manuals.

c) Copper Tubing

All copper tubing shall be manufactured in accordance with B.S. 2871 from C160 'Phosphorus De-oxidized Non-Arsennical copper' in accordance with B.S. 1172.

Pipe joints shall be made with soldered capillary fittings and connections to equipment shall be compression fittings manufactured in accordance with B.S. 864.

Short copper connections tubes between galvanized pipework and sanitary fittings shall not be used because of the risk of galvanic action.

If, as may occur in certain circumstances, it is not possible to make the connections in any other way than by the use of copper tubing, then a brass straight connector shall be positioned between the galvanized pipe and the copper tube in order to prevent direct contact.

d) Cast Iron Pipework

i) Internal Services

Internal iron pipework and fittings for use above ground in connection with internal building services shall be manufactured with spigot and socket joints of the weight required by the Local Authority and shall comply fully with the requirements of B.S. 416.

All joints on cast spigot and socket pipes shall be made with an approved cold caulking compound and so installed as to allow for any expansion or contraction that may take place.

All cast iron pipework, branches, tees, bends and other fittings shall be supplied complete with inspection covers for cleaning purposes. These inspection covers shall be included as part of the fittings and shall comply with the requirements of B.S. 416.

ii) External Services

Cast iron pipework which is used in accordance with buried external services shall be manufactured, coated and tested in accordance with the requirements of B.S. 1211.

All buried cast iron bends, elbows, sweep tees and other fittings, shall comply with the requirements of B.S. 1130.

Jointing on external cast iron pipes shall be carried out in accordance with one of the methods described in B.S. Code of Practice 301, Clause 505c(v), to the approval of the Engineer.

e) Pitch Fibre Pipework

Pitch Fibre Pipework and fittings are used in connection with external drainage services shall be manufactured in accordance with the requirements of B.S. 2760. Pipes shall be connected by means of purpose made tapered joints manufactured in accordance with B.S. 2760.

Until such time as the use of pitch impregnated fibre pipes is covered by a code of Practice, the jointing laying and cutting of these pipes shall be carried out in accordance with the requirements of the notes contained under Appendix C of B.S. 2760.

f) Concrete Pipe

Where concrete pipe and fittings are used in connection with the conveyance of surface water or sewage under atmosphere pressure, they shall be manufactured in accordance with the requirements of B.S. 556, Clause 1, except where otherwise stated.

The joints of concrete pipe and fittings may be one of the following depending upon application and conditions;-

- (i) Flexible spigot and socket type
- (ii) Flexible rebated type (Storm water drainage only)
- (iii) Ordinary spigot and socket type
- (iv) Ordinary rebated type (Storm water drainage only)

Joints (i) and (ii) shall be sealed with suitable rubber gaskets manufactured in accordance with B.S 2494 except where they are likely to be contaminated by oil products, in which case the gaskets shall be manufactured in accordance with B.S. 3514.

Joints (iii) and (iv) shall be made with an approved cement mortar mix.

g) P.V.C. (Hard) Pressure Pipe and Fittings

All P.V.C. pipes and fittings shall be manufactured in accordance with B.S. 3505:

h) Jointing

The method of jointing to be employed shall be that of Solvent welding, using the pipe and manufacturer's approved cement Seal rings joints shall be introduced where it is necessary to accommodate thermal expansion.

i) Anchoring

All bends, valves and hydrant tees etc, in the line of the water main shall be adequately anchored to resist thrust due to internal water pressure. A concrete block shall be cast under and around the pipe and between it and sides of the trench. Well-rammed material shall be used to support the pipe on either sides of the concrete.

j) Pipe Bed

Pipes shall be uniformly laid on a 75mm thick bed (sand or red soil) and must not be allowed to rest on the joint or on stones etc.

k) Support to Fittings

In underground installations care shall be taken to ensure that heavy components such as valves are fully supported so that no weight is carried by the pipeline.

l) Backfilling

For the protection of the pipe initial backfilling shall be carried out as soon as possible after laying. The initial backfill shall be fine grained material thoroughly compacted around the pipe and consolidated to a depth of 6" above the crown of the pipe at no time shall heavy rocks, stones or other objects be included in the balance of the backfill that might protrude the initial backfill layer and come into contact with the pipe.

m) Testing

Pipelines shall be tested in sections under an internal water pressure normally one and a half times the maximum allowable working pressure for the class of pipe used. Testing shall be carried out as soon as practicable after laying and when the pipeline is adequately anchored. Precautions shall be taken to eliminate all air from the test section and to fill the pipeline slowly to avoid risk of damage due to surge.

i. A.B.S. Waste System

Where indicated on the drawings and schedules, the Sub-Contractor shall supply and fix A.B.S. waste pipes and fittings.

The pipes, traps and fittings shall be in accordance with the relevant Standards including B.S. 3943, and fixed generally in accordance with manufacturer's instructions and B.S 5572.

Jointing of pipes shall be carried out by means of solvent welding. The manufacturer's recommended method of joint preparation and fixing shall be followed.

Standard brackets, as supplied for use with this system, shall be used wherever possible. Where the building structure renders this impracticable, the Sub-Contractor shall provide purpose made supports, the centres of which shall not exceed one metre.

Expansion joints shall be provided as indicated. Supporting brackets and pipe clips shall be fixed on each side of these joints.

ii. P.V.C. Soil System

The sub-contractor shall supply and fix P.V.C. soil pipe and fittings as indicated on the drawings and schedules.

Pipes and fittings shall be in accordance with relevant Standards, including B.S. 4514 and fixed to the manufacturer's instructions, and B.S. 5572.

The soil system shall incorporate synthetic rubber gaskets as provided by the manufacturer whose fixing instructions shall be strictly adhered to.

Connections to W.C. and pass shall be effected by the use of a W.C. connector gasket and cover, sized to suit pan socket.

Suitable supporting brackets and pipe clips shall be provided at maximum of metre centres.

The sub-contractor shall be responsible for the joint into the Gulley Trap on Drain as indicated on the drawings.

VALVES

a) Draw-off Taps and Stop Valves (upto 50mm Nominal Bore)

Draw off taps and valves upto 50mm nominal bore, unless otherwise stated or specified for attachment or connection to sanitary fittings shall be manufactured in accordance with the requirements of B.S.1010.

b) Gate Valves

All gate valves upto 80mm nominal bore and above, other than those required for fitting to buried water mains shall be of cast iron construction, in accordance with the requirements of B.S. 3464. All gate valves required for fittings to buried water mains shall be of cast iron construction in accordance with the requirements of B.S. 1218.

All gate valves upto and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S. 1952.

The pressure classification of all gate valves shall depend upon the pressure conditions pertaining to the Site of Works.

c) Globe Valves

All globe valves upto and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S. 3061.

The pressure classification of all globe valves shall depend upon the pressure conditions pertaining to the Site of Works.

d) Check or Non-Return Valves

All check or non-return valves 80mm nominal bore and above shall be of the swing check type of cast iron construction in accordance with the requirements of B.S. 4090.

The pressure classification of all check or non-return valves shall depend upon the pressure conditions pertaining to site of the Works.

e) Ball Valves

All ball valves for use in connection with hot and cold water services shall be of the Portsmouth type in accordance with the requirements of B.S. 1212, constructed from bronze or other corrosion resistant materials. These valves fall into three pressure classifications as follows;-

- | | | | |
|------|-----------------|---|-----------------|
| i) | Low pressure | - | 3.58 b maximum |
| ii) | Medium pressure | - | 7.72 b maximum |
| iii) | High pressure | - | 12.62 b maximum |

The pressure classification required for each ball valve will be designated in the description its associated equipment contained in section C of the Specification.

f) Manually Operated Mixing Valves

Mixing valves for shower fittings and other appliance being provided under the Sub-Contract. Works shall be manufactured in accordance with the requirements of B.S. 1415 from bronze or other corrosion resistant materials.

WASTE FITMENT TRAPS

a) Standard and Deep Seal P & S Traps

Where standard or deep seal traps are specified they shall be manufactured in suitable non-ferrous materials in accordance with the full requirements of B.S. 1184.

In certain circumstances, cast iron traps may be required for cast iron baths and in these instances bath traps shall be provided which are manufactured in accordance with the full requirements of BS. 1291

b) Anti-Syphon Traps

Where anti-syphon traps are specified, these shall be similar or equal to the range of traps manufactured by Greenwood and Hughes Limited, Deacon Works Littlehampton, Sussex, England. The trade name for traps manufactured by this company is "Grevak"

PIPE SUPPORTS

a) General

This sub-clause deals with pipe supports securing pipes to the structure of buildings for above ground application.

The variety and type of support shall be kept to a maximum and their design shall be such as to facilitate quick and secure fixings to metal, concrete, masonry or wood.

Consideration shall be given, when designing supports, to the maintenance of desired pipe falls and the restraining of pipe movements to a longitudinal axial direction only.

The Sub-Contractor shall install all steelwork forming part of the pipe support assemblies.

The sub-contractor shall submit all his proposals for pipe supports to the Engineer for approval before any erection work commences.

b) Steel and Copper Pipes and Tubes

Pipe runs shall be secured by pipe clips connected to pipe hangers, wall brackets, or trapeze type supports. 'U' bolts shall not be used as a substitute for pipe clips without the prior approval of the Engineer

An approximate guide to the maximum permissible supports spacing in metres for steel and copper pipe and tube is given in the following table for horizontal runs.

Size Nominal Bores	Copper Tube to B.S. 659	Steel Tube to B.S. 1387
15mm	1.25m	2.0m
20mm	2.0m	2.5m
25mm	2.0m	2.5m
32mm	2.5m	3.0m
40mm	2.5m	3.0m
50mm	2.5m	3.0m
65mm	3.0m	3.5m
80mm	3.0m	3.5m
100mm	3.0m	4.0m
125mm	3.0m	4.5m
150mm	3.5m	4.5m

The support spacing for vertical runs shall not exceed one and half times the distances given for horizontal runs.

c) Cast Iron Spigot and Socket Jointed Pipes

Cast iron and cement socketed pipes shall generally be supported at every socket joint by means of either holderbats secured rigidly to the structure, or purpose made straps for attachment to rigid steel support brackets.

When holderbats are used, they shall conform to the requirement of B.S.416.

Suitable anchors shall be provided at all changes of pipe directions, junctions and tees, to counteract the effect of end thrust loads.

d) Concrete and Pitch Fibre Pipes

These pipes shall not be used for above ground application.

e) Expansion Joints and Anchors

Where practicable, cold pipework systems shall be arranged with sufficient bends and changes of direction to absorb pipe expansion provided that the pipe stresses are contained within the working limits prescribed in the relevant B.S. specification.

The Sub-Contractor shall pay particular care when supporting cast iron pipes in order to ensure that settlement and building movement do not break the pipe joints.

Where piping anchors are supplied, they shall be fixed to the main structure only Details of all anchor design proposals shall be submitted to the Engineer for approval before erection commences.

The Sub-Contractor when arranging his piping shall ensure that no expansion movements are transmitted directly to connections and flanges on pumps or other items of plant.

The Sub-Contractor shall install flexible joints to prevent vibrations and other movements being transmitted from pumps to piping systems or vice versa.

SANITARY APPLIANCES

All sanitary appliances supplied and installed as part of the Sub-Contract works shall comply with the general requirements of B.S. specifications and shall be installed in accordance with the best standard of modern practice as described in C.P. 305 to the approval of the Engineer

SANITARY SERVICES

Soil, waste and vent pipe system shall be installed in accordance with the best standard of modern practice as described in B.S. 5572 to the approval of the Engineer.

The contractor shall be responsible for ensuring that all ground waste fittings are discharged to a gully trap before passing to the sewer via a manhole.

All necessary rodding and inspection facilities within the draining system in positions where easy accessibility is available.

Where a branch requires rodding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made rodding eye in the nearest adjacent wall or floor to which easy access is available.

The vent stacks shall terminate above roof level and where stack passes through roof, a weather skirt shall be provided. The contractor shall be responsible for sealing the roof after installation of the stacks.

The open end of each stack shall be fitted with a plastic coated or galvanised steel wire guard.

Access for rodding and testing shall be provided at the foot of each stack

PIPE SLEEVES

Main runs of pipe work are to be fitted with sleeves where they pass through walls and floors. Generally the sleeves shall be of P.V.C. except where they pass through the structure, where they shall be mild steel. The sleeves shall have 6 mm - 12 mm clearance of all round the pipe or for insulated pipework all around the installation. The sleeve will then be packed with slag wool or similar.

INSTALLATION

GENERAL

Installation of all pipework, valves, fittings and equipment shall be carried out under adequate supervision from skilled staff to the relevant codes and standards as specified herein. The Sub-Contractor shall be responsible to the Main Contractor for ensuring that all builders' work associated with his piping installation is carried out in a satisfactory manner to the approval of the Engineer.

ABOVE GROUND INSTALLATION

(a) Water Services

Before any joint is made, the pipes shall be hung in their supports and adjusted to ensure that the joining faces are parallel and any falls which shall be required are achieved without springing the pipe.

Where falls are not shown on the Contract Drawings or stated elsewhere in the Specification, pipework shall be installed to the lines of buildings and as close to the walls, ceiling, columns, etc, as is practicable.

All water systems shall be provided with sufficient drain points and automatic air vents to enable them to function correctly. Valves and other user equipment shall be installed with adequate access for operation and maintenance. Where valves and other operational equipment are unavoidably installed beyond normal reach or in such position as to be difficult to reach from a short stepladder, extension spindles with floor or wall pedestals shall be provided.

Screwed piping shall be installed with a sufficient number of unions to facilitate easy removal of valves and fittings and to enable alterations of pipework to be carried out without the need to cut the pipe.

Full allowance shall be made for the expansion and contraction of pipework, precautions being taken to ensure that any force produced by pipe movements are not transmitted to valves, equipment or plant.

All screwed joints to piping and fittings shall be made with P.T.F.E. Tape.

The test pressure shall be maintained by the pump for about one hour and if there is any leakage, it shall be measured by the extension of water pumped into the main in that time. A general leakage of one gallon per 25mm of diameter, per 1.6 kilometer per 24 hours per 30 metres head, may be considered reasonable but any visible individual leak shall be repaired.

(b) Water meter

Water meter shall conform to the requirement of EN ISO 4064 and have KEBS certification. A water meter shall be designated as accuracy class 2. This requires the Maximum Permissible Error (MPE) to be $\pm 2\%$ (for temperatures from 0.1 °C to 30 °C and $\pm 3\%$ for temperatures greater than 30 °C) for the upper flow rate zone. The MPE for the lower flow rate zone shall be $\pm 5\%$.

In-built sieves/strainers shall be incorporated in consumer flow meters.

Threaded meters shall be supplied complete with a set of connectors that are made of copper alloy or equivalent material resistant to corrosion, rust and damage due to shock or vibration. The connectors shall be threaded to the correct male size, comprising cap nuts, linings and fibber sealing washers. The meter linings shall have adequate provisions to safeguard against tampering.

A water meter shall include protection devices which can be sealed so as to prevent, both before and after correct installation of the water meter, dismantling or modification of the meter, its adjustment device or its correction device, without damaging these devices.

Working pressure shall be 1,600 kPa

The minimum warranty period shall be two years

(c) Sanitary Services

Soil, waste and vent pipe systems shall be installed in accordance with the best standards of modern practice as described in B.S.5572 to the approval of the Engineer.

The Sub-Contractor shall be responsible for ensuring that all ground floor waste fittings are discharged to a gully trap before passing to the sewer via a manhole.

The Sub-Contractor shall provide all necessary rodding and inspection facilities within the draining system in position where easy accessibility is available. WCs shall not fall under this requirement.

Where a branch requires rodding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made rodding eye in the nearest adjacent wall or floor to which easy access is available.

The vent stacks shall terminate above roof level and where stack passes through roof weather skirt shall be provided. The Sub-Contractor shall be responsible for sealing the roof after installation of the stacks.

The open end of each stack shall be fitted with a plastic coated or galvanised steel, wire guard.

Access for rodding and testing shall be provided at the foot of each stack.

(d) Sanitary Appliances

All sanitary appliances associated with the Sub-Contract works shall be installed in accordance with the best standard of modern practice as described in B.S.5572 to the approval of the Engineer

UNDERGROUND INSTALLATION

(a) General

All underground water and drainage service installations shall be carried out in accordance with the best standard of modern practice as described in C.P.301 and C.P.310 respectively and the following clause.

(b) Sequence of Operation for Underground Service Installation

i. Setting out

As described in B.S. code of practice 301 Clause 502.

ii. Breaking Up Surface (If in Roads)

As described in B.S. code of practice 301 Clause 503.

iii. Excavation and Timbering

As described in B.S. code of practice 301 Clause 503 and the following:-

Excavation shall be made to such depths and dimensions as may be required by the Engineer to obtain prior falls and firm foundations. No permanent construction shall be commenced on any bottom until the excavation has been examined and approved by the Engineer.

Should the Sub-Contractor err or without the instruction of the Engineer make any excavation below the required level of the pipe or bed, as the case may be, then he shall be required to refill such excavation to the correct levels with concrete 1:4:8 to 38mm maximum aggregate size.

No sub-soil water shall be discharged into the sewage systems without written permission of the Engineer.

iv. Laying of Concrete Beds or other Supports for Pipes (If required)

As described in B.S. code of practice 301 Clause 504 and the following:-

All drains below buildings shall be encased in concrete 150mm thick.

Concrete beds and supports shall be concrete 1:3:6 to 25mm maximum aggregate size.

v. Pipe Laying and Joining

Drain pipes be laid and jointed as described under B.S. code of practice 301 Clause 505.

Pitched fibre drain pipe shall be laid, jointed and cut in accordance with the requirements or the Note contained under Appendix C of B.S.2760.

Water pipes shall be laid and jointed as described under B.S. code of practice 310, clause 401, 402, 403 and 404.

vi. Testing of Pipelines

After pipelines are connected and joints have been sealed, the pipeline shall be tested before pipes are, if required, haunched or surrounded in concrete.

Methods of testing and inspection shall be in accordance with Clause 4 of the Specification.

vii. Concrete Beddings, Haunching and Surround

Concrete bedding, haunching and surround shall be provided as necessary or where called for by the Engineer in accordance with the requirements laid down in B.S. code of practice 301, Clause 310.

viii. Backfilling

Backfilling of trenches, headings and around manholes shall be carried out in accordance with the methods described in B.S. code of practice 301, Clause 508.

ix. Reinstatement of Surfaces

Following the final backfilling of all trenches, headings and manhole surrounds, the surface of the excavated areas shall be fully reinstated to the approval of the Engineer.

TESTING AND INSPECTION

SITE TEST - PIPEWORK SYSTEMS

a) Underground Water Mains

After laying, jointing and anchoring, the mains shall be slowly and carefully charged with water so that all air is expelled and allowed to stand full for three days before testing under pressure.

A long main shall be tested in sections as the work of laying proceeds and all joints shall be exposed for inspection during the testing.

The open end of the main may be temporarily closed for testing under moderate pressure by fitting a water pipe expanding plug, of which several types are available. The end of the main and the plug should be secured by struts or otherwise, to resist the end thrust of the water pressure in the main.

If the section of main terminates with a sluice valve, the wedge of the valve shall not be used to retain the water, instead the valve shall be fitted temporarily with a blank flange, or a socket valve with a plug and the wedge shall be placed in the open position while testing. The Sub-Contractor shall provide suitable end supports to withstand the end thrust of the water pressure in the main.

b) Above Ground Internal Water Services Installation

All water service pipe system installed above ground shall be tested hydraulically for a period of one hour to not less than one and half times the design working pressure.

If preferred, the Sub-Contractor may test the Pipelines in sections. Any such section found to be satisfactory need not be the subject of a further test when system has been completed, unless specifically requested by the Engineer.

During the test, each branch and joint shall be examined carefully for leaks and any defects revealed shall be made good by the Sub-Contractor and the section re-tested.

The Sub-Contractor shall take all necessary precautions to prevent damage occurring to special valves and fittings during the tests. Any item damaged shall be required or replaced at the Sub-Contractor's expenses.

c) Underground Drainage System

A site test shall be carried out on all drainage pipes before haunching or surrounds are applied. These tests shall be carried out preferably from manhole to manhole.

Short branch drains connected to a main drain between manholes shall be tested as one system with a main drain. In long branches, a testing junction shall be inserted next to the junction with the main

drain and the branch tested separately. After this has been passed, the testing junction shall be effectively sealed.

All tests on underground drains shall be permitted on cast iron drains at the discretion and to the approval of the Engineer.

Water tests shall be carried out in accordance with the methods described under B.S. Code of Practice 301, Clause 601(b) and (c) and the test pressure shall not be less than 1,520mm head at the highest point in the pipe section and not more than 10.36mm head at any point in the section.

The test pressure shall be maintained for the period of one hour during which time the pipe and joints shall be inspected for sweating and leakage. Any leak discovered during the tests shall be made good by the Sub-Contractor and the section re-tested.

In addition to pressure tests, drain pipe runs shall be tested for straightness where applicable. This test shall be carried out in accordance with one of the two methods described in B.S. code of Practice 301, Clause 601(e).

Testing of manholes shall be carried out in accordance with the methods described under B.S. code of practice 301, clause 601 (f).

d) Above Ground Soil, Waste and Ventilation System

All soil, waste and ventilating pipe system forming part of the above ground installation, shall be given appropriate test procedures as described in B.S. 5572.

Smoke tests on above ground soil, waste and ventilating pipe system shall not be permitted.

Pressure tests shall be carried out before any work that is to be concealed is finally enclosed. Any defects revealed by the tests shall be made good by the Sub-Contractor and the test repeated to the approval for the Engineer.

In all other respects, tests shall comply with the requirements of B.S. 5572.

SITE TEST - PERFORMANCE

Following satisfactory pressure test on the pipework systems, operational shall be carried out in accordance with the relevant B.S. code of practice on the systems as a whole to establish that special valves, gauges, controls, fittings, equipment and plant are functioning correctly to the satisfaction of the Engineer.

All hot water pipe work shall be installed with performed fibreglass lagging to a thickness of 25mm where the pipe runs above a false ceiling or in areas where the ambient temperature is higher than normal with the result that pipe "sweating" due to condensation will cause nuisance.

All lagged pipes which run a visible position after erection shall be given a canvas cover and prepared for a painting as follows:-

- i) Apply a coating of a suitable filler until the canvas weave disappears and allow to dry
- ii) Apply two undercoats of an approved paint and finish in suitable gloss enamel to colours approved by the Engineer.

All lagging for cold water and hot water pipes erected in crawl ways, ducts, and above false ceiling which, after erections are not visible from the corridors or rooms, shall be covered with a reinforced aluminum foil finish and banded in colours to be approved by the Engineer.

In all respects, unless otherwise stated, the hot and cold water installation shall be carried out in accordance with the best standard of modern practice as described in C.P. 342 and C.P. 310 respectively to the approval of the Engineer.

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains or large diameter, by a power driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded.

Pressure gauges should be recalibrated before the tests.

STERILIZATION OF HOT AND COLD WATER SYSTEMS

All underground water mains and above ground water distribution systems, cisterns, tanks etc shall be thoroughly sterilized and flushed out after the completion of all tests and before fully commissioned for handing over.

The sterilization procedure shall be carried out by the sub-contractor or specialists employed by the sub-contractor in accordance with the requirements of B.S. code of practice 310, clause 409, to the approval of the engineer.

PARTICULAR SPECIFICATIONS FOR PORTABLE, FIRE EXTINGUISHER AND HOSE REEL

INSTALLATIONS

GENERAL

The particular specification details the requirements for the supply and installation and commissioning of the Portable Fire Extinguishers and Boosted Hose Reel System. The contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the contract drawings but which are necessary for the completion and satisfactory functioning of the works.

If in the opinion of the contractor there is a difference between the requirements of the Specifications and the Contract Drawings, he shall clarify these differences with the Engineer before tendering.

SCOPE OF WORKS

The contractor shall supply, deliver, erect, test and commission all the portable fire extinguishers and Hose Reel which are called for in these Specifications and as shown on the Contract Drawings.

WATER/CO₂ EXTINGUISHERS

These shall be 9-litre water filled CO₂ cartridge operated portable fire extinguishers and shall comply with B.S. 1382: 1948 and to the requirements of B.S.4523: 1977. Unless manufactured with stainless steel, bodies shall have all internal surfaces completely coated with either a lead tin, lead alloy or zinc applied by hot dipping.

There shall be no visibly uncoated areas.

The extinguishers shall be clearly marked with the following:

- a) Method of operation.
- b) The words ‘WATER TYPE’ (GAS PRESSURE) in prominent letters.
- c) Name and address of the manufacturer or responsible vendor.
- d) The nominal charge of the liquid in imperial gallons and litres.
- e) The liquid level to which the extinguisher is to be charged.
- f) The year of manufacture.
- g) A declaration to the effect that the extinguisher has been tested to a pressure of 24.1 bar (350 p.s.i.).
- h) The number of British Standard ‘B.S’ 1382 or B.S. 5423: 1977.

PORTABLE CARBON DIOXIDE FIRE EXTINGUISHERS

These shall be portable carbon dioxide fire extinguishers and shall comply with B.S. 3326: 1960 and B.S. 5423: 1977.

The body of extinguisher shall be a seamless steel cylinder manufactured to one of the following British Standards; B.S. 401 or B.S. 1288.

The filling ratio shall comply with B.S. 5355 with valves fittings for compressed gas cylinders to B.S.341. Where a hose is fitted it shall be flexible and have a minimum working pressure of 206.85 bar (3000 p.s.i.). The hose is not to be under internal pressure until the extinguisher is operated.

The nozzle shall be manufactured of brass gunmetal, aluminium or stainless steel and may be fitted with a suitable valve for temporarily stopping the discharge if such means are not incorporated in the operating head.

The discharge horn shall be designed and constructed so as to direct the discharge and limit the entrainment of air. It shall be constructed of electrically non-conductive material.

The following markings shall be applied to the extinguishers:-

- a) The words “Carbon Dioxide Fire Extinguisher” and to include the appropriate nominal gas content.
- b) Method of operation.
- c) The words “Re-charge immediately after use”.
- d) Instructions for periodic checking.
- e) The number of the British Standard B.S. 3326: 1960 or B.S. 5423.
- f) The manufacturers name or identification markings

DRY CHEMICAL POWDER PORTABLE FIRE EXTINGUISHER

The portable dry powder fire extinguishers shall comply with BS3465: 1962 and BS 5423. The body shall be constructed to steel not less than the requirements of BS 1449 or aluminium to BS 1470 : 1972 and shall be suitably protected against corrosion.

The dry powder charge shall be not-toxic and retain its free flowing properties under normal storage conditions. Any pressurizing agent used as an expellant shall be in dry state; in particular compressed air.

The discharge tube and gas tube if either is fitted shall be made of steel, brass, copper or other not less suitable material. Where a hose is provided it shall not exceed 1,060mm and shall be acid and alkali resistant. Provision shall be made for securing the nozzle when not in use.

The extinguisher shall be clearly marked with the following information

- a) The word “Dry Powder Fire Extinguisher”
- b) Method of operation in prominent letters.
- c) The working pressure and the weight of the powder charge in Kilogramme.
- d) Manufacturers name or identification mark
- e) The words “RECHARGE AFTER USE” if rechargeable type.
- f) Instructions to regularly check the weight of the pressure container (gas Cartridge) or inspect the pressure indicator on stored pressure types when fitted, and remedy any loss indicated by either.
- g) The year of manufacture.
- h) The Pressure to which the extinguisher was tested.
- i) The number of this British Standard BS 3465 or BS 5423: 1977.
- j) When appropriate complete instructions for charging the extinguisher shall be clearly marked on the extinguisher or otherwise be supplied with the refill.

AIR FOAM FIRE EXTINGUISHER

These shall be of 9 litres capacity complete with refills cartridges and wall fixing brackets and complying with B.S. 5423 with the following specifications:-

Cylinder: to B.S. 1449

Necking: to be 76mm outside diameter steel EN 3A 2³/₄ X 8TPI female thread.

Headcap: to be plastic moulding acetyl resin.

CO2 Cylinder: to be 75gm P.V.C coated.

Internal Finish: to be polythene lining on phosphate coating.

External finish: to be phosphated - One coat primer paint and one coat stove enamel

B.S. 381 C.

BOOSTED HOSE REEL SYSTEM

General

The Particular Specification details the requirements for the supply, installation and commissioning of the hose reel installation. The hose reel installation shall comply in all respects to the requirements set out in C.O.P 5306 Part 1: 1976, B.S 5041 and B.S 5274. The System shall comprise of a pumped system.

Hose Reel Pumps

The fire hose reel pumps shall consist of a duplicate set of multi-line centrifugal pumps from approved manufacturers. The pumps shall be capable of delivering 138 litres/min at a running pressure of 2 bars at the level of top hose reel in the system

The pump casing shall be of cast iron construction with the impeller shaft of stainless steel with mechanical seal.

Control Panel

The control panel shall be constructed of mild steel 1.0mm thick sheet, be moisture, insect and rodent proof and shall be provided complete with circuit breakers and a wiring diagram enclosed in plastic laminate.

The pump shall be controlled by a flow switch therefore, the control panel shall include the following facilities:

- (a) 'On' push button for setting the control panel to live.
- (b) Green indicator light for indicating control panel live.
- (c) Duty / Stand-by pump auto change over.
- (d) Duty pump run green indicator light.
- (e) Stand-by pump run green indicator light.
- (f) Duty pump fail red indicator light.
- (g) Stand-by pump fail red indicator light.
- (h) Low water condition pump cut-out with red indicator light.

The pumps are to be protected by a low level cut-out switch to prevent dry pump run when low level water conditions occur in the water storage tank.

Hose Reel

The hose reel to the installation shall consist of a recessed, swing-type hose reel as Naffco or from other approved manufacturers.

The hose reel shall comply with B.S. 5274 : 1975 and B.S 3161 : 1970 and is to be installed to the requirements of C.P. 5306 Part 1: 1976.

The hose reel shall be supplied and installed complete with a first-aid non-kinking hose 30 metres long with a nylon spray / jet / shut-off nozzle fitted. A screw down chrome - plated globe valve to B.S 1010 to the inlet to the reel is to be supplied.

The heavy duty hosereel shall be model no. NF/50A automatic mounted on ground or wall equipped with special hose guide. Size of hose to be 25mm diameter with 50m hose

The orifice to the nozzle is to be not less than 4.8mm to maintain a minimum flow of 0.4 lit / sec to jet.

The hose reels shall be installed at 1.5 metres centre above the finished floor level in locations shown in the contract drawings.

Pipe Work

The pipe work for the hose reel installation shall be galvanised wrought steel tubing heavy grade Class C to B.S 1387: 1967 with pipe threads to B.S 21.

Pipe Fittings

The pipe fittings shall be wrought steel pipe fittings, welded or seamless fittings conforming to B.S. 1740 or malleable iron fittings to B.S 143.

All changes in direction will be with standard bends or long radius fittings. No elbows will be provide

Non-return Valves

The non-return valves up to and including 80mm diameter shall be to B.S. 5153 : 1974.

The valves shall be of cast iron construction with gunmetal seat and bronze hinge pin.

Gate Valves

The gate valves up to and including 80mm diameter shall be non-rising stem and wedge disc to B.S 5154: 1974 with screwed threads to B.S. 21 tapes thread

Sleeves

Where pipe work passes through walls, floors or ceilings, a sleeve shall be provided one diameter larger than the diameter of the pipe, the space between them to be packed with mineral wool, to the Engineer's approval.

Earthing

The hose reel installation shall be electrically earthed by a direct earth connection. The installation of the earthing shall be carried out by the Electrical contractor.

Finish Painting

Upon completion of testing and commissioning the hose reel installation, the pipe work shall be primed and finish painted with 2 No. coats of paints to the Engineer's requirements.

Testing and Commissioning

The hose reel installation shall be flushed out before testing to ensure that no builder's debris has entered the system. The installation is to be then tested to one and half times the working pressure of the installation to the approval of the Engineer. Simulated fault conditions of the pumping equipment are to be carried out before acceptance of the System by the Engineer.

Instruction Period

The contractor shall allow in his contract sum for instructing of the use of the equipment to the Client's maintenance staff. The period of instruction may be within the contract period but may also be required after the contract period has expired.

The period of time required shall be stipulated by the Client but will not exceed two days in which time the Client's staff shall be instructed on the operation and maintenance of the equipment.

DRY-RISER INSTALLATION

Pipes shall be galvanised steel tubing to B.S. 1387:1967 Class B with pipe threads to B.S. 21. Pipe fittings shall be wrought steel seamless pipe fitting to B.S. 1740 Part 1: 1971.

Flanges

The flanges shall comply with B.S 4504:1969. All flanges shall comply to a nominal Pressure Rating of 16 bar and shall be of either grey cast iron or steel

Gaskets

The gaskets for use with flanges to B.S 4504: 1969 shall comply with B.S 4865 Part 1: 1972 for pressure up to 64 bars.

Brigade Breeching

Fire Brigade Breeching inlet shall consist of twin inlets; each inlet consisting of 65mm diameter male instantaneous coupling to B.S. 336 with a non-return valve and a blank cap secured with a short chain. The breeching inlet shall be enclosed in a sheet metal inlet box, finished in „fire red“ backed enamel paint, with wired glass door to B.S. 3980. The door shall be secured with spring lock such that it can only be opened from the inside by breaking the glass and releasing the catch on the lock. The door glass front shall be clearly marked with 50mm high red lettering „DRY RISER BREECHING CONNECTOR“. **Landing valves:** Landing valves shall be 65mm diameter gunmetal gate pattern dry riser outlets with flanged inlets and female instantaneous outlets fitted with plugs secured by short chain and conforming to B.S 5041: Part 2:1976.

Air Release Valve

Air Release Valve shall be fixed to the dry riser terminating at least one metre above the topmost landing valve. The above valve shall be automatic air release valve of iron Grade E conforming to B.S. 1452. Float Guide and Seat Ring shall be of A.B.S plastic with seal ring of molded rubber, Maximum working pressure of the valve is to be 16 bar.

Earthing

The dry riser shall be electrically earthed by a direct earth connection. The installation of the earthing to be carried out by the electrical Sub-Contractor

Non-return valve

The non-return valves up to and including 80mm diameter shall conform to B.S 5153:1974 with flanges to B.S 4504 PN 16. The valves shall be of cast iron construction with gunmetal seat and disc with spring of phosphor bronze.

Gate Valves

The gate valves up to and including 80mm shall be non rising stem and wedge disc to B.S. 1952:1964 (B.S 5154:1974) with screwed threads to B.S.21(KS ISO 7 – 1) taper thread. The valves shall be of high grade bronze construction.

Gate valves exceeding 80mm and up to 300mm shall be to B.S 5163 with flanges to B.S 4504 PN 16. The valve is to be double flanged cast iron wedge gate valve for water works purposes with cast iron body to B.S 1452 GRADE 14 with rubber covered cast iron gate. The stem is to be of Forged Stainless Steel to B.S 970 with cast iron hand wheel.

Canvas Hose

The canvas hose shall be 65mm diameter 3000mm long designed for a bursting pressure of 34 bars. The canvas hose shall have attached instantaneous hose coupling, branch pipes and nozzle to B.S 336: 1965.

Hose cradle

The hose cradle shall be a high quality fitting designed for use in public buildings. The cradle shall be made in aluminum throughout and shall be supplied with a wall bracket and the finish shall be polished or chrome plated.

Testing & Commissioning

The installation is to be tested to one and half times the working pressure of the installation, all to the approval of the Engineer. The pressure shall be maintained for about 1 hour ensuring that there is no change in pressure is observed

FIRE HYDRANTS

The fire-hydrant system shall comply to the requirements of B.S. 5306 Part 1. The fire hydrants shall be of the screwdown type to B.S. 750 type 2. These shall be of meehanite cast iron body with bronze spindle rings and nut and nickel-plated mild steel bearing plate. Units shall have discharge capacity of not less than 34 1/s (450 gal/min) at a constant running pressure of 1.7 bars. Units shall be installed underground in a concrete block chamber with surface box manufactured from meehanite cast iron (medium or heavy traffic design as specified) all to B.S. 750. The cover shall be inscribed F.H and chained to the box, all as manufacturer by Glenfield Ltd., or equal, approved. An indication plate to B.S. 3251 and of approved manufacture shall be installed at a nearby and conspicuous position

Installation

The fire hydrants are installed along the water mains with the first hydrant at a location which is not more than 60 m from the entry of any building and they should not be more than 120 m apart.

Hydrant body

The body of the hydrant shall be made of grey cast iron complying with the requirements of BS 1452 having a tensile strength not less than that given for grade 14.

Hydrant Valve

The valve shall be faced with suitable resilient material. The threaded part of the valve, which engages with the spindle, shall be of bronze.

Body seating for the valves shall be of copper alloy complying with the requirements of BS 1400 (KS 06 – 744 – 1:1991) or high tensile brass complying with the requirements of BS 2872 or BS 2874.

Turning the spindle cap in a clockwise direction when viewed from above shall close valves and the direction of opening shall be permanently marked on the gland.

Spindle & Spindle Cap

The spindle nut shall be either of the same material as the spindle, or of copper alloy complying with the requirements of BS 1400 (KS 06 – 744 – 1:1991). It shall have a squared top formed to receive either a cast iron spindle cap.

The spindle shall be made of copper alloy complying with the requirements of BS 2874 (KS 06 – 744 – 1:1991), and it shall have a threaded machined of trapezoidal form. The spindle cap shall be of a cast iron secured to the spindle by one M12 hexagon socket set screw conforming to BS 4168.

Hydrant outlet

The outlet flange of the hydrant shall have a nominal diameter 65mm, and shall be fitted with a screwed outlet – Both flanges shall be 50 mm conforming to BS 4504: Part 1: 1969

The screwed outlet shall be provided with a cap of cast iron or other suitable material. The cap shall cover the outlet thread completely and shall be attached to the hydrant by a chain

The distance between the axis of the outlet and the nearest point on the spindle fitting shall be not less than 100 mm.

The screwed outlet shall be made of Copper alloy to BS 1400 (KS 06 – 744 – 1:1991), or Copper alloy to BS 2872, or Suitable Spheroidal graphite iron to BS 2789 protected against corrosion accordance with CP 2008.

Drain Boss

Each shall be provided with a suitable drain boss on the outlet side. This shall be located at the lowest practical point which will permit the filling of self-operating a drilled drip plug.

Jointing

The hydrants shall have machined joint faces through out and the fitting of adjoining parts shall be such as to make sound joints, corresponding parts of hydrants of the same design and manufacture shall be interchangeable.

Hydrant coating

The hydrant shall be coated in accordance to BS. 4164.

Surface Box.

The clear opening of hydrant surface boxes at ground level shall not be less than 250mm x 380mm.

The depth of frame shall normally be

- a) for boxes located on footpaths: 100mm
- b) For boxes located in roads: 125mm

Marking

Surface box covers shall be clearly marked by having the words “FIRE HYDRANT” in letter not less than 30mm high, or the initials “FH” in letters not less than 75mm high cast into the cover.

Surface Box Covers & Frames.

The surface box frames and covers shall be graded in accordance with BS 497:1967 and shall meet the loading test requirement also given in BS 497

Stand Pipes

One end of these shall have internal threads to couple with the 80mm diameter external threads of the screw down type or above ground fire Hydrant (BS 750 type 2 hydrants) outlet. It shall have 65mm diameter internal threads to couple with the interconnect or hose of the pump set

Hose pipe

Each cotton synthetic fibre rubberised fire hosepipe to be at least 25 metres long with 65mm diameter female instantaneous type connector.

Testing

Necessary test certificates from the manufacturer shall be needed. The test, to conform to BS 750: 1977:

PARTICULAR SPECIFICATIONS FOR SPRINKLER SYSTEMS

SECTION 1

1.0 General Regulations and Standards

The Works shall comply with the current editions of the following:

- a) The Kenya Government Regulations.
- b) The Fire Protection Systems installations shall comply in all aspects to the requirements set out in the Loss Protection Council's Rules which incorporates BS 5306: Part 2 (1990)
- c) National Fire Protection Association (NFPA) Standard 13 of USA
- d) Factory Mutual International (FMI) Standard 2 – 8N
- e) Verband der Sachversicherer (VdS) rules
- f) Comite Europeen des Assurances (CEA) Splinkler system planning and installation.

a) Plans

Shop design Plans and flow calculation shall be done by the manufacturer based on engineers drawing and specification and shall conform to NFPA

b) Approval of Installations

Equipment and devices in this project shall be either be listed or approved according to NFPA

c) Safety Requirement

Safety requirement for the entire installations shall conform to NFPA

d) Testing of the Installations

Testing and commissioning of the entire installation shall done according to NFPA

REFERENCES

National Fire Protection Association (NFPA):

1. NFPA 13 – Standard on water sprinkler system
2. NFPA 14 – Standard on water hydrant system
3. NFPA 14 – Standard on Carbon Dioxide Extinguishing Systems.
4. NFPA 70 – National Electrical Code.
5. NFPA 72 – Standard For Protective Signaling Systems.

SECTION 2

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK:

- A. Supply and installation of wet Sprinklers, wet hydrant, firefighting system
- B. Drawings: The contract drawings indicate the general arrangements of the wet Sprinklers firefighting system

General

The particular specification details the requirements for the supply, installation and commissioning of the Automatic Sprinkler Installation. The sprinkler installation shall comply in all respects to the requirements set out in National Fire Protection Association (NFPA), BS-EN-12845 and the Fire Offices' Committee Rules for Automatic Sprinkler Installation, 29th Edition for Special Hazard Class I - IV Installation.

The Contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the Contract Drawings but which are necessary for the completion and satisfactory functioning of the works.

No claims for extra payment shall be accepted from the Contractor because of his non-compliance with the above requirements.

If in the opinion of the Contractor there is a difference between the requirements of the specification and the Contract Drawings, he shall clarify this difference with the Engineer before tendering.

Climatic Conditions

- (a) The following climatic conditions apply at the site of the Works and all plant, equipment, apparatus, materials and installations shall be suitable for these conditions.
- (b) Where not otherwise stated, all ratings of plant, equipment and apparatus shall be interpreted at site rating and NOT sea level or other ratings.
- (c)

Maximum temperature	32°C
Minimum temperature	4°C
Average temperature	13°C
Range of relative humidity	40 - 95%
Altitude	1800m above sea level
Latitude	01°19'S
Longitude	36°C 55'E

Rainfall Extremely heavy at certain "periods

The Contractor shall be deemed to have taken account of the above details in his prices and his planning of the execution of the Works.

Scope of Works

The Contractor shall supply, deliver, erect, test and commission all the automatic fire fighting sprinkler installation which is called for in this specification and shown on the Contract Drawings listed in the drawing schedule.

Automatic Sprinkler Pump Sets

The automatic sprinkler pumps shall consist of an automatic horizontally mounted centrifugal electrically driven pump; an automatic horizontal!}- mounted diesel engine-driven fire pump and jockey pumps. All the Pumps Shall be UL listed/FM approved

Pumps shall be connected to the normal incoming electrical grid main and to the standby generator and the other to be coupled to a diesel engine.

Pumps

Electric Fire Pump

1No. Electrically driven Pump to NFPA 20 and BS 2613/1970 and BS 5306 Part 2 Standards. The pump to be complete with isolating valves, non-return valves, strainers, pressure gauges and automatic Engine starting Mechanism to be connected to the control panel Electric Fire Pump Controllers shall be designed to control and monitor the fire pumps, fulfilling the requirements described by the fire-pump controller standards.

The fire-pump controllers monitor the operation status and in the case of fire, the controller will receive a signal from the pressure switch and start the fire-pump. Fire controllers shall be wired fail-safe, and in the event of any control, cable becoming loose will start the fire pumps. The controllers shall operate the pumps in an automatic on / manual off condition. Once the fire pump has started via the controller, shall not stop until it is manually shut down.

Provision shall be made for low level cut outs to the pumps to prevent dry pump run in the event of low level water conditions.

The pumps shall be provided with a plate giving the output pressure at the nominal flow specified. Where the performance characteristic is achieved with an orifice plate not integral with pump delivery, the pump nameplate shall carry a reference to the face that the performance given is that of the pump and orifice plate combination and reference shall be made to the orifice K factor.

The electric supply shall be obtained from the main public supply. The electrical connections shall be such that a power supply is always available for the motor when the switches for the distribution of the other power throughout the premises are open. Any switches on the power feed to the motor must be clearly labeled "SPRINKLER PUMP MOTOR SUPPLY - NOT TO BE SWITCHED OFF IN THE EVENT OF FIRE".

A tell-tale indicator lamp or lamps shall be provided to show that; there is a power supply available for the motor. The failure of any one phase of the supply shall be indicated. The indicators shall be near the pump and so placed that the maintenance personnel can readily see it. All indicator lamps shall be in duplicate.

An automatic warning of power failure to the motor starting switch (of any one phase of the supply) shall be given visually and audibly at some suitable location. Power to this warning shall be taken from a separately switched sub circuit to that feeding the motor.

Jockey Fire Pumps

2No, Electrically driven Jockey pump to NFPA 20 Standards. The pump to be complete with isolating valves, non-return valves, strainers, pressure gauges and automatic Engine starting Mechanism to be connected to the control panel
Jockey Fire Pump Controllers shall be designed to control and monitor the fire pumps, fulfilling the requirements described by the fire-pump controller standards.

The fire-pump controllers monitor the operation status and in the case of fire, the controller will receive a signal from the pressure switch and start the fire-pump. Fire controllers shall be wired fail-safe, and in the event of any control, cable becoming loose will start the fire pumps. The controllers shall operate the pumps in an automatic on / manual off condition. Once the pressure drop the duty jockey pump shall stay and in event it is unable build up pressure the system shall start automatically shall not stop until it is manually shut down.

Diesel Fire Pump

1No. Diesel driven Pump to NFPA 20 Standard. The pump to be complete with isolating valves, non-return valves, strainers, pressure gauges, engine, 200 liter Diesel storage tank full of diesel and automatic Engine starting Mechanism to be connected to the control panel

Diesel Fire Pump Controllers shall be designed to control and monitor the fire pumps, fulfilling the requirements described by the fire-pump controller standards. The fire-pump controllers monitor the operation status and in the case of fire, the controller will receive a signal from the pressure switch and start the fire-pump. Fire controllers shall be wired fail-safe, and in the event of any control, cable becoming loose will start the fire pumps. The controllers shall operate the pumps in an automatic on / manual off condition. Once the fire pump has started via the controller, shall not stop until it is manually shut down.

The Engine Room shall be provided with adequate ventilation for the air required for aspiration and to limit the temperature rise in the room, to 10°C above the ambient temperature when the engine is on full load.

Type and Design

Vertical type multi-cylinder four-stroke engine, complete with all \ necessary ancillary equipment and drives, constructed to comply with BS 649 and suitable for running continuously on oil engine fuel to BS 2869, Class A.

The engine must be: -

Of the compression ignition mechanical direct injection type, capable of being started without the use of wicks, cartridges, heater plugs or either, at an engine room temperature of 7°C and must accept full load within 15 seconds from the receipt of the signal to start.

- a) Naturally aspirated. Super-charged or turbo-charged and water/ cooled.
- b) Capable of operating continuously on full load at the site elevation for a period of six hours.

- c) Provided with a governor to control the engine within 4.5% of its rated speed under any condition of load up to the full load rating.
- d) Any manual device fitted to the engine, which could prevent the engine starting, must return automatically to the normal position.
- e) The coupling between the engine and the pump must allow each unit to be removed without disturbing the other.

Rating

The rating shall be continuous as defined in NFPA and B.S. 649

Speed and Governing

The normal speed of the engine shall be 1500 revolutions per minute. Speed governing shall be BS 649, Class A, and over speed, protection shall be provided.

Cooling

Engine cooling shall be by water jacket, with water circulating pump and heavy-duty radiator with mechanically or electrically driven fan. The radiator shall be fitted with flanges or other suitable arrangement to enable ventilation ductwork to be attached with airtight joints. The fan rating shall be adequate allowing for the additional resistance to airflow of any ductwork and louvers fitted.

The cooling equipment shall be composite with the engine.

A thermostatically controlled valve shall be provided in the cooling system to assist rapid heating up of the water in the engine jacket when starting from cold and to control its temperature rise. A water-cooled lubricating oil stabilizer complying with BS 3274, shall be incorporated in the engine cooling system. Sufficient inhibitor shall be added to the cooling water to protect the cooling system from internal corrosion.

Engine Starting

Engine starting shall be by a battery powered electric starter motor, complete with automatic starting and sequencing control equipment and starter cut-out switch. The engine starting control equipment shall be arranged to disconnect the mains operated "batten" charger to prevent it from being overloaded during starting. The starter motor shall be of adequate power for its duty* and of the "non-hold-on" type in which the pinion is moved axially to engage within a gear-ring on the engine fly wheel before the starter motor is fully energized. The pinion shall positively disengage when the engine starts or when the motor is de-energized.

Fail-to-Start Protection

The starting equipment shall incorporate a suitable automatic process timer, so arranged that, if the engine fails to start within a reasonable time (e.g. 8 seconds). The starter motor shall be disconnected. The starting attempt shall be repeated after an interval of 3 seconds and, if necessary, repeated a third time. If the engine fails to start at the third attempt, the starter motor shall be automatically isolated from the battery.

Disconnection of the starter by the fail-to-start device shall operate the visual warning indicator(s) and audible alarm(s) specified, hereafter.

Engine safeguards

Safeguards shall be provided and arranged to stop the engine automatically by de-energizing a solenoid coupled to the stop lever on the fuel injection pump rack. The operation of this safeguard shall at the same time give individual warning of the failure by illuminating an appropriate visual indicator and sounding audible alarm(s) as specified hereafter.

The safeguards shall operate when any of the following conditions occur, irrespective of whether the set is on automatic or manual control: -

- Engine Over speed.
- High Cooling Water Temperature
- Low Lubricating Oil Pressure
- Low Cooling Water Level

A key operated switch shall be fitted on the control panel and so connected as to override the engine safeguards and, in an emergency, allow the engine to be restarted under manual control, but with the visual warnings remaining operative.

Oil Dipstick

A lubricating oil level dipstick suitable graduated shall be provided and located in accessible position. The engine shall be totally enclosed and the engine components shall be lubricated via pressure oil system from an integrated oil pump driven by the engine.

Starting Handle or Barring Gear

Suitable means shall be provided for turning by hand the engine main shaft and the associated pump to facilitate inspection and overhaul and to allow hand starting if necessary.

Starter Battery

The starter battery shall be 24 volts heavy duty high performance quality lead-acid type of adequate size, suitable for trickle charging and rapid re-charging after use and shall be supplied complete with corrosion resisting outer container or box of an approved type standing direct on the floor.

The type, voltage and ampere-hours capacity' of the battery shall be stated in the appropriate schedule. The battery shall be supplied in a fully charged state ready for use and shall be complete with hydrometer for testing and electrolyte.

The tender price shall be based on the provisions of a lead-acid type battery, but an alkaline battery may be offered as an alternative and, together with its charging equipment, shall then be separately described and priced in the appropriate schedule.

Dynamo, Cut-out etc.

An engine driven battery-charging dynamo (or alternator with static-rectification) of adequate capacity shall be provided complete with cut out, automatic voltage regulator, ammeter, wiring and engine mounted control board.

Engine Instruments

The following dial type engine instruments shall be provided: -

- Engine shaft speed indicating tachometer reading revolutions per minute.
- Service hours counter.
- Lubricating Oil Pressure Gauge.
- Lubricating Oil Thermometer.
- Cooling Water Thermometer.

The instruments may be mounted on a suitable panel fixed to the engine or may be incorporated in the main control panel.

Exhaust System and Silencing

The exhaust system shall be manufactured in heavy quality steel tubing to BS 1387, fitted with suitable robust flexible gas tight sections close to the engine to allow engine movement and to reduce the transmission of engine vibration to the remainder of the exhaust system and the surroundings. Bends shall have a minimum radius of three times the diameter of the tube. As far as possible, flexible sections shall be vertical, free from bends and have sufficient length or slack to allow free movement without damage.

Silencers shall be of heavy-duty baffle and absorption type, so designed and installed as to reduce noise to the minimum practicable level without appreciably impairing the working efficiency of the engine.

The silencers and exhaust pipework shall be properly and adequately supported clear of fuel tank and feed pipes, and shall be provided with suitable insulation to protect personnel, plant and buildings from excessive heat.

The pipework shall drain away from the exhaust manifold and drain cocks shall be fitted in the lower parts of the system to enable condensate readily to be removed.

The system shall be so constructed as to enable it to be readily dismantled for maintenance. Bolts, washers and nuts shall be greased with graphite grease or other suitable heat resisting lubricant during assembly.

The finish of all exhaust pipework and silencers exposed to the open air shall be sprayed metallic aluminum by a process complying the BS 2569, Part 2, Process A.

The exhaust system shall terminate at a safe point outside of the building to be approved by the Engineer.

Intake Air Cleaner

A suitable and efficient air cleaner/silencer of an approved type complying with BS 1701 Grade 'A' or 'B' for use in a medium atmosphere shall be fitted on the air intake manifold.

Drain Plugs and Cocks

Drain plugs and cocks, as appropriated shall be fitted adequately to drain the engine of lubricating oil, water and fuel. They shall be designed and constructed as to be free from leaks and so positioned as to be readily accessible and allow draining to be undertaken without need for special receptacles.

Fuel and Lubricating Oil Filters

Suitable and efficient oil filters of an approved type and construction, having replaceable filter elements, shall be provided in the fuel oil and engine lubrication systems. The oil filters shall be readily accessible and allow the elements to be changed without difficulty. The fuel oil filter shall be located as close as possible to the fuel pumps manifold.

Wiring and Engine Unit

The electrical wiring on the engine unit shall be carried out with MECC cable having a conductor minimum cross-section of 1.5mm² for single core cables and for multi-core cables.

All wiring shall be adequate and supported and protected from accidental damage and properly installed and terminated in suitable boxes with flexible connections, all in accordance with the manufacturers recommendations. Special arrangements shall be made where wiring is subject to movement and vibration. Mains voltage circuits and extra-low voltage circuits shall be segregated as practicable.

Fuel Tank and Connections

A fuel oil service tank shall be provided having a capacity sufficient to give ten hours full load running of the engine and manufactured and installed generally in accordance with BS 799, Part I. The tank complete with all necessary pipework, valves and connections, shall be arranged as an integral part of the set or shall be installed at high level on adequate and approved supports adjacent to the set.

The service tank shall be clearly lettered to indicate the type of oil to be used and the capacity of the tank in litres and gallons, and shall be provided with the following: -

- (i) Filling orifice, oil strainer, filling pipe extension and filler cap. .
- (ii) Vent pipe to atmosphere.
- (iii) Dial type contents level indicator, with adequate size scale clearly marked in proportional part content, i.e.empty, quarter, half, three-quarters and full.
- (iv) Connections for the engine leak-off return pipe (where necessary).
- (iv) Drain valve and drain hose connection.

Fuel Tank Filling Pump

A cast iron wall mounted hand operated semi-rotary fuel transfer pump shall be provided of a size capable (with normal operation) of transferring fuel from the delivery drum or other vessel to the service tank at a rate of at least twenty times the maximum consumption of the engine when at full output.

Coupling to Pump

The engine shall be coupled to the pump in an approved manner in a monobloc arrangement or by a suitable shaft coupling and satisfactorily guarded to comply with BS 1649.

The Contractor shall state the method of coupling proposed.

Installation Control Valves

The Contractor shall supply and install approved installation control valves called for on the Contract Drawings and in this specification. The installation control valves set shall comprise of a main stop valve, wet pipe alarm valve, a water motor alarm and gong and installation pressure gauges.

Spare Parts

The following spare parts shall be supplied with the engine and kept on hand: -

- Two sets of filters, elements and seals.
- Two sets of lubricating oil filter elements and seals.
- Two sets of belts.
- One complete set of engine - joints, gaskets and the hoses.
- Two injector nozzles

Control Panel

The Control panel is to be of Powder coated mild steel construction or other approved material, moisture-proof and insect and rodent-proof and shall be provided complete with a wiring diagram that is moisture-proof and may be mounted on the common pump base frame and to conform to NFPA .

Pressure switches shall control the pump operation, the control panel is therefore to include the following: -

- a) Manual Stop/Reset push button to No. 1 duty pump connected to Electrical Mains.
- b) Manual Stop/Reset push button to No. 2 standby pumps connected to diesel pump.
- c) Test push button with green indicator light to No. 2 stand by pump.
- d) Electric Alarm bell provided for remote warning of systems operation during pump run.
- e) Red warning for indication no water in storage tank.

Sprinkler Heads

The sprinkler heads shall be of conventional pattern, designed with a universal deflector and similar to "GRINNELL" type E., quartzoid bulb sprinkler heads as manufactured by Womald Ltd. or equal and approved.

All sprinkler heads shall comply with the following requirements: -

- Nominal Size 20mm.
- 'K' Factor 80%.
- Temperature Rating 68°C (Red Colour).
- Temperature Rating 141°C (Blue Colour).

Pipework

Materials for piping and the standards covering these installations shall be as described in NFPA 13. Black or galvanized steel pipe shall be either ASTM A 53 seamless grooved for pipe bigger than 65mm while 50mm and below to be electric welded, Grade A or B. The Pipe shall be Schedule 40 and above.

Pipe Supports

The variety and type of pipe supports shall be kept to a minimum and their design shall be such as to facilitate quick and secure fixing to both metals, concrete and wood.

Piping shall be secured in the normal manner with pipe clips. If bolts shall not be used as substitute for pipe clips.

Where the design of the structure is in reinforced concrete pipe hangers and brackets shall be secured to the structure by means of redheads, raw bolts or other approved means.

Where the structure is constructed to hollow clay pot and concrete fill the Contractor shall arrange for his pipe hangers and brackets to be supported from the concrete columns and beams. No rawbolts and redheads shall be inserted in any clay pot construction unless specifically and exceptionally approved by the Engineer.

An approximate guide to maximum permissible support spacings in millimeters for different classes of pipe and tube is given for horizontal runs in the following table: -

Vertical pipe runs shall be supported at intervals not greater than one and a half times the distance shown in the table below: -

SizeN//Bore(mm)	Copper to BS 659 (mm)	Steel Tube to BS 1387 Heavy Grade (mm)
15	1200	1800
20	1200	2000
25	1500	2500
32	1500	2500
40	1800	2700
50	1800	3000
65	1800	3400
80	2000	3400
100	2500	3700
125	2700	4000
150	2700	4300

The Contractor shall submit all pipe support design proposals for the Engineer's approval.

Positions and type of supports shall be shown on the working drawings and submitted to the Engineer's approval.

Pipe hangers to be as Hira walraven, UI Listed, BIS Heavy Duty Industrial Clamps, 5" Locking Bolts, HD1501 (M8/10, M10/12 (cat No. BUP 1000), BIS Rubber Lined Split Clamp, All hangers to be sound insulating as DN 4109, and 800mm raw bolt. All the hangers to be equal spaced at a distance of 600mm for the entire length of the pipeline

Pipe Fittings

The pipe fittings for sprinkler systems shall comply with high quality steel pipe fittings to B.S 1740 Part 1 with B.S 21 (KS ISO 7 – 1) tapered points threads and NFPA 13.

Flanges

The flanges shall comply with BS 4504:1969. All flanges shall comply with a nominal pressure rating of 16 bar (PN 16) and shall be either grey cast iron or steel with raised faces.

Gaskets

The gaskets for use with flanges to BS 4504: 1969 shall comply with BS 4865 Part I 1972 for pressure up to 64 bars.

Foot Valves

The foot valves shall be as Glenfield check valve No. 5803 to BS 5153: 1974 incorporating strainer, with flanges to BS 4504 PN 16.

The strainer shall be Mechanic Cast Iron with strainer area not less than twice the suction pipe area.

Non-Return Valves

The non-return valves shall be as Glenfield No. 5003 conforming to BS 5153: 1974 with flanges to BS 4504 PN 16,

The body, door and cover are to be of Mechanite Cast Iron construction with gunmetal seat to BS 1400.

Gate Valves

The gate valves up to and including 150mm diameter shall be as Glenfield RS Gate Valve 3500 series to BS 5163 with flanges to BS 4504 PN 16 with raised faces. The valve is a double flanged cast iron wedge gate valve for water work purposes with Methanide Cast Iron body to BS 1452 Grade 14 rubber covered Methanide Cast-iron gate. The stem is to be of forged stainless steel to BS 970 with Methanide cast iron hand wheel.

Finish. Painting

Upon completion of testing and commissioning the sprinkler installation shall be painted with INo. coat red oxide and 2No. coats of paint to the Engineer's requirements.

Approval of Automatic Sprinkler System

After the tender contract has been let, the Contractor shall prepare complete detailed working drawings of the protection with plans of the floor, details of water supplies up to the installation control valve and any pressure reducing valves, water meters, water locks and any orifice plates. The drawings shall be on an indicated scale not less than 1:100. A key of any symbol used is to be included. A summary schedule should be included stating: -

- Total number of sprinkler heads on each installation.
- Height of highest sprinkler head in each installation.
- Type of installation, in this case to be wet pipe system and the size of main control valves to be indicated.

The Contractor to the City Commission, Chief Fire Officer, shall submit the above data for final approval before erection of the equipment is commenced.

Instruction Period

The Contractor shall allow in his contract sum for instructing of the use of the equipment to the Client's maintenance staff. The period of instruction may be within the contract period but may also be required after the contract period has expired.

The period of time required shall be stipulated by the Client but will not exceed seven days in which time the Client's staff shall be instructed in the operation and maintenance of the equipment.

Maintenance and Servicing Contract

The Contractor shall, if required, enter into a maintenance and service agreement, with the employer, for this installation.

SECTION 03:

Bills of Quantities

A PLUMBING, DRAINAGE & FIRE FIGHTING**Sanitary Fittings - Supply Only**

SUPPLY ONLY the following sanitary fittings including all materials and jointings to supply, waste and overflow pipe fittings:-Note all sanitary fittings are coloured to project architect specific colour.

ALL RATES TO BE INCLUSIVE OF VAT

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A1.01	WC Suits: Duravit D-Code back to wall wash down model horizontal outlet model-N0. 211509..00 (white in colour), accessory are toilet seat and cover without softclose automatic closure, hinges stainless steel Model No. 0067310000 with all fixing included, complete with docol WC concealead flushvalve, bend connector. or equal and approved	No	10		
A1.02	Toilet Paper Dispenser: Circular toilet paper dispenser (Jumbo Roll) as Mediclinic PR2787 WHITE Epoxy Finish.	No	8		
A1.03	Toilet brush Holder as Yideli or equal and approved	No	10		
A1.04	Disabled suite: Avalon WC pan with horizontal outlet Doc.M value cistern, fittings and standard lever, Doc M seat ring, stainless steel hinge, hand rinse no overflow, no chainstay, spray mixer lever operated, mixing valve-thermostatic TMV3, Doc M support rail (5No.) Doc M hinged support rail and toilet roll holder, wall hangers(pair), grid waste, pan fixings, cistern cover clips.P trap outlet connector cat no WF1240WH,or equal and approved	No	3		
A1.05	Wash hand basin: Duravit D-Code vanity countertop basin 545mm, with overflow,with tap platform Model No. 033754..00 (white in colour) with a fixing, complete with one Non Conculsive time delay tapis or docol basin tap, chrome plated waste Ø 32mm and chrome plate bottle trap. Angle valves and any other necessary accessories. or equal and approved	No	14		

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A1.06	Wash hand basin Wash hand basin as Duravit D-Code 55 cat. no. 2310550-000. Brassware as self closing pillar tap 1/2" as Grohe cat No. 36265000, chrome plated complete with pop up waste, angle valves, complete with; chrome plated chain waste 32mm c and chrome plate bottle trap 32mm P trap, angle valve and wall brackets to fit. or equal and approved	No	2		
A1.07	Mirror: 900x600mm silver plated plain glass mirror with bevelled edges and fixed with chrome plated screws and dome shaped cover.	No	2		
A1.08	Mirror: 900x1300mm silver plated plain glass mirror with bevelled edges and fixed with chrome plated screws and dome shaped cover.	No	6		
A1.09	Coat Hooks: Duravit D-Code coat hooks holder cat no. 0099021020 or equal and approved	No	10		
A1.10	Soap dispenser: Press type Liquid soap dispenser made out of enamel coat mild steel as Mediclinic or Equal and approved	No	8		
A1.11	Hand driers: No Touch Vandal Resistance Automatic Hand drier as Mediclinic or Equal and approved	No	8		
A1.12	Paper towel dispensers: Decorative wall mounted paper towel dispensers 230mm high, 300 mm wide and 100mm deep with easy tear holder and a spring loaded mechanism to release one sheet per pull. Removable lid and opens sides for towel level viewing and easy refilling complete with all accessories including a foot operated stainless steel disposed towel bin with cover (300mm high and 300mm diameter) as Mediclinic or equal and approved	No	0		
A1.13	Urinal bowl: Urinal bowls as Duravit D-code cat no. 082930007 complete with dividers, 32mm Chrome plated hinged domed outlet grating, 32mm chrome plated urinal bottle-trap, Complete with a Concealed flush valve as Rocca Model or Equal and approved	No	9		
A1.14	Urinal sensor: Geberit urinal flush control electronic. Matt CP, cat No. 115.817.46.5 with Geberit Stainless steel cover as Geberit cat. No. 115.985.00.5	No	0		

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A1.15	Kitchen Sink : Franke Single bowl. Stainless Steel kitchen c/w chrome plated 1½” chrome plated bottle trap, 40mm chrome plated chain waste fitting (unslotted) and wall mounted Donald star sink cock with swivel spout pillar type No. STD 003 tap, angle valves and all the other accessories.or equal and approved	No	3		
A1.16	Kitchen undersink water heater: Instantaneous heater of capacity 10 litres and rating 3kw complete with adjustable thermostat, 40°C temperature lock,standard spout and valve, taps, mixer,and any other necessary accessories as Heatrae sadia streamline 95:010:187 or equal and approved	No	3		
A1.17	Shower Fitting: 15mm wall concealed 2 way shower fittings as Tapis complete with chrome plated stop cock, spout single inlet with only cold water supply or equal and approved	No	1		
A1.18	Instant Shower Heating unit: Fame Instant shower with Arm Super Ducha 4 No. HFAMSTSHWESD4DD GREY. With Donald Star Concealed Stopcock 1/2" No. STD 020 or equal and approved	No	1		
A1.19	Soap dish as Yideli or equal and approved	No	1		
A1.20	Dhobi Sink: Dhobi sink as Terrazzo 560x425x255 cat. No. FC 1230 WH c/w Chrome plated Bip Taps, 40mm Chrome plated waste fittings and 40mm Chrome plated bottle, and Built in brackets. or equal and approved.	No	1		
A1.21	Total for sanitary fittings c/f to price summary page				

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A2 Sanitary Fittings - Fix Only					
<i>FIX ONLY the following sanitary fittings including all materials and jointings to supply, waste and overflow pipe fittings:-Note all sanitary fittings are coloured to project architect specific colour.</i>					
A2.01	WC Suits: Duravit D-Code back to wall wash down model horizontal outlet model-N0. 211509..00 (white in colour), accessory are toilet seat and cover without softclose automatic closure, hinges stainless steel Model No. 0067310000 with all fixing included, complete with docol WC concealead flushvalve, bend connector. or equal and approved	No	10		
A2.02	Toilet Paper Dispenser: Circular toilet paper dispenser (Jumbo Roll) as Mediclinic PR2787 WHITE Epoxy Finish.	No	8		
A2.03	Toilet brush Holder as Yideli or equal and approved	No	10		
A2.04	Disabled suite: Avalon WC pan with horizontal outlet Doc.M value cistern, fittings and standard lever, Doc M seat ring, stainless steel hinge, hand rinse no overflow, no chainstay, spray mixer lever operated, mixing valve-thermostatic TMV3, Doc M support rail (5No.) Doc M hinged support rail and toilet roll holder, wall hangers(pair), grid waste, pan fixings, cistern cover clips.P trap outlet connector cat no WF1240WH,or equal and approved	No	3		
A2.05	Wash hand basin: Duravit D-Code vanity countertop basin 545mm, with overflow,with tap platform Model No. 033754..00 (white in colour) with a fixing, complete with one Non Conculsive time delay tapis or docol basin tap, chrome plated waste Ø 32mm and chrome plate bottle trap. Angle valves and any other necessary accessories. or equal and approved	No	14		
A2.06	Wash hand basin Wash hand basin as Duravit D-Code 55 cat. no. 2310550-000. Brassware as self closing pillar tap 1/2" as Grohe cat No. 36265000, chrome plated complete with pop up waste, angle valves, complete with; chrome plated chain waste 32mm c and chrome plate bottle trap 32mm P trap,angle valve and wall brackets to fit.or equal and approved	No	2		
A2.07	Mirror: 900x600mm silver plated plain glass mirror with bevelled edges and fixed with chrome plated screws and dome shaped cover.	No	1		
A2.08	Mirror: 900x1300mm silver plated plain glass mirror with bevelled edges and fixed with chrome plated screws and dome shaped cover.	No	6		
A2.09	Coat Hooks: Duravit D-Code coat hooks holder cat no. 0099021020 or equal and approved	No	10		
A2.10	Soap dispenser: Press type Liquid soap dispenser made out of enamel coat mild steel as Mediclinic or Equal and approved	No	8		

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A2.11	Hand driers: No Touch Vandal Resistance Automatic Hand drier as Mediclinic or Equal and approved	No	8		
A2.12	Paper towel dispensers: Decorative wall mounted paper towel dispensers 230mm high, 300 mm wide and 100mm deep with easy tear holder and a spring loaded mechanism to release one sheet per pull. Removable lid and opens sides for towel level viewing and easy refilling complete with all accessories including a foot operated stainless steel disposed towel bin with cover (300mm high and 300mm diameter) as Mediclinic or equal and approved	No	6		
A2.13	Urinal bowl: Urinal bowls as Duravit D-code cat no. 082930007 complete with dividers, 32mm Chrome plated hinged domed outlet grating, 32mm chrome plated urinal bottle-trap, Complete with a Concealed flush valve as Rocca Model or Equal and approved	No	9		
A2.14	Urinal sensor: Geberit urinal flush control electronic.Matt CP,cat No.115.817.46.5 with Geberit Stainless steel cover as Geberit cat. No. 115.985.00.5	No	0		
A2.15	Kitchen Sink : Franke Single bowl. Stainless Steel kitchen c/w chrome plated 1½” chrome plated bottle trap, 40mm chrome plated chain waste fitting (unslotted) and wall mounted Donald star sink cock with swivel spout pillar type No. STD 003 tap, angle valves and all the other accessories.or equal and approved	No	3		
A2.16	Kitchen undersink water heater: Instantaneous heater of capacity 10 litres and rating 3kw complete with adjustable thermostat, 40'C temperature lock,standard spout and valve, taps, mixer,and any other necessary accessories as Heatrae sadia streamline 95:010:187 or equal and approved	No	1		
A2.17	Shower Fitting: 15mm wall concealed 2 way shower fittings as Tapis complete with chrome platet stop cock, spout single inlet with only cold water supply or equal and approved	No	1		
A2.18	Instant Shower Heating unit: Fame Instant shower with Arm Super Ducha 4 No. HFAMSTSHWESD4DD GREY. With Donald Star Concealed Stopcock 1/2" No. STD 020 or equal and approved	No	1		
A2.19	Soap dish as Yideli or equal and approved	No	1		
A2.20	Dhobi Sink: Dhobi sink as Terrazzo 560x425x255 cat. No. FC 1230 WH c/w Chrome plated Bip Taps, 40mm Chrome plated waste fittings and 40mm Chrome plated bottle, and Built in brackets. or equal and approved.	No	1		
A2.21	Total for sanitary fittings c/f to price summary page				

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
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A3 Internal Plumbing Works

Supply and fix the following in PPR-C PN20 (Polypropylene Random Copolymer) internal water pipework systems with fittings fixed and welding to be in accordance to the manufacturer's printed instructions as described. All PPR- C bends, Tees, reducing Tees, reducers etc. are to be formed in accordance to the manufacturer's printed instructions. The installations to have the various sizes of connectors, adaptors, sockets, reducers holdbats, clips etc. as required for satisfactory functions. NOTE: The pipe diameters given are internal dimensions.

A3.01	15mm bore water pipes	Lm	9		
A3.02	20mm Ditto	Lm	10		
A3.03	25mm Ditto	Lm	18		
A3.04	32mm Ditto	Lm	34		
A3.05	40mm Ditto	Lm	55		
A3.06	50mm Ditto	Lm	55		
A3.07	63mm Ditto	Lm	25		
A3.08	15mm Bends and Elbows	No	3		
A3.09	20mm Ditto	No	11		
A3.10	25mm Ditto	No	12		
A3.11	32mm Ditto	No	12		
A3.12	40mm Ditto	No	16		
A3.13	50mm Ditto	No	7		
A3.14	63mm Ditto	No	4		
A3.15	15mm Tee	No	3		
A3.16	20mm Tee	No	6		

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A3.17	25mm Ditto	No	12		
A3.18	32mm Ditto	No	12		
A3.19	40mm Ditto	No	18		
A3.20	50mm Ditto	No	6		
A3.21	63mm Ditto	No	8		
A3.22	20x15mm Reducer	No	16		
A3.23	32x20mm Ditto	No	8		
A3.24	32x25mm Ditto	No	12		
A3.25	40x32mm Ditto	No	20		
A3.26	50x40mm Ditto	No	33		
A3.27	50x32mm Ditto	No	24		
A3.28	63x50mm Ditto	No	22		
A3.29	63mm Gate valves as peglar	No	5		
A3.30	50mm Gate valves as peglar	No	1		
A3.31	25mm Gate valves as peglar	No	3		
A3.32	15mm x 300mm long flexible connector complete with chrome plated stop cocks.	No	33		

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A3.33	Water storage tank (roof tanks) 5,000Lts PVC water storage tank dimensions 1850mm diameter x 2050mm high with a cover complete with all necessary backnuts, etc for satisfactory functioning of the system. The Tank to be as Kentank or Equivalent	No	2		
A3.34	Submersible Ground Water Pump: pump(Duty and stand by), of a flow rate of 1.19l/s at a pressure head of 18m,suitable for pumping clean water. Can be installed vertically or horizontally. All steel components are made in stainless steel, EN 1.4301 (AISI 304), that ensures high corrosive resistance. This pump carries drinking water approval. The pump is fitted with a 0.37 kW MS402 motor with sand shield, lip seal, water-lubricated journal bearings and a volume compensating diaphragm. The motor is a canned type submersible motor offering good mechanical stability and high efficiency. Suitable for temperatures up to 40 °C. The motor is not fitted with a temperature sensor. If temperature monitoring is desired, a Pt1000 sensor can be fitted. The motor is for direct-on-line starting (DOL).Pump to be as Grundfos SP 5A-4 or equal and approved.	No	1		
A3.35	Allow for connection to the water supply from the Local Authority including 50mm council meter.	No	0		
A3.36	Total for Internal Plumbing works c/f to price summary page				

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
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A4 Internal Drainage works - Supply and install

Supply and fix the following in UPVC PN8 soil and waste systems to BS 4514 and 5225 with fittings fixed in accordance to the manufacturer's printed instructions and BS 5572 and manufactured by "KEY TERRAIN" as described. All UPVC branches, Tees, reducing Tees, reducers etc. are to be formed in accordance to the manufacturer's printed instruction. The installations to have the various sizes of connectors, adaptors, sockets, reducers holdbats, clips etc. as required for satisfactory functioning.

A4.01	100mm heavy duty grey pipes	LM	49		
A4.02	50mm heavy duty waste pipes	No.	44		
A4.03	75mm heavy duty waste pipes	No.	15		
A4.04	40mm ditto	No.	22		
A4.05	32mm ditto	No.	32		
A4.06	100mm Access bend	No.	17		
A4.07	100mm Sweep bend	No.	17		
A4.08	50mm ditto	No.	11		
A4.09	40mm ditto	No.	11		
A4.10	32mm ditto	No.	8		
A4.11	100mm single Upvc Tee	No.	10		
A4.12	50mm ditto	No.	14		

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A4.13	40mm ditto	No.	9		
A4.14	32mm ditto	No.	6		
A4.15	50mm inspection plug	No.	11		
A4.16	40mm ditto	No.	8		
A4.17	32mm ditto	No.	11		
A4.18	100mm diameter Vent cowl and Weathering slate to suite 100mm pvc pipe	No.	4		
A4.19	100 x 50 x 40 mm 4 way floor trap	No.	20		
A4.20	32x50mm reducer	No.	11		
A4.21	40x50mm ditto	No.	12		
A4.22	40x32mm ditto	No.	6		
A4.23	100x50mm boss connector	No.	5		
A4.24	100mm diameter gulley trap c/w chamber and mild steel grating	No.	3		
A4.25	100mm diameter urinal trap c/w chamber and mild steel grating	No.	1		
A4.26	Standard Manhole 600 x 450mm complete with medium duty manhole covers and rings	No.	7		
A4.27	Allow for connection to the Local Authority Sewer line	Item	1		
A4.28	Sub Total For internal drainage c/f to price summary page.				

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
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A5 PORTABLE FIRE EXTINGUISHER

Supply and install the following fire fighting equipment (stored in vandal proof protective cabinets) manufactured to BS EN3 and are in themselves something of established standard for quality around the work.

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
A5.01	4.5kg CO ₂ gas Fire Extinguisher	No	3		
A5.02	4.5 Kg DCP Fire Extinguisher	No	3		
A5.03	9lts Water Fire Extinguisher	No	3		
A5.04	Fire blanket	No	3		
A5.05	Total for portable Fire Extinguishers c/f to price summary page				

Item	Description	Units	Qty	Rates (Kshs.)	Costs (Kshs)
<u>PRICE SUMMARY PAGE -</u>					
1	Sanitaryware & Fittings Supply Only	Item	1		
2	Sanitaryware & Fittings Fix Only	Item	1		
3	Supply & Fix Plumbing works	Item	1		
4	Supply & Fix Drainage works	Item	1		
5	Supply & Fix Portable Fire Extinguishers	Item	1		
6	Bore Hole Drilling and Equiping and pumps (PC Sum)	Item	1		4,060,000
7	DOCUMENTATION: Sum for Completion documents: Comprising Workshop drawings, manufacturer's technical product catalogues, users manuals, maintenance manuals, as installed drawings, test certificates, etc. { NOTE: Penultimate Valuation will not be paid until these are fully availed & signed off by the engineer }	Item	1		
8	TRAINING: Sum for Training of client personel / users (At least 5No Staff for 1Week)	Item	1		
9	TESTING & COMMISSIONING: Sum for Testing and commissioning of the entire installations set complete with all accessories, interconnections, controls, BMS link & activation and the necessary programing.	Item	1		
10	DLP SUM: Sum for 6 months comprehensive maintenance from date of practical completion.	Item	1		
11	Total for Offices Mechanical Installations INCLUSIVE VAT c/f to (Machakos) PRICE SUMMARY PAGE				

B**HOSE REEL INSTALLATIONS**

Supply, deliver, install test and commission and paint the appropriate colour code (signal red) the following fire fighting pipe work. Materials for piping and the standards covering these installations shall be as described in NFPA 13. Black or galvanized steel pipe shall be either ASTM A 53 seamless grooved for pipe bigger than 65mm while 50mm and below to be electric welded, Grade A or B. The Pipe shall be Schedule 40 and above. All valves, pressure gauges, pressure switches, meters and any othe accessories must be UListed and/or FM approved.

ALL RATES ARE VAT INCLUSIVE

ITEM	DESCRIPTION	UNIT	Qty	RATES (Kshs.)	AMOUNT (Kshs.)
B1.01	50mm bore water pipes	Lm	52		
B1.02	25mm bore water pipes	Lm	9		
B1.03	20mm bore water pipes	Lm	6		
B1.04	25mm nipples	lm	3		
B1.05	20mm nipples	lm	3		
B1.06	50mm bends and elbows	No	3		
B1.07	50mm Tee	No	6		
B1.08	50x25mm Reducer	No	3		
B1.09	25x20mm ditto	No	3		
B1.10	50mm gate valve as Pegler	No	0		
B1.11	25mm Gate valves	No	3		
B1.12	50mm non-return valve	No	0		
B1.13	50mm pipe union	No	14		
B1.14	25mm pipe union	No	3		

ITEM	DESCRIPTION	UNIT	Qty	RATES (Kshs.)	AMOUNT (Kshs.)
B1.15	Automatic, non-recessed swing type hosereel as Angus fire Armour model-1 or equal and approved. Hosereel shall have the following characteristics -Full 180 degree swing, delivery valve 25mm BSP inlet to BS5274 -25mmx30m long hose pipe -Mild steel feed pipe to BS1387 class "B."	No.	3		
B1.16	Automatic duplicate (2No.) Submerible Fire hosereel water booster pumps set one duty the other standby. The pumps Shall be set such that if the duty pump fails to start, the standby shall start automatically within 5seconds. The pump should be capable of delivering water at 5.4m ³ /hr against a positive head of 30metres. The pumps shall be supplied complete with 1no.control panel, 300litres pressure vessel, pressure gauge, pressure switch float switch and any other necessary fittings . This is strictly a fire hosereel and must be fire rated pump set. pumps to be as Grundfos SP 5A-8 or equivalent and approved.	Set	1		
B1.17	Total for hosereels system (Machakos) INCLUSIVE OF VAT c/f to PRICE SUMMARY page				

M&E SERVICES (MACHAKOS) PRICE SUMMARY PAGE

ITEM	DESCRIPTION	COST (Kshs.)
1	PLUMBING, DRAINAGE & FIRE FIGHTING	
2	HOSEREEL	
3	TOTAL SUM INCLUSIVE of VAT c/f to MAIN WORKS Summary Page	

AIR

CONDITIONING

INSTALLATION

PARTICULAR SPECIFICATIONS

a. SECTION 15831 – FAN COIL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, Division 1 Specification Sections, apply to this Section.
- B. Related Sections include:
 - 1. Division 15 Section “Basic Mechanical Requirements.”
 - 2. Division 15 Section “Hydronic Piping.”
 - 3. Division 15 Section “Metal Ducts and Accessories.”

1.2 SUMMARY

- A. This Section includes fan-coil units with water coils for heating and cooling.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified. Provide basic unit information such as model number, dimensions, weight, fan power and electrical requirements, coil construction, filter construction and efficiency. Include unit designation as given on the drawings, unit airflow, cooling performance at listed conditions.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage a firm experienced in manufacturing fan-coil units similar to those indicated for this Project and that have a record of successful in-service performance.
- B. Comply with ARI 440 for testing and rating units.
- C. Comply with ASHRAE 33 for testing air coils.
- D. Comply with NFPA 70 for components and installation.
- E. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Carrier
 - 2. Enviro – Tec
 - 3. York

2.2 MATERIALS

- A. Chassis: Galvanized steel with flanged edges.

- B. Coil Section Insulation: Faced, heavy-density, glass-fiber insulation over entire section.
 - C. Drain Pans: Galvanized steel, insulated with polystyrene or polyurethane insulation or a solid drain pan, both types with connection for drain.
 - D. Cabinet: Galvanized steel with removable panels.
 - 1. Horizontal Unit Bottom Panels: Fastened to unit with cam fasteners and hinge, with safety chain.
 - E. Cabinet Finish: Bonderize, phosphatize, and flow-coat with baked-on primer.
- 2.3 WATER COILS
- A. Fin-and-Tube Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1” mm. Leak test to 2068 kPa underwater.
- 2.4 FAN
- A. Centrifugal fan, with forward-curved, double-width wheels, in galvanized steel fan scrolls, directly connected to manufacturer's standard motor.
- 2.5 ACCESSORIES
- A. Wiring Terminations: Match conductor materials and sizes indicated. Connect motor to chassis wiring with plug connection.
 - B. Filters: 1”-mm-thick, throwaway filters in fiberboard frames.
 - C. Dampers: Steel damper blades with polyurethane stop across entire blade length, operated by factory-mounted electric operators for 25 percent open cycle.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and supports to receive fan-coil units for compliance with requirements for installation tolerances and other conditions affecting performance of fan-coil units. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install fan-coil units as indicated, to comply with manufacturer's written instructions and NFPA 90A.
- B. Connect fan-coil units to hydronic piping according to Division 15 Section "Hydronic Piping." Provide shutoff valve and union or flange at each connection.

3.3 FIELD QUALITY CONTROL

- A. Testing: After installing fan-coil units and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
- B. Remove and replace malfunctioning units with new units, and retest.

3.4 CLEANING

- A. Replace filters in each fan-coil unit.

3.5 COMMISSIONING

- A. Startup Services: Engage a factory-authorized service representative to provide startup service.
- B. Operate fan motor to verify proper rotation.
- C. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.

- AIR FILTRATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Disposable, extended area panel filters.
- B. Extended surface high efficiency media filters.
- C. Filter frames.
- D. Filter gages.

1.2 QUALITY ASSURANCE

- A. Provide all filters as product of one manufacturer.
- B. Assemble filter components to form filter banks from products of one manufacturer.
- C. All filters shall conform to class II of CCR Title 24, Part 12.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Provide filter media, filter performance data, filter assembly, filter gages, and filter frames.

1.4 OPERATION AND MAINTENANCE DATA

- A. Include 4 copies of instructions for operation, changing and periodic cleaning.

1.5 EXTRA STOCK

- A. Provide one set of disposable panel filters for each air-handling unit.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Store and protect products.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Aerostar
- B. Farr Filter

2.2 LOW EFFICIENCY FILTERS

- A. Average efficiency of 25-30%. Average arrestance 90%.
- B. Application: Pre-filters, fan coils, indoor unit split-system, construction start-up filters and elsewhere as indicated.

- C. Description: Pleated, disposable type, 1” 2” or 4” as scheduled. Each filter shall consist of a non-woven cotton fabric media, media support grid and enclosing frame.
- D. Manufacturer: Flanders airpure Pleat.

2.3 MEDIUM EFFICIENCY FILTERS:

- A. Average efficiency: 66 – 65%. Average arrestance.
- B. Application: Prefilter for air handling units as indicated on drawings.
- C. Description: Rigid, 4” thick, disposable type, consisting of media, media supports and enclosed frame.
- D. Manufacturer: Aerostar SL-65, Farr.

2.4 HIGH EFFICIENCY FILTERS:

- A. Average efficiency 90-95%. Minimum arrestance 99%.
- B. Application: After air filters for air handling units.
- C. Description: Rigid, 12” thick, disposable type, consisting of media, media supports and enclosing frame.
- D. Manufacturer: Aerostar FP95.

2.5 FILTER HOUSING:

- A. Housing for filters in air handling unit will be part of air handling unit section including holding frames and locking devices.
- B. Provide crank-operated spring loaded filter sealing mechanical and/or spring loaded bolt type filter sealing device for HEPA filters housing, factory tested under 3” wg. Pressure and soap bubble inspect for leakage.

2.6 FILTER GAUGES:

- A. Provide air filter gauges for all filter banks mounted on filter housing in an accessible location for ease of reading.
- B. Gauge required at each prefilter and final filter.
- C. Gauges: Magnehelic type, equivalent to Dwyer No. 2002-AF, range of 0-2” w.c., complete with required mounting accessories, tubing, vent valves and with static pressure taps installed across filter bank. Provide visual red line on gauge indicating final resistant point of filter.

2.7 TEMPORARY FILTERS: During construction period and during testing and balancing, provide replaceable media panel filters with pressure drop equal to filters specified. Do not run systems without filters.

2.8 CLEAN FILTERS: Provide clean filters when building is turned over to Hospital.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install air filter devices in accordance with manufacturer's instructions.
- B. Prevent passage of unfiltered air around filters with felt, rubber or neoprene gaskets.
- C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction.
- D. Install filter gage static pressure taps upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum in accessible position. Adjust and level.

SECTION 15890 - DUCTWORK

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Low pressure ducts/medium pressure ducts.
- B. Sheet metal plenum and housings.
- C. Isolation room exhaust ductwork.
- D. Stainless steel fume hood exhaust ductwork.

1.2 RELATED WORK

- A. Section 09900 - Painting: Exposed ductwork.
- B. Section 15121 - Expansion Compensation.
- C. Section 15140 - Supports and Anchors: Sleeves.
- D. Section 15290 - Duct Insulation.
- E. Section 15910 - Ductwork Accessories.
- F. Section 15936 - Air inlets and Outlets.
- G. Section 15990 - Testing, Adjusting and Balancing.

1.3 REFERENCES

- A. ASHRAE - Handbook Fundamentals; Duct Design.
- B. ASHRAE - Handbook Equipment; Duct Construction.
- C. ASTM A 90 - Weight of Coating on Zinc-Coated Galvanized Steel Articles.
- D. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- E. ASTM A 525 - General Requirements for Steel Sheet, Zinc- Coated Galvanized by the Hot-Dip Process.

- F. ASTM A 527 - Steel Sheet, Zinc-Coated Galvanized by Hot-Dip Process, Lock Forming Quality.
- G. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate.
- H. ASTM E 84 - Surface Burning Characteristics of Building Materials.
- I. NFPA 255 - Surface Burning Characteristics of Building Materials.
- J. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- K. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.
- L. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooling Equipment.
- M. SMACNA - HVAC Duct Construction Standards, 1995 Edition.
- N. UL 181 - Factory-Made Air Ducts and Connectors.
- O. UL 723 - Surface Burning Characteristics of Building Materials.
- P. California Mechanical Code (CMC), Title 24, 2001 Edition, Chapter 6.

1.4 DEFINITIONS

- A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.
- B. Low Pressure: 2 inch WG positive or negative static pressure and velocities less than 2,500 fpm.
- C. Medium Pressure: Duct serving system with air terminal controllers extending from the discharge of the air handling unit to inlet of air terminal controllers.

1.5 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A and NFPA 90B and NFPA 96 standards.
- B. California Mechanical Code (CMC), Title 24, 2001 Edition, Chapter 6.

1.6 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01340.
- B. Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work for low pressure.
- C. Submit samples under provisions of Section 01340.
- D. Submit samples of typical shop fabricated low and medium pressure duct fittings.
- E. Submit complete shop drawings, indicating method of connections, each plenum size, framing, for approval.
- F. Ductwork and sheet metal fabrication drawings. The contractor shall submit to the Architect for review 1/4" to 1 foot scaled plan drawings of all parts of the building showing all duct systems. Plans shall show all duct details, offset, transitions, after coordination with all other sections and existing conditions. Drawings shall also include mechanical rooms with ductwork and plenums complete. PARTIAL OR INCOMPLETE DRAWINGS WILL NOT BE ACCEPTABLE. Conform to Section 01330.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ductwork to the site clean and shrink wrapped under provisions of Section 01000.
- B. Store and protect products under provisions of Section 01000.

1.8 QUALITY ASSURANCE

- A. Flexible Duct Materials: Flame spread/smoke developed rating of not to exceed 25/50 in accordance with ASTM E84, NFPA 255 and UL 723.
- B. All duct fittings shall be manufactured. Field fabricated fitting is not acceptable.

PART 2 - PRODUCTS

2.1 MANUFACTURERS FOR FLEXIBLE DUCT

- A. Thermaflex Model "MK-E" (low pressure).
- B. Clasflex.

2.2 FLEXIBLE DUCT MATERIAL

- A. General: Factory pre-insulated, non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.
- B. Low pressure flexible ducts shall consist of an exterior reinforced laminated vapor barrier, 1-1/2" thick fiber glass insulation (K=0.25 @ 75 degrees F.), encapsulated spring steel wire Helix and impervious, smooth, non-perforated interior vinyl liner. Individual lengths of flexible ducts shall contain factory fabricated steel connection collars. Flexible ducts shall be supported at or near mid-length with 8" wide 28 ga. steel hanger collar attached to the structure with an acceptable duct hanger. Installation shall avoid sharp radius turns or offsets. 6' maximum length connecting to terminal outlets. Flexible ducts may be used to cross seismic joints without offset. Flexible ducts shall not penetrate through any wall. The composite assembly including insulation and vapor barrier shall meet Class 1 requirements of flame spread of 25 or less, smoke developed to 50 or less as set forth in NFPA 90A and be labeled by U.L. Air duct material listed and labeled with a flame and smoke rating. Duct shall be rated 6" positive wg. pressure. Submit data for review. Flexible round duct joints shall be held in place with factory fabricated steel connection collars. Secure with three sheet metal screws equally spaced. Seal joints with two wraps of acceptable duct tape.
- C. Supports, bar or angle reinforcing damper rods, which shall be of uncoated, mild steel, painted with one (1) coat of primer and one (1) additional coat of aluminum paint, confirming with painting division.
- D. Provide conical or tapered duct connection at all round duct takeoffs from rectangular sheet metal duct. Straight tab connections not acceptable.
- E. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone with canvas tape, or heavy mastic.
- F. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.3 LOW PRESSURE DUCTWORK

- A. Low Pressure duct system shall be used for supply air duct down stream of boxes, fan coil units, return air and exhaust air system.
- B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.

- C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.
- E. Round ducts shall be spiral galvanized steel type with matching fittings as manufactured by "United Sheet Metal" or equivalent by "Omni Duct". Round duct shall be fabricated and installed in accordance with 2001 CMC Table 6-2 and SMACNA "HVAC Duct Construction Standard" Table 3.2 for 2" wg. Where CMC and SMACNA requirements differ, the more stringent of the two requirements shall govern.
- F. All sheet metal fabricated or galvanized steel except supports, bar or angle reinforcing damper rods, which shall be of uncoated, mild steel, painted with one (1) coat of primer and one (1) additional coat of aluminum paint.
- G. Supports: Ducts shall be secured against displacement and vibration as detailed in the "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems" published by "The Sheet Metal Industry Fund of Los Angeles, California" (SMACNA) and "The Plumbing and Piping Industry Council Inc., Los Angeles, California" (PPIC).
- H. Steel Ducts: ASTM A525 or ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz per sq. ft. for each side in conformance with ASTM A90.
- I. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.
- J. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws, metal bands and factory built collars. Plastic collars will not be allowed.
- K. Rectangular low pressure ductwork shall be fabricated and installed in accordance with 2001 CMC Table 6 -1 and SMACNA "HVAC Duct Construction Standard" Second Edition 1995, Table 1-6 for 2" wg. Where CMC and SMACNA requirements differ, the more stringent of the two requirements shall govern. Seal all transverse joints and longitudinal seams with approved solvent based sealers for Class A.
- L. Use double nuts and lock washers on threaded rod supports.
- M. For fitting and branch connection: use 45° entry for rectangular duct and conical or bell mouth for round duct. Saddle tops, Straight tap, flanged or spin-in fitting are not acceptable.

2.4 ISOLATION ROOM EXHAUST DUCT

- A. Construct of 20 ga. Type 316 stainless steel with slip joint.
- B. Joint sealant shall be Plasite 7122 JAS joint sealant. Interior coating, exterior primer, and joint sealant materials shall have a Class I Flame Rating of 25 or less in accordance with ASTM E84-68.
- C. The exhaust duct shall be identified by appropriate labeling with the words "Caution Negative-Pressure Isolation Room Exhaust" or similar terminology. Such labeling shall be in a manner which is not readily removable and shall appear on the exhaust duct at intervals of not more than 20 feet (6096 mm) and at least once near each room and each story traversed by the exhaust system.

2.5 MEDIUM PRESSURE DUCTS

- A. Medium Pressure duct system shall be used for supply air duct and plenums downstream of supply fans and upstream of terminal boxes.
- B. Construct T's, bends, and elbows with 5-piece, or 3-piece 45° ells. long radius elbows. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is required, provide turning vanes of solid metal with glass fiber fill. Weld in place.

- C. Transform duct sizes gradually, not exceeding 15 degrees divergence and 30 degrees convergence.
- D. Fabricate continuously welded medium pressure round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Joints shall be minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.
- E. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90° conical or bell mouth connections may be used. Saddle tops, Straight tap, flanged or spin-in fitting are not acceptable.
- F. Medium pressure ductwork from the air handling unit to mixing dampers and air terminal units shall be fabricated and installed in accordance with 2001 CMC Table 6-1 and SMACNA "HVAC Duct Construction Standard" Second Edition 1995, Table 1-8 for 4" wg. Where CMC and SMACNA requirements differ, the more stringent of the two requirements shall govern. Seal all transverse joints, longitudinal seams and duct wall penetrations with approved solvent based sealers for Class A. When duct reinforcement required on two sides, they shall be tied with rods at the end.
 - 1. Round duct elbows up to 8" shall be die-stamped 20 gauge galvanized steel. Elbows larger than 8: shall be 5-piece welded walls with centerline radius not less than 1-1/2 times duct diameter unless otherwise approved by the Engineer. Branch take-offs shall be conical type, A.S.M.E. short flow nozzle, low-loss design, seamless construction. Fittings and pipe shall be as manufactured by Spiral Pipe Division of United Sheet Metal Company, or equal in "spiro-duct".
 - 2. All transverse joints, longitudinal seams, and duct penetrations wall shall be sealed by applying approved solvent based sealer to male end of duct with brush before assembly. After assembly and sheet metal screws are installed, apply 2" wide band of duct sealer around joint covering all screws and rivets. Allow 24 hours to set before pressure testing duct system. This Contractor shall guarantee the systems against air leakage in excess of 1%.
 - 3. Fire dampers for medium and high pressure ducts shall be of interlocking steel certain type. Submit shop drawings with Fire Marshal approval and California State Listing noted thereon. Access doors to high pressure duct fire dampers shall be minimum size 13" x 18".
 - 4. Medium and high pressure plenums and housings shall be constructed of 18 gauge galvanized iron and 3" x 3" x 1/4" galvanized angles in strict accordance with high pressure requirements of "Duct Manual" published by SMACNA.
 - 5. Submit complete shop drawings, indicating method of connections, each plenum size, framing, for review and acceptance.

2.6 FUME HOOD EXHAUST DUCT

- A. Provide stainless steel exhaust duct from fume hoods to the fume hood collecting plenum. The exhaust systems shall be for the use of corrosive, flammable and reactive material and shall be constructed and installed in accordance with Uniform Building Code (UBC) Standard Number 10.3 (1976 Edition) "Blower and Exhaust System for Dust, Stock and Vapor Removal".
 - 1. Ductwork and accessories shall be constructed from American Society for Testing and Materials (ASTM) A312 Type 316L stainless steel (SS) and built for structural strength.
 - 2. Exhaust duct for fume hood shall be 18 gauge SS minimum.
 - 3. Longitudinal and transverse joints between ductwork and fitting shall be continuous welded, use of spot welds and sealants is prohibited.
 - 4. Elbows and angles shall have the same gauge as ductwork, inside radius not less than width of duct.
 - 5. The duct system shall be fitted with copper-grounding straps, connected to the duct and to an effective grounding system.
- B. Fume hood exhaust air plenum on the roof shall be constructed of stainless steel. Construct in accordance with Section VI, SMACNA DCS.

2.7 CASINGS, HOUSINGS, PLENUMS & REGISTER BOXES

- A. Fabricate casings in accordance with SMACNA Low Pressure Duct Construction Standards and SMACNA High Pressure Duct Construction Standards and construct for operating pressures indicated.
- B. Mount floor mounted casings on 4 inch high concrete curbs. At floor, rivet panels on 8 inch centers to angles. Where floors are acoustically insulated, provide liner of 18 gage galvanized expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields.
- C. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection. Provide clear wire glass observation ports, minimum 6 X 6 inch size.
- D. Sheet metal housing shall be constructed of 18 gauge galvanized iron, reinforced with 2" x 2" x 1/4" galvanized angles to form a rigid housing. Housing shall be fastened to the floor and walls or channel base as shown and sealed. Housings shall be sturdily braced and stiffened to prevent vibration and breathing. Angles shall be on three foot (3') centers maximum. Sheet metal shall be riveted to angles. Spot welding will not be allowed. Joints in low pressure plenums shall be sealed during assembly with a generous coat of "United" duct sealer in the joint. A final sealer on all joints inside the plenums shall be made with 6 oz. canvas strips and Arabol.
- E. Plenum Access Doors: All access doors shall be of double wall, 20 gauge galvanized sheet metal construction. A 1" thickness of Fiberglass rigid board insulation shall be installed between inner and outer door shells. Edges of doors shall be flanged for rigidity. One inch galvanized angle iron frames in casings shall be provided to receive doors. Doors shall be sealed with sponge rubber cemented in place and shall be mounted with heavy duty galvanized hinges and provided with brass door latches and strikers that can be opened from either inside or outside the casings. Ventlock No. 260 or approved equal. Access doors shall be constructed and hinged so that the air pressure tends to close door.
- F. Fabricate acoustic casings with reinforcing turned inward. Provide 16 gage back facing and 22 gage perforated front facing with 3/32 inch diameter holes on 5/32 inch centers. Construct panels 3 inches thick packed with 4.5 lb/cu ft minimum glass fiber media, on inverted channels of 16 gage.
- G. Sheet metal register boxes shall be provided for all ceiling diffusers and registers with round duct connections. Register boxes shall be complete with round starter collar, size as indicated on drawings.
- H. Steel Ducts: ASTM A525 or ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz. per sq. ft. for each side in conformance with ASTM A90.

2.8 FABRICATION DRAWINGS

- A. Ductwork and sheet metal fabrication drawings. This contractor shall submit to the Architect and Engineer for review 1/4" to 1 foot scaled plan drawings of all parts of the building showing all duct systems. Plans shall show all duct details, offset, transitions, elevation, etc., after coordination with all other trades and existing conditions. Drawings shall also include mechanical rooms with ductwork and plenums complete. PARTIAL OR INCOMPLETE DRAWINGS WILL NOT BE ACCEPTABLE.

2.9 FLEXIBLE DUCT CONNECTION AT SEISMIC SEPARATION

- A. Flexible duct connection at seismic separation: provide where shown on drawings flexible duct connections shall be "Durolan" as manufactured by Duro-Dyne, closely woven glass fabric double coated with neoprene and suitable for the system pressure.

2.10 MISCELLANEOUS MATERIALS

- A. Duct Sealant: United Duct Sealer, 3M #800, or equal, nonflammable, UL labeled.
- B. Tape Sealing System: Hardcast RTA-50 or equal (no known equal), two-part system. Tape DT-5400, minimum 4" wide. Adhesive FTA20 for indoor applications, TRTA-50 for indoors or outdoors.
- C. Gasket Material: Tremco 440, Ductmate 440, or equal, minimum 3/16" thick by 1/2" wide.

- D. Test Ports: Steel with screw cap to suit exhaust service, Ventlock 699, Young Regulator, or equal. Coat inside of test ports same as ductwork when installed on coated ducts.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Drawings are in part diagrammatic and are intended to convey the scope of work and indicate the general arrangement of equipment, ducts and piping. Consult general construction drawings for all conditions affecting work and verify spaces in which work will be installed. Where job conditions require changes in indicated locations and arrangement, make such changes at no additional cost to Owner. Contractor shall verify duct sizes and clearances on job prior to fabricating ductwork. Provide transitions and offsets as required to install the work and allow clearance for other sections.
- B. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal cap with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- C. On medium pressure systems use only 5-piece, long radius elbows and 3-piece, 45° elbows. Tees shall be conical. All fittings shall be manufactured. Saddle tops in lieu of conical tees will not be allowed.
- D. All ductwork, supply, return, and exhaust shall be sealed. Ductwork shall be sealed according to SMACNA Class A. Solvent based sealers are preferred. Water based sealers may be used on renovations where odor may be a problem with hospital staff.
- E. Supply ductwork and plenums downstream of supply fans and upstream of terminal boxes shall be leak tested to show leakage is less than 1% of design cfm. Furnish results to the CM.
- F. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- G. Coat buried, metal ductwork without factory jacket with one coat and seams and joints with additional coat of asphalt base protective coating.
- H. Connect diffusers or troffer boots to low pressure ducts with 6 feet maximum length of flexible duct. Hold in place with strap or clamp.
- I. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- J. Neck connection of diffuser or register shall not be made directly into main trunks. Where direct duct neck connection are required due to space limitations, main duct shall be lined 5 feet each side of neck connection.
- K. Girth seams shall be at intervals of 48" or less. All side of ducts shall be cross broken. Where required to prevent sagging and vibration, ducts shall be stiffened on the outside with flat bars or angles.
- L. Provide Young Regulator #110 instrument port in each main supply duct and main return adjacent to air handling equipment.
- M. All duct joints shall be sealed by applying "United" duct sealer to male end of duct with brush before assembly. After assembly and sheet metal screws are installed, apply 2" wide band of duct sealer around joint covering all screws and rivets. Allow 24 hours to set before pressure testing duct system. The Contractor shall guarantee the systems against air leakage in excess of 4%. All audible leaks sealed. No duct tape will be allowed.
- N. Flashings, counterflashings and equipment exposed above the roof or exterior to the building shall have all seams and laps soldered with 50/50 solder or sealed with PRC Rubber #5000 or #7000. These installations shall be coordinated with the roofing section.
- O. Layout:

1. Manual Balancing Dampers: Install in all supply ducts, downstream of boxes, where two or more ducts are connected of a plenum and where shown on drawings, and at the branch takeoff connection of all return and exhaust branch ducts even though such balancing dampers may not be shown on the drawings. Provide locking, indicating quadrant operators.
 2. Contractor shall verify duct sizes and clearances on job prior to fabricating ductwork. Provide transitions and offsets as required to install the work and allow clearance for other trades.
 3. Casings & Joints: Airtight for the purpose intended. Sealed with seal and transverse duct joints, ends of standing seams, and all around united duct sealer or equal.
 4. Drawings indicate required size and points of termination of ducts and pipes, and suggest proper routes of ductwork and piping to conform to structure, avoid obstructions, and preserve clearances. However, it is not the intention of drawings to indicate all necessary offsets, and it shall be the responsibility of the Contractor to install ductwork and piping in such a manner as to conform to structure, avoid obstructions, preserve headroom, and keep openings and passageways clear without further instructions or cost. Make changes in locations of equipment, ductwork, and piping which may be necessary in order to accomplish this.
 5. All Architectural and Structural drawings of the building and those for the plumbing, mechanical and electrical work are hereby made a part of these specifications, and shall be consulted by the Contractor and his work adjusted to meet the conditions shown thereon.
 6. Reroute, provide transition with same cross sectional area and make necessary duct changes in order to fit ductwork in attic without any additional cost to the Owner.
- P. Duct leakage test: All ductwork shall be tested for leaks, using necessary instruments before insulating ductwork. Conduct tests as follows and as recommended in accordance with SMACNA Air Leakage Test Manual and Charter 23 of the National Standards Manual of the Associated Air Balance Control.
1. All the leak testing shall be observed and witness by the General Contractors Quality Control on-sit representative.
 2. At all times onsite, the General Contractor and all partner General Contractors shall have the duct leak test training Video distributed by HCA Design and Construction.
 3. The General Contractor to maintain on-site a set of ductwork prints that are shaded in different colors to show the duct sections isolated for each test.
 4. The contractor shall indicate of the print the date each section of duct was tested and the final percent leakage rate measured for each test section.
 5. Test apparatus shall be a high-pressure portable blower with an orifice flow measuring device. Each orifice assembly is accurately calibrated with its' own calibration curve.
 6. Seal all openings in duct section and plenum to be tested.
 7. Connect test apparatus to test section of duct, using a flexible duct connection or hose, (fitting provided by Mechanical Contractor).
 8. Duct access panel is to be installed, if require in that duct section, before the pressure duct leakage test.
 9. Close damper on blower and gradually open damper on suction side of blower.
 10. Determine amount of air leakage and make repairs as required.
 11. Each section shall be tested at 1.5 times the design system operating static pressure. Leakage factor allowable shall be 1% based on the total operating CFM of the section of duct under test.
 12. Tested sections of ductwork shall be visually marked with certification sticker and initials of field test inspector. Tests shall be made before duct sections are concealed.
 13. The entire duct system shall be not covered with insulation or concealed in the ceiling, shafts, etc. until complete air duct leak test has been conducted and approved by Owner, IOR, the Design Team.
 14. The entire duct system shall be tested for leaks after complete installation and joints are mmade from the air handlers to the CAV units for supply air systems, relief, OSA, return and exhaust air system. Systems from mains (12" in size and larger duct) up to AH units and exhaust fans. Allowable leakage is 1% for all the systems.
- Q. Install all fresh air intakes as to be 10' - 0" from any and all sanitary vents or exhaust fan discharge. When necessary, extend vents or provide additional fresh air intake ductwork approved by the Architect.

- R. All exhaust air duct shall be completely air tight throughout the duct run and shall be equipped with back draft damper in accordance with section 1104 UMC 88.
- S. All outside air intake/louvers shall be equipped with wire mesh screens and back draft damper as per section 706(h) UMC 88.
- T. Duct smoke detectors shall be installed in supply air main ducts for all air handling units that exceeds 2000 CFM for automatic shut-off. Duct smoke detectors by electrical contractor.
- U. Provide openings thru roof, concrete wall, stud wall & at all places wherever mechanical duct, pipe and all other utility crossing/or penetrating. Provide structural member and/or strengthening method as per structural drawings or as necessary at all crossing/penetrations. Refer to structural drawing for method of strengthening.
- V. Pitch duct distribution according to structural beam slope in order to accommodate ductwork in attic space and wherever it occurs.
- W. Contractor is responsible to fit all ductwork in available attic space and also shall provide all fittings, elbows to accommodate ductwork in available space without any additional cost.
- X. All ductwork shall be positively sealed according to specification. Ductwork installation will need periodic inspection during construction. Ductwork installation will not be approved without Architect's periodic inspection for approval. No duct tape will be allowed. All mechanical duct joint shall be araboled.
- Y. All concealed mechanical work shall be inspected and approved by Architect prior to concealing or covering any mechanical work.
- Z. Provide minimum 24" X 24" clear access door/panel to all concealed mechanical work for adjustments, repairs & maintenance.
- AA. Where not otherwise specified herein, shown, noted, or required by codes, work shall conform to "HVAC Duct Construction Standards, Metal and Flexible," First Edition, 1995, as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
- BB. Duct Placement and Fittings:
 - 1. Form transitions with uniform taper not to exceed 15 degree include angle, unless shown otherwise on drawings.
 - 2. Offsets over 15 degrees shall have two radius turns or square turning vanes.
 - 3. Exposed Ducts: Exercise extreme care to product neat and pleasing-in-appearance joints, connections, supports, and other modifications. Ducts shall have no offsets, dents, or dings. They shall be clean and grease-free. Remove all excess sealant. Appearance shall be acceptable to the owner's representative.
 - 4. Install ducts true to line and grade.
 - 5. Make changes of direction by curved sections with inside radius equal to duct width or square elbows with turning vanes as shown. Where square elbows are definitely shown, radius turns shall not be used.
 - 6. Closely fit and accurately place ducts, coordinating with work of other trades. Ducts shall be so placed that piping, ceiling support grid, ceilings, and light fixtures may be installed without warping, springing, or deforming ducts.
 - 7. Use 45° entry tapered duct for rectangular branch and conical or bell mouth for round branch connections takeoff from rectangular sheet metal duct. Straight tap or spin-in fittings are not acceptable.
- CC. Medium Pressure Round Ductwork:
 - 1. United McGill Corporation, Uni-Seal, or equal, prefabricated, machine-wrapped, round duct with a sealed spiral-locked seam, minimum gauges of 26 in sizes through 14" basic round diameters, 24 in sizes 15" through 26" diameter, 22 for ducts 27" through 36" diameter, and 20 for ducts 37" through 50" diameter.
 - 2. Fittings: United McGill "Uniform", or shop fabricated or match, or equal, minimum 20 gauge zinc-coated steel with continuous butt welded joints.
 - 3. 45-degree and 90-degree elbows, 3" through 8" Diameter: Die stamped with all butt welded seams. Elbows 9" diameter and larger shall be 5 piece all butt welded. Radius to center of duct shall not be less than 1.5 times the duct diameter.

4. Reducers: Machine formed to ASME short flow nozzle shape.
5. Tees: Conical tape machine formed to short flow nozzle shape.
6. Laterals: Machine formed to ASME short flow nozzle, conical tape at 30 deg.F to 45 deg.F.
7. Round Tap Fittings: Saddle type for round duct or conical for rectangular ducts.
8. Round Duct Joints; Join by means of couplings with swaged bead in center and secured with sheet metal screws at each end of coupling. Make duct-to-fittings joints either by a tight slip fit of the fitting lapped inside the duct or by means of couplings with swaged bead in center, all secured with sheet metal screws. Screw spacing: 6", unless otherwise shown on the drawings. Seal joints and seams with 4" wide Hardcast tape or specified internal sealant applied continuously around the coupling.
- 9.

DD. Low Pressure Round Ductwork:

1. Same as medium pressure round ductwork, except United McGill "Uniweld" fittings, spot-welded and sealed same gauge as duct, may be used.

EE. Duct Support:

1. Support horizontal ducts with hangers of schedule size and spacing per SMACNA DCS, Tables 4-1 and 4-2. Install hangers at each change in direction of duct.
2. Extend strap hangers down both sides of ducts, turn under bottom 2" minimum. Metal screw hangers to bottom of duct and to upper and lower sides of ducts at not more than 12" on center.
3. Provide angle hangers formed by extending vertical bracing and angles or by rods connecting to bottom angles if size of bracing angles conforms to hanger schedule.
4. Support vertical ducts at every floor with angles or channels riveted to ducts. Rest angles or channels on floor slab or structural steel members placed in opening, unless otherwise noted.
5. Construct hangers of galvanized steel.
6. Provide hangers for duct as recommended by SMACNA.
7. Power driven anchor not permitted.

FF. Ducts Outdoors:

1. Exposed ducts outdoors or on roof shall be sealed watertight. Install outdoor horizontal ducts with pitched top to ensure complete drainage. Pitch to of duct 1/2" from edge to edge.
2. All steel parts, including nuts and bolts, for duct supports outdoors or on roof shall be hot-dipped galvanized after fabrication.

3.2 DUCT ACCESSORIES

- A. Duct Access Doors: Install in ducts and plenum walls where shown and where required for cleaning and for access to equipment and devices in ducts, including automatic dampers. Doors shall airtight. Doors outdoors shall be weathertight.
- B. Gravity Backdraft Dampers: Install dampers in removable flanged duct section. Adjust counter balance for proper relief pressure or as directed by the owner's representative. Install an access panel in duct immediately upstream or downstream from the damper for access to the counter weight adjustment and for inspection.
 1. After fabrication, coat all components with coating specified for fume exhaust and ducts.
- C. Fire/Smoke Dampers: Install fire smoke dampers with access doors in accordance with all governing regulations, listing requirements, and manufacturer's recommendations.
- D. Volume Dampers: Volume dampers are required on each branch of supply, return and exhaust ductwork. Install damper as far upstream from air outlet/inlet as possible. Where required additional volume dampers are necessary to achieve proper air balance, furnish and install them in ducts where shown or not shown, at no additional cost to the contract.
- E. Fixed Turning Vanes: Install vanes in square elbows. Vanes shall run full diagonal dimension of elbow with first vane tight in heel corner. When turning vanes are installed in duct with internal insulation, install 20 gauge hat

channels of same depth as insulation and secure vane runners to channels. Contractor-fabricated turning vanes shall not be acceptable.

1. Use single thickness turning vanes only where shown and where required for tight turns. Vanes shall be 18 gauge galvanized steel metal. Secure vanes to duct at both ends with angles and screws at 3" o.c. minimum spacing. Reinforce turning vanes with ½" diameter tie rods when vanes are longer than 72".

F. Adjustable Air Extractors: Install at tap-ins without flared connection. Secure operator to duct with screws after balancing.

G. Provide Plexiglass Viewports in ductwork at all humidifiers installation to observe operation.

3.3 CLEANING

A. Clean all plenums and air ducts so that no dirt or dust is present in any system.

B. Examine air handling systems and clear any obstruction and debris. With dampers wide open and closed, run fan systems and check for air leaks.

C. Patch, repair or replace ductwork as required. All ductwork shall be made airtight. Repair or replace ducts and joints as required to the satisfaction of the owner's representative.

3.4 DUCT-LEAK TESTING

A. Use extreme care in the fabrication and installation of all the ductwork, including Isolation Room exhaust ducts and plenums, to ensure that it will be airtight. All the duct systems shall be leak tested for leaks in sections as the work progresses, before insulating. Fire/smoke dampers, access panels and appropriate branch ducts shall be in place during the testing.

B. Follow procedure published by United Sheet Metal Division of United McGill Corporation entitled "System Pressure Testing for Leaks" using prescribed test kit containing test blower, two U-tube manometer, and calibrated orifice tube. Orifice flow measurement device to be individually calibrated against a primary standard and a calibrated curve permanently attached to orifice tube assembly.

C. Test Procedures:

1. Test for audible leaks as follows:

- a. Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
- b. Start the blower with its control damper closed to avoid damage to ducts.
- c. Gradually open the inlet damper until the duct pressure reaches 25% in excess of designed duct operating pressure.
- d. Survey all joints for audible leaks. Mark each duct and repair after shutting down blower. Do not apply a retest until sealants have set.

2. After all audible leaks have been sealed, measure the remaining leakage with the orifice section of the test apparatus as follows:

- a. Start blower and open damper until pressure in duct reaches 25% in excess of designed duct operating pressure.
- b. Read the pressure differential across the orifice. The leakage rated in cfm shall be read directly from the calibration curve for the orifice.
- c. Total allowable leakage shall not exceed 1% of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.

D. All leak testing is to be witnessed by General Contractor's Quality Control on-site representative. The General Contractor is required to have on-site, at all times, the duct leak test training video distributed by HCA Design

and Construction to all Partner General Contractors. Require the General Contractor to maintain, on-site, a set of ductwork prints that are shaded in different colors to show the duct sections isolated for each test. The General Contractor shall also indicate on the print, the date each section of duct was tested and the final percent leakage rate measured for each test section.

- E. Rectangular ducts shall perform to Leakage Class 6.
- F. Round ducts shall perform to Leakage Class 3.

3.5 DUCTWORK APPLICATION SCHEDULE

<u>AIR SYSTEM</u>	<u>MATERIAL</u>
Low Pressure Supply	Galv. Steel
Return and Relief	Galv. Steel
Outside Air Intake	Galv. Steel
General Exhaust	Galv. Steel
Isolation Room Exhaust	Galv. Steel
Fume Hood Exhaust	Stainless Steel

3.6 ADJUSTING AND CLEANING

- A. Prior to installation, all ductwork left on site shall be kept with closed up open ends.
- B. Clean duct system to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment which may be harmed by excessive dirt with temporary filters, or bypass during cleaning.
- C. Protect equipment which may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

SECTION 15910 - DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Volume control dampers.
- B. Combination fire and smoke dampers.
- C. Smoke dampers.
- D. Backdraft dampers.
- E. Flexible duct connections.
- F. Duct access doors.
- G. Duct instrument test ports.
- H. Sound Trap

1.2 SUBMITTALS

- A. Submit under the provisions of Section 01330.
- B. Complete submittals shall be provided to the Mechanical Engineer for approval.
- C. Submittals shall include the following information:
 - 1. Complete rectangular and round duct appurtenances including:
 - a. Double wall turning vanes.
 - b. Manual volume dampers – lined & wrapped ductwork.
 - c. Manual volume dampers above non-accessible ceilings.
 - d. Housings and plenums Field Fabrication Drawings.
 - e. Duct through roof details.
 - f. Combination Fire / Smoke damper assemblies.
 - g. Fusible Link Fire Damper assemblies.
 - h. Sheet metal register boxes.
 - i. Flexible ductwork.
 - j. Instrument test ports.
 - 2. Manufacturer model numbers and technical cut sheets shall be provided for all purchased products for items listed above.
 - 3. Submit appropriate SMACNA Plate or schedule where duct construction is based on SMACNA Standards.
- D. Refer to Section 15010 for additional submittal requirements.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in the manufacturer's original, unopened, labeled containers and protect all products against moisture, tampering or damage from improper handling or storage.
- B. Do not deliver materials to the Project Site before they are ready for installation, unless adequate security is provided. The security and protection of all jobsite materials is the responsibility of the installing Contractor.

- C. All materials and products shall be new and in perfect condition when received, of the best grade and of the same manufacturer throughout for each class or group of materials or products.
- D. Provide standard products of a manufacturer regularly engaged in the manufacturer of the product indicated. Where more than one (1) unit of any product or material is required, Provide products by the same manufacturer.
- E. Protect all ductwork and specialties from entry of contaminating material.

PART 2 - PRODUCTS

2.1 VOLUME CONTROL DAMPERS

- A. Install volume dampers at each branch duct for supply, return, and exhaust duct systems, manually operated opposed blade dampers with interlocking edges, fabricated of 18-gauge steel and equipped with locking quadrants and end bearings.
- B. Duro Dyne SRH-228 damper regulators shall be installed on dampers in lined duct; SRST-2 on wrapped duct, with proper offset for duct insulation.
- C. Each damper regulator assembly shall be equipped with a closed end bearing assembly, shaft size to match regulator rod, Duro Dyne model "SB."
- D. Where manual dampers are installed above non-accessible ceilings, provide "Duro Dyne" model AD-38 miter gear assembly, 3/8" sq. rod, length as required, and model SRC-38 concealed regulator set with hex nut for each damper shown on the drawings. Install regulator set in a flush mounted 4S electrical box with blank cover, painted to match ceiling finish.
- E. Provide stainless steel dampers and components of dampers installed in stainless steel duct systems.

2.2 COMBINATION FIRE/SMOKE DAMPERS

- A. Manufacturer: Ruskin FSD 60 or equivalent by Pottorff.
- B. Fabricate in accordance with NFPA 90A, U1555, and UL555S.
- C. Provide factory sleeve for each damper. Install damper operator on exterior of sleeve and link to damper operating shaft.
- D. Fabricate with multiple blades with galvanized steel frame and 14 gage air foil blades, labeling as a leakage class I, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade tops, lock and 1/2 inch actuator shaft.
- E. Operators shall be spring return electric type suitable to operate on 120 V AC, 60 cycle. Operators shall be UL Listed and labeled. Provide disconnected switches.
- F. Provide two microswitches, one at each end of damper, to indicate damper position. Damper reset from fire alarm system. Fusible link melts and spring action close damper in fire mode.

2.3 DUCT SMOKE DAMPERS

- A. Manufacturer: Ruskin SD60 low leakage or equivalent by Pottorff.
- B. Fabricate in accordance with NFPA 90A and UL 555S.

- C. Provide factory sleeve for each damper. Install damper operation on exterior of sleeve and link to damper operating shaft.
- D. Fabricate with multiple blades and shall bear UL label for leakage resistance Class I. The leakage rating shall not exceed 4 cfm/square foot at 1" w.g. after exposure to 450°F for ½ hour. Blade edge shall be silicone rubber designed to withstand 450°F. Jamb seals shall be stainless steel.
- E. Operator shall be electric type suitable to operate on 120V AC, 60 cycle and shall be factory installed by the damper manufacturer to constitute a UL rated package. Linkage shall be arranged to permit emergency manual operation of damper. Provide disconnected switch.
- F. Provide Ruskin SP100 switch package for blade position indicator. The switch package shall include two position indicator switches linked directly to the damper blade to provide the capability of remotely indicating damper blade position.

2.4 BACKDRAFT DAMPERS

- A. Manufacturer: Ruskin BD2 Op equivalent by Pottorff.
- B. Fabricate multi-blade, parallel action gravity balanced back draft dampers of 16 gage galvanized steel, or extruded aluminum, with center pivoted blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.5 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards and as indicated.
- B. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz per sq yd, approximately six (6) inches wide, crimped into metal edging strip.
- C. Leaded vinyl sheet, minimum 0.55 inch thick, 0.87 lbs per sq ft, 10 dB attenuation in 10 to 10,000 Hz range.

2.6 DUCT ACCESS DOORS

- A. Manufacturer: Ruskin or equivalent by Pottorff.
- B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards suitable for pressure classification in which it will be installed.
- C. Review locations prior to fabrication.
- D. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one-inch thick insulation with sheet metal cover.
- E. Access doors smaller than 12 inches square may be secured with sash locks.
- F. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.
- G. Access doors with sheet metal screw fasteners are not approved.

2.7 DUCT INSTRUMENT TEST PORTS

- A. All duct instrument test ports shall be as manufactured by "DuroDyne Model TH-1".

2.8 SOUND TRAP

- A. Description: Factory assembled unit, tested and certified by an independent acoustic testing laboratory, per ASTM E477. Provide test data taken within six months or submittal date.
- B. Manufacturer: IAC or equivalent by Vibro Acoustics.
- C. Construction:
 - 1. Casings: 22 gauge minimum galvanized steel with minimum 26 gauge perforated galvanized steel baffle in accordance with ASHRAE Guide recommended construction for high pressure ductwork. Seams locked form and mastic filled. Acoustic baffles use smooth bell-mouth at inlet and discharge, attached to casing using tongue and groove connection. Provide vertical supports where baffles are horizontal.
 - 2. Acoustical Fill: Inorganic long fiberglass or mineral fiber packed under not less than 5% compression, and have a flame spread classification of 25, smoke development rating 15, and fuel contribution 20.
 - 3. For the supply air sound traps, provide IAC packless silencers for hospital service, having the feature of no sound absorptive material of any kind in the shell.
- D. Acoustical Performance: Sound trap tested by an independent testing laboratory and certified that units must meet the acousting ratings. Meet local codes for fill erosion.
- E. Certification: The sound traps shall meet all applicable codes for hospital use and shall be so certified.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions.
- B. Provide balancing dampers at points on supply, return and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers only where indicated.
- C. Provide combination fire and smoke dampers and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- D. Demonstrate re-setting of combination fire and smoke dampers and smoke dampers to authorities having jurisdiction and Owner's representative.
- E. Provide back draft dampers on all exhaust fans and where indicated on drawings.
- F. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment except for fans or equipment equipped with internal Spring Isolators.
- G. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated.
- H. Provide duct instrument test ports where indicated and required for testing and balancing purposes.

SECTION 15920 - ISOLATION ROOM PRESSURE MONITORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 specification sections apply to this section.
- B. Provide a room pressure monitoring system of Isolation Room.
- C. System shall include, but not be limited to, control panels, sensing stations and alarm modules.
- D. Total system shall be installed and commissioned by, or under the direct supervision of, factory trained and authorized field engineers.

1.2 DESCRIPTION

- A. An Isolation Room pressure monitoring system shall be furnished and installed to monitor the airflow into and out of Isolation Rooms.
- B. The system shall include a room pressure controller, a pressure sensor, a low voltage control transformer, low voltage control wiring, and a damper/actuator assembly. All components of the room pressure controller shall be part of a completely designed, tested, catalogued, and factory coordinated package by a single manufacturer, for single point responsibility.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01330.
- B. Submit shop drawings indicating configuration, general assembly and materials used in fabrication.
- C. Submit product data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings.
- D. Submit manufacturer's installation instructions.
- E. Furnish shop drawings on all equipment provided under this Section, including but not limited to:
 - 1. Hardware and devices
 - 2. Installation control drawings
 - 3. Sequence of Operation
 - 4. Operating and Maintenance manuals

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data.
- B. Include manufacturer's descriptive literature, operating instructions, maintenance and repair data and parts lists.

1.5 WARRANTY

- A. Provide two year manufacturer's warranty for all parts.
- B. Equipment and materials: Equipment and materials shall be catalogued products of manufacturers regularly engaged in the production of laboratory airflow control systems. Products shall be manufacturer's latest standard

design and shall have been tested and proven as a complete laboratory airflow system in actual use for a period of over three years..

- C. Warranty shall commence upon the date of owner acceptance and extend for a period of twenty-four months, whereupon, any defects in materials or system performance shall be repaired by the manufacturer at no cost to the owner.
- D. During the warranty period, if a service contract for the routing care, calibration, parts replacement, or upgrade of the system is required or recommended by the manufacturer, or such a contract is to be offered to the owner during or after the warranty period, such contract and services shall also be included during the warranty period at no cost to the owner.

PART 2 - PRODUCTS

2.1 Manufacturer: TSI Incorporated Model 8630-SC Bi-directional pressure sensor, Triatek or equal.

2.2 Pressure Controller:

- A. The room pressure controller shall measure, display and control room pressure. It shall provide access to menu driven programming options via a keypad. The keypad shall be a smooth spill-proof membrane switch.
- B. The case shall be an aesthetically pleasing molded case manufactured with industrial grade plastic. Case shall mount to a double gang electrical box (4" wide x 4" tall x 2.5" deep). The room pressure controller shall be capable of being mounted where convenient for the user (within 250 feet of pressure sensor).
- C. Two indicator lights shall be on the front of the monitor to indicate the following conditions:
 - a. Red – ALARM conditions.
 - b. Green – NORMAL or safe pressure condition.
- D. The controller must have a sliding outer cover that gives an aesthetic appearance while protecting the display and membrane switch. The cover provides the capability of concealing the display while still having the safe (green light) and alarm (red light) visible.
- E. There shall be a two-line alphanumeric digital display indicating the measured room pressure in inches of H₂O. The display shall have a range of -0.20000 to +0.20000 with a resolution of 5% of reading and shall be updated every one half second.
- F. There shall be low and high alarms for negative pressure and low and high alarms for positive pressure. Each alarm shall be capable of having a unique set point.
- G. The controller shall have an audible alarm that sounds when the room is in alarm condition. In addition, an alarm contact for low pressure alarm shall be SPST (N.O.) The contact shall close in a low alarm condition.
- H. An analog pressure output that via a keypad allows the user to select either a 0-10 VDC or 4-20 mA linear analog output. In addition the output pressure range shall be selectable, either -0.1 to +0.1 inches H₂O or -0.01 to +0.01 inches H₂O.
- I. A negative pressure, positive pressure, no isolation input contact shall initiate the room pressure monitor to enable negative pressure alarms, positive pressure alarms or when in no isolation mode, disable all alarms.
- J. An analog flow station input.
- K. RS-485 communications with field selectable Modbus or Cimetrix communications protocol. The RS-485 wiring shall be daisy chained from unit to unit and has the capability to send to the building management system.
- L. Monitor wiring shall be to a terminal strip which plugs into the back of the monitor.

2.3 Pressure Sensor:

- A. The pressure sensor shall consist of two velocity sensing elements mounted in-line with each other and a temperature compensating element as described in U.S. Patent #4, 787,251. The velocity sensing elements shall be ceramic coated platinum RTD for corrosion resistance and easy cleaning. Constant temperature thermal anemometry shall be used to make the air velocity measurement. Pressure transducers are not acceptable.
- B. The pressure sensor shall be temperature compensated over a range of 55°F to 95°F.
- C. The pressure assembly shall consist of a molded plastic sensor, PVC tubing, an intumescent ring, and a matching sensor housing. The pressure sensor is mounted on one side of the wall, the matching sensor housing on the other side of the wall, with the PVC tubing penetrating the wall.
- D. The pressure sensor assembly shall be ANSI/UL 1479 listed for “Fire Tests of Through-Penetration Firestops”. The unit shall have a two-hour fire rating.
- E. The pressure sensor shall accurately measure room pressure from -0.20000 to +0.20000 inches H₂O. The sensor shall be bi-directional to determine the proper direction of pressure. Uni-directional sensors are not acceptable.
- F. The pressure sensor shall be capable of being mounted on either side of the wall (i.e. in the controlled space or in the reference space). A dip switch shall be provided to select which side of the wall the pressure sensor is mounted.
- G. A 25-foot, 6-conductor, 22 AWG cable shall be provided for the wiring connection between the sensors and the pressure monitor.

2.4 Transformer:

- A. The transformer shall have a primary-side voltage of 120 VAC and a secondary-side voltage of 24 VAC. The transformer shall have a rating of 20 VA with a 0.5 amps maximum.
- B. The transformer shall be UL and CSA listed.
- C. A 25-foot, 2-conductor, 22 AWG cable shall be provided as the electrical interface between the transformer and the pressure monitor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The room pressure controller shall be installed as recommended by the manufacturer’s installation instructions.
- B. Start-up shall be performed by the control system manufacturer or a factory authorized representative.

- C. Start-up shall include verifying the control of each specified room. Ceilings and door shall be installed and the HVAC systems (exhaust and supply fans) shall be properly air balanced before start-up shall occur.
- D. The manufacturer shall include a thermal anemometer based air velocity meter with the room pressure control system. The equipment shall be given to permanent building personnel who shall be responsible for periodically maintaining and verifying proper pressure in each specified room.

3.2 ISOLATION ROOM PRESSURE MONITORING SYSTEM DOCUMENTATION AND TRAINING

- A. The supplier shall provide all the documentation and training necessary so that the owner can be capable of operating and maintaining the control system.
- B. Provide 4 hours of training for Hospital personnel. Training is to include: systems operation, troubleshooting, instrument calibration, alarm handling, and system reconfiguration.

SECTION 15930 - AIR TERMINAL UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- E. Drawings and general provisions if the contract, including general and supplementary conditions and Division 1 specification sections apply to this section.
- F. Provide a complete system for the constant air volume control in the spaces.
- G. System shall include, but not be limited to, control panels, supply constant air volume boxes, sensing stations, reheat and recool coils.
- H. Total system shall be installed and commissioned by, or under the direct supervision of, factory trained and authorized field engineers.

1.2 SECTION INCLUDES

- A. Constant air volume terminal units.
- B. Constant air volume terminal units with reheat coils.
- C. Integral sound attenuator.
- D. Integral heating coils.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01330.
- B. Submit shop drawings indicating configuration, general assembly and materials used in fabrication.
- C. Submit product data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings which indicate air flow, static pressure and NC designation.
- D. Include schedules listing discharge and radiated sound power level for each of second through sixth octave bands at inlet static pressures of one to 4 inch wg.
- I. Submit manufacturer's installation instructions.
- J. Coordinate exact sizes and locations of components with the contractor installing the ductwork, temperature controls, and Division 16 work.
- K. Furnish shop drawings on all equipment provided under this Section, including but not limited to:
 - 1. Hardware and devices
 - 2. Installation control drawings
 - 3. Sequence of Operation
 - 4. Operating and Maintenance manuals

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data.
- B. Include manufacturer's descriptive literature, operating instructions, maintenance and repair data and parts lists.

C. Include directions for resetting constant volume regulators.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum eight years experience.
- B. Supplier of this section's system shall be regularly engaged in the production, assembly, and installation of laboratory fume hood control systems and have a proven track record of a minimum of five years.
- C. Supplier of this section's systems shall assume single source responsibility for the complete installation, calibration, and startup of the fume hood tracking systems. Systems shall be left in a completely automated, fully functioning mode of operation.

1.6 WARRANTY

- A. Provide one year manufacturer's warranty.
- B. Warranty: Include coverage of system powered control systems and operating controls, see Section 13810.

1.7 EXTRA MATERIALS

- A. Provide one additional motor of each size, see Section 13810.

PART 2 - PRODUCTS

2.1 AIR TERMINAL UNITS

- A. Description: Provide completely factory assembled and calibrated pressure independent DDC air terminal controllers, consisting of electronic controls, digitally addressable capability air volume damper, control actuator, air volume regulator, velocity sensors, sound attenuator, and hot water reheat coil.
- B. Manufacturer: Enviro-Tec or equivalent by Anemostat, Nailor or Titus.
- C. Construction and Dampers: 24 gauge minimum galvanized steel outer casing, 1" thick, 1 ½" pcf fiberglass insulation and 26 gauge solid inner surface for double wall construction. 20 gauge minimum galvanized steel controller housing, and damper. Seal all seams to form an air tight to maximum air leakage 2% at 3" w.g. All controllers shall be factory checked and calibrated for airflow limits.
- D. Hot water reheat coils shall be 2 row, with copper tubes and aluminum fins. Provide ½" tube diameter with minimum 0.20" wall thickness. Coil rows, fins and sizes shall be as scheduled. Face areas indicated are minimum. On unit with reheat, rectangular end of transition set up for slip and drive connection.
- E. The Digital Terminal Control Unit (TCU) for each zone terminal shall be of the electronic distributed digital application specific addressable type furnished by the zone terminal manufacturer as a complete system, including zone temperature sensor, interface relays, heating coils, disconnects, 120/24 VAC transformers and the like.
- F. The controls subcontractor will be responsible for the control wiring, zone terminal control addressing, inclusion in the host computer data base, heating hot water control valve with actuator, and related testing. The zone terminal manufacturer shall be responsible for the code acceptance, noise generation and air delivery performance. The HVAC contractor shall be responsible for zone terminal installation, ductwork connections, start-up and testing and balancing.
- G. The HVAC contractor shall provide complete adjustment, calibration and tuning of the zone terminal control systems throughout the period of testing and balancing for the air conditioning systems and shall instruct the hospital facility Engineer on maintenance and operation of this control equipment.

- H. The zone terminal manufacturer shall provide composite, electric, direct-digital control and building control system diagrams showing interconnection and addressing of all equipment and controls.
- I. Controls: Actuators, space temperature sensors, and wiring shall be furnished under Section 15975 “Building Management System”. Terminal manufacturer shall accept and factory install controllers provided by controls subcontractor.
- J. Terminal units shall be sized such that at nominal terminal design flow, the pressure drop through the assembly shall be not more than 0.3 water column.
- K. Each unit shall be shipped with appropriate identification including model, size, maximum and minimum rated air flow within the limits of the control system and velocity vs. cfm chart for validating performance.
- L. Acoustics: Unit shall be acoustically treated and tested for unit discharge sound power level (LW). Sound power levels in 2nd – 7th octave bands at inlet pressure from minimum 3” w.g. shall be submitted for approval.
- M. Units shall be sized to produce noise levels NC-26 discharge sound criteria in accordance with ARI-885-98, at design cfm and 1.5” w.g. pressure drops through the terminal. Noise levels must be based on all air from a given terminal going into space tested.

Room Noise Criteria

<u>SPACE TYPE</u>	<u>ROOM NOISE CRITERIA</u>
Public Corridors and Rooms	NC-45
restaurant and other public areas	NC-40
General Open Office Areas	NC-35
Private Office	NC-30
Conference Rooms	NC-25
Interview Rooms	NC 25-30
Meeting Rooms	NC 25-30
Security Control	NC 30-35
Large Conference Rooms	NC-25
Open Office	NC-35

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide ceiling access doors or locate units above easily removable ceiling components.
- C. Support units individually from structure. Do not support from adjacent ductwork.
- D. Connect to ductwork in accordance with Section 15890.
- E. Install heating coils in accordance with Section 15790.

SECTION 15940 - AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Devices shall provide the required air throw and spread with no apparent drafts or noise within the ventilated or air conditioned area.
- B. All air distribution accessories required to effect these conditions shall be provided and installed by this Contractor.
- C. Diffusers and registers causing excessive air movement, drafts or objectionable noise, shall be replaced at no cost to the Owner.

1.2 SUBMITTALS

- A. Submit under the provisions of Section 01330.
- B. Complete submittals shall be provided to the Mechanical Engineer for approval.
- C. Submittals shall include the following information:
 - 1. Submit complete directory showing manufacturer's product number, technical cut-sheet providing complete application information, all trim and appurtenance data for each Air Distribution Device proposed for use on the Project.
 - 2. Manufacturer's Data: Submit maintenance data and replacement material lists for each type of product. Include this data in maintenance manual.
 - 3. Submit manufacturer's installation instructions.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in the manufacturer's original, unopened, labeled containers and protect all products against moisture, tampering or damage from improper handling or storage.
- B. Do not deliver materials to the Project Site before they are ready for installation, unless adequate security is provided. The security and protection of all jobsite materials is the responsibility of the installing Contractor.
- C. All materials and products shall be new and in perfect condition when received, of the best grade and of the same manufacturer throughout for each class or group of materials or products.
- D. Provide standard products of a manufacturer regularly engaged in the manufacturer of the product indicated. Where more than one (1) unit of any product or material is required, provide products by the same manufacturer.
- E. Protect all equipment and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Anemostat
- B. Titus.
- C. Nailor.

2.2 RECTANGULAR CEILING DIFFUSERS

- A. Diffusers shall be modular removable core type with adjustable volume control dampers as manufactured by “Anemostat Model RMD”.
- B. Furnish all diffusers in a factory applied baked enamel finish. Color as selected by Architect.
- C. Verify all frame types prior to ordering. Submit shop drawings, including color samples, for approval.
- D. Provide in the neck of each diffuser at duct take-off from main duct, an adjustable type air extractor and volume controller. Submit shop drawings for approval.
- E. Where air distribution devices are installed in lay-in ceilings, twenty four inches by twenty four inches (24x24") filler panel shall be provided.

2.3 RETURN AND EXHAUST REGISTERS

- A. Registers shall be aluminum construction with key operated $\frac{3}{4}$ " spacing on centers, opposed blade, volume control dampers as manufactured by “Anemostat Model 3HOD”.
- B. Furnish all registers in a factory applied baked enamel finish. Color as selected by the Architect.
- C. Verify all frame types prior to ordering. Submit shop drawings, including color samples, for approval.
- D. Where air distribution devices are installed in lay-in ceilings twenty four inches by twenty four inches (24"x24") filler panel shall be provided.

2.4 SIDEWALL SUPPLY REGISTERS

- A. Face bars shall be seven thirty seconds of an inch ($\frac{7}{32}$ " thick, $\frac{3}{4}$ " spacing on centers and shall be permanently fixed in position. Borders shall be one inch (1") wide. Auxiliary subframes shall be furnished as required to fit wall finish.
- B. Opposed blade key operated volume control dampers, extractors, and equalizing grids shall be provided for each register shown on plans.
- C. All registers shall have baked enamel finish, color as selected by the Architect.
- D. It shall be the responsibility of the Mechanical Contractor to verify all required frame types as they relate to ceiling construction prior to ordering all air distribution devices. Submit shop drawings, including color samples, for approval.
- E. All sidewall supply and return registers shall be as manufactured by “Anemostat Model S2VO”.

2.5 LAMINAR FLOW PANEL DIFFUSERS FOR TREATMENT/TRUMA ROOMS 1002, 1003, 1006, 1114, 1115, AND 1118.

- A. Description: Special perforated panel diffusers to be laminar flow type. Diffuser is to utilize two separate plenums to deliver air to the space with zero aspiration at the face of the perforated plate with velocities in the plane of the perforated plate to vary not more than 10%.

- B. Manufacturer: Precision Air Products or equivalent by Anemostat.
 - C. Air shall be admitted to the initial plenum through an inlet collar, then the filter assembly and balancing mechanism. Perforated air diffusion devices, V or U shaped, of not more than 25% open area are to redistribute air into the secondary plenum. The balancing valve mechanism is to be adjustable through a screw arrangement. Plenum and frame assembly is to be constructed of 14 Ga. white baked epoxy aluminum.
 - D. Perforated distributed plate to be anodized aluminum. Perforations in plate are to be 3/8" diameter giving 16% open area. Plate is to be retained to the module frame through the use of quarter-turn fasteners. Safety retainers of vinyl- coated stainless steel cable or chains to prevent accidental dropping of plate during disassembly. The distribution plate shall be installed in aluminum
 - E. Border trim and all exposed parts to be white baked epoxy.
 - F. Panel manufacturer shall furnish an extruded anodized aluminum tee and angle frame assembly suspension system to support panel diffusers, blank-off panels and light fixtures. Minimum wall thickness of tees and angles shall be 0.125": with a minimum weight of 0.43 lbs. per linear foot. The face of the tee shall be 1-1/2" by 1- 7/16" high. The basic module size 2' 1/2" X 4' 1/2", see drawings for entire module size.
 - G. The suspension system shall be Healiarc welded at all intersection points in assemblies not larger than 6' X 18'. Where sub-assemblies butt together for field assembly the butting angles shall be half tees fastened with "U" clips.
 - H. All tees and angles shall be pre-punches on 6' centers for hanger wires. Systems shall be designed for minimum weight of 10 lbs. per sq. foot.
 - I. Panel manufacturer shall furnish perforated blank-off panels identical in appearance to the panel diffusers where indicated on the drawings. Panel to have solid panel installed behind perforate plate.
- 2.6 LAMINAR FLOW PANEL DIFFUSERS WITH HEPA FILTERS FOR CATH-LAB 1297 AND 1299
- A. Description: Special perforated panel diffusers with HEPA filters.
 - B. Manufactures: Precision Air Products or equivalent by Anemostat.
 - C. The entire laminar flow unit shall be suspended from the structure above. Provide an extruded aluminum tee and angle frame assembly to support air distribution modules, lighting fixtures around the perimeter of the "clean zone" and fill-in panels. Minimum wall thickness of aluminum tee shall be 0.125 inches, minimum weight shall be 0.43lbs./ft. The frame shall be assembled and mechanically fastened together by the manufacturer into sub- assemblies. All members shall be pre-punched on 6" centers for attachment of support hangers. Hangers shall be attached on 2'0" centers in two directions. The completed ceiling frame shall be capable of supporting a load of 10 lbs./ft. The complete frame shall be finished with a white baked epoxy enamel or clear anodized finish.
 - E. Construct a frame to support standard size laminar air flow diffusers with HEPA filters. Except for the mounting base for the surgical light, the complete area within the perimeter of the unit is to be active laminar flow diffusers with HEPA filters. Each laminar air diffuser, fill-in panel, and fluorescent light fixture shall be gasketed to form an airtight seal against support frame. Furnish fill-in panels for all surgical lights and gas columns (where shown on the drawings). The laminar flow panel diffusers supplier shall coordinate exact diffuser sizes with the C-channels support for Cath-Lab equipment.
 - F. Specialized Perforated Rectangular Panel Diffusers: Shall be laminar flow type: Diffuser shall utilize two separate plenums to deliver air to the space with zero aspiration at the face of the perforated plate with velocities in the plane of the perforated plate to vary no more than 10%.
 - 1. Panel diffuser initial plenum to serve as a common plenum for one or two adjacent panel diffusers. A flexible interconnecting duct between panel diffusers modules shall attach to an internal panel diffusers flange.

2. Terminal HEPA filter shall be mounted within final plenum. HEPA filter shall be accessible and removable from the room.
 3. The “knife edge” of the retainer frame and the filter’s gel seal shall form an airtight union.
 4. Perforated distribution plate shall be 0.050” aluminum. Perforation to be 16% open area for 25 or less CFM per square ft. of module or 23% open area for higher velocities. The plate shall be retained to the module frame by means of quarter-turn fasteners. Safety retainers of vinyl-coated stainless steel cable or chain shall be provided to prevent accidental dropping of plate. Distribution plate shall be installed with aluminum mounting frame with mitered back-welded corners.
- G. HEPA Filter: The HEPA filter shall be laminar flow grade. The HEPA filter shall have a minimum efficiency of 99.99% on 0.3 micron particles. Each filter installed shall be factory laser scanned and certified by the filter manufacturer.
- H. Fill-In Panels: Panels identical in appearance to the active air distribution modules shall be furnished where shown on the drawings to accommodate surgical lights and gas columns.
- 2.7 LAMINAR FLOW PANEL DIFFUSERS FOR SPECIAL TRAUMA, ORTHO NEURO, AND CARDIOVASCULAR OPERATING ROOMS
- A. Furnish and install vertical flow surgical clean area system configured as a recirculatory system. Supply air from a central air handling unit (AHU) shall be mixed with the recirculated return air thru the booster fan coil unit. The booster fan coil unit shall discharge HEPA filtered air in a true constant pressure/constant velocity unidirectional laminar airflow pattern from the ceiling filter units downward across the surgical work area to the peripherally located return air grilles. The laminar flow pattern shall be created in the work area by utilization of laminar flow diffusers and fixed containment panels at the perimeter of the work area. The containment panels shall decrease the induction of impure air into the clean zone.
 - B. Manufactures: Precision Air Products or equivalent.
 - C. The system shall have a modular ceiling-mounted booster fan coil unit with chilled water coil, hot water coil. The system shall have the capacity of providing temperatures between 62°F to 85°F in 15 minutes. Set point and operation mode shall be controlled from a control panel within the room.
 - D. The entire laminar flow unit shall be suspended from the structure above. Provide an extruded aluminum tee and angle frame assembly to support air distribution modules, lighting fixtures around the perimeter of the “clean zone” and fill-in panels. Minimum wall thickness of aluminum tee shall be 0.125 inches, minimum weight shall be 0.43lbs./ft. The frame shall be assembled and mechanically fastened together by the manufacturer into sub-assemblies. All members shall be pre-punched on 6” centers for attachment of support hangers. Hangers shall be attached on 2’0” centers in two directions. The completed ceiling frame shall be capable of supporting a load of 10 lbs./ft. The complete frame shall be finished with a white baked epoxy enamel or clear anodized finish.
 - E. Construct a frame to support standard size laminar air flow diffusers with HEPA filters. Except for the mounting base for the surgical light, the complete area within the perimeter of the unit is to be active laminar flow diffusers with HEPA filters. Each laminar air diffuser, fill-in panel, and fluorescent light fixture shall be gasketed to form an airtight seal against support frame. Furnish fill-in panels for all surgical lights and gas columns (where shown on the drawings).
 - F. Specialized Perforated Rectangular Panel Diffusers: Shall be laminar flow type: Diffuser shall utilize two separate plenums to deliver air to the space with zero aspiration at the face of the perforated plate with velocities in the plane of the perforated plate to vary no more than 10%.
 1. Panel diffuser initial plenum to serve as a common plenum for one or two adjacent panel diffusers. A flexible interconnecting duct between panel diffusers modules shall attach to an internal panel diffusers flange.

2. Terminal HEPA filter shall be mounted within final plenum. HEPA filter shall be accessible and removable from the room.
 3. The “knife edge” of the retainer frame and the filter’s gel seal shall form an airtight union.
 4. Perforated distribution plate shall be 0.050” aluminum. Perforation to be 16% open area for 25 or less CFM per square ft. of module or 23% open area for higher velocities. The plate shall be retained to the module frame by means of quarter-turn fasteners. Safety retainers of vinyl-coated stainless steel cable or chain shall be provided to prevent accidental dropping of plate. Distribution plate shall be installed with aluminum mounting frame with mitered back-welded corners.
- G. HEPA Filter: The HEPA filter shall be laminar flow grade. The HEPA filter shall have a minimum efficiency of 99.99% on 0.3 micron particles. Each filter installed shall be factory laser scanned and certified by the filter manufacturer.
1. The extruded aluminum filter frame shall be 3 inches deep and shall be furnished with a silicone gel seal upstream on flange cup.
- H. Fill-In Panels: Panels identical in appearance to the active air distribution modules shall be furnished where shown on the drawings to accommodate surgical lights and gas columns.
- I. Booster Fan Coil Unit: Shall be specified in Section 15855 “Air Handling Units”. Unit shall consist of direct driven, centrifugal fan, chilled water cooling coil, hot water reheat coil, and VSD. Unit shall have capacities and performance characteristics as specified on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install items in accordance with manufacturers' instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers, grilles and registers, regardless of whether dampers are specified as part of the diffuser or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black.
- F. Provide filter gauges across the HEPA filters bank.

END OF SECTION 15940

SECTION 15950 - HUMIDIFIER

PART 1 - GENERAL

1.1 WORK INCLUDES

- A. Steam humidifiers

1.2 GENERAL

- A. Humidification systems shall be factory engineered and assembled with all components as scheduled, specified, or required by the contract documents.
- B. Capacity and performance shall be as scheduled. Each system shall be selected in accordance with principals set forth in the ASHRAE Guide and the manufacturer's literature.
- C. The manufacturer shall be responsible for examining the application of each system to assure each will operate properly in the intended application.
- D. All items of a given type shall be products of the same manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Dri-Steem Humidifier
- B. Armstrong
- C. Spirak Sarco

2.2 STEAM HUMIDIFIERS

- A. Description: Steam jacketed distribution manifold with separating chamber, quiet operating capable of delivering moisture free steam without condensate drip.
- B. Features: Provide electric operated normally closed modulating steam control valve with pilot positioner. Provide an interlocked temperature switch to keep humidifier valve closed until temperature in the condensate discharge piping approaches steam temperature. Coordinate with Section 15975 BUILDING MANAGEMENT SYSTEMS. Separating Chamber and Manifolds: Stainless steel or cast iron separating chamber with re-evaporation or drying chamber. Stainless steel steam jacketed dispersing manifolds with internal noise attenuator.
- D. Humidifier shall achieve total absorption of the steam at 90% relative humidity of supply air in a steam travel of 3'.
- E. Provide inverted bucket traps and strainers.
- F. Humidifiers in air handling units shall be furnished and installed by the air handling unit manufacturer.

PART 3 - EXECUTION

- A. The humidifiers shall be installed in accordance to the manufacturer's installation instructions. The contractor shall be responsible for providing a weatherproof cover over the humidifier if the unit is installed outside.

PARTICULAR SPECIFICATIONS MECHANICAL VENTILATION

GENERAL

This section specifies the general requirement for mechanical ventilation and air conditioning plant, equipment and materials forming part of the sub-contract works and shall apply except where specifically stated elsewhere in the specification or on the contract drawings.

INSTALLATION

Installation of all ductwork, plant and equipment shall be carried out under adequate supervision from skilled staff to relevant codes and standards specified herein.

The sub-contractor shall be responsible for ensuring that sufficient provision is made to prevent the transmission of vibration from equipment to the supporting structure. In the case of fans, this shall be done by rot and vermin proof flexible connections and anti-vibration mounting of an approved type.

The sub-contractor shall ensure that all ducting systems are provided with sufficient access hatches complete with covers, for maintenance purposes.

Damper and other user equipment shall be installed with adequate access for operation and maintenance. Where dampers and other operational equipment are unavoidably installed beyond normal reach and in such a position as to be difficult to reach from a short stepladder, extension spindles shall be provided

The variety and type of supports of ducts and fans shall be kept to a minimum and their design shall be such as to facilitate quick and secure fixing to both metal, concrete, brickwork and wood. Where the design of the structure is in reinforced concrete, supports shall be secured to the structure by means of redheads, raw bolts and other approved means.

Where the sub-contractor proposes to secure his supports by other means than to the main structural concrete, he shall consult with the Engineer before proceeding.

TESTING INSPECTION

Site Tests

The sub-contractor shall supply all instruments and equipment necessary to carry out site tests and shall arrange with other sub-contractors for the testing of other associated equipment which may affect the performance of the plant installed under these sub-contract works.

Site Test Fans

All fans shall be charged with a suitable lubricant and shall be tested upon completion of the ancillary system erection to ascertain that the performance of each fan complies with the requirements of the specification.

Completion of Works – Balancing and commissioning

Following the site tests and prior hand over, mechanical ventilation or air conditioning systems shall be balanced by means of grilles, dampers and other special controls installed, so as to give the required air flow rates and

where applicable the desired temperatures, pressures and humidity conditions in all areas served by the said systems.

The complete system shall be balanced and commissioned as a whole. Sectional balancing and commissioning on any one part of the system where this excludes final complete system balancing and commissioning shall not be accepted.

Test volumes within ducts shall be within + 5% of the design volumes, and volumes at grills and diffusers shall be within + 10% of the design volume.

When the system has been balanced to the satisfaction of the Engineer it shall be run under complete automatic mode for 72 hours continuous operation to ascertain any faults in operations before acceptance and hand-over. Any faults discovered during this time shall be corrected and a further test of 72 hours duration shall be carried out to ensure satisfactory operation, all at the expense of the sub-contractor.

DUCT WORK

The sub-contractor shall supply, deliver and erect all ductwork shown on the contract drawing.

All duct work shall be manufactured in accordance with Heating and Ventilation Contractor's Association (H.V.C.A.) specification DW/121,1969 except where stated otherwise.

Ductwork shall be manufactured from galvanized mild steel sheet unless otherwise specified. All external ductwork shall be manufactured from black mild steel sheet and galvanized after manufacture. All seams shall be of lockform type. All ductwork systems shall be complete with all necessary dampers, bends, tees, tapers, transformation and special pieces.

Where removal is required for access or maintenance, ducting shall be provided with steel angle flange joints suitably painted and protected.

Only bend type 1-7 inclusive as detailed in the H.V.C.A. specification will be permitted.

Only duct connection type 41-44 inclusive, 53 and 54 as detailed in the H.V.C.A. specification will be permitted. All joints shall be fixed as to be suitable for the direction of airflow.

Transformation and taper pieces shall wherever possible, be constructed so that the included angle does not exceed 30 degrees.

All flanged joints shall be sealed by use of asbestos string, compressed between the flanges, and where slip joints occur, these shall be sealed by 'Prestick' or other similar suitable jointing compound and adhesive tape 40mm wide. Exposed sheet metal edges shall be painted with galvatite before sealing.

Dampers shall be of aerofoil section and manufactured from galvanized mild steel sheet. Damper blades shall be sealed with a 3mm thick felt or rubber seal to minimize leakage. Operating quadrants shall be provided with locknuts and the quadrant shall be clearly marked with 'open' and 'closed' positions. Multileaf damper blades shall be operated by one arm through a linkage external to the duct.

The sub-contractor shall provide sufficient access doors and handholes in the ductwork the purpose of maintenance and inspection. Access doors shall be of the hinged type and soar openings in the duct shall be adequately stiffened, and made air tight with purpose made rubber around the door perimeter.

All support and brackets shall be wire brushed and painted one coat of red oxide paint prior to and after erection. All nuts and bolts shall be sheradized. The fastening of electrical cables to ductwork will not be permitted.

Where ductwork has installation incorporating an external vapour seal, the ductwork shall be insulated from the support by a rot – proof softwood, hardwood or other suitable closed cell insulator of not less than 25mm greater thickness than the insulation to be applied so the vapour seal may be bounded to the face of the timber, all as detailed in Clause DW/121, 1969.

Where ductwork passes through floors and walls, etc. galvanized sheet sleeves or builders work timber frames shall be provided. The space between duct and sleeve or frame shall be packed with asbestos rope or mastic to prevent air movement or noise transmission from one space to another. Ducts must not come into direct contact with the building fabric.

Hangers and brackets shall be manufactured from rolled mild steel angle or channel sections and shall generally be of the drop rod hanger or cantilever type. The hangers shall be spaced to ensure adequate support and where practicable shall be fitted at each ductwork joint.

The sub-contractor shall supply and install, where called for, louvred inlets and outlets with insect proof screens. The louvred shall be constructed throughout from extruded aluminium sections and shall have lacquered and anodized finish to prevent corrosion. The louvres shall be weather proof and have free area of not less than 50%.

The sub-contractor shall ensure that wherever fan or similar equipment are connected to the ductwork system, the connections are made with a heavy duty rot and vermin proof neoprene, or similar material, flexible connection to prevent vibration transmission to the duct work or building fabric. Flexible connections shall be secured by a pre-drilled mating flange, or when fixing to a spigot, the spigot should be beaded and a jubilee clip or split flat iron ring should be used.

The sub-contractor shall provide test holes in all branch ducts and in the main duct on the discharge of the fan. The holes shall be suitable spaced in accordance B.S. 848, shall be situated on a straight length of ductwork and where possible not less than 2m down stream of any bends or dampers. After the completion of testing the sub-contractor shall provide and fix propriety metal or plastic plugs to all test holes. The use of rubber or cork bungs will not be permitted.

INSULATION

General Description

All heated, cooled and recalculated air ductwork shall be insulated.

Insulation shall be of 25mm thick expanded polystyrene sheet or spray applied polyurethane foam to a uniform thickness of 25mm. Polystyrene shall be fixed so that the edges butt closely without a gap and the insulation shall overlap at corners by the thickness of the insulation. The sheet shall be fixed by means of a suitable adhesive and plastic impingement pines attached to the ductwork.

Ductwork in Plant Rooms

The insulation described above shall be finished by the application of 15mm thick layer of hard setting plastic compound trowelled to a smooth finish. All corners shall be protected by setting in a 1mm thick aluminum angle strip into the hard setting finish. Insulation shall be bevelled to an angle of 45 degrees at all connecting flanges, access hatches and all other places where operation or maintenance is likely to cause the breaking of the insulation.

The insulation described shall then be given a vapour sealing by the application of two coats of anti -condensation paint.

Ductwork External to Plant Rooms

The insulations described above in clause 5.01 above shall be finished by the application of two coats of bitumastic paint.

FINISH PAINTING

Upon completion of the installation and after all tests have been carried out to the satisfaction of the Engineer, the plant, equipment, support, etc, shall be examined and all priming coats damaged during the erection made good.

Plant or equipment, ductwork, etc, which is to be insulated, shall have had the priming paint protection made good before the application of the insulation.

After the above procedures have been carried out to the satisfaction of the Engineer various surfaces shall be given the necessary preparation as recommended by the paint and the sub-contractor and Engineer at a later date.

For the purpose of the specification, however, it shall be deemed that the sub-contractor's tender price was based on the identification requirements for the various services detailed in Code of Practice DW/161 Identification of Ductwork as published by H.V.C.A.

BILLS OF QUANTITIES

A AIR CONDITIONING

The Contractor shall supply labour and supply, deliver, install, fix, connect, test, label and commission the works, clean, complete and working to every detail as described in the specification and by related specifications and on the drawings listed in the Schedule or Drawings to the satisfaction of the Consulting Engineers. **Note; Acceptable models are strictly Toshiba, Daikin, York and Dunham Bush. ALL RATES TO BE VAT INCLUSIVE**

Item	Description	Units	Qty	Rates (Kshs.)	COST (Kshs.)
A1	SERVER ROOM				
A1.01	AIR COOLING UNIT (24,000 BTU) Convertible Type Split System (Floor standing) air cooling unit of capacity 7.1kw as "Carrier" 38GL 024 and condensing unit as 38YL 024 or equal and approved. The unit shall be supplied complete with room thermometer, room thermostat and controls or remoted control device.the unit shall be such that if the power supply goes off, it will restart automatically after power is restored. Other models, which are acceptable, are as Toshiba, Daikin.	Item	2		
A1.02	Allow for refrigerant pipework complete with lagging 7/8 " refrigerant pipes and lagging (gas line)	Lm	12		
A1.03	3/8" refrigerant pipe (liquid line)	Lm	12		
A1.04	Refrigerant pipe trunking where they are exposed	Lm	12		
A1.05	R410 Refrigerant	Item	1		
A1.06	Drain 20mm class 'B' GMS pipe complete with fittings	Lm	0		
A1.07	ELECTRICAL Allow for associated Electrical works from the isolator to the A/C and from indoor unit to outdoor unit.	Item	1		
A1.08	Surge protector Power surge protector as SOLATEC to suite	No.	0		
A1.09	Mounting bracket Mounting bracket for the outdoor units to suite	No.	1		
A1.11	Total for Server room A/C C/F to Price Summary page				

Item	Description	Units	Qty	Rates (Kshs.)	COST (Kshs.)
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AIR CONDITIONING PRICE SUMMARY PAGE

1	Sub-total for the server room		Item		
2	DOCUMENTATION: Sum for Completion documents: Comprising Workshop drawings, manufacturer's technical product catalogues, users manuals, maintenance manuals, as installed drawings, test certificates, etc. { NOTE: Penultimate Valuation will not be paid until these are fully availed & signed off by the engineer }		Item		
3	TRAINING: Sum for Training of client personel / users (At least 5No Staff for 1Week)		Item		
4	TESTING & COMMISSIONING: Sum for Testing and commissioning of the entire installations set complete with all accessories, interconnections, controls, BMS link & activation and the necessary programing.		Item		
5	DLP SUM: Sum for 6 months comprehensive maintenance from date of practical completion.		Item		
6	Total for Air Conditioning Installations without VAT c/f to (Machakos) PRICE SUMMARY PAGE				

AIR CONDITIONING (MACHAKOS) PRICE SUMMARY PAGE

ITEM	DESCRIPTION	COST (Kshs.)
1	Server Room Air Conditioning	
2	TOTAL SUM INCLUSIVE of VAT c/f to MAIN WORKS Summary Page	

PROPOSED OFFICE BLOCK FOR TSC- MACHAKOS

ITEM No.	DESCRIPTION	AMOUNT Kshs
	<p>SUMMARY PAGE</p> <p>A Total for Plumbing Fire Fighting and Drainage</p> <p>B Total for Server Room Air conditioning</p>	
	TOTAL FOR MECHANICAL INSTALLATION WORKS TO MAIN SUMMARY	-

PART NO. 7

ELECTRICAL INSTALLATION WORKS

ELECTRICAL INSTALLATIONS
PARTICULAR SPECIFICATIONS

SECTION 01:

1a. PARTICULAR SPECIFICATIONS FOR ELECTRICAL INSTALLATIONS

1. SCOPE

The Electrical Contractor shall supply labour and supply, deliver, install, fix, connect, test, label and commission the electrical works, clean, complete and working to every detail as described in the specification and by related specifications and on the drawings listed in the Schedule or Drawings to the satisfaction of the Consulting Engineers.

The electrical Contractor shall be responsible for the supply, delivery, installation, connection, testing and setting to work of the entire electrical system in accordance with the Contract Documents.

The electrical Contractor shall provide all the necessary tools, skilled and un-skilled labour to comply and complete in accordance with the main contractor's works program.

2. STANDARDS & REGULATIONS

The electrical portion of the works shall comply with the current regulations of:

- The Kenya Power and Lighting Co. Ltd.
- The latest Kenya Bureau of Standards.
- Codes of Practice of the British Standards Institution
- The Regulations for Electrical Equipment in buildings issued by the Institution of Electrical Engineers (I.E.E) in Great Britain and
- This specification.

3. POWERSUPPLY

The supply voltage at the point of use shall be

- 240 volts single phase or
- 415 volts 3 phase 50hz.

This shall be a TN-C-S system via separate neutral and protective conductor throughout the system.

4. CONDUIT INSTALLATIONS

4.1 GENERAL

All conduits shall be installed strictly in accordance with the manufacturer's instructions.

All conduit fittings and accessories, including couplers, ordinary clips, saddles, pipe hooks, reducers, stopping plugs, lockouts and male and female bushes shall be manufactured dimensionally, similar to B.S.S. 31/1940. Solid tees shall not be used. Solid inspection elbows or bends or inspection tees shall be used only in exceptional circumstances and then only with the Engineer's approval.

Where it eases the installation of cast-in-situ back entry boxes on the loop-in system, purpose made bends manufactured by Egatube and comprising a tight bend with a push socket at one end and a threaded socket at the other end may be used with the Engineer's approval.

4.2 FIXING OF CONDUITS

Conduits shall be installed on the loop-in system and shall either be cast-in-situ in the main concrete structure, concealed in chases cast in concrete walls, or chases cut in solid partition walls, run in ceiling spaces or in hollow partitions of floors, or concealed below the floor screed, whichever shall prove to be the most suitable method of

installation for use in the building under construction. Unless it is clearly specified or shown on the drawing, the method of installing conduits shall be subjected to the approval of the Engineer.

Sunken conduits run in chases in walls shall be fixed by means of mild steel pipe hooks or non-metallic saddles spaced not more than 1 m apart. Where a conduit is concealed behind plaster it shall be sunk to a depth of either 10 mm below finished plaster level, or installed flush with the structural wall level before application of plaster, whichever is the lesser depth.

Conduit fixed on the surface of walls or ceiling shall be fixed by spacer bar saddles fixed not more than 1 m apart.

Surface conduit shall also be fixed 230 mm on both sides of all boxes, the box itself securely fixed. Where such an arrangement of boxes and saddles would prove to be both unsightly and unnecessary, short lengths of conduit not exceeding 1 m in length between boxes need not be secured further than by connection to the adjacent boxes. In such cases the **Engineer reserves the right** to insist upon additional fixing being provided, should he for any reason whatsoever consider such additional fixing necessary.

Where two or more lines of conduit run parallel to each other, on the surface of walls, etc., the distance between them shall not be less than 15mm and conduits shall not cross.

Conduits shall be installed in such a manner as to prevent interference with other services and shall be kept at least 180 mm clear of gas or water pipes, and heat in excess of 68 degrees C.

A means of expansion shall be provided in conduit runs in excess of 6 m without any bend or set, by use of 'Egatube' expansion couplings, which shall also be used at building expansion joints.

Conduits cast-in-situ shall be frequently secured to the steel reinforcement work, with heavy binding wire to prevent movement of the conduit and conduit boxes during the pouring and vibrating of the concrete. Outlet boxes shall be securely fixed to the shuttering with nails, or by means, which shall be visible as a marker on removal of the shuttering only where marks can be concealed.

Conduit shall be installed after the first grid of steel reinforcement work is securely fixed and all open ends of conduits shall be protected by couplings plugged with a suitable non-metallic stopping plug. **The number of right angle bends in conduit cast-in-situ shall not exceed two between boxes.**

Immediately prior to installation of the wiring all conduit and fittings shall be dried and cleaned out by drawing through a cloth swab. Rawl plugs shall be used for fixing to brickwork, self-tapping screws for fixing to aluminium section, raw nuts, raw-anchors spring toggles, gravity toggles or raw bolts, shall be used for fixing to other materials as **approved by the Engineer.**

Corners shall be turned by easy bends or sets made in accordance with the manufacturer's instructions without altering the section or splitting conduit.

4.3 CONDUITS BENDING

The conduits shall be bent and formed strictly in accordance with the manufacturer's instructions: -

- i. Small sizes, i.e. 20 and 25 mm shall be bent cold by inserting the correct size bending spring. It is essential for right angle bends that the conduit is bent past 90 degrees to allow for "spring back".
- ii. Large size of conduit shall be pre-heated before inserting rubber cord to prevent kinking. Conduits badly formed or bent or damaged in any way shall not be used.

4.4 CIRCULAR BOXES INSPECTION

Boxes will not be permitted in floors unless approved. Boxes cast-in-situ must face downwards from the ceiling/floor section. Small standard circular non-metallic conduit boxes, conforming dimensionally with B.S. 31/1940 with standard circular non-metallic (4mm) lids and nylon fixing screws, shall be provided and fixed at all junctions.

The above circular boxes or equivalent looping 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.

Where ceiling roses occur and the ceiling box is recessed below the finished level of the ceiling, suitable extensive rings to accommodate the ceiling rose must be provided. Where ceiling boxes, including extension rings, are flush with the ceiling surface, break joints rings shall be provided to hide the joints.

Where a non-metallic outlet box of thermoplastic material is used for the suspension of lighting fitting, care shall be taken to ensure that the temperature of the box does not exceed 60°C. The weight suspended from the box shall not exceed 3 kg.

Where wiring system incorporates galvanized conduit and trunking, the trunking shall be deemed to be galvanized unless specified otherwise.

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 circumstance be such that a space factor of 45% is exceeded.

Conduits and trunking shall be mechanically and electrically continuous. Conduits shall be tightly screwed between the various lengths so that they butt at the socketed joints. The internal edges of conduit and all fittings shall be smooth, free from burrs and other defects. Oil and other insulating substances shall be removed from the screw threads. Where conduits terminate in fuse-gear, distribution board, adaptable boxes, non-spouted switchboxes, etc., they shall, unless otherwise stated, be connected thereto by means of smooth bore male brass brushes, compression washers and sockets. All exposed threads and abrasions shall be painted (using an oil paint for black enamelled tubing and galvanised tubing immediately after the conduits are erected. All bends and sets shall be made cold without altering the section of the conduit. 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 without the inter-position of a draw-in box.

Where straight runs of conduit are installed, draw-in boxes shall be provided at distances not exceeding 15 m. No tees, elbows, sleeves, either of inspection or solid type, will be permitted.

Conduits throughout shall be of sufficient section and so arranged with draw-in boxes to allow easy drawing in and out of any one or all of the cables in the conduit.

Conduits shall be swabbed out prior to drawing in cables, and they shall be laid so as to drain off all condensed moisture without injury to end connections.

Conduits and trunking shall be run at least 150 mm clear of hot water and steam pipes, and at least 75 mm clear of cold water and other services unless otherwise approved by the Engineer.

Conduits installed and buried in walls shall allow a minimum of 15 mm cover. These conduits and those cast-in-situ concrete slabs shall be given one coat of rust prevention paint before installation of conduit and before concrete is placed. Sunk circular conduit boxes shall be provided with break joint rings of white moulded material or metal.

Surface conduit shall be run in square symmetrical lines and shall be marked on site for approval before installation. Conduits shall be fixed by means of distance saddles spaced at not more than 1.2 m for 20mm and 50mm conduit and 1.5 m for larger sizes.

Conduits shall be fixed at each side of conduit boxes at a distance not exceeding 250 mm, and the saddles shall be equally spaced.

Where conduit runs enter specified areas requiring flameproof equipment, barrier boxes shall be inserted immediately before the conduit enters the flameproof area.

All conduits installed within this area shall be solid drawn galvanized, as shall be conduit fittings and accessories and Buxton Certified as suitable for Group 11 Hazards. Equipment shall comply with B.S 229, B.S.S. 889, and

C.P. 1003. In **NO CASE SHALL** conduits from different distribution boards be connected at one box, likewise cables from different distribution boards shall not be housed in the same conduit specified.

All conduit boxes except loop-in pattern concrete floor shall be fixed direct to the structure apart from the support provided by the conduits. Box lids where required, shall be heavy gauge metal, secured by means of zinc plated or cadmium steel screws. All adaptable boxes and lids of the same size shall be interchangeable.

Boxes used in conjunction with mineral insulated copper sheathed cable boxes shall be galvanized and painted after erection.

Draw-in boxes in the floor are generally to be avoided but where they are essential they must be grouped in positions **approved by the Engineer** and covered by suitable floor straps, either with non-ferrous tray or covers.

The floor trap covers are to be recessed and filled in with a material to match the floor surface.

The Contractor must take full responsibility for the fillings of all covers, but the fillings in materials will be supplied and carried out by the Main Building Contractor.

Where it is intended to fix enclosed lighting fittings directly to a box to suspend a fitting of weight in excess of 3 kg, Egatube steel insert clips shall be used.

4.5 SWITCH AND SOCKET OUTLET BOXES

All boxes intended for switches, socket outlets or other outlets shall be fitted with brass ferrules to accommodate fixing screws.

All other conditions are as stated in item above on Circular boxes.

4.6 STOPPING PLUGS

All spare ways in junction boxes, etc., left for possible future extensions shall be fitted with the stopping plugs.

4.7 JOINTING

Joints shall be made water-tight by the use of 'Egaweld' cement applied with a brush or rug. 'Egaweld' shall be applied to the complete circumference of conduit. Conduit shall be thoroughly cleaned at the ends to ensure a good adhesion of the fittings. 'Egaweld' shall not be permitted to enter into the conduit.

4.8 CAPACITY OF CONDUITWORK

The cables shall run in the conduits so as not to exceed the capacities as set out in the IEE Regulations.

Conduits shall be best quality new super high impact grade heavy gauge 'A' riding PVC unplasticised conduits as manufactured by Egatube suitable for plain connections.

Conduits of sizes less than 20 mm shall not be used without the written authority of the Engineer.

5. TRUNKING INSTALLATIONS

Trunking shall only be installed in situations which will remain readily accessible throughout the life of the buildings. No cable trunking shall be installed behind a plastered ceiling or in other inaccessible situations.

All cable trunking shall comply with BS 4678, part 1 "Steel surface trunking" and part 2 for "Steel under floor (duct) trunking".

Sheet steel cable trunking may be used on installations employing steel conduits, for connecting two or more switchboards together or where several conduits would otherwise have to run alongside each other. Proper allowance should be made for the derating of cables installed together in a container system. The cables must be capable of carrying the current imposed by the equipment connected. Attention is drawn to Chapter 52 of the IEE Regulations, particularly Section 522, 523 and Appendix 4: the current carrying capabilities of cables indicated

shall not be exceeded. The Engineer must be consulted as to precise details concerning trunking routes and applications.

All lengths of trunking shall be heavy gauge zinc coated steel connected together by internally fitted rectangular couplings of sufficient width to provide a minimum bearing face of 25mm, to which the lengths shall be bolted on site or welded at the factory.

Adequate provision shall be made to allow for expansion.

All Tee pieces and bends shall be formed with similar means of connection and the inner radii area shall be such that cables will not be bent through a radius less than that prescribed in the IEE Regulations. Only bends and tees of approved pattern will be accepted.

All fixing screws within the trunking shall be of the round head type. The trunking shall have an over-lapping well-fitted lid securely fixed to the trunking by approved means that will avoid damage to the cables. Self-tapping screws shall not be used.

All necessary accessories including long sleeve couplings, end piece, bends, sets, tees, reducers, branches, fillets, pin racks, cable retainers etc., shall be purpose-made units rather than being fabricated on site.

Where a change in direction of trunking run occurs, the deviation should be effected by a purpose-made unit manufactured on similar lines to the bends and tee pieces described above. Where this is not practical, changes in direction shall be fabricated in a neat workmanlike manner. All joints shall fit closely and gaps will not be permitted. All burrs and sharp edges shall be removed and no screw shall protrude into or out of the trunking.

Trunking shall be firmly attached to its associated equipment either by bolted flanges or by male bushes and couplings.

Where trunking is connected to equipment by means of flange connectors, the entry into the equipment shall be of the same cross-section as the trunking.

Where trunking does not terminate in equipment, the otherwise open end shall be capped with a cover suitably bolted in position.

Where communications, extra low voltage circuits (category 1) etc., are contained in a trunking, the requisite number of separate compartments shall be provided to segregate the wiring. Where conduits are taken off such trunking they shall not pass through other compartments unless prior permission is obtained from the Engineer.

The entire trunking is required to be recessed in the structure of the building; the finished edge of the trunking is to be installed flush with the plaster work.

Trunking runs shall be so arranged that the lid or cover plate is always on the top or side and not underneath, unless this cannot be avoided, in which case the Engineer's permission shall be obtained.

Wherever trunking passes through walls, vertical partitions etc., a fixed piece of trunking lid shall be fitted to the trunking extended 25 mm either side of the wall or other barrier, this is to allow removal of the adjacent lid without disturbing the building fabric. Care shall be taken to ensure that no opening is left between the trunking and the building structure through which fire might spread.

In addition, a suitable barrier of incombustible material shall be provided and fitted inside the trunking, in accordance with the IEE Regulations 528. On vertical runs of trunking internal incombustible barriers shall be fitted at the distance between floors or 5m, whichever is the less, in accordance with IEE Regulations 527.1.

All necessary trunking support work, hangers, brackets and fixing requirements shall be provided by the electrical Contractor.

Earth links of the appropriate size and type shall be installed at every jointing coupling manufactured bend, etc., throughout the entire trunking system. Where trunking is used to provide a protective conductor it shall comply

with the requirements of Chapter 54 of the IEE Regulations, particularly Section 543; alternatively, a separate protective conductor shall be installed in the trunking to comply with section 543 of the IEE Regulations.

In cases where sheet steel trunking is installed and there is danger of movement, a flexible earth conductor shall be installed bonding all joints in the trunking. This shall be fitted in addition to the standard earth links. Cable retaining strips shall be fitted at 1 m intervals. Insulated cable support pins shall be fitted at intervals of 4 m in vertical runs of trunking and at the top of the vertical trunking.

6. INSTALLATION OF CABLES

6.1 GENERAL

Cables shall be rated for the maximum connected load with due consideration to the following factors: -

- i. Voltage drops not in excess of 4% of the nominal voltage.
- ii. Ambient temperature.
- iii. Degree of excess-current protection.
- iv. Grouping
- v. Cables run under defined conditions.

6.2 BENDING OF CABLES

Bending of cables shall be in accordance with clause 522.8.3 of the IEE Regulations and no cable shall be bent to radius less than that specified by the cable manufacturers.

6.3 JOINTS IN CABLES

The wiring shall be carried out on the looping-in principle. All joints shall be made at the terminals of main switches, distribution boards, ceiling roses, switches and socket outlets, etc. and fixed apparatus only. **No joints** shall be made in conduits and other cable raceways unless specifically approved.

6.4 PVC / XPLE INSULATED CABLE

The wiring shall be carried out in 250 Volt grade or 440 Volt grade for 3 phase PVC / XLPE Insulated cables, as specified elsewhere run drawn in non-metallic conduits. The cables shall be of the sizes specified on the drawing.

6.5 WIRING INSTALLATION

Cables shall be drawn into accessories, distribution boards and switchgear after the erection of the conduit system. Under no circumstances shall it be permitted to draw cables into an incomplete section of the conduit installation.

6.6 CABLES IN CONDUITS AND TRUNKING

All cables shall be polyvinyl chloride (PVC) insulated to BS 6604, "PVC-insulated cables (non-armoured) for electric power lighting", 450/750-volt grade, or cross linked polyethylene (XPLE) unless an alternative is specified elsewhere in the contract documents.

The quality and size of cables contained in any one conduit shall comply with IEE Regulations.

No cable with a cross-section area of less than 1.5mm² shall be used. All cables installed in a conduit or trunking system shall be PVC / XLPE insulated conductors and shall be colour coded in accordance with the IEE Regulation 524.3 and 514.3.

Final sub-circuits shall be run in conduits separate from main or sub-main cables.

All cables in conduit shall be drawn in simultaneously.

All cables shall be drawn in without the use of excessive force, without the use of lubricants and the wiring shall be easily withdrawable.

6.7 TERMINATION OF CABLES

Cables shall be terminated in accordance with **Chapter 52 of the IEE Regulations, particularly Section 527.**

Cables shall be terminated by one of the following methods: -

- a) The cable conductors shall be sweated into lugs of the appropriate size for the cable and equipment terminal.
- b) The cable conductors shall be secured by compression type lugs of the correct size for the cable and equipment terminal.
- c) The cable conductors shall be secured in pinch screw terminals.
- d) The cable shall be secured by means of clamps.

Where cables are required to terminate at connectors, as at lighting points, such connectors shall secure all the strands of stranded cables. Care shall be taken to ensure that cables are not damaged during preparation for termination.

Cables terminating at pinch screw terminals shall be twisted together and single cables shall have the conductor doubled back to ensure adequate surface for pinching screws.

Cables connected to lamp holders or other components at which heat is produced shall be insulated with heat resisting material capable of withstanding, without detriment, the temperature encountered.

All terminations on PVC/SWA/PVC insulated cables shall be by compression type glands of an approved design and manufacture with facilities for clamping the armouring the outer sheath of the cable.

Glands mounted outdoors shall incorporate a seal to prevent ingress of moisture into the gland, and all glands shall be fitted with a thermoplastic shroud.

Where circular terminations are to be made, these shall be completed using Ross Counterney terminals.

Where cables are terminated in "Klippon" type terminals with parallel faced jaws, the individual cores shall be terminated using the appropriate flat or hook blade crimped lugs. Where the terminal faces are concaved, the cores shall be terminated in wires pin crimped lugs.

The electrical Contractor shall avoid multiple connections under one screw or one pin. Where more than two wires are required, a common termination jumper bar shall be used.

Terminals shall be mounted on rails or supports. All internal wiring is to be clearly marked by markers.

6.8 SEGRAGATION OF SERVICES

Cables of differing voltages shall be segregated so that there is no possibility of a fault in a power cable damaging any adjacent cables or imposing a different voltage upon them in accordance with **IEE regulation 528.**

6.9 IDENTIFICATION OF CABLES

All cables shall be fitted with non-corrosive cable identification bands at each end, and at all changes of direction where they leave a group of cables. All cable cores connected to equipment having marked terminals shall be fitted with non-corrosive identification bands bearing markings corresponding to those of the terminals at both ends.

7. EARTHING

All earthing shall be as PME Earthing (TN-C-S) System

The whole of the metallic portion of the installation, other than current carrying parts, shall be electrically and mechanically bonded to the consumer's main earth terminal and also if applicable, to the lightning protection system or other points specified.

The installation shall be earthed in accordance with the Seventeenth Edition of the Regulations for Electrical Installation issued by the IEE, BS CP1013, "Earthing" and BS 6651' "The protection of structures against Lightning". The electrical Contractor's attention is drawn to Chapter 54 of the IEE Regulations and to the Earthing and Lightning Protection Consultants Handbook publication CHB/4/95 by W. J. Furse & Co Ltd.

A main earth terminal shall be supplied and installed adjacent to the electricity supply cable termination. The terminal shall be of ample size and capacity to suit the installation. All items of equipment, switchgear, etc., shall be bonded to this earth terminal using PVC / XLPE insulated PVC / XLPE sheathed cables, coloured green and yellow as per table 51 and sized in accordance with **section 543 of the IEE Regulations**. An invarine label reading **"SAFETY ELECTRICAL CONNECTION - DO NOT REMOVE" in engraved upper case characters not less than 4.75mm high**, shall be permanently fixed immediately adjacent to or on the earth terminal.

A heavy duty copper clamp **complying with BS. 951** shall be used to bond the main protective conductor to the electricity supply cable armouring or metallic sheath (where applicable the armouring and sheath shall be bonded together).

All protective conductors shall, where possible, be enclosed within metal trunking or conduit serving switchgear, distribution board etc., so as to provide mechanical protection. Where protective conductors are run on building surfaces they shall be properly fixed and supported by means of PVC coated metal saddles along selected routes.

Earth continuity between separate items of switchgear, distribution boards etc., mounted adjacent to one another shall be affected by means of high conductivity continuous copper tape, or PVC / XLPE sheathed cable, coloured green and yellow **as per table 51** and sized in accordance with the **Section 543 of the IEE Regulations**, connecting all items to the earth terminal.

All items of switchgear, accessories, luminaires, conduits, and the outer sheaths of MICC cables, the armouring of all PVC/SWA/PVC cables together with all other items of electrical plant and equipment shall be effectively earthened by means of a protective conductor.

At every terminal point on the fixed wiring an integral earth terminal shall be provided e.g BESA boxes, accessory boxes etc. A protective conductor shall be provided and installed between this terminal and the earth terminal on the associated switch, socket outlet, luminaire etc.

Each circuit protective conductor shall be connected to a multiway earth terminal provided and fixed within each distribution board. The earth terminal shall be provided with an adequate number of ways such that not more than one conductor per terminal shall be installed and the earthing conductors shall be connected in the same sequence as the current carrying conductors.

All metal piped services, e.g., Heating, Water and Gas Services, wastes and piped services at sinks, baths and showers etc., shall be bonded to the earth terminal in accordance with the **IEE Regulations 411.3.1.2**.

A 50 mm section of each gas and water pipe, at position close to their entry into the relevant building, shall be cleaned and made smooth. A copper-earthing clamp designed to permit the connection of protective conductors shall be provided and sized in accordance with **Section 543 of the IEE Regulations**.

The clamp shall be a proprietary type or shall be fabricated from high conductivity copper strip, minimum size 40 mm x 4 mm which shall encircle the cleaned sections of the pipe. A permanent label indelibly marked with the words, **"SAFETY ELECTRICAL CONNECTION - DO NOT REMOVE"** in legible type not less than 4.75 mm high, shall be permanently fixed at the points of connections.

The final connection of bonding conductors from gas, water pipes and other services to the earthing terminal shall not be completed until earth electrode and earth impedance tests have been satisfactorily completed.

Bonding connections to pipework shall be as un-obstructive as possible and where practicable shall be made in service ducts or accessible voids and shall be indicated on the Record Drawings.

All materials and sundry item shall be provided whether or not specifically mentioned necessary to completely and effectively earth the installation. The installation shall be fully protected against dampness and corrosion and the effect of electrolytic action between dissimilar materials. A completely permanent installation shall be provided which shall be fully accessible for regular testing and inspection.

The value of earth resistance from any point of an installation to the general mass of earth shall be low enough to ensure operation of circuit protective devices and shall in any case not exceed the following:

- i. Four (4) ohms for electrical equipment**
- ii. One (1) Ohm for ICT Equipment**
- iii. Seven (7) ohms for lightning protection system**

Each earthing cable shall terminate in an approved design of cable lug.

Where earth conductors are run upon structures or walls they shall be fastened by means of heavy gauge non-ferrous fasteners not more than 0.75 m apart on horizontal runs and not more than 1.2 m apart on vertical runs and to give a minimum clearance of 4 mm from the fixing face.

In the event of the electrical Contractor not being able to establish a suitable earth connection to the electricity supply cable, earth electrodes shall be installed which shall be galvanized or copper clad steel extendable rods not less than 16 mm diameter and not less than 1.2 m in length. Connections to electrodes shall be made by means of solderless mechanical clamps.

To avoid corrosion, all earth system connections shall be cleaned bright and immediately covered with silicon MS4 compound or approved equal.

Earth pits, where required, shall be in accordance with the Contractor's relevant drawings, with the facility to disconnect the earth ring while measuring the electrode earth resistance.

Where fittings and accessories require earthing, an earth continuity conductor shall be run through the conduit. The earth continuity conductor shall be a green coloured PVC / XLPE insulated copper wire of minimum size 2.5 sq. mm and shall be continuous between terminals. Where the earth terminal is formed by a brass screw and washer, "Ross Courtney" type terminations shall be used. All switches, socket outlets, ceiling boxes etc., shall be supplied with an earth terminal.

Earth Continuity: Each final sub-circuit that is required to be earthed shall be provided with its own individual earth continuity conductor which shall be run from a terminal on the earth bar in the distribution board or consumer's control unit protecting that particular final sub-circuit.

8. FUSED SWITCH UNITS, SWITCHFUSES AND ISOLATORS

The above units comply with **BS 5419** and shall be **500-volt type** and installed where specified and indicated on the relevant drawings.

All switchgear shall be provided with suitable locks for padlocking the switches in the 'OFF' position. The cover shall be interlocked with the operating mechanism to prevent it from being opened in the 'ON' position. This interlocking shall also prevent the switch from being closed with the cover open unless for maintenance purposes. The cover shall be gasketed to prevent ingress of dust.

The switch action mechanism shall be of the parallel operation (double break type having cartridge fuses mounted switches) and shall be **ASTA certified** to meet adequately all the duties specified.

The end plates shall be removable for drilling for conduit or cable entry and shall be fitted with additional distance pieces where necessary. Switchgear boards shall be fixed to the wall/floor by Rawl bolts or other approved fixings.

No building alteration shall be allowed when moving the switchboard into position, the switchboard being supplied in sections to be built in position, if so required.

Switchgear shall be delivered to site when required to suit the progress of the works. Care shall be taken to preserve the manufacturer's paint finish. Any refurbishing etc. shall be carried out, using paint obtained from the switchboard manufacturer, to the original standard of finish.

All fuses in switchgear shall be HRC fuses sized for the fused-switch units or switch-fuses etc., in which they are incorporated. They shall be ASTA certified for compliance with BS 88, Category of Duty 440 A.C 5 Class 01 and in all cases fuse links shall be selected to provide circuits discrimination.

9. CONTROL PANELS AND CUBICLES

The details specified shall apply as far as fused switches, bus-bars and rating etc are concerned. The panels shall be constructed from rolled steel channel minimum size 60 mm x 30 mm deep x 5 mm or equivalent angle section clad with sheet steel of 3 mm gauge. 2 mm gauge may be used for covers and doors of not more than 1 m square.

Terminals shall be of the "Klippon" standards rail-mounted feed-through type or approved equal. All terminals shall be identified by means of numbered or lettered marking tags, which shall be identical to the number of letters applied to the cables. Cables shall be identified as terminations by means of cable markers as manufactured by "Klippon" or approved equal. 25% spare terminals capacity within wiring duct shall be provided. All components motors, starters, relays, timers, etc. shall be labelled showing their reference and function and these shall relate to the panels' schematic wiring diagram provided with the "As-built" drawing and manuals.

All control panels shall be fitted with multi-pole isolating switches through which all electricity supplies shall pass. The door(s) of the control panel shall not open unless the isolating switch is in the "off" position. A facility to lock the control panel isolating switch in the "off" position shall be included.

10. DISTRIBUTION BOARDS

a) General

All distribution boards, unless stated otherwise, shall be miniature Circuit Breaker Distribution Boards and shall be of surface or flush type, as specified or instructed on site. Facilities for local isolation of the distribution boards shall be provided by either a local fused-switch unit or an integral isolating switch, whichever is specified.

Where surface mounted on a flush installation, all conductors shall terminate behind the board in an adequate box. For surface mounting, trunking shall be fixed between the board and ceiling level, or conduits run directly into the board. Adequate earth continuity connection shall be made between the various components.

b) Miniature Circuit Breaker Distribution Boards

MCB distribution boards shall comply with BS. 5486 part 12 'Particular requirements for miniature circuits-breaker boards'. The cases shall be constructed of heavy gauge sheet steel, in such a manner as to afford rigidity and maximum ease of wiring for full size circuit and main cables.

The cover shall be provided with an efficient gasket or alternatively designed with generous overlapping edges to prevent the ingress of dust. Components shall not be manufactured from zinc alloy in conjunction with sheet steel where they are relied upon for earth continuity.

Where the cover is required to be lockable, cylinder type locks shall be provided, having two keys per lock. All locked distribution boards shall be handed to the Engineering Supervisor on completion of the works. The cases shall be provided with detachable cable/conduit terminating plates, which shall be reversible and interchangeable from top to bottom.

All screws and nuts used in the construction of the case shall be fitted with shake proof washers and care taken to ensure efficient earth continuity. An external earthing terminal with cable socket shall be fitted.

All MCB banks shall be fitted to frames, with robust locking plates provided to ensure the frames rigidly in the fixed position.

The banks shall be so spaced to obviate the necessity for insulating barriers, but protection shall be provided by means of insulating shields to prevent accidental contact with main bus-bars and incoming mains cable.

Bus-bars shall be of high conductivity, hard drawn copper conductors connected to the MCB contacts by means of spring washered screws or bolts, unless plug-in type MCB's are specified.

Neutral bars shall be similar to the main bus-bars and shall have two screw terminals per way for rating of 30 amps or over. Single screw connections will be allowed for capacities up to 30 amps. The neutral bars shall have one terminal for each MCB within the board, and connection of conductors to the neutral bar shall be in the same order as the MCB ways.

Where installations are carried out with cables with a protective conductor, all distribution boards shall also contain internal earthing bars similar to the neutral bars detailed above, with one terminal for each MCB within the board. Earthing conductors shall be connected in the manner described for neutral conductors to neutral bars.

Where a main integral isolating switch is provided in an MCB case it shall be arranged to isolate incoming live and neutral main cables from the bus-bars. The isolator switch shall be rated at 500 volts and of the quick make-and break pattern with positive action. Incoming and outgoing terminals shall be fitted with two clamping screws and outgoing conductors to the bus-bars shall be high conductivity hard drawn copper rods.

Isolating switches shall comply with IEE Regulations, Part 537, and shall be capable of carrying their full rated load continuously and shall 'make' or 'break' their full rated load without undue burning of the contacts.

c) Miniature Circuit Breakers (MCB's)

All MCB's shall have movements which are positive in both directions (make and break) so as to enable units to be closed decisively by the operation of the handle, and to be able to assume the 'OFF' position unless the contacts are definitely separated, to safeguard against false indications.

The handle shall be trip free to make it impossible for the operator to hold the breaker in the closed position under faulty conditions. The operating mechanism and arc chambers of the circuit breaker shall be separated from the terminals and fixing screws.

Terminal identification shall be readily discernable as viewed from the front of the board with automatic and clear signal identification for both 'ON' and 'OFF' position.

All terminals shall be readily accessible from the front and each wiring chamber shall be closed by a screw fixed cover which protects the terminals and prevents dust from settling on the insulation.

Where the full capacity of a distribution board is not required the electrical Contractor shall fix blanking plates in the vacant MCB housings. All MCB's shall be rated at 500 volts minimum, and comply with BS 3871 "Miniature and moulded case circuits breakers" and 4752 part 1, "Circuit breakers".

11. LABELLING AND ENGRAVING

a) Labelling

All fused-switch units, switch fuses, switches, bus-bar chambers, distribution boards etc., and all items of equipment on the main panel shall be identified in accordance with **Section 514 of the IEE Regulations** and shall have securely fitted externally a white 'Traffolyte', 'Formica' or other approved plastic laminate label engraved with 6 mm high black letters detailing the function of the equipment and any reference number.

Red, Yellow, Blue, Black & Green plastic laminate phase discs shall be fixed inside all switchgear and distribution boards to indicate to which phase of the supply the various circuits are connected. The colour rings shall comply with **Part 524 of the IEE Regulations**.

Each TP or TP & N item of switchgear shall have fitted on the cover a white plastic laminate label having '**CAUTION**' - **415 VOLTS**' engraved in 10 mm high red lettering.

b) Engraving

The electrical Contractor shall allow for engraving of all switched fused spurs, double pole switch accessories and any other accessories which are customarily required.

The accessory plate shall be engraved in either black or red, capital letters 5 mm high, detailing and appliance or equipment being supplied by the accessory e.g., 'WATER PUMP' etc.

12. MOUNTING HEIGHTS

The approximate position of main switchgear, control equipment distribution boards, fittings and accessories shall be as indicated on the Drawings. Actual positions shall be determined on site by the Engineer.

Unless otherwise stated on the relevant drawings or directed by the Engineer the following mounting heights of all accessories above finished floor level shall be adhered to: -

- i. Lighting Switches - 1400 mm to center**
- ii. Socket Outlet and Spur - 300 mm to center (or 150 mm above work top level to center)**
- iii. Distribution Boards - 1800 mm to lower edges.**

All groups of accessories shall be in line either vertically or horizontally or as specified.

13. LUMINAIRES

All Luminaires shall be of the manufacture, size and type specified and shall comply in all respects to BS 4533 "**Electric Luminaires**".

The electrical Contractor shall supply and install all luminaires including lamps, lamp holders, control gear, capacitors, glassware, diffusers or other attachments, heat resistant internal cables, fuses and terminals and all necessary suspension gear. In case where Luminaires are supplied by the client the Contractor shall deliver to site, store, install, commission and set to work.

Unless otherwise stated, indoor luminaires shall be suitable for **Class 1 normal indoor environments**, giving a degree of protection against ingress of moisture or dust.

All Luminaires shall be assembled and installed in accordance with the respective manufacturer's instructions/recommendations, in the position and mounting heights specified.

Luminaires shall not be installed under dirty and hazardous site conditions, and any damage or deterioration to luminaires installed under these conditions shall be made good by the electrical Contractor.

The Luminaires shall be cleaned free of dust and dirt after completion of the installation. Where dirt, dust, corrosion or other conditions cause imperfections in the luminaires, they shall be replaced.

Luminaires, diffusers, attachments or glassware etc., shall be properly stored to final erection, in such a manner as to avoid damage of any kind.

Luminaires fixings shall generally be suitable for direct connection to conduit boxes or as otherwise specified. Luminaires not provided with suitable BESA box shall be modified as necessary.

Where a flexible cord supports, or partly supports, a luminaire the maximum mass supported by the cord shall not exceed the values set out in **IEE Regulations 522.8**

The minimum cross-section area flexible cord to be employed shall be 0.75mm².

Specified attention shall be given to Chapter 52 of the IEE Regulations, particularly Regulation 521-5 and 521-6, Appendices 1 to 15.

Pendant tungsten luminaires shall be fitted with heat resistant flexible cord complying with BS 6500, capable of continuous operation with a conductor temperature of 150 degrees C. The cable shall be of the circular multi-core type, finished white, if not otherwise specified.

Ceiling mounted tungsten luminaires; spotlights and other luminaires of the category 'hot' luminaires shall be wired internally with cables suitable for continuous operation at 185-degree C. Where cable tails are provided they shall be of the heat resistant type capable of operation at 185-degree C.

Exterior luminaires, fixed to the walls of buildings etc., shall be wired such that final circuit wiring terminates within the luminaire. All final circuit cables so installed shall be provided with heat resistant slaves from the connection point within the luminaire for a distance of 300 mm.

All fluorescent and other discharge luminaires shall be provided with an integral fused connector block. The rating of the fuse shall be in accordance with the manufacturer's instructions to protect the internal wiring of the luminaire and to provide discrimination between final circuit protection and luminaire protection.

All recessed and semi-recessed luminaires in ceilings shall be connected by three core 0.75 mm² high temperature flexible cord from the terminals of the luminaires to a plug-in ceiling rose fixed and connected to an accessible outlet box in the wiring system, within the suspended ceiling immediately above the luminaire. The ceiling rose shall be accessible via the opening provided in the ceiling.

The electrical Contractor shall ensure that the methods of suspension for luminaires are electrically and mechanically sound.

Luminaires suspended by means of tubes shall be fitted to ball joints allowing a swing of at least 20 degrees all round. Reliable earthing between the fixed and moving parts shall be provided by means of a flexible braided copper tape.

Fluorescent luminaires shall be provided with a minimum of two fixings, except in the case of recessed modular luminaires or surface-mounted luminaires exceeding 300 mm in width, where four number fixings (one from each corner) shall be provided by means of conduit drops or threaded rods.

Normally visible luminaires support shall be conduit. All fluorescent luminaires shall be solidly mounted with all assembly nuts, bolts and accessories made tight to prevent vibrations and noise. Anti-vibration packing shall be fitted where necessary. Luminaires mounted direct to trunking shall be fixed by means of the manufacturer's recommended fixing assemblies.

Unless stated otherwise, all luminaire supports shall be fixed to the building primary structure. Luminaires shall not be supported from suspended ceiling unless otherwise specified. The electrical Contractor shall be responsible for mounting and fixing arrangements.

Break joint rings of approved colour shall be provided for all suspended luminaires and fluorescent batten luminaires where the batten is of insufficient width to cover completely the conduit box and its associated clearance hole in the ceiling.

The metalwork of all luminaires shall be effectively bonded to the earthing system in accordance with Chapter 54 of the IEE Regulations.

Care shall be taken to ensure that the internal wiring of luminaires and the cables of any fixed wiring shall not be in contact with high temperature areas in luminaires.

Lighting track shall be of the type, size, finish, number of circuits and manufacture specified and shall comply with the requirements of the relevant section of **BS.4533**. The positions of luminaires as shown on the Drawings are approximate only and exact position shall be determined after reference to the **Engineering supervisor**.

14. LIGHTING SWITCHES

Lighting switches shall be of the type, size and manufacture as specified.

Wall and ceiling switches shall comply with **BS 3676**. Wall and ceiling switches controlling A.C lighting circuits shall be rated 6 or 10 amps and be of the slow-break quick-make, type unless stated otherwise.

Where several switches on one phase are shown at one position, a ganged box shall be used.

Where switches at any location are connected to different phases, purpose-make phase barrier switches shall be installed. The phases shall be separated by means of rigidly fixed barriers and the cable for each phase shall be confined to the area enclosed by the barriers for that phase.

Switches connected to a particular phase shall have separate cover or covers fitted over each phase. The covers shall be engraved, "CAUTION 415 VOLTS".

The switch plate of the specified finish shall be fitted over phase cover to render the switch unit indistinguishable from the switches that are not phase barrier switches.

Alternatively, each gang shall have its own piping and box for each phase, physically separated from other phases with similar arrangements.

For flush position on a plastered or equivalent finish wall, the switches shall have overlapping plates.

In any places where the finish is fair-faced brickwork, the wiring shall be installed on the back of the wall and make a back entry into the accessories. Each switch in these areas shall be neatly recessed and shall incorporate an overlapping plate.

For surface-mounted positions and such Plant Rooms, Electrical Switch room etc., employing a surface-mounted system or wiring, switches shall be surface-mounted, having metal front plates of an aluminium finish, mounted in matching metal boxes.

15. SOCKET OUTLETS

All socket outlets and plugs shall be supplied and installed in accordance with the manufacture, type, sizes and finish specified.

All round pin 2A, 5A, 15A, and 30A socket outlets shall comply with the requirements of **BS 546**.

All sockets outlets shall be switched and complete with safety shutters, unless otherwise specified.

All switched sockets outlets shall be complete with steel boxes of the same manufacture, complete with earth terminal.

Assemblies shall comply fully with the requirements of the **IEE Regulations concerning the bonding** of protective conductor terminals and each such terminal shall be connected by a conductor, having a minimum cross-sectional area of 2.5 mm², to a permanent earthing terminal incorporated in the associated box providing an effective, solid connection to the earth continuity conductor of the installation.

Where the assembly does not provide a reliable electrical contact between the cover plate and box with effective connection of metal operating bars and toggles, then an insulated earthing lead shall be provided, solidly connected to the metal plate and operating bar or toggle and terminating at the fixed earthing terminal incorporated in the associated box. 13 amp sockets will generally be installed using ring circuits in accordance with **15 of the IEE Regulations**.

All plugs shall be of moulded rubber or other resilient material complying with **BS 1363 or BS 546**. The plug shall have internal cord grip. 13 amp plugs shall be fitted with cartridge fuse links to **BS 1362**. The fuse rating shall be selected to give protection to the flexible cord or cable connected.

All fuses installed within 13 Amp plug top, fused spurs, clock connections etc., shall be cartridge fuse links rated at 240 volts, **ASTA certified for compliance with BS 1362** 'General purpose fuse links for domestic and similar purposes', or **BS 464** 'Cartridge fuse links (rated at up to 5 amperes) for AC and DC service', or **BS 2950** 'Cartridge fuse-link for telecommunications and light electrical apparatus'.

All equipment which is locally fused shall have fitted fuses with characteristics which are recommended by the manufacturer of the equipment.

If any appliance or equipment suffers due to incorrect fusing of the appliances, such appliances or equipment shall be repaired or replaced at the electrical Contractor's cost, to the satisfaction of the Engineer.

16. INSPECTION AND TESTING

A visual inspection shall be made in accordance with IEE Regulations Chapter 61. References shall be made to Appendix 6 of the IEE Regulations, which is a checklist for initial inspection of installations.

The electrical installation shall be inspected and tested by the electrical Contractor in accordance with Chapter 61 of the IEE Regulations.

Where any part of installation is to be concealed within a building, fabric tests shall be made to ensure that the installation is satisfactory prior to concealment.

Upon completion of the works the whole installation shall be subjected to the tests detailed hereafter and every defect shall be noted, corrected and brought to the notice of the Engineer.

All tests shall be witnessed by the Engineer to his full satisfaction and he shall be given at least one week's notice in writing of the proposed tests.

All labour and test instruments shall be provided by the electrical Contractor and the instruments shall be correctly calibrated and certified for the limits of accuracy required and shall be operated by a competent person. If, in the Engineer's opinion, a particular instrument is not suitable, then an acceptable alternative shall be provided. The Engineer shall be at liberty to demand the use of any testing instrument or apparatus that he may reasonably consider to be necessary in the execution of the testing.

In the event of the installation failing to pass the test, the Engineer has the full authority of the Employer to deduct from the Contract Price all reasonable expenses incurred, due to him being required to attend a repetition of the test.

The following items, where relevant, shall be tested in the sequence indicated. Standard methods of testing, in respect of some of the following regulations of this section, are given in Appendix 6 of the IEE Regulations.

- i. Continuity of ring final circuit conductors.
- ii. Continuity of protective conductors, including main supplementary equipotential bonding.
- iii. Earth electrode resistance.
- iv. Insulation resistance.
- v. Insulation of site-built assemblies.
- vi. Protection of barriers or enclosures provided during erection.
- vii. Insulation of non-conducting floors and walls.
- viii. Polarity.
- ix. Earth fault loop impedance.
- x. Operation of residual current devices and fault voltage operated protected devices.

Upon completion of all tests and commissioning, two copies of detailed certificates shall be provided by the electrical Contractor to show that the equipment, materials, installation etc., have been tested and commissioned. One copy of each, duly completed and signed shall be submitted to the Engineer within 15 days of the results being obtained. The second copy of the certificates shall be retained to be included with operator and maintenance manuals. The results of the test and details of completion for the electrical test shall be detailed on the Test and Completion Certificates respectively; issued by the National Inspection Council for Electrical Installation Contracting or other approved authority.

17. SUPPLY AND DISTRIBUTION

a) Metering

The [K.P&L.Co. \(Power Utility Company\)](#) Meter is to be located in the meter board

HT Meter from Power Utility Provider shall be as specified in the Utility provider requirements

All switch fuses, fuse switches, MCBs, MCCB's including meters shall be of reputable manufacture meeting current British standards as stipulated in the general specifications. Any other quality that does not strictly meet these standards shall not be acceptable.

b) Supply

The premise is to be fed from the HV / LV switchboard. This feeds power panels, rising mains, distribution boards and consumer units located at various load centers.

These boards feed various sub-mains boards, which in turn feed the final sub-circuits

18. LIGHTING AND SMALL POWER INSTALLATIONS

a) Installation system

With the exception of where otherwise noted on the drawings, the installation shall throughout be carried out in PVC or XLPE cables of not less than 1.5mm² copper drawn in high grade PVC conduit.

b) Lighting control system accessories

The switching arrangements for the indoor lighting shall be as indicated on the drawings.

Types of Manufacturer for accessories and fixed apparatus to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be as MK, Clipsal, Philips or Legrand but shall be subject to the approval of the Engineer.

c) Connections to fixed appliances

The Contractor shall supply and interconnect flexible cords between spur units'/outlet boxes and the appliances where flex connections are needed.

All connections shall be made by white heat-resisting PVC / XLPE flexible cords having fuse rating in accordance with the respective circuits subjected to a minimum of 1.5mm².

d) Mounting heights and locations

All mountings heights stated shall mean the heights from finished floor level to underside of the accessory.

- i. Lighting control switches - 1400mm above floor level and 100mm away from architrave. If mounted in a column they shall be located in the center.
- ii. Socket Outlets - 300mm above finished floor except for areas that are otherwise stated on the drawings.
- iii. Connection Units and Outlets - Connection units having cord outlets shall be located as to limit the length of the flex cord to approx. 600mm and be located slightly higher than the inlet on the appliances. The same applies to outlet boxes.
- iv. Conduit Boxes (General) - Where one fitting is shown in a room the box shall be in the centre (unless otherwise stated). Where two or more fittings are to be installed, they shall be half of the between two fittings. Where one row of fittings is to be installed they shall be located in the center. Where installed between beams they shall be in between two beams. All boxes shall be with covers.

e) Wall and ceiling finishing's

The Contractor is to obtain information regarding ceiling claddings before the installation is commenced as he will be held responsible if the conduit boxes as well as for switches and socket outlets, telephone etc are not installed at the right depth.

f) Lighting fittings

The Contractor shall supply, deliver to site, install and commission all the fittings.

Types of Manufacturer for light fittings and associated accessories to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be as Thorn & Philips but shall be subject to the approval of the Engineer.

Where appliance's fittings shall be supplied complete with bulbs or tubes, the tubes shall be as Thorn or Osram Manufacturers. The bulbs shall also be Phillips, Osram or GE makes. Equivalent makes may be substituted but shall be subject to the approval of the Engineer.

g) Fixing and location

Details of fixing and location of various fittings are as shown on relevant drawings.

Fluorescent and incandescent fittings shall, in addition to being fixed to the conduit boxes, also be fixed by means of PVC covered raw plugs (no wooden plugs) at the fixing centres.

h) Outdoor Installations

A rubber gasket shall be fitted on the conduit boxes for the outdoor fittings in order to provide a waterproof seal.

All switch panels shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be as MK, Clipsal, Philips or Legrand but shall be subject to the approval of the Engineer.

Each switch panel shall be fed from a particular phase as NOT more than one shall be allowed inside one panel. Separate conduits shall be installed to each panel.

i) Power installations

The Contractor shall include for all installations shown on the drawings and specified in the bills of quantities.

The Contractor shall satisfy himself that there is a continuous conduit, trunking and/or duct system to facilitate installation of the entire power installation and shall be held responsible where continuity does not exist.

j) Installation system

The installation system for the indoor installation shall be carried out in concealed PVC conduits, PVC ducts and surface mounting trunking. The size of the cables shall not be less than 2.5mm² for ring main circuits.

19. FIRE ALARM INSTALLATIONS (Where Applicable)

The installation for the above shall be carried out using fire tuff 1.5mm² copper cables drawn in high impact grade PVC conduits.

The Contractor shall ensure a continuous link-up between individual break-glass call units, automated devices, bells and the panels. Also the link between individual occupancies and the main panel that shall be located in the block shall be ensured.

The fire alarm system must be intelligent type and fully addressable.

20. STRUCTURED CABLING, SECURITY, CCTV, ACCESS CONTROL & BMS INSTALLATIONS (Where Applicable)

a) Installation system

In the bid for electrical installation, supports for all cables in the structured cabling, security, CCTV, Access Control & BMS systems shall be included.

The electrical bidder shall include for trunking, conduits etc. to ensure a continuous supply system from the telephone / ICT room / Server room to any individual outlet.

The ICT and security contractors shall do all cabling and the backbone superhighway along the vertical building riser.

The same shall have appropriate plug on points for the occupants on each floor.

Holes in structures shall be provided by the main contractor.

The conduits shall at each point terminate in deep switch-boxes as specified for lighting control switches.

b) Mounting heights and locations

Mounting heights shall be as for socket outlets.

c) Blank-off plates

All Blank off plates shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be as MK, Clipsal, Philips or Legrand but shall be subject to the approval of the Engineer.

Blank plates shall be flat type and shall match wall colour.

21. EXCLUSIONS

Exclusions (This clause DOES NOT apply for this contract)

Excluded from this Sub-Contract is;

- i. Control panels for motor-starters and internal wiring between control-panels, motors, thermostats etc.
- ii. Supply and installation, including wiring, of alarm security and equipment. This excludes conduits, draw-wires, boxes, holes in trunking system and blank-off plates, which forms part of this Sub-Contract.
- iii. All telephone system and equipment. This excludes conduits, draw-wires, boxes, holes in trunking systems and blank-off plates which forms part of this contract.

22. DEFINITIONS & INTEPRATION OF ELECTRICAL TERMS

The terms, phrases and abbreviations shall be deemed to have the following meanings wherever used hereinafter and in all contract documents.

i. Lighting Point:

"Install a lighting point complete with concealed diameter 20mm Ø H.G. PVC conduit, conduit couplers, conduit bends, box, wiring in 3x1.5mm² PVC / XLPE S/C CU cables and all accessories, but excluding the light switch".

ii. Socket Outlet:

"Install 13A power outlet comprising Trunking/concealed diameter 20mm Ø H.G. PVC conduit, conduit couplers, conduit bends, box, ring mains wiring in 6x2.5mm² PVC / XLPE S/C CU cables and all accessories including 13A switched Socket plate.

All socket outlets must have safely shutters on both live and neutral.

iii. Telephone Point:

"Install telephone cord outlet point complete with Trunking/ concealed diameter 25mm Ø H.G.PVC conduit box, and draw wire."

All Telephone outlets must have Continuous links interlinking all the points.

iv. 20A DP Outlet:

"Install outlet for 20A DP switch comprising Trunking/ of concealed diameter 25mmØ H.G PVC conduit, wiring in 3x2.5mm² PVC / XLPE S/C CU cables,box and 20A DP switch plate with neon light and all accessories".

v. Security Alarm Call Point.

"Install outlet for security alarm call point comprising Trunking/concealed diameter 20mm Ø HG PVC conduit, draw wire and box including blanking plate.

All call points must be interconnected.

vi. Consumer Unit:

"Supply and install SP/N power consumers' unit complete with SP/N Integral isolator".

vii. Distribution Board:

"Supply and install TP/N power distribution board, complete with TP/N integral isolator."

viii. Earthing:

Protective multiple earthing to Kenya Power and Lighting Co. (K. P. & L. Co.) Standards comprising 1200mm deep-driven pure electrolytic copper earth electrode, electrode clamps, yellow/green earth lead, earth pit complete with cover and all accessories".

ix. Labelling:

"Comprehensive, concise and instructive permanent labelling of all the sub-circuits, complete with identification of the sizes of all the sub-circuit cables, permanent traffolyte identification of the board such as "DB A" and identification of the sizes of the sub-mains and their origin e.g. "Board A: Supply, 4.x16mm²; SOURCE, DB1"

x. Blanking Plates:

"Supply and install blanking plates in all the spare ways."

xi. Switched Spur Outlet:

"Install 13A fused, switched spur outlets with neon light and 5A Integral fuse complete with Concealed diameter 20mm Ø H.G PVC Conduit, box, wiring in 3x2.5mm² wiring for power supply and all accessories".

xii. Trunking:

"Supply and install 250x50mm white stove-enamelled 3-compartment metal trunking (to details shown) complete with bends, end plates cover, screws etc and all accessories.

xiii. Cooker outlet:

"Install 45A DP cooker control unit, complete with concealed box, concealed diameter 25mm Ø H.G.PVC conduit, box, wiring in 3x6.0mm² PVC / XLPE S/C CU cables and all accessories including 45A DP cooker control unit, with an integral socket fitted with neon lights, and cooker connector unit.

xiv. 32A TP outlet:

"Install outlet for 32A TP switch comprising of concealed diameter 32mmØ HG PVC conduit, wiring in 4 x 6.0+6.0mm² etc. PVC / XLPE S/C CU cables, box, 32A TP switch plate with neon light and all accessories.

xv. Specifications

All light fittings and associated accessories to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be as Thorn & Philips but shall be subject to the approval of the Engineer.

Proposed TSC Machakos Office Block – Elec & ICT Particular Specifications

All Sockets, telephone outlets, TV outlets, switches, spur outlets, fixed apparatus and all other related accessories to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be as MK, Clipsal, Philips or Legrand but shall be subject to the approval of the Engineer.

All Isolators and associated accessories to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be Hager but shall be subject to the approval of the Engineer.

All Distribution boards / Consumer units and associated accessories to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be Merlin Gerlin but shall be subject to the approval of the Engineer.

All Conduits and associated accessories to be used shall be as Specified in the bills of quantities. Where the in the event it is not mentioned, the default manufacturers shall be Metro but shall be subject to the approval of the Engineer.

All conduits/ducts must be heavy gauge. Where steel pipes are specified, they must be minimum of **Class B** in strength.

xvi. Contract

The electrical contract shall be for supplying, delivering, fixing / installing, testing, commissioning and setting to work to the full satisfaction of the Engineer and the Contractor's price must include all costs for the entire process.

The installation shall be carried out strictly in accordance with the provision of the **17th Edition of Wiring regulations as published by the Institution Electrical Engineers, Great Britain**, the most current relevant standards issued by the **Kenya Bureau of Standards**, and with strict adherence to the safety requirements and **by-laws of the Kenya Power and Lighting Co. Ltd.**

All equipment and accessories supplied for the contract must be certified by the Kenya Bureau of Standards and a certificate issued upon request.

The Contractor shall ensure that the highest standards of workmanship and highest quality materials are used at all times. Inferior workmanship and low quality materials shall be rejected and replaced at the Contractors own cost.

Other than ceiling fixture accessories, light fittings etc, all the other mounting heights will be re-confirmed with the Engineer on site.

All light fittings must be completed with appropriate lamp, bulb, tube, starter, control gear, etc as applicable

STRUCTURED CABLING INSTALLATIONS

PARTICULAR SPECIFICATIONS

SECTION 02:

2b. PARTICULAR SPECIFICATIONS FOR STRUCTURED CABLING INSTALLATIONS

1. SCOPE

The scope of the contract is twofold namely supply, deliver, install, test and provide certification for a complete and operational structured cabling system and to perform the disconnections, removal, and relocations etc. of the existing telephone and computer installations.

This will involve backbone connection from the server in the Computer room to the new GIBIC/switches and Horizontal cabling from the administration cabinet

The structured cabling shall be of star topology.

UTP installation shall be purely **Cat 6A (Unless Otherwise stated in the Bills of Quantities)** structured cabling.

All necessary accessories shall be inclusive.

2. STANDARDS & REGULATIONS

The system should follow the following standards as a minimum:

- ISO / IEC, CAK, ATM CENELEC 11801
- ANSI/ BICSI / EIA / TIA 56
- Latest Edition of the IEEE / IET regulations
- Kenya Bureau of Standards
- National Electrical Code
- UL 2024A Optical Fiber Cable Routing Assemblies for non-metallic cable pathways
- NEMA VE1/CSA22.2
- Electric Power Act and Rules made there under.
- Any other Federal, state, and local codes, rules, regulations, and ordinances

3. DEFINITIONS & INTEPRATION OF ICT TERMS

The terms, phrases and abbreviations shall be deemed to have the following meanings wherever used hereinafter and in all contract documents.

Data Point: Shall in the case mean an installation complete with data cable linked from the patch panel in the respective area cabinet to the outlet via the pathways installed by others to close proximity of the desk but excluding the faceplate.

Telephone / Voice Point: Shall in the case mean an installation complete with telephone cable linked from the patch panel in the respective area cabinet to the outlet via the pathways installed by others to close proximity of the desk but excluding the faceplate.

4. NETWORK MANAGEMENT SYSTEM

Bidders must propose the manufacturers Network Management system for centralized configuration, maintenance and troubleshooting of active equipment's. Third party standalone systems should not be offered as part of the solution. Features and functionalities of the system should include the following:

- (a) Should be compatible with Microsoft windows/Linux operating systems
- (b) Graphical User Interface for central Management and network viewing
- (c) Network discovery and inventory management
- (d) VLAN, multicast, security and load-balancing/fail over configuration
- (e) Downloading and saving of log file from the device flash memory
- (f) Centralized upgrade/backup and archiving of active devices
- (g) Export of network topology to JPEG or other standard formats.

5. EQUIPMENT NETWORK CABINETS

The work-group network or switches and patch panels arrangement shall be housed in an equipment cabinet/rack to be supplied by the sub – contractor to be appointed

The cabinet shall be metallic (appropriately sized as specified in the BQ) and all mounting accessories

The cabinet should be constructed to enhance cooling and ventilation.

Cabinets shall be required to have the following:

a) Front Doors

- For Server room Free Standing cabinets, the front door shall be perforated (75%) Arc-Fold with Swing
- For other wall mount cabinets, the front door shall be made of Tempered glass

b) Rear Doors

- For Free Standing Cabinets they shall have 1 x Double-section Full Perforation with Swing Handle Lock (Hexagon Honey-Comb)

c) Side doors

- For Free Standing Cabinets they shall have 2 x Lift Off Type with Quick Release Catch & Cam Lock
- For Wall Mounted Cabinets they shall have 2 x Lift Off Type with Quick Release Catch & Cam Lock

d) Top Tray - 6 x 4-inch Top Fan Tray with Guard & Filter (Low Noise)

e) Frame – Shall be Full Vented Top Frame with Front / Rear / Side Cable Entrance

f) Finish – Shall be as Epoxy Powder Coating (RAL 9004 Black)

g) Complete with Cable Management, Cable duct cover, Lock & Key, Panel Mounts, Base frame with provision for cable entrance, Set of Heavy Duty Castor wheels, Set of Levelling stands

h) 12 Way Power Distribution unit with 13A UK Sockets for 240V and all other accessories required.

6. NETWORK SWITCHES (ACTIVE CONTROL EQUIPMENT)

The network switches used shall be able to support Gigabit speeds and will have power over Ethernet capability, UTP Star cabling topology, preferably a switching hub capable of being set up as a Virtual LAN (V-LAN) and compatible with any existing LAN Management devices.

The new network switches should have a minimum of (24No) twenty-four UTP cable connections employing standard RJ45 female connectors plus one (1No.) GBIC Fast Ethernet port for stacking or connecting to the backbone.

All the ports shall be individually numbered.

In addition the system shall have the following standards as a minimum:

CORE EQUIPMENT:

- (a) IEEE 802.3 compliant for power over Ethernet
- (b) IEEE 802.1 based security compliant
- (c) SNMP compliant for security
- (d) Layer 2/3/4 switch
- (e) Backplane/switch fabric Bandwidth Capacity of 150 GBPS or more.
- (f) Should support Gigabit Ethernet to the desktop
- (g) Should have at least 10-slots or higher chassis
- (h) The core switches should have two links to each floor configured in active/active configuration. The links should deliver 2GBPS throughput when all ports are active.
- (i) The core switch should have redundant power supply, redundant fan tray and redundant CPU/ supervisor engine installed
- (j) Fiber cable linking stacks on each floor to the core should be connected to 1000Base X(GBIC) port on the core switch.
- (k) Should be installed with the latest version of system software at the time of delivery.
- (l) Should support Quality of service for various applications.

LAN EDGE EQUIPMENT:

- (a) IEEE 802.3 compliant for power over Ethernet
- (b) Should support IEEE 802.1, SSH, SNMP
- (c) The equipment's should support layer 3 routing.
- (d) Switch Fabric forwarding Bandwidth of 64GBPS or more.
- (e) Active control equipment's at the LAN Edge should support 10/100/1000 MBPS on all ports (RJ45) and Gigabit to the desktop connectivity
- (f) The switches should have 24/48 ports of 10/100/1000 MBPS.
- (g) The equipment's should have at least two 1000BaseX Gigabit uplink ports for terminating backbone Fiber.
- (h) More than 12,000MAC addresses should be available on each switch.
- (i) Each stack on the edge will have two links of Fiber to the core switch, totaling two fiber terminations from the core switch to the stack.

- (j) Should support Jumbo frames.
- (k) Total stack throughput bandwidth of 64 GBPS or more.

7. UTP PATCH PANELS

All UTP Fiber links to individual floors should be terminated on Patch Panels. The patch panels shall:

- (a) Be as **Cat 6A** UTP patch panels.
- (b) Be able to fit into any standard EIA 19-inch equipment rack, secured to the rack firmly with nuts and bolts at all the four corners.
- (c) Have rear cable management and front designation strips, 110 PCB mounted connectors and integral RJ mounted jack sockets.
- (d) Be RoHS Compliant

8. FIBER PATCH PANELS

All Backbone Fiber links to individual floors should be terminated on Fiber Patch Panels. The patch panels shall:

- (a) Contain Connector interfaces should support ST, SC simplex, SC duplex, FC, LC or MT-RJ.
- (b) Contain TIA/EIA-604 FOCIS compliant or compatible simplex or duplex fiber optic adapters
- (c) Meet TIA/EIA-568-B.3 requirements
- (d) Follow the TIA/EIA-568-C.3 suggested color identification scheme
- (e) Contain split sleeve material: Zirconia ceramic
- (f) Supports UPC connector

9. DATA OUTLETS (UTP & FIBER)

All UTP cabling outlets to individual points should be terminated on Face plates. The face plates shall:

- (a) Have UTP as **CAT 6A** Face plates and as specified in ISO 11801.
- (b) Have Individual modules snap in and out of provided insert
- (c) Have Single or double gang configurations as specified.
- (d) Be Excellent for copper applications
- (e) Have Shutters to protect modules when not in use
- (f) Be of 86 x 86mm single gang faceplate frame and one 1/2 size sloped shuttered module insert. Depth to rear of modules: 18.0mm
- (g) Be mounted on trunking faceplates, wall recessed patress boxes, floor outlet communications stations, floor mounted pedestals or floor boxes.
- (h) Have the UTP data outlet jacks feature 110, Krone LSA or universal style insulation displacement connectors. The same tools required for termination of the patch panels shall be used for the data jacks.
- (i) Have all the **CAT 6A** Snap-in data jacks be fully compliant with **Category 6A** TSB 40A requirements.
- (j) RoHS Compliant

The trunking and pedestals are to be supplied and installed by others unless otherwise specified in bills of quantities.

10. COPPER CABLING (U/UTP, F/UTP, SF/UTP, U/FTP, F/FTP, SF/FTP)

The UTP cable shall meet or exceed the following specifications;

- (a) **CATEGORY 6A** compliant UTP cable

- (b) 4-pair cables with 100 ohm impedance.
- (c) Compliant to standards such as TIA/EIA – 268-B. 2-1 and IEC 61156-5
- (d) Compliant to ISO 11801.
- (e) Made of polyolefin insulation
- (f) Pulling force should support up to 50N/mm²

The cabling shall be drawn in trunking or conduits and the points mounted on trunking faceplates, wall recessed patress boxes, floor outlet communications stations, floor mounted pedestals or floor boxes.

11. FIBER CABLING (OPTICAL)

The Fiber cable shall meet or exceed the following specifications;

- (a) **Multimode or Single Mode** compliant Optical Fiber cable as specified in the BQ.
- (b) Graded Index: Nominal 62.5/125 micron
- (c) OS1 & OS2 Cables shall be Compliant to standards such as ITU-TG.652 (Categories A, B, C & D), EN 50173, IEC 60793-1, ISO/IEC 24072 & TIA-492CAAA
- (d) OS3 Cables shall exceed IEC 60793-1-10, TIA/EIA 492AAAA and Telcordia GR-20-CORE specifications
- (e) Low Smoke Zero Halogen (LSZH) rated jackets shall meet IES 60332-1, IEC 60332-3C, IEC 61034 and IEC 60754-2 for standards compliant safety.
- (f) RoHS Compliant
- (g) Shall be made of flexible to allow for quick breakout and ease of routing

OS1 / OS2 specifications;

- (i) Core Diameter: 8.2µm typical for OS1 & OS2 and
- (ii) Cladding Diameter: 125µm ± 0.7µm
- (iii) Cladding Non-Circularity: ≤ 1%
- (iv) Core-Cladding Concentricity: ≤ 0.5µm
- (v) Coating Diameter: 242µm ± 7µm
- (vi) Coating-Cladding Concentricity: ≤ 12µm
- (vii) Attenuation: 1310nm: ≤ 0.39dB/km, 1310 – 1625nm: ≤ 0.34dB/km and 1550nm: ≤ 0.25dB/km
- (viii) Numerical Aperture: 0.14 typical
- (ix) Operating Temperature Range: -60° C to +85° C
- (x) Temperature Dependence (-60° C to +85° C): ≤ 0.05dB/km
- (xi) Temperature-Humidity Cycling (-10° C to +85° C, up to 98% RH): ≤ 0.05dB/km
- (xii) Water Immersion (23° C ± 2° C): ≤ 0.05dB/km
- (xiii) Heat Aging (85° C ± 2° C): ≤ 0.05dB/km

OS3 specifications;

- (i) Colored buffers for ease of identification
- (ii) High quality buffering offers ease of stripping while maintaining optical performance

- (iii) Cable shall support network transmission speeds up to 10 Gb/s for link lengths up to 300 metres with an 850nm source per IEEE 802.3ae 10 GbE Standard; backward compatible for use with all 50/125µm system requirements
- (iv) Core Diameter: 50.0µm ± 2.5µm
- (v) Core Non-Circularity: ≤ 5%
- (vi) Cladding Diameter: 125µm ± 1µm
- (vii) Cladding Non-Circularity: < 1%
- (viii) Core-Cladding Concentricity: ≤ 1.5µm
- (ix) Coating Diameter: 245µm ± 10µm
- (x) Coating-Cladding Concentricity: < 10µm
- (xi) Attenuation: 850nm: ≤ 3dB/km, 1300nm: ≤ 1dB/km
- (xii) Temperature Dependence - 850nm (-60° C to +85° C): ≤ 0.10dB/km
- (xiii) Temperature Dependence - 1300nm (-60° C to +85° C): ≤ 0.10dB/km
- (xiv) Temperature-Humidity Cycling - 850nm (-10° C to +85° C, >90% RH): ≤ 0.20dB/km
- (xv) Temperature-Humidity Cycling - 1300nm (-10° C to +85° C, >90% RH): ≤ 0.20dB/km
- (xvi) Connector

The cabling shall be drawn in defined pathways such as cable trays, trunking or conduits and the points mounted on outlet communications stations among other device

12. TELEPHONE OUTLETS & CABLING

This shall involve drawing of telephone multicore cable from the supply undertaking termination point to the main distribution center and the necessary terminations from the distribution terminal to the administration cabinet.

Cabling shall be done to the various RJ45 work area outlets using [Cat 6A UTP](#) or [SC TP 4](#) pair stranded cable. The telephone outlets cabling shall be drawn in trunking or conduits and the points mounted on trunking faceplates, wall recessed patch boxes, floor outlet communications stations, floor mounted pedestals or floor boxes.

The trunking and pedestals are to be supplied and installed by others unless otherwise specified in bills of quantities.

The UTP data outlet jacks shall feature 110, Krone LSA or universal style insulation displacement connectors. The same tools required for termination of the patch panels shall be used for the data jacks.

All the [Cat 6A](#) Snap-in data jacks shall be fully compliant with category 6A TSB 40A requirements.

13. BACKBONE & HORIZONTAL CABLING

[Cat 6A](#), Unscreened Twisted pair (UTP) 4 pair Copper cables conforming to EIA/TIA 568A and ISO 11801 Standards, radiate from the administration cabinet in the server room to the various works areas.

[Cat 6A](#) UTP 4 pair copper cables should be laid in trunking / Conduits from the Hubs to the data outlets.

[Cat 6A](#) UTP 4 pair copper cables should be laid in trunking / conduits from the patch panels to the telephone outlets as shown on the drawing.

Cable installations should be carried out by trained cable technicians skilled in the installation of telecommunications cables and use of associated tools such as IDC punch down tools and hand cables held cable testers.

Maximum pulling forces should not be infringed during installation to avoid cable damage or performance impairment. Recommended minimum bending radius during and after installation should be adhered to.

It is important to minimize the twisting of cable during installation and cables must never be laid off over the flange of a cable reel.

During installation, cable management precautions that should be observed include the elimination of cable stress caused by tension, sharp bends and tightly bunched cables.

Cables should be dressed into neat groups and fixed into place whether in trunking, cable tray or cabinet, using nylon cable ties. Cable ties should be fitted at 300mm centers and should be fitted with just enough tension, such as not to deform cables.

Installed cables should be clearly identified at both ends with printed self-laminated wrap round labels.

During installation and subsequently, care should be taken to prevent damage to the cabling and especially where cables are exposed in cable trays.

14. PATCHCORDS

All Patch cords shall be factory fabricated

CAT 6A stranded 4 pair UTP RJ45 connector terminated cables shall be provided as per the specified lengths in the bills of quantities

15. EARTHING

All data equipment cabinets must be earthed for safety.

All earth conductors shall be colour coded as green or green & yellow insulated

All earth conductors shall be made of copper.

Each cabinet must have its own specific conductor connecting it to earth. Serial connections from one cabinet to another are not allowed.

Each patch panel installed in the data cabinet should also be earthed to the cabinet using a separate conductor.

16. TESTING

The installation shall be Tested and Certified **CAT 6A** compliant per ISO 11801 requirements.

The test must include but not limited to:

- Basic link test
- Attenuation
- Attenuation to Cross Talk Ratio (ACR)
- Near End Cross Talk (NEXT)
- Wire map
- Cable length Impedanc Every single cable must be tested in both directions.

2c. PARTICULAR SPECIFICATIONS FOR INTERCOM PABX INSTALLATIONS

17. SCOPE OF THE WORK

The contractor shall supply, deliver, unload, test, commission, guarantee and be liable for defects, and be responsible for the initial maintenance, all as specified herein, of intercom/PABX and structured cabling works. The equipment will be entirely Electronic, ISDN native and with time multiplexing architecture.

The contractor shall supply and install associated items of plant equipment other than those clearly stated to be supplied by others. He shall supply and install all accessories, whether described in the specification or not, essential to the completion of the works to the satisfaction of the Engineer.

All equipment supplied shall be type approved by CAK and the installation shall be approved by the Communications Authority of Kenya (the competent Authority). The tenderer shall be responsible for all negotiations with and payments to the commission. He shall also pay all fees.

18. MINIMUM REQUIREMENTS

This specification defines minimum requirements, but tenderers who offer superior facilities will be considered.

Any tender, which does not comply with the minimum requirements, will be rejected.

19. EQUIPMENT FINISH

The equipment finish shall be the responsibility of the contractor, who shall be responsible for its protection during erection and in the course of making good to the building finishes after equipment erection.

20. INTERFERENCE SUPPRESSION

The equipment and all its accessories shall be suppressed so as not to interfere with any communications, radio, T.V, Security or electro-medical equipment, recording or computer systems.

21. DOOR KEYS

The contractor shall keep the equipment suite locked at all times when his staff are not present and shall at the conclusion of the contract hand over all keys to the Engineer.

22. EQUIPMENT HARDWARE

The tenderer shall quote for multimedia applications digital PABX. The equipment may operate on single processor.

23. EQUIPMENT SOFTWARE

The equipment shall be preloaded with core software for driving it and giving it full operating flexibility. The list of features and services should be comprehensive and extensive and comprising of:-

- System features
- Operator features
- Standard telephone features
- Executive telephone features
- System administration features
- Digital Network features
- Data features
- Special applications features

24. SYSTEM FEATURES

The system features shall include but not limited to the following facilities;-

- Direct inward dialing
- Direct outward dialing
- Dial pulse signaling
- DTMF to dial pulse conversion (Tone to pulse conversion)
- Direct Trunk access
- Class of Service
- Flexible assignment of printer ports
- Flexible numbering of extensions
- Flexile tone plan
- Group Hunting
- Multiple operator console
- Music on hold
- Tandem trunks
- Tie trunks
- Extension features e.g. call forwarding, Busy override, conference, (up to 8 conferences) camp on etc.

BARRING AND ROUTE RESTRICTION

It shall be possible at will to bar any extension from access to the public exchange network. Selective route Restriction equipment is required on all both way and outgoing exchange lines to prevent any or all extensions from reaching certain areas of the public telephone network including all areas outside the borders of the Republic. The equipment shall prevent a user, after receiving main exchange dial tone, dialing any number of pre-selected 4 digit codes. It shall be possible to change such pre- selected codes easily and at will without the addition of further equipment, but a security system must prevent this being done by unauthorized persons. It shall not be possible to defeat this equipment from an extension by non-standard dialing, switch hook flashing, enquiry or transfer use, tie line transfer, switch follow on calls after an outside caller has disconnected, or in any other way except that which may be used especially for extensions entitled to full access.

It shall not be possible for an extension to receive public exchange dial tone without the route restriction devices being in circuit.

A follow-on call trap is required on the exchange lines, and this must not prevent the operator from flashing the main exchange.

It shall not be possible for an extension to originate a new outside call following the disconnection of an established call until the public exchange and local subscribers auto equipment has released, and the route restriction and barring equipment has been reset and re-connected to the circuit.

Camp-on-busy, Trunk offer, “call back” and automatic transfer facilities must not de-activate the barring and route restriction circuit.

The exchange should be suitable for the future addition of direct dialing-in facilities, ring back when free absent extension transfer.

25. CLASS OF SERVICE

It is required to group subscribers at will into and/or more of the following categories;

25.1 Full Access

Those permitted incoming calls, tie line calls, internal calls, and outside access to exchange lines and STD but not to the international codes.

25.2 Trunk Route Restriction

Those permitted incoming call, tie line calls, internal calls, and outside access to local codes permitted by the trunk barring equipment.

25.3 Trunk Barred

Those permitted incoming call, tie line calls, internal calls, and outside access via the operator.

25.4 Restricted Access

Those permitted incoming calls and internal calls only.

25.5 Barred Access

Those permitted tie line and internal calls only.

It should not be possible to transfer an exchange line from category (i) extension or from the switchboard to a category (ii) extension without activating the route restriction equipment to prevent the barred extension dialing, unauthorized codes. It shall not be possible to transfer an exchange line to a category (iv) or (v) extension.

There shall be a means of re-allocating subscriber access to the various PABX facilities which shall be promoted by a security system that will prevent unauthorized alterations.

The contractor will be responsible for programming the PABX to incorporate the clients initial wishes regarding extension access to facilities, and for reprogramming it to incorporate such changes as the client wishes to make up to the end of the guarantee period. He will also be responsible for training such staff as the employer shall nominate to undertake reprogramming.

26. ATTENDANT CONSOLE

One or more operator attendant consoles as indicated in the list of main requirements shall be supplied, together with two operators' handsets and two operators' lightweight headsets per position. They shall be fitted with suitable lightweight plugs and jacks.

Each console shall be equipped with all necessary facilities for controlling, connecting and monitoring the progress of calls and shall display alarms as necessary.

Night service facilities will normally be provided such that the operator can route in-coming calls to pre-selected extensions when the console is not manned

Attendant consoles will be multiplex so that the connecting cable will comprise a minimum number of pairs, with little restriction on the siting of the consoles and positions shall be so common that any operator can attend to any call.

Call presentation, chaining process, call back will be entirely managed by the P.A.B.X; however it will be possible to put certain call on individual hold, on keys which have been reserved to that effect.

The information displayed on the terminal give maximum details about the communication (normal call, urgent call, queue status, internal called-party, status of the terminal etc).

27. TELEPHONE INSTRUMENTS

The acquiring of telephone instruments has been liberalized. However, they must be type-approved by the CAK and the tenderer must obtain the necessary approval.

27.1 Executive Telephone Instruments

The Executive Telephone instruments shall have but not limited to the following operating characteristics:-

- Standard telephone facilities
- Abbreviated dialing
- Automatic ring back indication
- Calling number display
- Calls indication
- Call waiting display
- Do-not disturb indication
- Extension status indication
- Hands free
- Individual speed dialing
- Intercom
- LCD display (16 characters)
- Microphone unit.
- On hook dialing
- Password protection
- Repeat last number
- Ringing level and tune selection
- Store and redial
- Single key access to line features

27.2 Standard Telephone Instruments

The ordinary telephone instruments shall be of push button type. They shall at least have the following operating characteristics:-

- Standard telephone facilities
- Automatic ring back indication
- Extension status indication
- Individual speed dialing
- On hook dialing
- Repeat last Number
- Ringing level and tune selection
- Store and redial.

28. NUMBER SYSTEM

The number scheme will be:-

Level O Access to PABX Telephone Operator

- “ 9 Access to the main exchange
- “ 8 Night service
- “ 7 spare for future tie line access
- “ 6 Tie line access
- “ 5 spare for extensions
- “ 4 Extensions
- “ 3 Extensions
- “ 2 Extensions
- “ 1 Spare for special facilities.

29. EXCHANGE LINES

Exchange lines shall be arranged for first party release. The PABX must be capable of processing the number of digits required for international calls in accordance with CCITT and CCIL recommendations.

A device shall be fitted to sense main exchange dial tone as there may be considerable delay in receiving this after the seizure of a tree exchange line.

30. TIE LINES

The lines will provide access to all extensions and the operator. They are to be for auto-auto working through signaling and first party release. Tones are to be returned over to tie lines.

Disconnect loop signaling is at present employed with a maximum loop resistance of 2000 ohms.

31. SYSTEM MAINTENANCE

31.1 Test Equipment and Tools

A PABX routine test set and a set of maintenance tools are to be supplied.

31.2 Maintenance Features

The PABX shall have the following system maintenance features:-

- Line status monitoring device
- Station message data recording port
- System Working report
- On site system administration using a compatible terminal and attendant console.
- Remote system administration capability
- Automatic on-line diagnostic testing

Maintenance diagnostic software programmes shall be provided which can be run as required whilst the PABX is in normal service.

31.3 Maintenance and Operating Manuals

On practical completion of the works, the contractor shall furnish two sets of copies each of maintenance and operating manuals relating to the PABX installed. The manuals shall be legibly written in English and properly bound with hard cover.

They will include but not limited to:-

- System description
- Fault finding procedure

- Maintenance and servicing periods and procedures
- Schematic and wiring diagrams of the equipment
- Record drawings

32. POWER SUPPLY

32.1 Rectifier

The PABX shall be fed through rectifier and a DC –DC converter fed from 240V A.C. 50Hz power supply. The rectifier will be equipped with the following devices:-

Security device to monitor the minimum and maximum authorized values of the output voltage. When one of the thresholds is reached, the power supply to the PABX must cut itself automatically “Floating” and automatic “Equalization” device with manual command of the “Equalization” mode and automatic switch back to “floating” mode once the battery is loaded.

The rectifier will be sized to supply power to the P.A.B.X and simultaneously allow re-loading of the battery within 10Hours maximum.

32.2 Battery

A stationery battery is required to supply power during peak hours and mains supply failures and to provide smoothing for DC out put from the rectifier.

The battery shall be “Maintenance Free” and shall have sufficient capacity when fully charged to supply power to the PABX in the event of mains supply failure for minimum of 8 hours. The minimum DC out put shall be 48V DC = 10% and its life expectancy shall be 20 years. Automotive or Traction battery will not be accepted.

32.3 Voltage stabilizer

A voltage stabilizer of suitable rating is required. It shall have a response time of NOT more than 0.1 second and a correction range from -12% to +12% with surge/spike protection

33. EARTHING

An independent telecommunication earth shall be provided for the PABX and the MDF (if available). The earth lead cable shall not be less than 6mm² and shall terminate to copper earth electrode(s) in a concrete manhole (300mm x 300mm) with a suitable concrete cover.

34. OTHER REQUIREMENTS

The PABX shall:

- (i) Be fully I.P
- (ii) have remote maintenance interface MDF and lightning protection;
- (iii) have duplicated CPU and Voltage Stabilizer with each unit having its own power supply
- (iv) be of compact modular design with sub-lines pre-wired and easily removable;
- (v) have at least 50% power failure trunk transfer facility;
- (vi) be able to support both digital and analogue circuits;
- (vii) have a battery backup of at least 8 hrs autonomy;
- (viii) have direct inward system access facilities and data communication services;
- (ix) be equipped with flexible music on hold;
- (x) be ISDN equipped;

- (xi) the system must support dial by name
- (xii) be equipped with station Hunt groups facility;
- (xiii) be complete with a maintenance terminal facility with VDU and Key board;
- (xiv) have call forwarding automatic call transfer, three party conference among other standard features;
- (xv) be equipped with mains power supply Anti-surge, over-voltage and under-voltage protection devices and lightning protectors for all cards;
- (xvi) have facility for selection for night service/special night answer point;
- (xvii) have on screen fault indication facility;
- (xviii) have computer-telephone inter-face for digital instruments capability;
- (xix) be ready to accommodate either or all E1 and ISDN cards which include but are not limited to BRA , PRA BPRA and LIOx;
- (xx) Be **type approved by the CAK**. The tenderer must indicate the type approval references for the various parts that constitute the equipment. Photostat copies of type approvals must be attached
- (xxi) Be VOIP ready
- (xxii) Be compatible for connection to Telkom Kenya Telecommunication network.
- (xxiii) Incorporate communications server security

35. TELEPHONE MANAGEMENT SYSTEM

35.1 Scope of Works

The works to be carried out comprise supply, installation, testing and commissioning of the following:

- i. Telephone call management software
- ii. 1 No. Desktop computer
- iii. 1 No. Medium duty laser printer
- iv. 1No. Medium duty UPS

35.2 Technical Specifications

35.2.1 Call Management Software

System Capabilities

The software system shall be able to perform the following:

- a. Telephone calls tracking
- b. Telephone calls costing/billing
- c. Telephone calls budgeting
- d. The software system shall be fully window based and run as a background task
- e. All telephone call costs shall be computed basing on the prevailing service provider's rates, or shall be customized for employer's own use.
- f. The software system shall have the capability of automatically barring and unbarring exchange lines and level 9 lines that shall go beyond their budget allocation and automatically reinstate them on budget re-allocation.

It shall also have the capability of automatically barring and unbarring roaming PINS that shall go beyond their budget allocation and automatically reinstate them on budget re-allocation.

- g. The software system shall be able to allocate password to the users.

Reports Generated

The call management software shall be able to generate the following:-

- a. Dates of calls
- b. Duration of calls
- c. Extension numbers where calls originate
- d. Approximate cost of trunk calls
- e. Time of calls
- f. Detailed report on call transfers
- g. Details of exchange lines used
- h. Details of extension lines used
- i. Detailed report of most frequently called numbers
- j. Detailed report of longest calls for selected duration
- k. Detailed report of mobile calls by extensions
- l. Detail of most expensive calls within selected time
- m. Graphical presentation of reports.

SECTION 03:

Bills of Quantities

ELECTRICAL RELATED INSTALLATIONS MANDATORY REQUIREMENTS:

Bidders must adhere to the underlisted requirements failure to which will lead to automatic disqualification. Any other makes of products or any deviation from the specifications apart from the underlisted must be subject to prior approval by the engineer in writing.

A GENERAL

a1 The Electrical Contractor shall supply labour and supply, deliver, install, fix, connect, test, label and commission the works, clean, complete and working to every detail as described below and in the related specifications and /or on the drawings to the satisfaction of the Consulting Engineers & Client.

a2 The bidder is required to visit the site prior to submitting their bid in order to familiarise with existing infrastructure, installations and to ascertain any criss-crossing services as no claims will be entertained as a consequence of this.

a3 In cases where, the premise within which the works are to be undertaken are relatively occupied, No interference at all with the operations or services will be entertained. All bidders must take this into consideration when quoting as no claim will be entertained on the basis of this. Bidder to include any costs arising as a consequent of this in their pricing.

a4 The Contractor shall fill in all rates in all cases even where there are zero quantities.

a5 The Client reserves the right to provide SUPPLY ONLY Items and no claims such as loss of profit will be entertained.

a6 NB: Technical product Catalogues of the specified models should be attached as part of the Bid document.

a7 In some instances, the Bidders MUST HAVE compliance statements as mentioned below ;

- Statutory compliance
- Technical specifications
- Experience from past general electrical projects
- Experience from past mission critical electrical projects
- Capacity of bidder in finances by producing annual turnover statements
- Proposed project plan indicating key milestones
- Company organizational structure and staff profiles
- Completeness of the Tender documents & BOQ's

B LOW VOLTAGE SWITCHBOARDS & SWITCHGEAR

All switchgear and power panels should be Fully Type Tested Switchboard Assembly (FTTA) or IEC b1 60439 Under whose License Certificate is to be attached. The gear must be of same type/manufacturer end to end. No mix of breakers of different types will be allowed in the system.

Switchboards shall be Prefabricated and shall comply with international standards IEC 61439-1&2 as b2 well as BS 5486 concerning the construction of Verified assemblies. Under whose License Certificate shall be issued.

Switchboards selection of Switchgear and Controlgear components shall be made in compliance with b3 standard IEC 60947. The selected switchgear and controlgear brands shall be equal to the ones mentioned in the type tests reports of the equipment.

b4 Switchboards shall comply with standard IEC 60068.2.30 (Hot and damp climates) and with standard IEC 60068.2.11 (salt mist).

b5 Switchboards Busbars shall be made of electrolytic copper, (type Cu ETP as defined by standard ISO 1337).

b6 Switchboards shall be Locally Prefabricated with Local Support

b7 Switchboards shall be BLOKSET TYPE as Schneider Electric or Equivalent to Approval

Switchboards shall make it possible to implement fixed or withdrawable distribution and motor-control b8 sections, positioned side by side, which together form an assembly referred to as an electrical switchboard.

Switchboards shall have digital meters must be a minimum specification as PM810, PM820 by b9 Schneider; Lifasa MCA plus from Legrand or DMG700 by Lovarto. This must be able to record real time readings, Power analysis (Past & Present), Energy readings & Demand readings, Maximum Power ever experienced by the Switchboards

Switchboards shall ensure the safety of life and property as well as provide a high level of continuity of b10 service. Operating safety shall be ensured by the use of compartments in compliance with standard IEC 61439-1&2 and according to form types 1, 2b, 3b and 4.

Switchgear Enclosures, front plates and doors of low-voltage switchboards shall be made of 2 mm thick, b11 steel sheetmetal which shall have received an anti-corrosion coating (hot polymerised polyester/epoxy powder).

b12 Switchboards shall be compatible with all system earthing arrangements defined in standard IEC 60364 (IT, TT or TN).

- Switchboards degree of protection shall be defined in compliance with standard IEC 60529 as follows Under Whose License Certificate shall be issued.
- IP 20 with a door or with front plates;
- IP 31 with a door
- IP 42 with a door and gasket kit;
- IP 54 with a door and gasket kit.
- Switchboards shall have a permissible asymmetric short-circuit current of up to 100 kA for 1 second. The busbars shall be designed for mounting on insulated supports that are sufficient in number to accept the electrodynamic forces resulting from the flow of the peak asymmetric short-circuit current (220 kA peak). The different short-circuit current levels shall be:
 - 30 kA: peak value of I_{sc} 65 kA
 - 50 kA: peak value of I_{sc} 105 kA
 - 85 kA: peak value of I_{sc} 187 kA
 - 100 kA: peak value of I_{sc} 220 kA (for double busbars arrangement)

- b13 Switchboards shall have natural ventilation or controlled ventilation shall make it possible for the switchgear and control gear components to operate within the recommended temperature ranges
Switchboards shall have small depths, thus optimising layout in electrical rooms
- 400 mm up to 1600A
 - 600mm up to 6300A.
- b14 Switchboards shall conform to the following mandatory requirements:
- Switchboards shall be BMS compatible with BACnet protocol , MODBUS (RTU) protocol.
 - Short Circuit Rating for the Switchboard (Certificate to be issued).
 - Short Circuit Rating for the Switchboard (Certificate to be issued).
 - KEBS Standard Certificate - Diamond Mark (Certificate to be issued).
 - ISO 9001 (Certificate to be issued).
 - ISO 14001 (Certificate to be issued).
 - Temperature Rise Test for Switchboard (Certificate to be issued).
 - Switchboards shall have Phase Indicator Lights on the outer side of the panel.
 - Switchboards shall have an earthing circuit including a bar that can be removed for isolation purposes
 - during the necessary insulation measurements (removal of the bar shall require a tool).
 - Switchboards shall be suitable for front and/or rear connections (to be precised).
 - Switchboards shall have Cable entry shall be via the bottom and/or the top (to be precised).
 - Switchboards shall be 2200mm high (to be precised).
 - Switchboards shall have breakers of same type/manufacturer. No mix of breakers of different types will be allowed in the system. The entire installation should be an end to end solution from one manufacturer.
- b15 All breakers (ACB's & MCCB's) in the main switchgear shall be adjustable.
All Switchgear should be as LEGRAND, MERLIN GERLIN, MEM Eaton, ABB OR TERASAKI etc
- b16 as per BQ. These should be free standing, FTTA, modular, extensible, metal clad, cubicle pattern to IP42 rating, Form 3b separation and should match the existing switchgear on site which is as LEGRAND, MERLIN GERLIN, ABB OR TERASAKI.
- b17 All AVR Models to be as ORTEA with Input at $400 \pm 25\%$ (3P+N) and Output as $400 \pm 1\%$ (3P+N).

C DISTRIBUTION BOARDS

- c1 All Distribution board & Consumer Units incomers should have Rated Live busbars, Neutral busbar & Earth busbar to IEC standards and to have a short circuit breaking capacity of 25kA to IEC standards.
- c2 All Distribution boards & Consumer Units should be fabricated as per latest 17th Edition of BS 7671 requirements. They will include RCD/RCBOs, ELCB's etc for protection purposes
- c3 All MCBs should have a short circuit breaking capacity of 10-15kA to IEC standards.

D EARTHING

All earthing treatment where required should be by use of appropriate compounds such as Bentonite and marconite to achieve stipulated impedance. Under no circumstance should charcoal or common salt be used.

All earthing treatment where required shall be by use of appropriate compounds such as Bentonite / Marconite to achieve stipulated impedance. Under no circumstance should charcoal or common salt be used.

- Earthing values shall be: { <(Less than) }
- Electrical = < 4 Ohms
- ICT = < 1 Ohm

d3 Lightning Protection = < 7 Ohms

- All earth Inspection chambers should be of HEAVY GAUGE as a minimum, with Lockable lid & should be engraved 'EARTH'. This should be as Furse.

E CABLING

- e1 All HT Cabling to be as Elsewedy Cables or Equal & Approved.
- e2 All LV Cables shall be as East African Cables or Equal & Approved.
- e3 Colour code for 3-phase system cabling should be: Red for red phase, Yellow for yellow Phase, Blue for blue phase, Black for Neutral & Yellow/Green for Earth cables.
- e4 All Sub-Mains cables should be XLPE CU cables.
- e5 All cables to distribution boards should be XPLE CU cables and this should be catered for in the rates.

F LIGHTING

- f1 A lighting points shall consist of 1 way, 2 way and intermediate points as shown on layouts. Pricing for this must be included in the rates.
- f2 All LED Chips for Light Lamps shall be of cree model and should come with a heat sink
- f3 All LED Light Lamps should come with a heat sink as crewe or equivalent to approval by the engineers.
- f4 All Emergency Light fixtures shall have an Emergency kit for 3hr autonomy
- f5 All Emergency Light fixtures shall work normally under normal working conditions and only use the battery in event of Power source failure.
- f6 All Emergency Light fixtures shall have an indicator light incorporated as part of the fixture showing the status of the charge on the battery
All light fittings to come with LED energy saving lamps. The wattage to be determined by the area of installation and recommended LUX levels in that specific area. Pricing for this to be catered for in the rates.
- f7
- f8 5 Amp cable connector blocks must be used to connect the flex cable to the concealed cables. Pricing for this must be included in the rates.
Where there is suspended ceilings, all light fittings must be self supported to avoid them exerting weight on ceilings. Where there are no celing, the contractor shall allow in the rates proper suspesion of any MEP services.
- f9

NB; All light fittings to come with At least 2-year limited warranty. The High Bay lights should c/w Steel wire guard, secured to fixture with v-band. Hardware and accessories for mounting and powering be included.

Housing:

- Durable, die-cast aluminum heat sink & housing
- White polyester powder-coat finish
- LEDs protected against dust and dirt with tempered glass lens
- 16" diffuse polycarbonate prismatic reflector
- Included slide splice box mounts directly over junction box or with 3/4" pendant (provided by others)
- Splice box has six 1/2" and two 3/4" knockouts on the sides
- Damp locations not exceeding 40°C (104°F) ambient temps
- Prismatic reflectors not intended for use in environments where any concentrations of industrial cutting fluids are used.

- f10
- f11 *The contractor allows in the rates for at least 1.5 meter long 1.5mm sq 3 core white flex from the connector block to the Light fittings. Cables from the round box should be neatly concealed using a ceiling rose c/w a biscuit ring and upto light. Heavy lights to have heavy gauge steel chains and hooks for each light for supsension in slab, roof terraces and on saflok roofing supports . Each light MUST be self supporting from the slab level to the ceiling level. Pricing for this must be included in the rates.*

G POWER POINTS

- g1 Equipment Isolators Shall be located not more than 2 Meters from the actual equipment. This should be considered when quoting for the points.
All power sockets, Dp switches, light switches, and accessories must be as Legrand, MK or crispal white, polycarbonate, screwless or equal and approved unless otherwise adviced or specified by the Engineer and catered for in the rates. Sockets mounted outside to be IP66. Switches to be wide rocker type, and must be as mentioned above and approved by the Engineer. This is to be catered for in the rates.
- g2

A LIGHTING & SMALL POWER INSTALLATIONS**A1 Lighting Cabling Installations**

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A1.01	LIGHTING POINTS (1WAY): 1 way switching lighting points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm Ø HG PVC conduits concealed in building fabrics.	No.	122		
A1.02	EXTRACT FAN POINTS (1WAY): Ditto but for toilet extract fan	No.	0		
A1.03	LIGHTING POINTS (2WAY): Ditto but for two way switching lighting points.	No.	9		
A1.04	LIGHTING POINTS (Intermediate): Ditto but for intermediate switching lighting points.	No.	24		
A1.05	LIGHTING POINTS (Emergency): Ditto but for emergency lighting points.	No.	5		
A1.06	PHOTOCELL LIGHTING POINTS: Ditto but for sensor switching lighting points.	No.	2		
A1.07	SENSOR LIGHTING POINTS: Ditto but for occupational sensor switching lighting points.	No.	29		
A1.08	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

A2 Switches & Accessories

All Switches & Associated Accessories shall be as Legrand Belanko (White)

A2.01	10A 1 gang 1 way switch	No.	26		
A2.02	10A 1 gang 2 way switch	No.	5		
A2.03	10A 2 gang 1way switch	No.	4		
A2.04	10A 2 gang 2 way switch	No.	7		
A2.05	10A 3 gang 1 way switch	No.	2		
A2.06	10A 3 gang 2 way switch	No.	2		
A2.07	10A Intermediate switch	No.	6		
A2.08	6A 1 gang 1 way architrave switch	No.	2		
A2.09	6A 2 Gang 1 way architrave Switch	No.	2		
A2.10	PHOTOCELL: Outdoor dusk to dawn photocell sensor switch	No.	2		
A2.11	TYPE OS: Ceiling surface mount PIR Sensor with a 360 degree view angle and a hard shell spherical lens. The sensor/detector should have a minimum adjustable range of 12meters or more mounted at a height of 3000mm to Engineers approval. As HONEYWELL, PIERLITE, EX-OR MULTI-FUNCTION PIR.	No.	24		
A2.12	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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A3 Light Fittings & Accessories

Fittings Must be quoted for as Specified below.

A3.01	TYPE 2A: A versatile square luminaire for surface mounting with LED light source 3000/4000K colour temperature options as Thorn Omega LED.	No.	13		
A3.02	TYPE 2Ae: Ditto but emergency version with an emergency backup gear for 3hr autonomy	No.	0		
A3.03	TYPE 4A: A versatile rectangular luminaire for surface mounting with LED light source 3000/4000K colour temperature options as Thorn Omega LED.	No.	11		
A3.04	TYPE 4Ae: Ditto but emergency version with an emergency backup gear for 3hr autonomy	No.	0		
A3.05	TYPE A: Slim circular ceiling luminaire in white/satin chrome finish with 1250lm to 3500lm LED as THORN NOVALINE	No.	7		
A3.06	TYPE B: Durable, white, die-cast aluminium body and opal polycarbonate diffuser with vandal resistant screw fixings, 352mm length by 102mm wide LED Bulkhead. IP65. As THORN ESCORT.	No.	15		
A3.07	TYPE GT: IP66 post top decorative aluminium 40W LED lantern, ULOR 0%, powder coated silver grey finish, with street or symmetrical optics and integrated dimming system with internal switch. As Thorn Plurio LED.	No.	2		
A3.08	TYPE P: Hanging pendant with aluminium lampshade of 180mm Diameter and 1100mm height c/w 1 x 14W Energy saving lamp. This is as EGLO MERCUR 88293.	No.	1		
A3.09	TYPE G2: Round surface mount LED downlights incorporating a thermally optimised, deep drawn aluminium body, with OSRAM LEDs of 3000K Colour, cool light with no IR/UV Radiation. 150mm Diameter. IP54. As Thorn Chalice or equivalent to approval.	No.	19		
A3.10	TYPE G3: Round surface mount LED downlights incorporating a thermally optimised, deep drawn aluminium body, with OSRAM LEDs of 3000K Colour, cool light with no IR/UV Radiation. 85mm Diameter. IP54. As Thorn Chalice or equivalent to approval.	No.	14		

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A3.11	TYPE 1: Ceiling Surface Mount LED Square downlights 15W with frosted glass as Liper or equivalent to approval, IP44 rated for the washrooms.	No.	29		
A3.12	TYPE M: Slim Surface Mounted Mirror Light with Body and End Caps made of extruded aluminium c/w opal polycarbonate diffuser with glare free distribution for 14W fluorescent lamp with dimensions as 616mm by 90mm width by 60mm height as THORN CIMI	No.	16		
A3.13	TYPE 4P: 1200mm long HPF water proof fluorescent fittings for SINGLE tube. IP65 rated with sheet steel gear tray and polycarbonate fixing clips, c/w all other accessories and 1x20W LED tube.	No.	18		
A3.14	TYPE 2P: 600mm long HPF water proof fluorescent fittings for SINGLE tube. IP65 rated with sheet steel gear tray and polycarbonate fixing clips, c/w all other accessories and 1x10W LED tube.	No.	3		
A3.15	TYPE FL: Enclosed black polypropylene floodlight with polycarbonate visor, integral control gear with photocell, asymmetrical reflector for 100W HIT-DE and HSE-I lamps. IP65 rated. As Thorn Sonpak LX7-15.	No.	1		
A3.16	EXIT A: Self contained Suspended mounted Double Sided Maintained LED Exit Sign. It should have a minimum viewing distance of 27 meters & 3-Hour maintained operation inbuilt battery system. This should be White finish with Extruded Aluminium Body, Engraved flame retardant acrylic Blade & for 8W LED with constant colour Temperature (i.e. Ra>92) over the product life cycle as THORN VOYAGER LED.	No.	3		
A3.17	EXIT B: Self contained Surface mounted Single Sided Maintained LED Exit Sign. It should have a minimum viewing distance of 27 meters & 3-Hour maintained operation inbuilt battery system. This should be White finish with Extruded Aluminium Body, Engraved flame retardant acrylic Blade & for 8W LED with constant colour Temperature (i.e. Ra>92) over the product life cycle as THORN VOYAGER LED.	No.	2		
A3.18	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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A4 Cable Ladders, Cable Trays, Trunking & Conduits Installations

A4.01	CABLE LADDER (POWER): 300 x 100mm POWDER COATED (WHITE) steel factory fabricated Cable Ladder complete with angle bends, Tees, end caps to detail and mounting brackets & accessories to approval. Includes equipotential bonding in 6mm cable.	LM	0		
A4.02	CABLE LADDER (POWER): 600 x 100mm POWDER COATED (WHITE) steel factory fabricated Cable Ladder complete with angle bends, Tees, end caps to detail and mounting brackets & accessories to approval. Includes equipotential bonding in 6mm cable.	LM	0		
A4.03	RISERS CABLE TRAY (POWER DUCTS): 300 x 50mm POWDER COATED (WHITE) steel factory fabricated Cable tray complete with angle bends, Tees, end caps and mounting brackets & accessories to detail and to approval. Includes equipotential bonding in 6mm cable.	LM	9		
A4.04	RISERS CABLE TRAY (ICT DUCTS): 300 x 50mm POWDER COATED (GREY) steel factory fabricated Cable tray complete with angle bends, Tees, end caps and mounting brackets & accessories to detail and to approval. Includes equipotential bonding in 6mm cable.	LM	9		
A4.05	CABLE TRAY (POWER) : 75 x 50mm POWDER COATED (WHITE) steel factory fabricated Cable tray complete with angle bends, Tees, end caps to detail and mounting brackets & accessories to approval. Includes equipotential bonding in 6mm cable.	LM	0		
A4.06	CABLE TRAY (POWER) : 200 x 50mm POWDER COATED (WHITE) steel factory fabricated Cable tray complete with angle bends, Tees, end caps to detail and mounting brackets & accessories to approval. Includes equipotential bonding in 6mm cable.	LM	30		
A4.07	CABLE TRAY (ICT) : 150 x 50mm POWDER COATED (GREY) steel factory fabricated Cable tray complete with angle bends, Tees, end caps to detail and mounting brackets & accessories to approval. Includes equipotential bonding in 6mm cable.	LM	30		

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A4.08	TRUNKING: 250 x 50mm, 3 compartment Screw on stove enamelled factory fabricated metallic trunking c/w angle bends, Tees, end caps to detail and and mounting brackets & accessories to approval. Includes equipotential bonding in 6mm cable.	LM	130		
A4.09	BLANKING FACEPLATES (SINGLE): Blanking faceplates for single outlets	No.	30		
A4.10	BLANKING FACEPLATES (TWIN): Blanking faceplates for twin outlets	No.	30		
A4.11	FLOOR PVC CONDUITS: 38mm Ø HG PVC conduits for linking Services from the Ducts and from the Trunking	LM	100		
A4.12	FLOOR PVC CONDUITS: 20mm Ø HG PVC conduits for linking from the Duct to the Equipment	LM	540		
A4.13	FLOOR PVC SLEEVES: 50mm Ø HG PVC sleeves for linking Services from the Manholes and from the horizontal Ducts	LM	80		
A4.14	CABLE TIES: Allow for cable ties at one meter interval along the cable trays and cable ladders above.	Floors	3		
A4.15	ADAPTER JUNCTION BOXES: 100 x 100 x 60mm deep 3-compartment PVC adaptable box with 6No. 32/38 mm knock-out provisions for trunking / conduit- link interphase	No.	5		
A4.16	ADAPTER JUNCTION BOXES: 150 x 150 x 60mm deep 3-compartment PVC adaptable box with 6No. 32/38 mm knock-out provisions for trunking / conduit- link interphase	No.	5		
A4.17	ADAPTER JUNCTION BOXES: 200 x 250 x 60mm deep 3-compartment PVC adaptable box with 6No. 32/38 mm knock-out provisions for trunking / conduit- link interphase	No.	14		
A4.18	FLOOR BOX: 3 Compartment floor box with hinged cover c/w all cover plates as Crabtree GR03G to approval	No.	8		
A4.19	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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A5 Power Supply & Accessories

All equipment Isolators will be located not more than 2 meters from the actual equipment. This should be considered when quoting for the points.

All Sockets to be as Legrand Belanko/MK (Raw Power -White, Clean Power- Red inner trim)

A5.01	SOCKETS POINTS: Ring mains socket outlet points wired in 3x2.5mm sq PVC insulated single core copper cables drawn in concealed 20mm Ø HG PVC conduits concealed in building fabrics or in trunking.	No.	95		
A5.02	SOCKET (13A): 13A twin shuttered switched socket	No.	93		
A5.03	SOCKET (13A): 13A single shuttered switched socket	No.	1		
A5.04	SOCKET (SHAVER): Shaver socket outlet	No.	1		
A5.05	CLEAN POWER SOCKET: Points wired in 3x2.5mm sq PVC insulated single core copper cables drawn in concealed 20mm Ø HG PVC conduits concealed in building fabrics or in trunking.	No.	6		
A5.06	SOCKET (CLEAN): 13A twin shuttered switched socket	No.	6		
A5.07	WORKSTATIONS POWER PLUG POINT: DP control switch outlet points for clean power wired in 3core 4.0mm sq flex copper cables wired from DB'xF' to each point.	No.	6		
A5.08	DP SWITCH CLEAN: 20A fused, unswitched screwless DP control switch with neon indicator	No.	6		
A5.09	HAND DRIERS: Points wired in 3x2.5mm sq PVC insulated single core copper cables drawn in 20mm HG PVC conduit concealed in building fabrics.	No.	10		
A5.10	DP SWITCH (HD): 20A fused unswitched DP control switch with neon indicator c/w 2.5mm sq 3 core flex cable to hand drier.	No.	10		
A5.11	URINAL & WHB POWER POINTS: Sensor outlet points wired in 3x1.5mm sq PVC insulated single core copper cables drawn in 20mm HG PVC conduit c/w conduit outlet to urinal sensor position.	No.	10		
A5.12	WATER HEATER POWER POINTS: Undersink & Instant Shower power outlet points wired in 3x4.0mm sq PVC insulated single core copper cables drawn in 25mm HG PVC conduit concealed in building fabrics.	No.	5		
A5.13	DP SWITCH (WH): 20A fused, unswitched screwless DP control switch with neon indicator.	No.	5		
A5.14	CABLE OUTLET: 20A cable outlet c/w connector for above points	No.	21		

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A5.15	COOKER: Power point outlets for cooker control unit and cooker connection wired in 3core 6.0mm sq flex copper cables drawn in 25mm HG PVC conduit concealed in building fabrics.	No.	2		
A5.16	DP SWITCH (COOKER UNIT) : 45A cooker control unit DP switch marked 'Cooker' c/w neon indicator and switched socket faceplate	No.	2		
A5.17	CABLE OUTLET: 45A cable outlet c/w connector for cooker unit above	No.	2		
A5.18	KITCHEN HOOD EXTRACT: Power point outlet wired in 3x2.5mm sq PVC insulated single core copper cables drawn in 20mm HG PVC conduit	No.	2		
A5.19	KITCHEN HOOD EXTRACT: 13A switched, fused connection units complete with cord outlet for kitchen extract hood	No.	2		
A5.20	CABLE OUTLET: 45A cable outlet c/w connector for cooker unit above	No.	2		
A5.21	PANELS POWER POINTS: Single phase systems Panel outlet points wired in wired in 3x2.5mm sq PVC insulated single core copper cables drawn in 20mm HG PVC conduit	No.	3		
A5.22	DP SWITCH (PANELS): 20A fused, unswitched DP control switch with neon indicator	No.	3		
A5.23	CABLE OUTLET: 20A cable outlet c/w connector for panel above	No.	3		
A5.24	FIRE ALARM: Conduit Outlets for fire alarm interlinked in concealed 25mm Ø HG PVC conduit c/w draw wire.	No.	48		
A5.25	CCTV: Conduit Outlets for CCTV in concealed 20mm Ø HG PVC conduit c/w draw wire.	No.	12		
A5.26	TV: Conduit Outlets for TV points in concealed 20mm Ø HG PVC conduit c/w draw wire.	No.	2		
A5.27	ACCESS CONTROL: Conduit Outlets for ACS in concealed 20mm Ø HG PVC conduit c/w draw wire.	No.	2		
A5.28	EMERGENCY POWER OFF: EPO button wired in 3x2.5mm sq PVC insulated single core copper cables drawn in 20mm HG PVC conduit concealed in building fabrics.	No.	1		
A5.29	GATE HOUSE CU: 4-way consumer unit for gate house c/w 1No. 10A and 1 No. 32A MCBs	No.	1		
A5.30	CABLING (LV Panel to CU Above): 6mm sq 3Core PVC/SWA/PVC copper cables drawn in 50mm Ø HG PVC sleeves.	LM	30		
A5.31	Labelling of final sub-circuits done in red Traffolytte labels properly anchored on the specific devices.	Item	1		
A5.32	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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A6 Mechanical Equipment Power Supply

All equipment Isolators will be located not more than 2 meters from the actual equipment. This should be considered when quoting for the points.

A6.01	PUMPS (BOOSTER): Single phase outlet point wired in 4mm sq 3-Core PVC/SWA/PVC copper cable from DB'PUMPS'	LM	20		
A6.02	20A SPN Isolator control switch for System above with enclosure as Hager (IP65 rated)	No.	1		
A6.03	PUMPS (HOSE REEL): Three phase outlet point wired in 6mm sq 4-Core PVC/SWA/PVC copper cable + 6mm sq E.C.C from DB'PUMPS'	LM	20		
A6.04	20A TPN Isolator control switch for System above with enclosure as Hager (IP65 rated)	No.	1		
A6.05	PUMPS (BOREHOLE): Single phase outlet point wired in 4mm sq 3-Core PVC/SWA/PVC copper cable from DB'PUMPS'	LM	30		
A6.06	20A SPN Isolator control switch for System above with enclosure as Hager (IP65 rated)	No.	1		
A6.07	ISOLATOR - OUTDOOR AC UNIT: 20A TPN control Isolator switch for 3 phase unit with enclosure as Hager (IP65 Rated)	No.	1		
A6.08	CABLING (DB'x' to ISOLATOR Above): 6mm sq 4-Core PVC/PVC copper cable + 6mm sq E.C.C	LM	10		
A6.09	AC POWER POINTS: Single phase Air conditioning units outlet points wired in 2.5mm ² twin + earth PVC insulated CU cables from DB'MV'	No.	3		
A6.10	20A fused, switched DP control switch with neon indicator for Airconditioners and other systems.	No.	3		
A6.11	ISOLATOR - TOILET EXTRACT FAN AT ROOF: 20A SPN control Isolator switch for single phase unit with enclosure as Hager (IP65 Rated)	No.	1		
A6.12	CABLING (DB'x' to ISOLATOR Above): Single phase power outlet points wired in 4mm sq 3-Core PVC/PVC copper cable from from DB'MV' to Isolator above	LM	10		
A6.13	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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A7 Power distribution and Cabling

All Distribution board & Consumer Units incomers should have a short circuit breaking capacity of 25kA to IEC standards.

All MCB's should have a short circuit breaking capacity of 10-15kA to IEC standards.

All Distribution board & Consumer Units incomers should have Rated Live busbars, Neutral busbar & Earth busbar to IEC standards.

All Distribution Boards shall be as Merlin Gerlin

All MCB's shall have Isobar Mechanism

A7.01	DISTRIBUTION BOARDS (RAW POWER) DB'xF': 12 way 125A rated TPN Surface wall mounted distribution board as Merlin Gerlin.	No.	3		
A7.02	10A SP MCB with Isobar Mechanism	No.	18		
A7.03	20A SPMCB with Isobar Mechanism	No.	23		
A7.04	32A SP MCB with Isobar Mechanism	No.	18		
A7.05	20A TP MCB with Isobar Mechanism	No.	3		
A7.06	SP Breaker Blanking plates	No.	16		
A7.07	TP Breaker Blanking plates	No.	10		
A7.08	CABLING (Sub-Board to DB Above): 10mm sq 4-Core PVC/PVC copper cable + 10mm sq E.C.C	LM	55		
A7.09	Cable glands for above cables	No.	6		
A7.10	Cable lugs for for above cables	No.	24		
A7.11	CONSUMER UNIT (SERVER ROOM - CLEAN POWER) CU'ICT': 9 way 100A rated SPN Surface wall mounted consumer unit/w transparent glass cover	No.	1		
A7.12	20A SP MCB with Isobar Mechanism	No.	4		
A7.13	32A SP MCB with Isobar Mechanism	No.	0		
A7.14	SP Blanking plates	No.	5		
A7.15	CABLING (Sub-Board to CU Above): 6mm sq 3-Core PVC/PVC copper cable	LM	30		
A7.16	Cable glands for above cables	No.	2		
A7.17	Cable lugs for for above cables	No.	8		
A7.18	UPS ISOLATOR: 32A SPN Isolator control switch for System above with enclosure as Hager (IP65 rated)	No.	1		
A7.19	INDUSTRIAL PLUG (1-PH): 32A 3-Pin Industrial plug c/w Isolator control switch for Main ICT Cabinet	No.	1		

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A7.20	DISTRIBUTION BOARD (LIFT) DB'LIFT': 4 way 100A rated TPN Surface wall mounted distribution board as Merlin Gerlin.	No.	1		
A7.21	10A SP MCB with Isobar Mechanism	No.	1		
A7.22	32A SP MCB with Isobar Mechanism	No.	1		
A7.23	32A TP MCB with Isobar Mechanism	No.	1		
A7.24	SP Breaker Blanking plates	No.	1		
A7.25	TP Breaker Blanking plates	No.	2		
A7.26	CABLING (Sub-Board to DB Above): 10mm sq 4-Core PVC/PVC copper cable + 10mm sq E.C.C	LM	40		
A7.27	Cable glands for above cables	No.	2		
A7.28	Cable lugs for for above cables	No.	8		
A7.29	LIFT ISOLATOR: 40A TPN Isolator control switch for System above with enclosure as Hager (IP65 rated)	No.	1		
A7.30	DISTRIBUTION BOARD (PUMPS) DB'PUMPS': 4 way 125A rated TPN Surface wall mounted distribution board as Merlin Gerlin.	No.	1		
A7.31	20A SP MCB with Isobar Mechanism	No.	1		
A7.32	32A SP MCB with Isobar Mechanism	No.	2		
A7.33	20A TP MCB with Isobar Mechanism	No.	1		
A7.34	SP Breaker Blanking plates	No.	2		
A7.35	TP Breaker Blanking plates	No.	2		
A7.36	CABLING (LV PANEL to DB Above): 10mm sq 4-Core PVC/PVC copper cable + 10mm sq E.C.C	LM	30		
A7.37	Cable glands for above cables	No.	2		
A7.38	Cable lugs for for above cables	No.	8		
A7.39	Labelling of all DB's, CU's and Final sub-circuits should be done in red Traffolytte labels properly anchored on the specific devices.	Item	1		
A7.40	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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B LV SWITCHGEAR, SUBMAINS CABLING & SYSTEMS EARTHING

All LV Cabling to be as East African Cables

Colour code for 3-phase system cabling should be: Red for red phase, Yellow for yellow Phase, Blue for blue phase, Black for Neutral & Yellow/Green for Earth cables.

All cables Labelling tags shall be as Legrand and should be done on both ends

B1 LV Panel Meterboard & Cabling

Kindly give approximate dimensions of Panel above (L x W x H):

Length =

Width =

Height =

Weight =

B1.01	<p>LV PANEL METERBOARD as per schematic drawing & have the following specifications:</p> <p>FREE STANDING PANEL, Type Tested Assembly (TTA), modular, extensible, metal clad, cubicle pattern to IP31 rating and of Form 2b separation, fabricated using a minimum of 16 SWG or 2mm thick steel sheets.</p> <p>Comprise of a termination point for connection of remote signals for Mains available & Mains on Load, Generator available & Generator on load.</p> <p>MUST be BMS compatible and the interphase module(s) for MODBUS (RTU) link incorporated to monitor as a minimum the following: Mains available & Mains on Load, voltage, current, kW, kWh, KVA, & power factor.</p> <p>MUST include Surge Protective Device as DEHNshield B TT 255 FM combined arrester or equivalent complete with appropriate protection.</p> <p>MUST include include phase indicator LED lights & all associated instrumentation, appropriate Neutral & Earth Bars, Connector block for termination of outgoing cables, and Cable Space & Management for running of outgoing cables.</p> <p>Comprise the following switchgear:</p>	No.	1		
B1.02	Incomer				
a	100Amp 4P MCCB (ADJUSTABLE) with adjustable overcurrent settings, having a short circuit breaking capacity of 35KA at 415Vac, 50Hz, c/w shunt trip	No.	1		
b	Supply and Install a Set of digital energy multimeter (complete with current transformers and fuse holder & fuses) for indication of voltage, current, kW, kWh, KVA, power factor, etc.	Item.	1		

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
B1.03	Automatic Changeover (Mains to Generator)				
	The Panel should be such that in event of Mains power outage, it picks up available supply from the Generator.				
	Supply & Install a 100Amps 4P motorised automatic mains & generator changeover. This should comprise of:-	Item.			
a	100Amps 4P mechanically interlocked motorised MCCB and associated PLC, with adjustable overcurrent settings, auxiliary contact for breaker monitoring, having a short circuit breaking capacity of 35KA at 415Vac, 50Hz.	Item.	1		
b	Supply & install control unit for auto-changeover Type UA-1 or equivalent.	No.	1		
c	Supply & install under/over voltage sensing relay.	Item.	1		
d	Supply and Install set of indication to show Mains supply available / in use or Generator supply available / in use.	Item.	1		
e	Supply and Install set of voltage free normally open/closed contacts for generator start/stop signal.	Item.	1		
B1.04	Busbars				
a	125A TPN rated busbars with a provision for future expansion.	Item.	1		
b	Neutral link bar and earth bar	Item.	1		
B1.05	Outgoers				
a	32Amp SP MCCB with adjustable overcurrent settings, having a short circuit breaking capacity of 18KA.	No.	2		
b	32Amp 3P MCCB with adjustable overcurrent settings, having a short circuit breaking capacity of 18KA.	No.	1		
c	40Amp 3P MCCB with adjustable overcurrent settings, having a short circuit breaking capacity of 18KA.	No.	1		
d	100Amp 3P MCCB (adjustable) with adjustable overcurrent settings, having a short circuit breaking capacity of 18KA.	No.	1		
e	1-Phase blanked spareways for upto 40Amp SP MCCB	No.	1		
f	3-Phase blanked spareways for upto 63Amp 3P MCCB	No.	2		
B1.06	Cabling				
a	LV PANEL to Distribution Sub-Board: 25mm sq 4-Core PVC/ SWA/PVC copper cable + 16mm sq E.C.C	LM	30		
	Cable glands for above cables	No.	2		
	Cable lugs for for above cables	No.	8		
b	LABELLING: Labelling of cables and final sub-circuits. Labelling should be done in red Traffolytte labels properly anchored on the specific devices.	Item	1		
B2.07	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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B2 Distribution Sub-board

Kindly give approximate dimensions of Panel above (L x W x H):

Length =

Width =

Height =

Weight =

B2.01	DISTRIBUTION SUB-BOARD as per schematic drawing & have the following specifications: SURFACE MOUNT PANEL, Type Tested Assembly (TTA), modular, extensible, metal clad, IP31 rating and of Form 2b separation, fabricated using a minimum of 16 SWG or 2mm thick steel sheets. Comprise the following switchgear:	No.	1		
B2.02	Main Incomer				
a	100Amp 3P MCCB with adjustable overcurrent settings, having a short circuit breaking capacity of 35KA at 415Vac, 50Hz.	No.	1		
B2.03	Busbars				
a	125A TPN rated busbars with a provision for future expansion.	Item.	1		
b	Neutral link bar and earth bar	Item.	1		
B2.04	Outgoers				
a	20Amp SP MCB	No.	0		
b	32Amp SP MCB	No.	1		
c	40Amp 3P MCB	No.	3		
d	63Amp 3P MCB	No.	1		
e	1-Phase blanked spareways	No.	2		
f	3-Phase blanked spareways	No.	4		
B2.07	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
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B3 System Earthing

Pricing to include earth treatment.

All earthing Cables Colour code shall be Yellow/Green or Green

LV ROOM EARTHING:

B3.01	EARTH MATT: Supply & Install Earthing Matt for Body Earthing of Switchgear complete with a copper lattice matt measuring 1000mm X 1000mm constructed with copper tapes measuring 25mm X 3mm, adjacent to switch room. Should be extended to the concrete inspection chamber with appropriate cable / copper rod.	No.	1		
B3.02	EARTH INSPECTION PIT: 300mm x 300mm Concrete Inspection Chamber clearly marked "EARTH"	No.	1		
B3.03	COPPER BAR: Supply & Install an Earth Potential copper bar measuring 600mm long X 50mm wide X 6mm thick, mounted on insulators in Switch room.	No.	1		
B3.04	PIT - EARTH BAR CONNECTION CABLE: Connect the copper lattice matt through the Inspection Chamber and the Earth potential copper bar in Switch room with 16mm sq PVC insulated SC copper cable c/w appropriate cable lugs & any other accessories required.	LM	5		
B3.05	EARTH BAR - EQUIPMENT CABLING: Connect the Earth potential copper and LV Panel Meterboard with 16mm sq PVC insulated SC copper cable c/w appropriate cable lugs & any other accessories required.	LM	5		

GENERATOR ROOM EARTHING:

B3.06	EARTH MATT: Supply & Install Earthing Matt for Body Earthing of Genset complete with a copper lattice matt measuring 1000mm X 1000mm constructed with copper tapes measuring 25mm X 3mm, adjacent to generator room. Should be extended to the concrete inspection chamber with appropriate cable / copper rod.	No.	1		
B3.07	EARTH INSPECTION PIT: 300mm x 300mm Concrete Inspection Chamber clearly marked "EARTH"	No.	1		
B3.08	COPPER BAR: Supply & Install a Earth Potential copper bar measuring 600mm long X 50mm wide X 6mm thick, mounted on insulators in room(s)	No.	1		
B3.09	PIT - EARTH BAR CONNECTION CABLE: Connect the copper lattice matt through the Inspection Chamber and the Earth potential copper bar in Generator room with 16mm sq PVC insulated SC copper cable c/w appropriate cable lugs & any other accessories required.	LM	5		
B3.10	EARTH BAR - EQUIPMENT CABLING: Connect the Earth potential copper bar and Equipment with 16mm sq PVC insulated SC copper cable c/w appropriate cable lugs & any other accessories required.	LM	5		

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
<u>SERVER ROOM & ICT SYSTEMS EARTHING:</u>					
B3.11	EARTH MATT: Supply & Install Earthing Matt for Body Earthing of ICT Equipment complete with a copper lattice matt measuring 1000mm X 1000mm constructed with copper tapes measuring 25mm X 3mm.	No.	1		
B3.12	EARTH INSPECTION PIT: 300mm x 300mm Concrete Inspection Chamber clearly marked "EARTH"	No.	1		
B3.13	COPPER BAR: Supply & Install a Earth Potential copper bar measuring 600mm long X 50mm wide X 6mm thick, mounted on insulators in room(s)	No.	1		
B3.14	PIT - EARTH BAR CONNECTION CABLE: Connect the copper lattice matt through the Inspection Chamber and the Earth potential copper bar in Server room with 10mm sq PVC insulated SC copper cable c/w appropriate cable lugs & any other accessories required.	LM	50		
B3.15	EARTH BAR - EQUIPMENT CABLING: Connect the Earth potential copper bar and Equipment with 10mm sq PVC insulated SC copper cable c/w appropriate cable lugs & any other accessories required.	LM	5		

ACCESSORIES

B3.16	Supply and install 11mm cable markers on both ends of the cables above.	Item.	1		
B3.17	Allow for cable ties for fastening all the above cables at every 300mm interval	Item.	2		
B3.18	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

C POWER RETICULATION & ICT DUCTWORK

C1.01	EXCAVATIONS: Trenching upto 600mm deep, laying of sleeves, backfilling and compacting.	LM	50		
C1.02	POWER MANHOLES: Steel Manhole Covers as per BS497 & En-124 Standards c/w all Frame, Anchors and all other accessories. Cover rated as MEDIUM GAUGE (2500Kgs), engraved 'POWER'. As EAFW.	No.	4		
C1.03	SLEEVES (POWER): 200mm Diameter Heavy gauge PVC sleeves for power. Make as Metro	LM	0		
C1.04	SLEEVES (POWER): 100mm Diameter Heavy gauge PVC sleeves for power. Make as Metro	LM	30		
C1.05	ICT MANHOLES: Steel Manhole Covers as per BS497 & En-124 Standards c/w all Frame, Anchors and all other accessories. Cover rated as MEDIUM GAUGE (2500Kgs), engraved 'ICT'. As EAFW.	No.	3		
C1.06	SLEEVES (ICT): 100mm Diameter Heavy gauge PVC sleeves for ICT. Make as Metro	LM	30		
C1.07	ROAD CROSSING DUCT: 9" Culvert / sleeves for road crossing for KPLC supply cables.	LM	10		
C1.08	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
D FIRE ALARM INSTALLATIONS					
D1.01	FIRE ALARM PANEL: 2-LOOP Addressable fire control panel with the following as minimum requirements: a Should be to loop & communicate with all the other panels in the Premises b Should be to control all fire alarm devices. c Compatible with the fire escape pressurization fans to enable trigger the fans whenever a signal for fire is detected. d Compatible with Lifts & Security devices e.g. Access Control, CCTV & Other Systems in the building for ease of management. e Include inbuilt integral Printer and be Network Ready g Should be BMS "BACNet IP " compatible and should be supplied with the interface port fitted plus any necessary software & programming necessary. h Should be able to cater for All the devices listed below with an additional 20%	No.	1		
D1.02	SMOKE DETECTORS (PHOTOELECTRIC): Addressable Ionisation Smoke detector c/w Bases and all other accessories.	No.	41		
D1.03	HEAT DETECTORS: Addressable Ionisation Heat detector c/w Bases and all other accessories.	No.	2		
D1.04	STROBE LIGHT (CEILING MOUNT): Ceiling mounted Flasher strobe light c/w Bases and all other accessories.	No.	0		
D1.05	WALL SOUNDER BEACON & FLASHER UNIT (COMBINED): Wall mounted Loop powered wall sounder combined with a flasher beacon (as one unit).	No.	4		
D1.06	MANUAL CALL POINT (BREAKGLASS): Surface mount manual call point. This should be a resettable breakglass unit as opposed to a glass.	No.	4		
D1.07	CABLING: Wiring of fire alarm points using 1.5mm ² fire resistant cable as FIRETEC or FP200.	No.	51		
D1.08	INPUT/OUTPUT INTERPHASE UNIT: Channel interface for linking the fire alarm to other systems in the building complete with integral accessories.	No.	2		
D1.09	DISABLED TOILET ALARM KIT: Complete disable toilet alarm system for 1-4 zones/toilets as Zeta's DPTA-KIT4 or equivalent.	No.	1		
D1.10	POWER SUPPLY: Sum for power supply to the various components that require energisation.	Item	1		
D1.11	SUB-TOTAL Inclusive of VAT c/f to ELECTRICAL & FIRE ALARM INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
<u>ELECTRICAL & FIRE ALARM PRICE SUMMARY PAGE</u>					
A	LIGHTING CABLING INSTALLATIONS				
B	SWITCHES & ACCESSORIES				
C	LIGHT FITTINGS & ACCESSORIES				
D	CABLE LADDERS, CABLE TRAYS, TRUNKING & CONDUITS INSTALLATIONS				
E	POWER SUPPLY & ACCESSORIES				
F	MECHANICAL EQUIPMENT POWER SUPPLY				
G	POWER DISTRIBUTION & CABLING				
H	LV PANEL METERBOARD				
I	DISTRIBUTION SUB-BOARD				
J	SYSTEM EARTHING				
K	POWER RETICULATION & ICT DUCTWORK				
L	FIRE ALARM INSTALLATIONS				
M	Preliminaries and General Conditions				
N	SIGNAGE & LABELLING: Allow sum for putting up signage and permanent labels on all installations including cabling as required by the International safety standards				
O	KPLC LIAISON: Allow sum for Liaison with KPLC for permanent Power Connection for entire premises.				
P	ATTENDANCE & LIAISON: Allow sum for attendance to other specialists, Contractors & Management team e.g. Security, Fire Alarm, Building management, Client, BMS, etc.				
Q	TESTING & COMMISSIONING: Sum for testing and commissioning of the entire installations, Including Fire Alarm, LV and Switchgear, complete with all accessories, interconnections, controls, BMS link & activation and the necessary programing.				
R	DOCUMENTATION: Sum for Completion documents: Comprising Workshop drawings, manufacturer's technical product catalogues, users manuals, maintenance manuals, as installed drawings, test certificates, etc. {NOTE: Penultimate Valuation will not be paid until these are fully availed & signed off by the engineer}				
S	TRAINING: Sum for Training of client personel / users (At least 5No Staff for 1Week)				
T	DLP SUM: Sum for 6 months comprehensive maintenance from date of practical completion i.e. for maintainance and replacement of consumables such as blown out devices				
U	TOTAL SUM c/f to Electrical Summary Page				

A STRUCTURED CABLING**A1 Server Room (Infrastructure & Cabling)**

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A1.01	<p>ICT DISTRIBUTION CABINET (SERVER ROOM): Specifications of the Cabinet to be as:</p> <ul style="list-style-type: none"> • 42U Rack Floor Standing. Model As TOTEN (Imported Quality) • Width as 800mm & Depth as 1000mm • Finish with Epoxy Powder Coating (RAL 9004 Black) • Frame: Full Vented Top Frame with Front / Rear / Side Cable Entrance • TOP TRAY: 6 x 4-inch Top Fan Tray with Guard & Filter (Low Noise) • SIDE DOORS: 2 x Lift Off Type with Quick Release Catch & Cam Lock • FRONT DOOR: 1 x Perforated (75%) Arc-Fold with Swing • REAR DOOR: 1 x Double-section Full Perforation with Swing Handle Lock (Hexagon Honey-Comb) <p>Complete with Cable Management, Lock & Key, Panel Mounts, Base frame with provision for cable entrance, Set of Heavy duty Castor wheels,</p> <ul style="list-style-type: none"> • Set of Levelling stands, at least 8 Way Power Distribution Unit with 13A UK Sockets for 240V and all other accessories required. 	No.	1		
	CORE SWITCH				
A1.02	<p>CORE SWITCH: Cisco WS-C2960L-24PQ-LL 24-Port 24 10/100/1000 Power over Ethernet plus (PoE+) ports (PoE budget of 195W); four 1-Gigabit Ethernet small form-factor pluggable (SFP) and four 10-Gigabit Ethernet small form-factor pluggable plus (SFP+) module uplink slots.</p>	No.	1		
A1.03	<p>MODULES: Multimode Fiber modules for above switch(es). Should be 10G.</p>	No.	2		
	FIBER SYSTEM				
A1.04	<p>FIBER PATCH PANEL (MAIN CABINET): 12 port Fiber Optic Modular Panel with the option of using SC simplex, LC duplex or MT-RJ adapters</p>	No.	1		
A1.05	<p>FIBER PATCH CORDS (MAIN CABINET): 1 Meter Long Appropriate Fiber Patch cords as Siemon</p>	No.	5		
A1.06	<p>ADAPTORS - Duplex: Duplex LC Fiber Adaptors</p>	No.	12		
A1.07	<p>LC CONNECTORS - Duplex: Duplex LC Fiber Connectors</p>	No.	12		
A1.08	<p>FIBER TERMINATION: To Patch Panel Per Core</p>	No.	12		
A1.09	<p>CABLE MANAGERS (MAIN CABINET): Siemon 2 U Cable managers for patch cords, horizontal and vertical cables e.t.c to approved cable organizers</p>	No.	5		
A1.10	<p>FIBER VERTICAL CABLING: 4-core fiber optic cable (multimode) 62.5/12.5 micron, running to each Floor Cabinet</p>	LM	55		
A1.11	SUB-TOTAL Inclusive of VAT c/f to ICT & SECURITY INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
A2 Floor Switches					
A2.01	FLOOR NETWORK SWITCH: Cisco WS-C2960L-48PS-LL 48-Port Gigabit PoE Managed Switch 10/100/1000BaseT PoE + 4 Gigabit SFP ports.	No.	3		
A2.02	MODULES: Multimode Fiber modules for above switch(es)	No.	6		
A2.03	STACK CABLES: Appropriate stack cables for the above Switches	No.	1		
A2.04	FLOOR NETWORK SWITCH: Cisco WS-C2960L-24PS-LL 24-Port Gigabit PoE Managed Switch 10/100/1000BaseT PoE + 4 Gigabit SFP ports.	No.	0		
A2.05	MODULES: Multimode Fiber modules for above switch(es)	No.	0		
A2.06	SUB-TOTAL c/f to ICT & SECURITY INSTALLATIONS PRICE SUMMARY PAGE				
A3 Data & Voice Cabling					
A3.01	DATA POINTS: Horizontal cabling for data outlet points wired in 4 pair UTP CAT 6A CU cables drawn in cable tray and trunking and radiating in a star topology from the cabinet.	No.	65		
A3.02	VOICE POINTS: Horizontal cabling for voice outlet points wired in 4 pair UTP CAT 6A CU cables drawn in cable tray and trunking and radiating in a star topology from the cabinet.	No.	23		
A3.03	ACCESS POINTS: Horizontal cabling for WiFi outlet points wired in 4 pair UTP CAT 6A CU cables drawn in cable tray and trunking and radiating in a star topology from the cabinet.	No.	1		
A3.04	DUAL GANG SOCKETS: RJ45 Dual Gang socket outlet / faceplate c/w modules	No.	88		
A3.05	SINGLE GANG SOCKETS: RJ45 Single Gang socket outlet / faceplate c/w modules	No.	6		
A3.06	DESK PATCH CORDS: Drop cables / flyleads. Factory terminated, 5 meters long	No.	89		
A3.07	CABINET PATCH CORDS: Cat 6A stranded 4 pair UTP patch cord. Factory terminated, 1 meter long	No.	89		
A3.08	DATA PATCH PANEL: 48 port Data patch panel	No.	3		
A3.09	DATA PATCH PANEL: 24 port Data patch panel	No.	0		
A3.10	CABLE MANAGER: Provide 2U cable organizers for patch leads, horizontal cabling etc to approval.	No.	10		
A3.11	WI-FI: Access point to be as Ruckus 510 c/w all accessories.	No.	1		
A3.12	ICT CABINET (Floors): 15U Wall mount Cabinet, Width as 600mm & Depth as 600mm. Fully loaded including cable management tray all cable management accessories, lock and key, glass viewing window, mounting provisions, an extractor fan, and PDU for power connection inside the Cabinet.	No.	3		
A3.13	SUB-TOTAL Inclusive of VAT c/f to ICT & SECURITY INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
B IP-PABX & TELEPHONY					
B1 PABX					
B1.01	PABX: Full IP-PABX unit capable of supporting around 50-100 Users, with all Licences required and power supply unit (PSU). <i>To Include the following:</i> <ul style="list-style-type: none"> Should be Rack Mount (2U per shelf), include E1 (PR-ISDN) Connection, an be expandable. Complete with all licences and all accessories for full operation. 	No.	1		
B2 Phones					
B2.01	PHONE 01 (RECEPTION): Operator console IP phone as Panasonic KX-NT546 or equivalent to approval <i>To have the following features:</i> <ul style="list-style-type: none"> POE IP Phone, with high-resolution, graphical, grayscale display (Size 6x16 LCD), 2 Gigabit Ethernet Ports (10/100 Base-T). 24 line freely programmable function keys, dedicated fixed keys for more efficient communications, and Electronic Hook Switch. Speaker Phone, handset and bluetooth compatible headset with full duplex Black Colour. 	No.	3		
B2.02	CONSOLE: DSS Console with 48 flexible buttons for compatible with above phone	No.	1		
B2.03	PHONE 02 (BUILDING OFFICES) - Building Management Room, Gate House(s), Security Room, Maintenance Office, etc: IP Phone with LCD and caller ID as Panasonic KX-NT511P or equivalent to approval <i>To have the following features:</i> <ul style="list-style-type: none"> Standard dial pad, 1-line backlit LCD display, speaker phone, POE, 2 Gigabit Ethernet Ports (10/100 Base-T) black colour 	No.	1		
B2.04	PHONE 03 (OFFICES) - Workstations: IP Phone with LCD and caller ID as Panasonic KX-NT551 or equivalent to approval <i>To have the following features:</i> <ul style="list-style-type: none"> Standard dial pad, 1-line backlit LCD display, speaker phone, POE, 2 Gigabit Ethernet Ports (10/100 Base-T) black colour 	No.	18		
B2.05	PHONE 04 (DIRECTORS' OFFICES) - Workstations: IP Phone with LCD and caller ID as Panasonic KX-HDV430 or equivalent to approval <i>To have the following features:</i> <ul style="list-style-type: none"> POE IP Phone, with high-resolution, smart 4.4 inch back-lit display, standard dial pad, 24 programmable keys & 4 soft keys. Speaker Phone, handset and bluetooth compatible headset with full duplex, Electronic Hook Switch, Black Colour. 	No.	1		
B3 Cabling & Connections					
B3.01	CABLING: Cabling & Connections for all PABX interconnections as stated in the items above	Item	1		
B4	SUB-TOTAL Inclusive of VAT c/f to ICT & SECURITY INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
C CCTV INSTALLATIONS					
C1 Cameras & Accessories					
C1.01	CAMERA MODEL 01: Panoramic IP Dome Camera (180 Degree View): Panoramic IP Dome camera with 180° view angle c/w all other accessories.	No.	0		
C1.02	CAMERA MODEL 02: Indoor Panoramic IP Dome Camera (360 Degree View): Panoramic IP Dome camera with 360° view angle c/w all other accessories.	No.	1		
C1.03	CAMERA MODEL 03: Outdoor Panoramic IP Dome Camera (360 Degree View): Panoramic IP Dome camera with 360° view angle c/w all other accessories.	No.	2		
C1.04	CAMERA MODEL 04: Outdoor PTZ (Pan, Tilt & Zoom) Camera (360 Degree View): Outdoor PTZ Camera with 360 Degree View angle c/w all other accessories.	No.	0		
C1.05	CAMERA POLES: 6,000mm high above ground Camera poles for Outdoor cameras c/w all other accessories.	No.	0		
C1.06	CABLING: Horizontal cabling for Cameras wired in 4 pair UTP CAT 6A CU cables drawn in conduitwork / trunking installed by others and radiating in a star topology from the Switches in the ICT cabinets to the individual cameras & Including Associated accessories including factory terminated RJ 45 sockets and modules to enable a full operation of the installations.	No.	3		
C1.07	CAMERA LICENCES: Camera Licences for all the above IP based Cameras. Please note that the Licences should NOT be annual renewable licenses	No.	3		
C2 Viewing & Recording					
C2.01	NETWORK VIDEO RECORDER (NVR): Network Video Recorder c/w all other accessories. NOTE: Storage Capacity for this NVR Should be 60 Days for all the Cameras Mentioned above. (Calculations of the same to be attached in submission.)	No.	1		
C2.02	MONITOR(S): Wall Mounted monitors c/w mounting brackets, Connection Cables & all other accessories.	No.	1		
C2.03	JOYSTICK CONTROLLER MODULE: Joystick Controller Module c/w connection cables & all other accessories. NOTE: Joystick module should be able to control any of the workstations without interchange of the cables.	No.	0		
C2.04	WORKSTATION & SOFTWARE: Workstation c/w HDD, Accessories, software & all other accessories.	No.	1		
C2.05	PATCH PANEL: 24 port Data patch panel as SIEMON®	No.	0		
C2.06	CABLE MANAGER: Provide 2HU cable organizers for patch leads, horizontal cabling etc to approval.	No.	0		
C2.07	PATCHCORDS: 1 Meter CAT 6A UTP Factory Terminated patch cords for use in the switches	No.	6		
C3	SUB-TOTAL Inclusive of VAT c/f to ICT & SECURITY INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
D ACCESS CONTROL					
D1.01	CARD READER CONTROLLER: Panel to accommodate 1No. access controled door c/w all other accessories. The panel should be BMS BACNet compatible, with the BACNet interface port fitted.	No.	2		
D1.02	BIOMETRIC FINGERPRINT READER WITH PIN PAD & CARD READER: Should come with all other accessories. NOTE: This should be programable to different modes of operation as user demands.	No.	0		
D1.03	CARD READER WITH PINPAD (CR-KP): Proximity card reader with Pinpad c/w all other accessories.	No.	2		
D1.04	CARD READER (CR): Proximity card readers c/w all other accessories.	No.	0		
D1.05	REQUEST TO EXIT (RTE) SWITCH: Request to Exit (RTE) Switch c/w all other accessories.	No.	2		
D1.06	EMERGENCY BREAKGLASS UNIT (BG): For all access controled rooms c/w all other accessories.	No.	2		
D1.07	DOOR RELEASE KEYSWITCH (KS): Door Release Keyswitch c/w all other accessories.	No.	2		
D1.08	ELECTROMAGNETIC LOCK -ML- SINGLE: Maglock c/w mounting brackets and all other accessories.	No.	2		
D1.09	ELECTROMAGNETIC LOCK -ML- DUAL: Maglock c/w mounting brackets and all other accessories.	No.	1		
D1.10	MAGNETIC DOOR CONTACT - MDC (SLIMLINE): Magnetic Door contact (Slimline) for the fire exit doors c/w all other accessories.	No.	2		
D1.11	CABLING: Horizontal cabling for Access Contol devices wired in 4 pair UTP CAT 6 CU cables drawn in conduitwork / trunking installed by others and radiating in a star topology from the to the individual devices & Including Associated accessories including factory terminated RJ 45 sockets and modules to enable a full operation of the installations.	No.	14		
D1.12	PROXIMITY ACCESS CARD (ORDINARY): Proximity Access Cards c/w all other accessories.	No.	10		
D1.13	POWER SUPPLY: Power supply for all the above equipment that require power.	Item	0		
D1.14	WORKSTATION & SOFTWARE: Workstation c/w HDD, Accessories, software & all other accessories.	No.	0		
D1.15	INTEGRATION: Allow sum for interlinking the Access control system to other security alarm panel installed by others.	Item	1		
D1.16	ADDITIONAL ACCESSORIES: Any other necessary item. please specify on a separate sheet showing the various items and their individual costs. Give lumpsum here (If non write NIL)	Item			
D1.17	SUB-TOTAL Inclusive of VAT c/f to ICT & SECURITY INSTALLATIONS PRICE SUMMARY PAGE				

Item	DESCRIPTION	Unit	Qty	RATE (Kshs.)	COST (Kshs.)
<u>ICT & SECURITY PRICE SUMMARY PAGE</u>					
A	SERVER ROOM (INRFASTRUCURE & CABLING)				
B	FLOOR NETWORK SWITCHES				
C	DATA & VOICE CABLING				
D	IP-PABX & TELEPHONY				
E	CCTV INSTALLATIONS				
F	ACCESS CONTROL				
G	UPS: Allow sum for 10kVA double conversion on-line UPS for essential power protection needs				
H	Preliminaries and General Conditions				
I	SIGNAGE & LABELLING: Allow sum for putting up signage and permanent labels on all installations including cabling as required by the International Standards				
J	CABLE MANAGEMENT: Sum for cable Ties for neatly holding the cables in the cable trays and cabinets				
K	ATTENDANCE & LIAISON: Allow sum for attendance to other Specialists, Service Providers, Contractors, Management team e.g. Fire Alarm, Building management, Client, BMS, etc. for connections and all matters pertaining to above Installations for the project				
L	TESTING & COMMISSIONING: Sum for testing and commissioning of the entire installations, complete with all accessories, interconnections, controls, BMS link & activation and the necessary system configurations and programing.				
M	DOCUMENTATION: Sum for Completion documents: Comprising Workshop drawings, manufacturer's technical product catalogues, users manuals, maintenance manuals, as installed drawings, test certificates, etc. {NOTE: Penultimate Valuation will not be paid until these are fully availed & signed off by the engineer}				
N	TRAINING: Sum for Training of client personel / users (At least 5No Staff for 1Week)				
O	DLP SUM: Sum for 6 months comprehensive maintenance from date of practical completion i.e. for maintainance and replacement of consumables such as blown out devices				
P	TOTAL SUM c/f to Electrical Summary Page				

ELECTRICAL SUMMARY PAGE

A	ELECTRICAL & FIRE ALARM	
B	ICT & SECURITY	
C	TOTAL SUM c/f to Main Works Summary Page	

PART NO. 8
PROVISIONAL SUMS

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS

NO.	DESCRIPTION			
	<p><u>PART NO. 8</u></p> <p><u>PROVISIONAL SUMS</u></p> <p><u>ELEMENT NO. 1</u></p> <p><u>NOTES:</u></p> <p>1. The following sums may be expended in whole or in part at the sole discretion and on the sole written authority of the Project Manager.</p> <p>2. The following sums <u>include</u> 16% V.A.T.</p> <p><u>Provide Provisional Sums to cover the cost of the following items to be carried out at Main Contractor's Bill rates or rates pro-rata thereto:</u></p> <p>A <u>Joinery</u> Shillings Eight Hundred Thousand (Shs. 800,000.00) only for the Joinery Fittings;</p> <p>B <u>Statutory Approvals</u> Shillings Four Hundred Thirty Thousand (Shs. 430,000.00) only for the Statutory Approvals;</p> <p>C <u>Contingencies</u> Shillings Five Million (Shs. 5,000,000.00) only for contingencies to cover cost of any unforeseen or minor additional works;</p>			
			Item	800,000.00
			Item	430,000.00
			Item	5,000,000.00
	Total Amount of Element No. 1 Provisional Sums Carried to Part Summary			6,230,000.00

PROPOSED OFFICE BLOCKS FOR TSC- MACHAKOS

NO.	DESCRIPTION	
<u>SUMMARY</u>		
<u>PROVISIONAL SUMS</u>		
<u>ELEMENT NO.</u>	<u>ELEMENT</u>	
1	Provisional Sums	6,230,000.00
TOTAL FOR PROVISIONAL SUMS TO MAIN SUMMARY		6,230,000.00

PART NO. 9

MAIN SUMMARY

Based on stated Completion of **60 (Sixty) Calender Weeks.**

PART NO. 9
SPECIFICATIONS
AND
BILLS OF QUANTITIES
FOR
PROPOSED OFFICE BLOCK
FOR
TEACHERS SERVICE COMMISSION-MACHAKOS
MAIN SUMMARY

PART NO.	PART	PAGE NO.	KSHS.	CTS.
	<u>BILLS OF QUANTITIES FOR: -</u>			
4	Office Block	4/36		
5	External Works	5/81		
6	Mechanical Installation Works	6/95		
7	Electrical Installation Works	7/66		
	<u>Sub-Total</u>	Shs.		
2	Particular Preliminaries	2/7		
3	General Preliminaries	3/29		
8	Provisional Sums	8/2	6,230,000	00
<u>TOTAL AMOUNT OF TENDER (V.A.T Inclusive)</u>		KSHS		

TOTAL AMOUNT OF TENDER IN WORDS KENYA SHILLINGS:

.....

PART NO. 9
SPECIFICATIONS
AND
BILLS OF QUANTITIES
FOR
PROPOSED OFFICE BLOCK
FOR
TEACHERS SERVICE COMMISSION-MACHAKOS
MAIN SUMMARY (Ctd).
(TENDER.)

Signature of Tenderer

Name of Tenderer

Address

.....

Date

Signature of Witness

Name of Witness

Address

.....

Date

APPENDIX NO. 1
SCHEDULE OF DAYWORKS RATES

(THESE RATES ARE PROVIDED TO BE USED IN THE EVENT OF DAYWORKS ACTIVITIES AS DIRECTED BY THE PROJECT MANAGER)

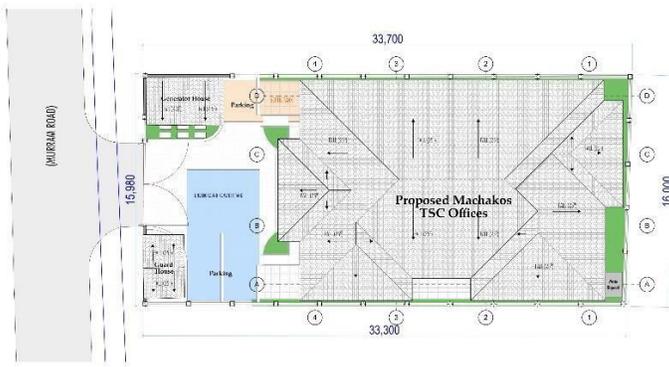
		Qty	Unit	Rate	KSHS	CTS
DAYWORKS						
Note:						
<u><i>All rates provided by the contractor to include and cover for profits and overheads, transport, insurances and premiums as required by regulatory authorities and all other mark-up</i></u>						
Labour						
a	Foreman	1	Hrs			
b	Driver	1	Hrs			
c	Skilled Labour	1	Hrs			
d	Unskilled Labour	1	Hrs			
e	Steel fixer	1	Hrs			
Materials						
e	Cement Portland BS 12/1978	1	Ton			
f	Reinforcement	1	Kg			
g	Aggregates for concrete	1	m3			
h	Wrot shuttering timber	1	m2			
j	Wrot Shuttering timber	1	m2			
k	Timber for trenches	1	m2			
l	Sand	1	m3			
m	Building Stones	1	m2			
Plant and Equipment						
n	Flatbed Trailer	1	Hrs			
p	Wheel Loader	1	Hrs			
q	Truck (25 T), Including Driver	1	Hrs			
r	Truck (8 T), Including Driver	1	Hrs			
s	Tipper Truck (5 T), Including Driver	1	Hrs			
t	Pick-up (4WD), Including Driver	1	Hrs			
u	Land Rover, Including Driver	1	Hrs			
v	Sedan-2000cc, Including Driver	1	Hrs			

		Qty	Unit	Rate	KSHS	CTS
Plant and Equipment Cnt'd						
a	Welding Machine (300A)	1	Hrs			
b	Ultrasonic Thickness Gauge	1	Hrs			
c	Elcometer for Paint Thickness	1	Hrs			
d	Compressor (600CFM)	1	Hrs			
e	Generator (5 KVA)	1	Hrs			
f	Generator (10 KVA)	1	Hrs			
g	Power Grinder/Brush	1	Hrs			
h	Scrapping/Cleaning/Handtools (Set)	1	Hrs			
	Hand Painting Tools	1	Hrs			
j	Paint Sprayer (Including Compressor)	1	Hrs			
k	Concrete Mixer (0.4 M3)	1	Hrs			
l	Jack Hammer	1	Hrs			
m	Vibrator for (Concrete Work)	1	Hrs			
n	Mobile Crane (25T), including operator	1	Hrs			
p	Mobile Crane (5T), including operator	1	Hrs			
q	Trailer (25T), including operator	1	Hrs			
r	Allow for any other items of Materials, Plant or Equipment					
	a)		Item			
	b)		Item			
	c)		Item			
	d)		Item			
	e)		Item			

APPENDIX NO. 2
DRAWINGS

ARCHITECTURAL DRAWINGS

MINISTRY OF TRADE



MINISTRY OF TRADE



SITE PLAN (Scale 1:100)

NOTES

1. All dimensions are in millimeters unless otherwise stated.
2. Figures shown shall be referred to as indicated.
3. Contractor to check correct dimensions before commencing construction and any discrepancy to be reported to the architect for clarification.
4. All dimensions shall be in accordance with the architect's details.
5. All walls are 225mm thick to be reinforced with hoop iron at alternate course.
6. All roof slope and plumbing shall comply with MOE and local authority requirements.
7. All drainage pipes passing under buildings and structures to be enclosed in 100mm concrete channels.
8. All drainage to be maintained and protected.
9. 100mm gauge perforated steel mesh shall be provided in treatment to be provided under ground concrete slab.
10. All drainage to be provided.
11. Provide permanent ventilation above all slabs and all mechanical ductwork shall be 100mm.
12. Details of access and egress to be provided as per schedule.

FINISHES

1. FLOORS
 - a. 100mm concrete
 - b. 100mm concrete
 - c. 100mm concrete
2. WALLS
 - a. 225mm concrete
 - b. 225mm concrete
 - c. 225mm concrete
 - d. 225mm concrete
 - e. 225mm concrete
 - f. 225mm concrete
 - g. 225mm concrete
 - h. 225mm concrete
 - i. 225mm concrete
 - j. 225mm concrete
 - k. 225mm concrete
 - l. 225mm concrete
 - m. 225mm concrete
 - n. 225mm concrete
 - o. 225mm concrete
 - p. 225mm concrete
 - q. 225mm concrete
 - r. 225mm concrete
 - s. 225mm concrete
 - t. 225mm concrete
 - u. 225mm concrete
 - v. 225mm concrete
 - w. 225mm concrete
 - x. 225mm concrete
 - y. 225mm concrete
 - z. 225mm concrete
3. CEILING
 - a. 100mm concrete
 - b. 100mm concrete
 - c. 100mm concrete
 - d. 100mm concrete
 - e. 100mm concrete
 - f. 100mm concrete
 - g. 100mm concrete
 - h. 100mm concrete
 - i. 100mm concrete
 - j. 100mm concrete
 - k. 100mm concrete
 - l. 100mm concrete
 - m. 100mm concrete
 - n. 100mm concrete
 - o. 100mm concrete
 - p. 100mm concrete
 - q. 100mm concrete
 - r. 100mm concrete
 - s. 100mm concrete
 - t. 100mm concrete
 - u. 100mm concrete
 - v. 100mm concrete
 - w. 100mm concrete
 - x. 100mm concrete
 - y. 100mm concrete
 - z. 100mm concrete

REVISIONS

No.	Date	Revision

PROJECT INFORMATION

PROJECT NAME: PROPOSED DOUBLE STOREY OFFICE BLOCKS FOR TEACHERS SERVICE COMMISSION (TSC) AT MACHAKOS COUNTY, MACHAKOS DISTRICT, N. MURRAY COUNTY, KENYA

CLIENT: TEACHERS SERVICE COMMISSION, P.O. BOX, NAIROBI, KENYA

DATE: 01/11/2011
SCALE: 1:100
PROJECT NO.: 11/11/2011

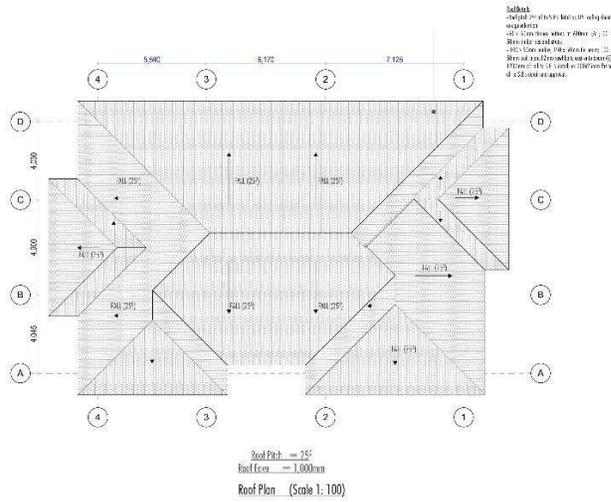
PROJECT TEAM

ARCHITECT: DAMA SERVICES LIMITED
 ARCHITECTS/ENGINEERS/PLANNERS/PROJECT MANAGERS
 P.O. BOX 10000, NAIROBI, KENYA
 TEL: +254 20 2727272

PROJECT NO.: 11/11/2011
SCALE: 1:100
DATE: 01/11/2011

APPROVALS

NAME: _____
SIGNATURE: _____
DATE: _____



NOTES

- All dimensions and instructions shall otherwise stated figures shall be to be unless otherwise stated.
- Contractor to check all dimensions before commencing construction. Any discrepancy to be reported to the Architect for clarification.
- All dimensions shall be taken to the finished state.
- All walls less than 200mm thick to be reinforced with top and bottom bars.
- All concrete and plastering work to comply with MOE and local Authority requirements.
- All drainage pipes, gutters, water fittings, and downpipes to be installed above ground level.
- All works to be completed by the date of the drawing.
- 100% coverage of finished ground shall be provided to be achieved under ground concrete slab.
- All works to be completed by the date of the drawing.
- Where a permanent structure is shown all doors and windows shall be shown in the drawing.
- Rate of losses and allowances to be as per schedule.

FINISHES

- FLOORS**
 - 1. 100mm concrete
 - 2. 100mm concrete
 - 3. 100mm concrete
- SKYING**
 - 1. 100mm concrete
 - 2. 100mm concrete
 - 3. 100mm concrete
- WALLS**
 - 1. 100mm concrete
 - 2. 100mm concrete
 - 3. 100mm concrete
 - 4. 100mm concrete
 - 5. 100mm concrete
 - 6. 100mm concrete
 - 7. 100mm concrete
 - 8. 100mm concrete
 - 9. 100mm concrete
 - 10. 100mm concrete
- CEILING**
 - 1. 100mm concrete
 - 2. 100mm concrete
 - 3. 100mm concrete
 - 4. 100mm concrete
 - 5. 100mm concrete
 - 6. 100mm concrete
 - 7. 100mm concrete
 - 8. 100mm concrete
 - 9. 100mm concrete
 - 10. 100mm concrete

AMENDMENTS

No.	Date	Revision

PROJECT INFORMATION

PROJECT DETAILS
 Name: **PROPOSED SIBOLI STREET OFFICE BLOCKS FOR TEACHERS SERVICE COMMISSION (ESC) AT VARDAS COURTES, MACHAKOS PLOT No. MCH/54/2017/02**

Client: **TEACHERS SERVICE COMMISSION P.O. BOX, NAIROBI, KENYA**
 Design No.: Design Scale: Working Hours: Duration:
 Date: Date: Date: Date:

PROJECT TEAM

Architectural Firm: **DAMA SERVICES LIMITED**
 Architects: P.O. Box 11281
 Project Architect: P.O. Box 11281
 Designer:
 Draftsman:
 Date:

APPROVALS

Signature:
 Date:

MACHAKOS TSC - DOOR SCHEDULE A					
DOOR TYPE	D-01	D-02	D-03	D-04	D-5(e)
DESCRIPTION	- Double leaf aluminium glass door with 8mm thick glass and double sidelights.	- Single leaf laminated flush door. - Door frame section- 150x50 mm. - Door frame size- 2400x900 mm.	- Double leaf aluminium glass door with 8mm thick glass	- Single leaf laminated flush door. - Door frame section- 150x50 mm. - Door frame size- 2400x900 mm.	- Single leaf laminated flush door. - Door frame section- 150x50 mm. - Door frame size- 2400x1100 mm.
PLAN					
ELEVATIONS					
IRON WORKERY SCHEDULE	a). 6 No. Brass hinges as "Union" or equivalent. b). 3-Lever Mortice Lock as "Union" or equivalent. c). 2 No. door stop d). Matching fixed handle set for passive door All ironmongery to be approved by the Architect and supplied with matching screws as necessary.	a). 3 No. Brass hinges as "Union" or equivalent. b). 2-Lever Mortice Lock as "Union" or equivalent. c). 1 No. door stop All ironmongery to be approved by the Architect and supplied with matching screws as necessary.	a). 6 No. Brass hinges as "Union" or equivalent. b). 2-Lever Mortice Lock as "Union" or equivalent. c). 2 No. door stop All ironmongery to be approved by the Architect and supplied with matching screws as necessary.	a). 3 No. Brass hinges as "Union" or equivalent. b). 2-Lever Mortice Lock as "Union" or equivalent & security access control. c). 1 No. door stop All ironmongery to be approved by the Architect and supplied with matching screws as necessary.	a). 3 No. Brass hinges as "Union" or equivalent. b). 1 No. medium duty door closer c). 1 No. Steel Push Plate. d). 1 No. Steel Pull Bar All ironmongery to be approved by the Architect and supplied with matching screws as necessary.
LOCATION	- Main Entrance	Sub-County Offices, Security Office, Store Clerk, Door/Down, server room, IT, Staffing, Director's Office (Deputy and secretary), Kitchen, Human resource.	File Exit	Registry	- Washroom Entrances
QUANTITY	- 1 No.	- 16 No.	- 1 No.	- 1 No.	- 3 No.

NOTES

- All dimensions and materials shall otherwise stated.
- Contractor to check other dimensions before commencing construction work any deviation to be reported to the Architect for clarification.
- Structures shall be built in accordance with the following:
- All masonry shall be built in accordance with the relevant code of practice.
- Advantage and planning work to comply with MCR and local Authority requirements.
- All drainage pipes, gutters, water fittings, and downpipes to be installed in above ground.
- All works to be completed by the date of completion of the project.
- 100% payment of the contract sum shall be made in full on completion of the project.
- All bills of materials to be submitted to the Architect for approval.
- Rate of bills of materials to be submitted to the Architect for approval.

FINISHES

- FLOORS
 - 300mm concrete
 - 100mm screed
 - 20mm tiles
 - 10mm grout
- WALLS
 - 200mm concrete
 - 100mm screed
 - 20mm tiles
 - 10mm grout
- CEILING
 - 100mm concrete
 - 100mm screed
 - 20mm tiles
 - 10mm grout

APPENDICES

No.	Date	Revision

PROJECT INFORMATION

PROJECT DETAILS

PROJECT: **PROVIDING SCHOOL STORE OFFICE BLOCKS FOR TEACHERS SERVICE COMMISSION (TSC) AT VARIOUS COUNTIES, MACHAKOS DISTRICT**
No. MCH/54/2017/20

CLIENT

TEACHERS SERVICE COMMISSION
P.O. BOX, NAIROBI, KENYA

OWNER: Mr. [Name] (Project Manager)
Designing: [Name] (Architect)
Date: [Date]

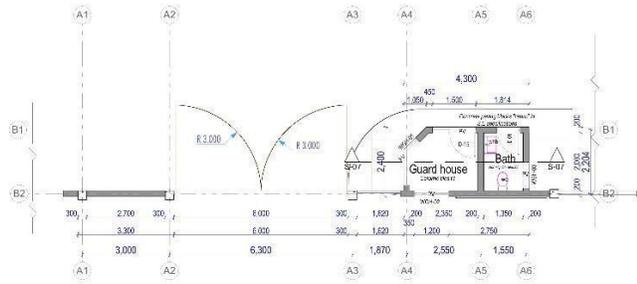
PROJECT TEAM

Architectural Firm: **DAMA SERVICES LIMITED**
Architectural Firm: [Name]
P.O. Box 100, Nairobi, Kenya
Tel: +254 20 222 2222

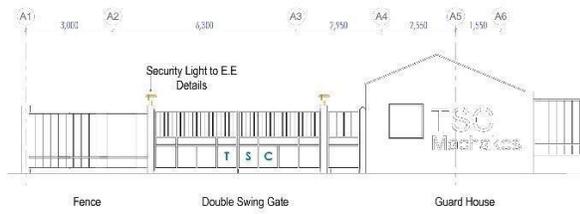
Project Architect: [Name] (P.E.A.) (P.E.S.)
Signature: [Signature]
Checked By: [Name] (P.E.A.)
Designing: [Name] (P.E.A.)
Drawn By: [Name] (P.E.A.)
Date: [Date]

APPROVALS

Signature: [Signature]
Date: [Date]



Guard house Plan 1:100



Guard house Elevation 1:100

NOTES

1. All dimensions are in millimeters unless otherwise stated.
2. Fixtures, materials to be submitted for approval.
3. Contractor to check other drawings before commencing construction and any discrepancy to be reported to the architect for clarification.
4. All structural work to be in accordance with the relevant code of practice.
5. All walls up to 220mm thick to be reinforced with 100mm dia reinforcement.
6. All drainage and plumbing work to comply with MOE and local authority requirements.
7. All drainage pipes passing under buildings and driveways to be enclosed in 100mm concrete channels.
8. All services to be protected and protected.
9. 100% surge protection of wells and cables to be provided to be installed under ground concrete slab.
10. All electrical work to be in accordance with the relevant code of practice.
11. Provide permanent ventilation above all doors and all mechanical exhausts and fans.
12. Refer to associated drawings for respective schedules.

FINISHES

1. FLOORS
 - 1.1. 100mm concrete
 - 1.2. 100mm concrete
 - 1.3. 100mm concrete
2. WALLS
 - 2.1. 100mm concrete
 - 2.2. 100mm concrete
 - 2.3. 100mm concrete
 - 2.4. 100mm concrete
 - 2.5. 100mm concrete
 - 2.6. 100mm concrete
3. CEILING
 - 3.1. 100mm concrete
 - 3.2. 100mm concrete
 - 3.3. 100mm concrete
 - 3.4. 100mm concrete
 - 3.5. 100mm concrete

No.	Date	Revision

PROJECT INFORMATION

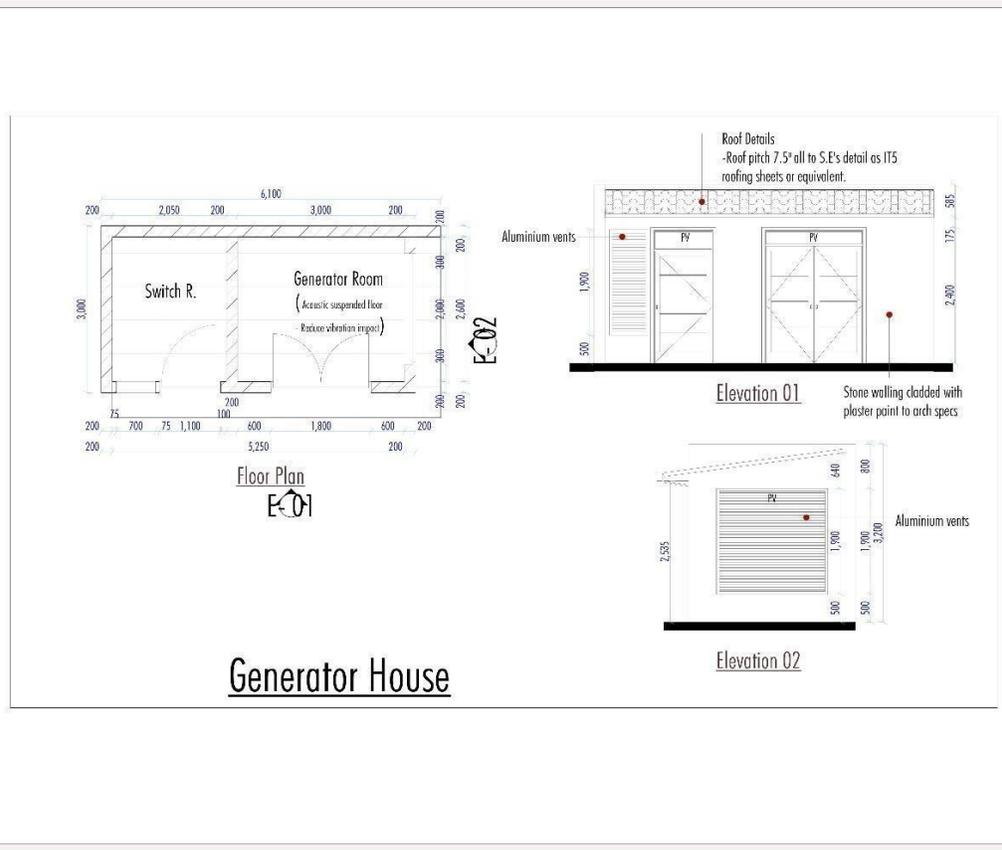
1. PROJECT DETAILS
 NAME: PROPOSED DOUBLE STOREY OFFICE BLOCKS FOR TEACHERS SERVICE COMMISSION (TSC) AT VARIOUS COUNTRIES, MACHAKOS DISTRICT No. MACHAKOS/2017/02

CLIENT: TEACHERS SERVICE COMMISSION, P.O. BOX, NAIROBI, KENYA
 DRAWN BY: [Name] BUILDING NUMBER: [Number] ARCHITECT: [Name]
 SCALE: 1:100

2. PROJECT TEAM
 ARCHITECTURAL FIRM: DAMA SERVICES LIMITED
 ARCHITECT: [Name] PROJECT MANAGER: [Name]
 CONSULTANT: [Name]

Project Architect: [Name] NO. [Number]
 Signature: [Name]
 Checked by: [Name]
 Designed by: [Name]
 Date: [Date]

3. APPROVALS
 Name: [Name]
 Signature: [Name]
 Date: [Date]



Generator House

NOTES

- All dimensions and materials shall otherwise stated.
- Contractor to check all dimensions before commencing construction. Check any discrepancy to be reported to the Architect for clarification.
- All structural work shall be in accordance with the relevant code of practice.
- All walls up to 220mm thick to be reinforced with top and bottom reinforcement.
- All drainage and plumbing work to comply with MOE and local Authority requirements.
- All drainage pipes, gully, water fittings, and downpipes to be installed. Obtain source materials.
- All works to be in accordance with the drawings.
- 100% storage provision of finished work and material to be retained under plastic cover until completion of the project.
- Final programme of works shall be submitted and approved by the Architect.
- Final programme of works shall be submitted and approved by the Architect.

FINISHES

- FLOORS
 - 20mm concrete
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete
- WALLING
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete
- ROOF
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete
- CEILING
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete
 - 100mm concrete

AMENDMENTS

No.	Date	Revision

PROJECT INFORMATION

PROJECT DETAILS
 PROJECT: PROFESOR SOBRIE STREET OFFICE BLOCKS FOR TEACHERS SERVICE COMMISSION (ESC) AT VANDOS COURTESY, MACHAKOS PLOT No. MCH/54/2017/02

CLIENT: TEACHERS SERVICE COMMISSION
 P.O. BOX, NAIROBI, KENYA

OWNER: Mr. Sobrie, P.O. Box 10000, Nairobi, Kenya
 Date: 15/05/2017

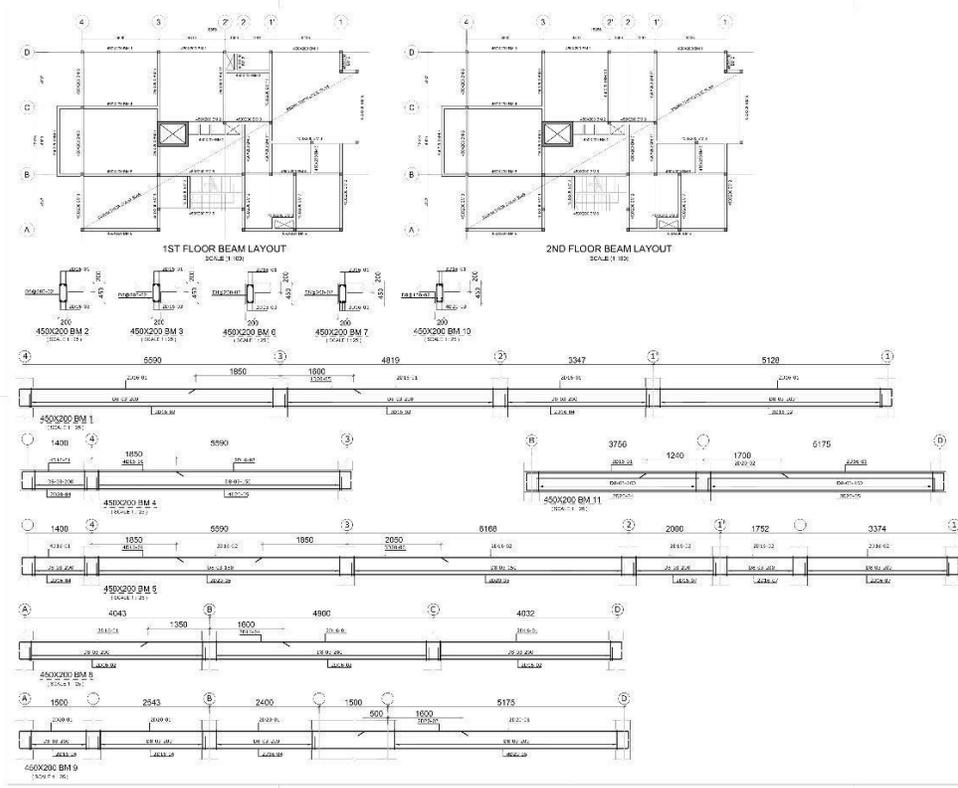
PROJECT TEAM
 Architectural Firm: DAMA SERVICES LIMITED
 ARCHITECT: Mr. Dama, P.O. Box 10000, Nairobi, Kenya
 TEL: +254 20 2222222

Project Architect: C.E. P.O. Box 10000, Nairobi, Kenya
 Signature: _____
 Checked By: _____
 Designing By: _____
 Drawn By: _____
 Date: _____

3. APPROVALS

Signature: _____
 Date: _____

STRUCTURAL DRAWINGS



NOTES

GENERAL

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE SPECIFIED.
4. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE SPECIFIED.
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STEEL

REINFORCEMENT SHALL BE AS PER THE FOLLOWING:

- 1. ALL REINFORCEMENT SHALL BE AS PER THE FOLLOWING:
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CONCRETE

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SHEDULE JIBAL SI BIL

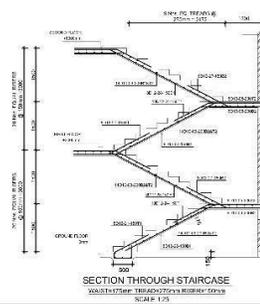
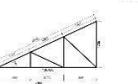
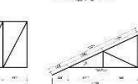
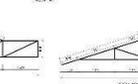
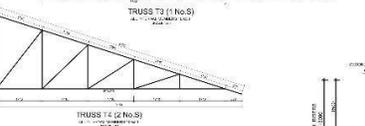
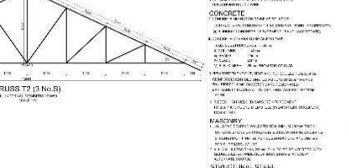
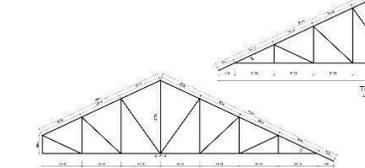
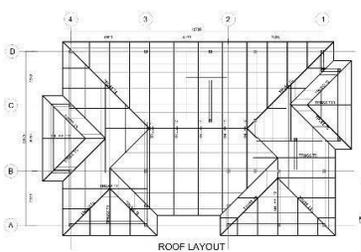
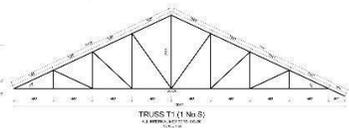
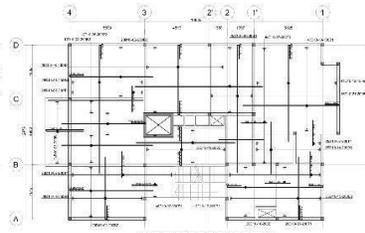
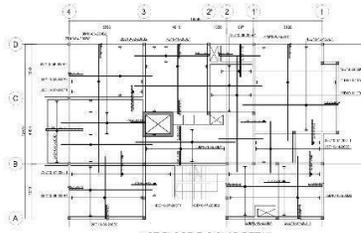
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PROPOSED OFFICE BLOCK FOR TEACHERS SERVICE COMMISSION (TSC) AT MACHAKOS COUNTY

UPDATED



NOTES

GENERAL

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL DIMENSIONS ARE TO FACE UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE SPECIFIED.
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CONCRETE

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STEEL

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REVISIONS

No.	Description	Date
1	Issue for Approval	10/10/2023
2	Issue for Construction	10/10/2023
3	Issue for Construction	10/10/2023
4	Issue for Construction	10/10/2023
5	Issue for Construction	10/10/2023
6	Issue for Construction	10/10/2023
7	Issue for Construction	10/10/2023
8	Issue for Construction	10/10/2023
9	Issue for Construction	10/10/2023
10	Issue for Construction	10/10/2023

PROJECT
PROPOSED DOUBLE STOREY OFFICE BLOCK
FOR TEACHERS SERVICE COMMISSION
TEACHERS SERVICE COMMISSION

CLIENT
TEACHERS SERVICE COMMISSION

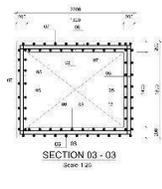
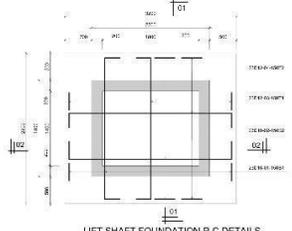
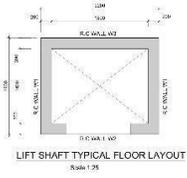
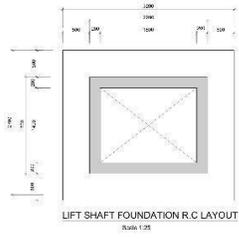
DESIGNER
INTICOM LTD.
CONSULTING ENGINEER
SPECIALIST IN STRUCTURAL ENGINEERING

PREPARED BY
DAMA SERVICES LTD.

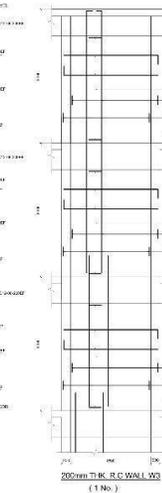
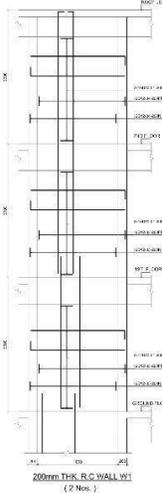
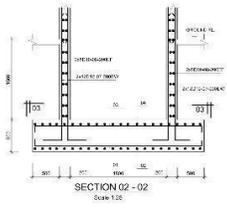
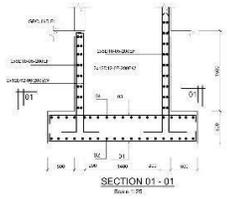
DISTRICT
NO. 8, PAVILION ROAD, SINGAPORE 119078

STARSCAPE DETAILS

DATE: 10/10/2023
SCALE: 1/200
DRAWN: J.S. SINGH
CHECKED: J.S. SINGH
DATE: 10/10/2023



NOTES
GENERAL
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL WALLS ARE TO BE CONSTRUCTED WITH 200mm THICK R.C WALLS.
3. ALL WALLS ARE TO BE CONSTRUCTED WITH 150mm THICK R.C WALLS.
4. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK R.C WALLS.
5. ALL WALLS ARE TO BE CONSTRUCTED WITH 50mm THICK R.C WALLS.



CONCRETE
GENERAL
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
2. ALL WALLS ARE TO BE CONSTRUCTED WITH 200mm THICK R.C WALLS.
3. ALL WALLS ARE TO BE CONSTRUCTED WITH 150mm THICK R.C WALLS.
4. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK R.C WALLS.
5. ALL WALLS ARE TO BE CONSTRUCTED WITH 50mm THICK R.C WALLS.

NO.	DESCRIPTION	QTY	UNIT
1	CONCRETE	1.00	M ³
2	REINFORCEMENT	1.00	T

PROJECT
PROPOSED DOUBLE STOREY OFFICE BLOCK
FOR TEACHERS SERVICE COMMISSION
(SHELL) IN MADRAS CITY
TEACHERS SERVICE COMMISSION

CLIENT
INTICOM LTD,
TEACHERS SERVICE COMMISSION
MADRAS

DESIGNER
DAMA SERVICES LTD.

DATE
10/01/2024

SCALE
1:25

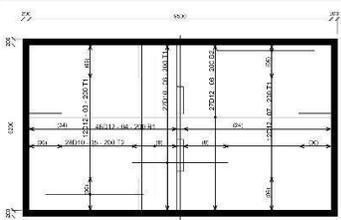
PROJECT TITLE
LIFT SHAFT DETAILS

PROJECT NO.
1000

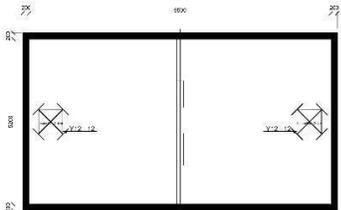
DATE
10/01/2024

SCALE
1:25

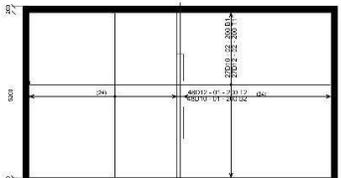
PROJECT TITLE
LIFT SHAFT DETAILS



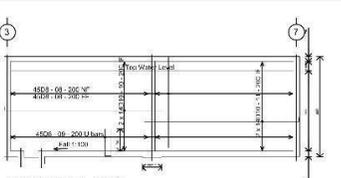
TOP SLAB R.C DETAILS 1:50



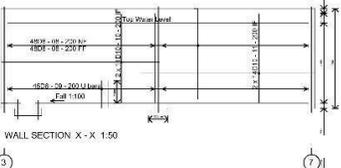
TOP SLAB R.C DETAILS 1:50



BOTTOM SLAB R.C DETAILS 1:50



WALL SECTION X-X 1:50



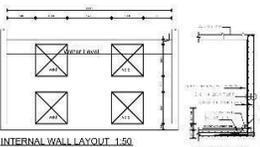
WALL SECTION X-X 1:50



WALL SECTION X-X 1:50



BOTTOM SLAB LAYOUT 1:50



INTERNAL WALL LAYOUT 1:50

GENERAL
 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
 2. ALL WALLS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL BUILDING REGULATIONS.
 3. ALL WALLS ARE TO BE FINISHED WITH PLASTER AND PAINT.
 4. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK BRICKS.
 5. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK BLOCKS.
 6. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK CONCRETE BLOCKS.
 7. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK CONCRETE BLOCKS.
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 9. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK CONCRETE BLOCKS.
 10. ALL WALLS ARE TO BE CONSTRUCTED WITH 100mm THICK CONCRETE BLOCKS.

STRUCTURAL TIMBER
 1. ALL TIMBER SHALL BE OF THE BEST QUALITY AND SHALL BE TREATED WITH AN ANTI-TERMITICIDE.
 2. ALL TIMBER SHALL BE OF THE BEST QUALITY AND SHALL BE TREATED WITH AN ANTI-TERMITICIDE.
 3. ALL TIMBER SHALL BE OF THE BEST QUALITY AND SHALL BE TREATED WITH AN ANTI-TERMITICIDE.
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STRUCTURAL STEEL
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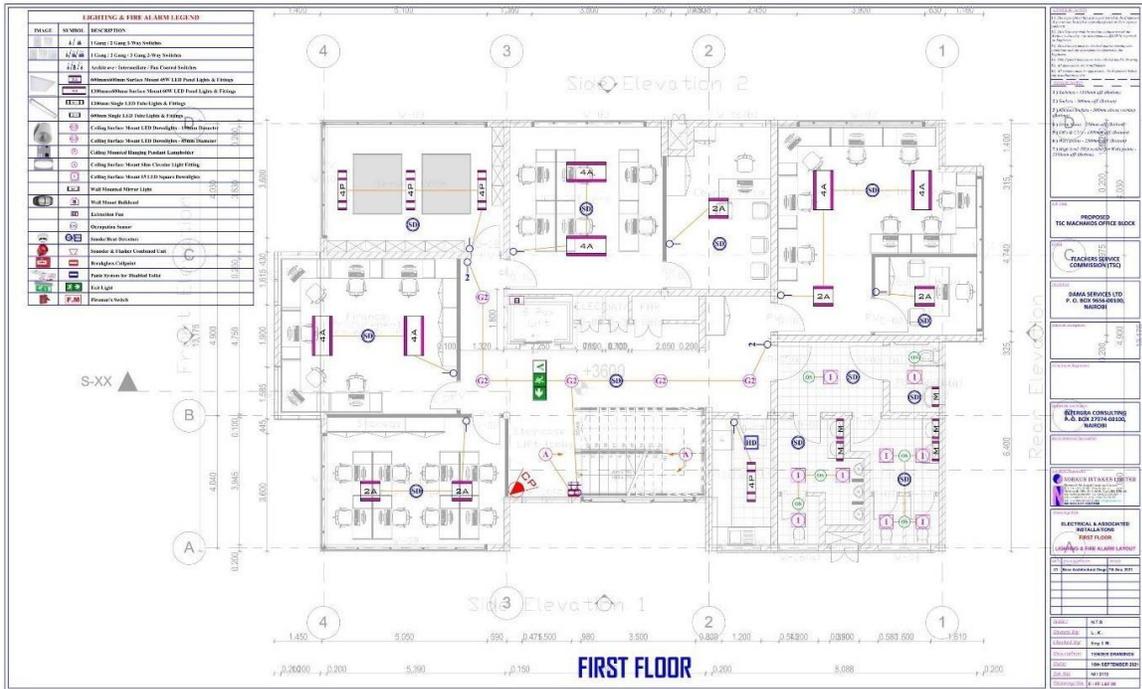
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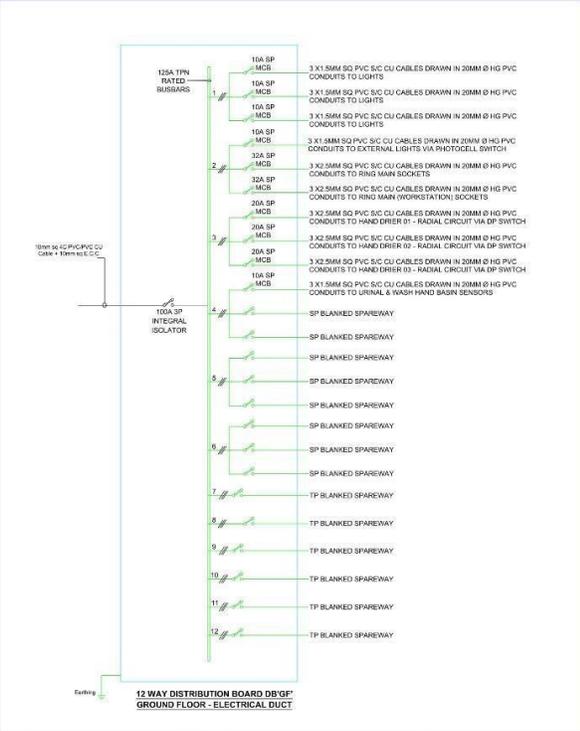
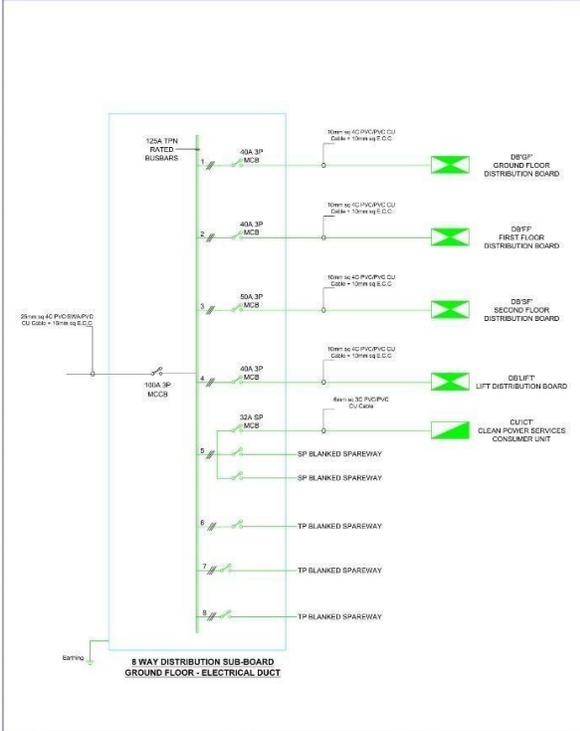
TEACHER'S SERVICE COMMISSION

PROPOSED DOUBLE STOREY OFFICE BLOCK
 FOR TEACHER'S SERVICE COMMISSION ON PLOT
 NO. 103/20/2017/02
 PROJECT
 INTICOM LTD.
 P.O. BOX 14 05 03030
 (00101)

DATE	DESCRIPTION	BY	CHK'D BY

ELECTRICAL DRAWINGS





General Notes:

- The copyright of this drawing is vested in the Engineer.
- It must not be used or reproduced without their express authority.
- This drawing shall be used in conjunction with the relevant Electrical and Mechanical (E&M) drawings by Engineers.
- This drawing must be checked against existing site conditions and any discrepancies reported to the Engineer.
- Only approved dimensions as the values from this drawing.
- All dimensions are in millimeters.
- All supplies must be approved by the Engineers before any installation can start.

Notes:

- Switches - 120mm off (bottom).
- Switches - 300mm off (bottom).
- Blanking plate - 200mm above working (bottom).
- Draw Lines - 250mm off (bottom).
- DB'GF CU - 1000mm off (bottom).
- DB'FF CU - 2500mm off (bottom).
- DB'SF CU - 2500mm off (bottom).
- DB'LIFT CU - 2500mm off (bottom).
- Height from 1000mm for Protection panel - 2500mm off (bottom).

Scale:

NORKUN INTAKES LTD
 Electrical & Mechanical Consulting Engineers (E&M)
 Nairobi Kenya
 P.O. Box 9656 - 00100
 Nairobi, Kenya
 Tel: +254 20 278 9988 - 2789 2789
 Fax: +254 20 278 9988
 Email: info@norkun.co.ke

Client:

DAMA SERVICES LTD
 P. O. Box 9656 - 00100
 NAIROBI, KENYA

Project:

PROPOSED TSC MACHAKOS OFFICE BLOCK DEVELOPMENT

Client:

TEACHERS SERVICE COMMISSION (TSC)

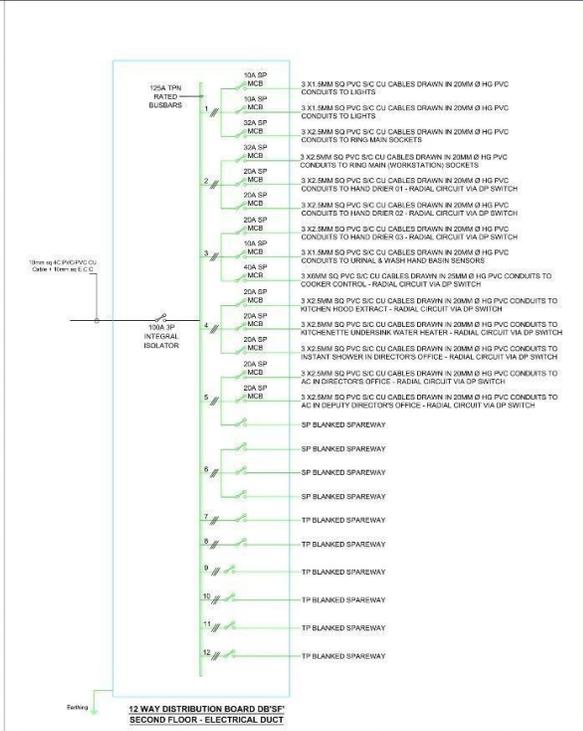
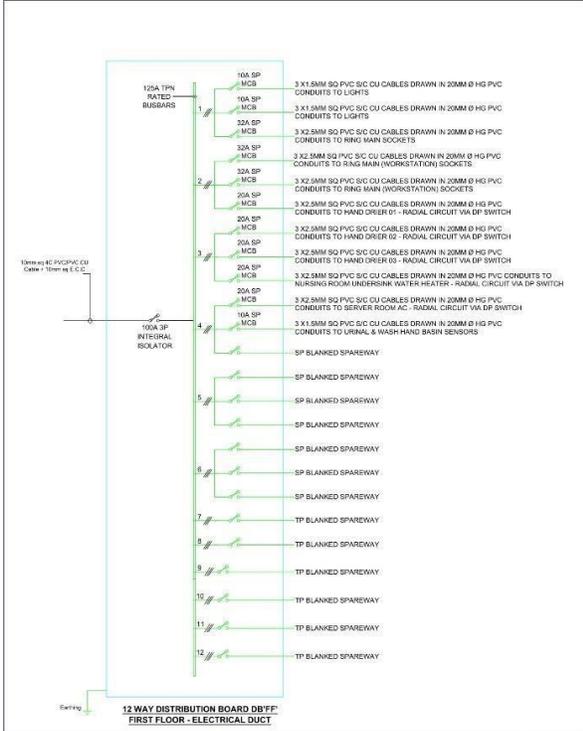
Revision:

ELECTRICAL & ASSOCIATED INSTALLATIONS POWER SCHEMATICS 02

Drawn: N.T.S.
Checked: L.K.
Checked: Eng. I.H.

Date: 12th SEP 2021
Scale: N.T.S.
Drawn: L.K.
Checked: Eng. I.H.

Proj. No.: NI / 2112 / E - P502



General Notes

- The copyright of this drawing is vested in the Engineer.
- It shall not be used or reproduced without the express authority of the Engineer.
- This drawing shall be used in conjunction with the architect's drawing, and the responsibility shall be upon the Engineer.
- This drawing must be checked against existing site conditions and any discrepancies reported to the Engineer.
- Any physical dimensions shall be taken from this drawing.
- All dimensions are in millimeters.
- All supplies must be approved by the Engineer before any installation is done.

Notes

- 1) Switches - 100mm off (bottom)
- 2) Switches - 50mm off (bottom)
- 3) Switches - 100mm off (bottom)
- 4) Switches - 25mm off (bottom)
- 5) 100A SP - 100mm off (bottom)
- 6) 100A SP - 250mm off (bottom)
- 7) 100A SP - 100mm off (bottom)

Client
NORKEN INTAKES LTD
Electrical & Mechanical Consulting Engineers (P.L.C.)
P.O. Box 9656 - 00100
NAIROBI, KENYA

Contractor
DAMA SERVICES LTD
P. O. Box 9656 - 00100
NAIROBI, KENYA

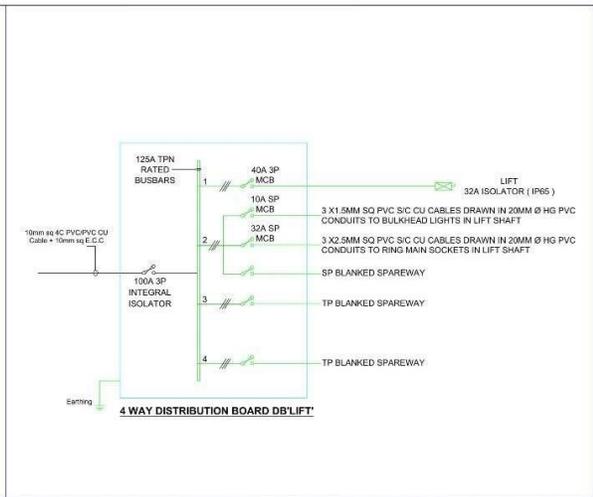
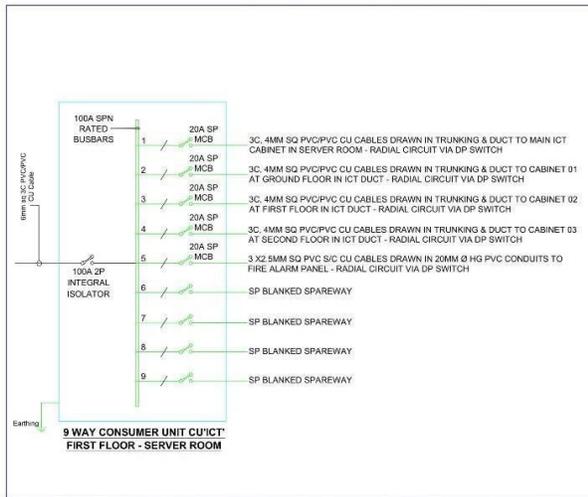
Project
PROPOSED TSC MACHAKOS OFFICE BLOCK DEVELOPMENT
TEACHERS SERVICE COMMISSION (TSC)

Revision
REVISIONS

No.	Description	Date
1	Issue for Tender	15/09/2021
2	Issue for T.S.D.	15/09/2021
3	Issue for L.R.	15/09/2021
4	Issue for E.I.R.	15/09/2021

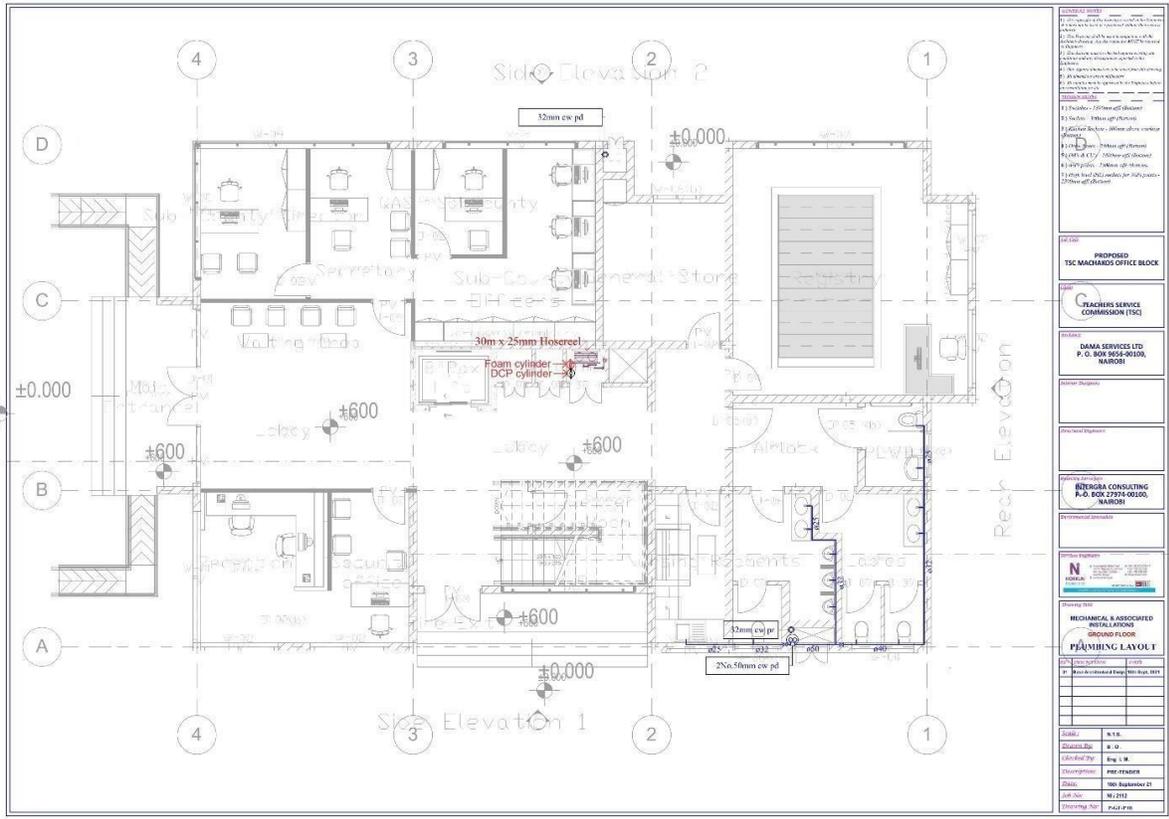
Scale: N.T.S.
Drawing: L.R.
Checked: Eng. I.R.

NI / 2112 / E - P593

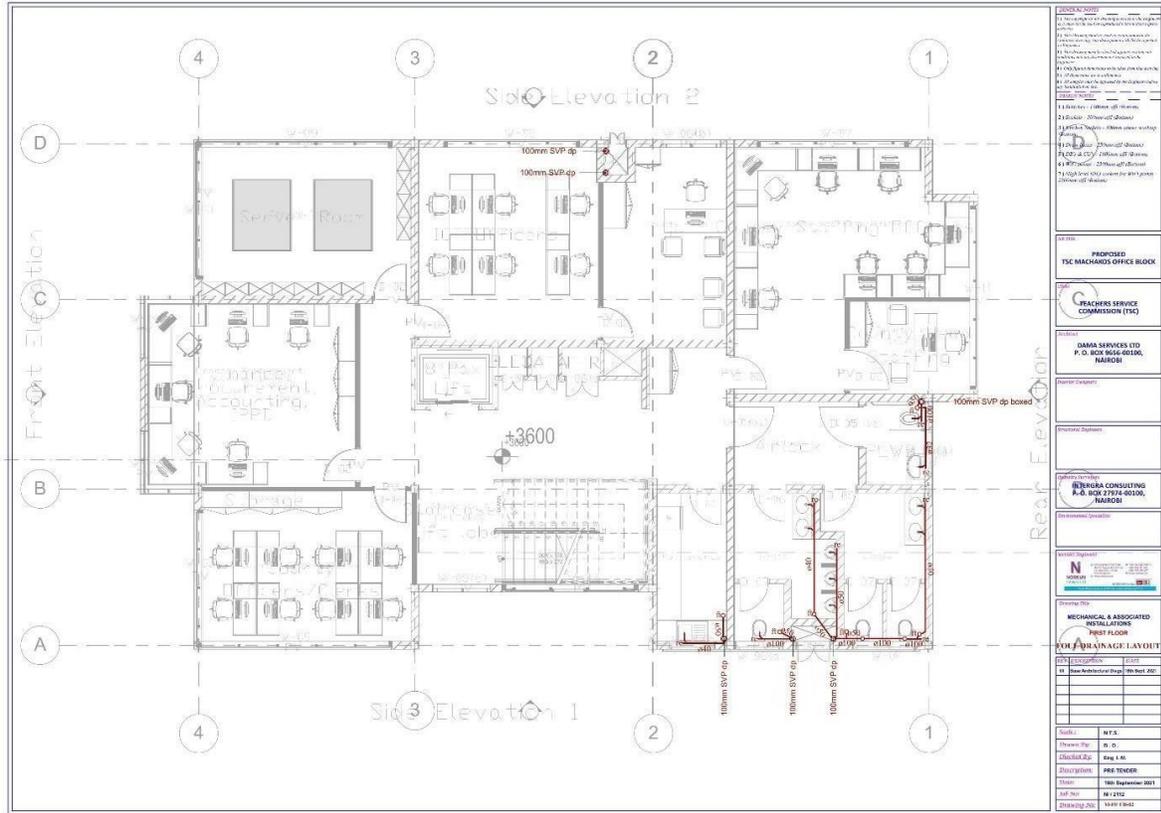


<p>General Notes:</p> <ol style="list-style-type: none"> 1) The copyright of this drawing is vested in the Engineer. 2) It may not be used or reproduced without their express authority. 3) The drawing shall be used in conjunction with the Architects drawing. Any deviation is the responsibility of the Engineer. 4) The drawing shall be checked against existing site conditions and any discrepancies reported to the Engineer. 5) All dimensions are in millimeters unless otherwise stated. 6) All dimensions are in millimeters. 7) All samples must be approved by the Engineer before any construction can start. 	<p>Notes:</p> <ol style="list-style-type: none"> 1) 100A SPN - 1200mm off (Main) 2) 100A SPN - 1000mm off (Main) 3) 100A SPN - 1000mm off (Main) 4) 100A SPN - 1000mm off (Main) 5) 100A SPN - 1000mm off (Main) 6) 100A SPN - 1000mm off (Main) 7) 100A SPN - 1000mm off (Main) 	<p>Service Engineer:</p> <p>NORKUN INTAKES LTD Electrical & Mechanical Contracting Engineers (P.L.C.) Nairobi, Kenya P.O. Box 9655 - 00100 NAIROBI, KENYA</p>	<p>Contractor:</p> <p>DAMA SERVICES LTD P. O. Box 9655 - 00100 NAIROBI, KENYA</p>	<p>Job Title:</p> <p>PROPOSED TSC MACHANOS OFFICE BLOCK DEVELOPMENT</p> <p>Client:</p> <p>TEACHERS SERVICE COMMISSION (TSC)</p>	<p>Drawing Title:</p> <p>ELECTRICAL & ASSOCIATED INSTALLATIONS POWER SCHEMATICS 04</p> <p>Date: 13th SEP 2021 Scale: N.T.S. Drawn: L.K. Checked: Eng. I.M.</p> <p>Job No: NI / 2112 / E - P804</p>
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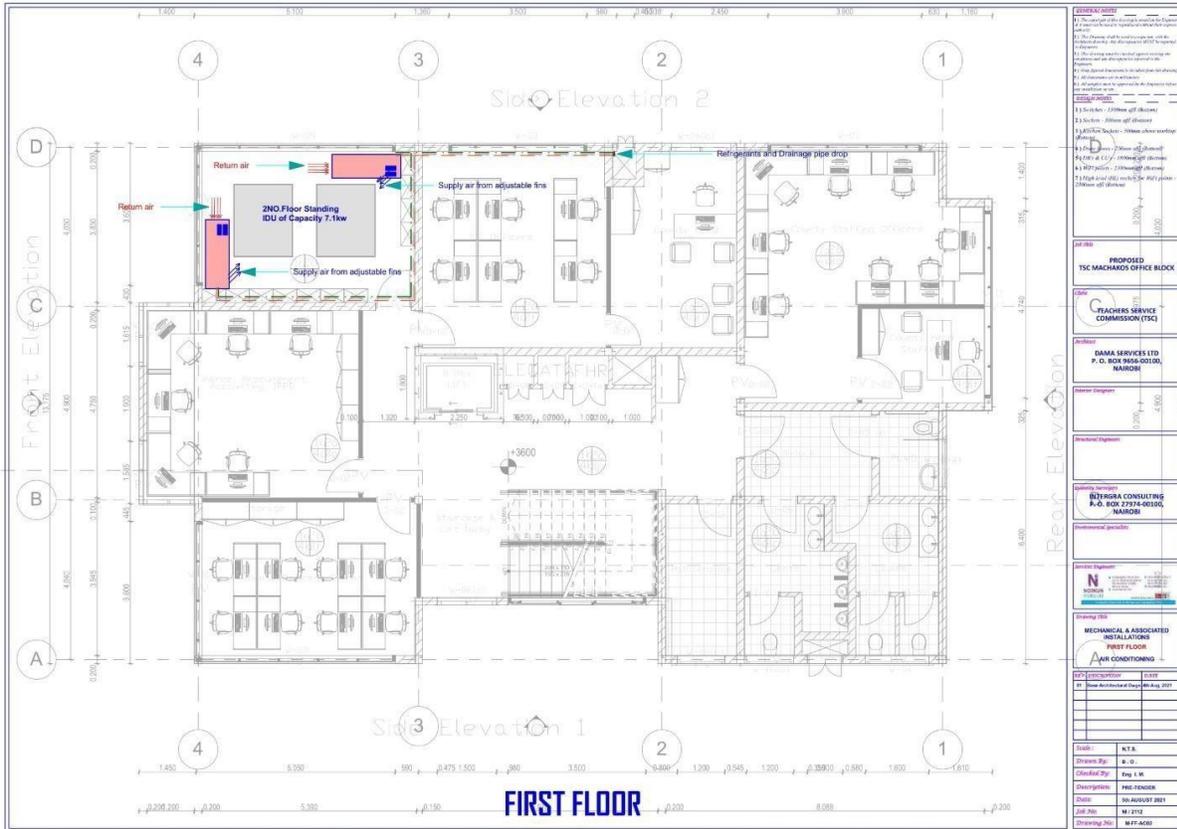
MECHANICAL DRAWINGS

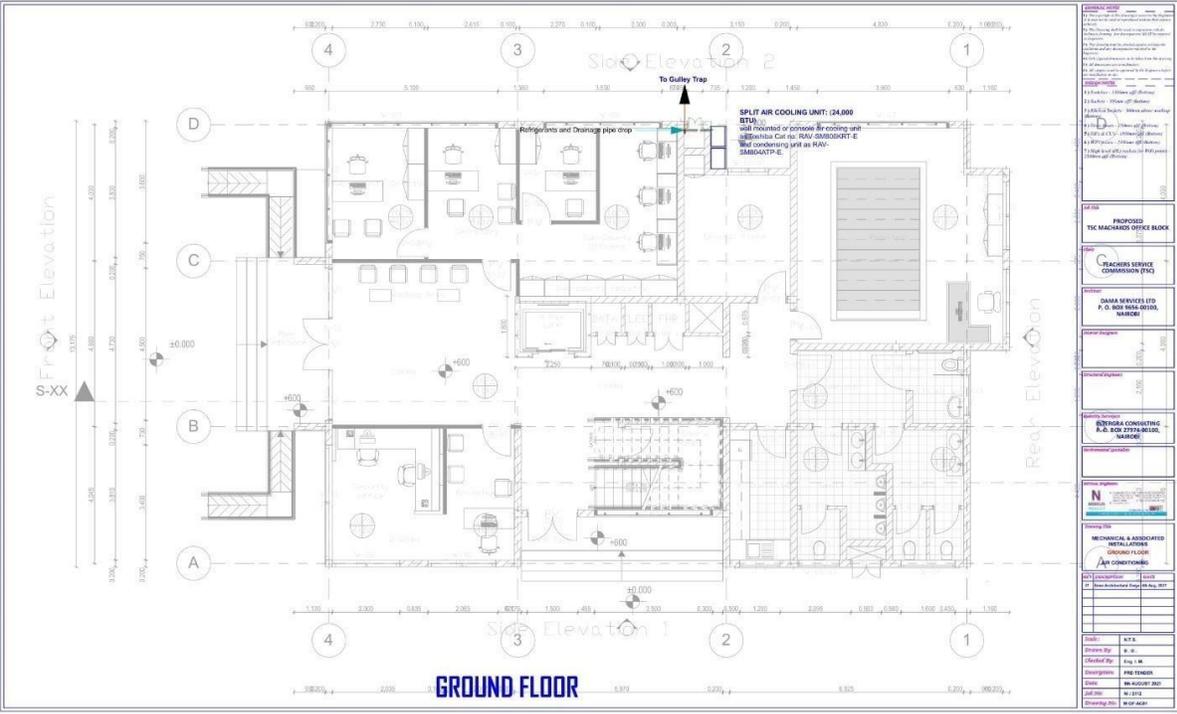


<p>PROPOSED TSC MADHARAS OFFICE BLOCK</p> <p>MECHANICAL & ASSOCIATED INSTALLATIONS</p> <p>GROUND FLOOR</p> <p>PLUMBING LAYOUT</p>	
Client:	TSC
Designer:	ME
Checked by:	Eng. L.W.
Description:	PRE-FEASIBILITY
Date:	18th September 2011
Scale:	As Shown
Drawing No:	ME-GF-01



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1	General Notes
2	Structural Notes
3	MEP Notes
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9	Plaster Schedule
10	Roofing Schedule
11	Site Works Schedule
12	Other Schedule
PROPOSED TSC MANAGED OFFICE BLOCK	
TEACHERS SERVICE COMMISSION (TSC)	
DAMA SERVICES LTD P. O. BOX 9556-0100, NAIROBI	
MEP CONSULTING P. O. BOX 27974-0100, NAIROBI	
MECHANICAL & ASSOCIATED INSTALLATIONS FIRST FLOOR	
MEP MANAGE LAYOUT	
Scale:	N.F.S.
Drawn By:	R. S.
Checked By:	Eng. M.
Discipline:	MEP TENDER
Date:	16th September 2021
Ref No:	ME 27974
Drawing No:	MEP 1 (REV)





PROPOSED	TIC MACHADOS OFFICE BLOCK
CLIENT	TEACHERS SERVICE COMMISSION (TSC)
DESIGNER	DAMA SERVICES LTD P. O. BOX 9004-00105 NAIROBI
SCALE	1:100
DATE	2018
PROJECT NO.	MECHANICAL & ASSOCIATED METALLURGY AIR CONDITIONING
DESIGNER	M.T.S.
CLIENT	TSC
DESIGNER	Eng. I.M.
ENGINEER	ENG. TONY
DATE	18/06/2018
SCALE	1:100
PROJECT NO.	MECHANICAL & ASSOCIATED